Question-led Learning

Teaching and learning and curriculum development

Questions and curiosity
Into action

Melvin Freestone - www.questionledlearning.org

Question-led learning

Acknowledgement
Special thanks to Phil Tyson for his insightful contributions and experienced advice.

Preface

Work in progress

‘Question-led learning’ is designed to support learning through inquiry. It outlines learning that is foundational for living and working in a complex and rapidly changing world.

Resourceful people ask questions to build and create knowledge and experience. In so doing, understanding, imagination, creativity, and inventiveness are opened.

Questions gain added value when they are personalised to the needs of learners and customised to the aspirations of different communities.

Melvin Freestone *May 2025*

Walking on two legs!

Inquiry-based learning and developing enabling capabilities are interdependent and mutually supportive.

They are brought into action through question-led learning and direct teaching

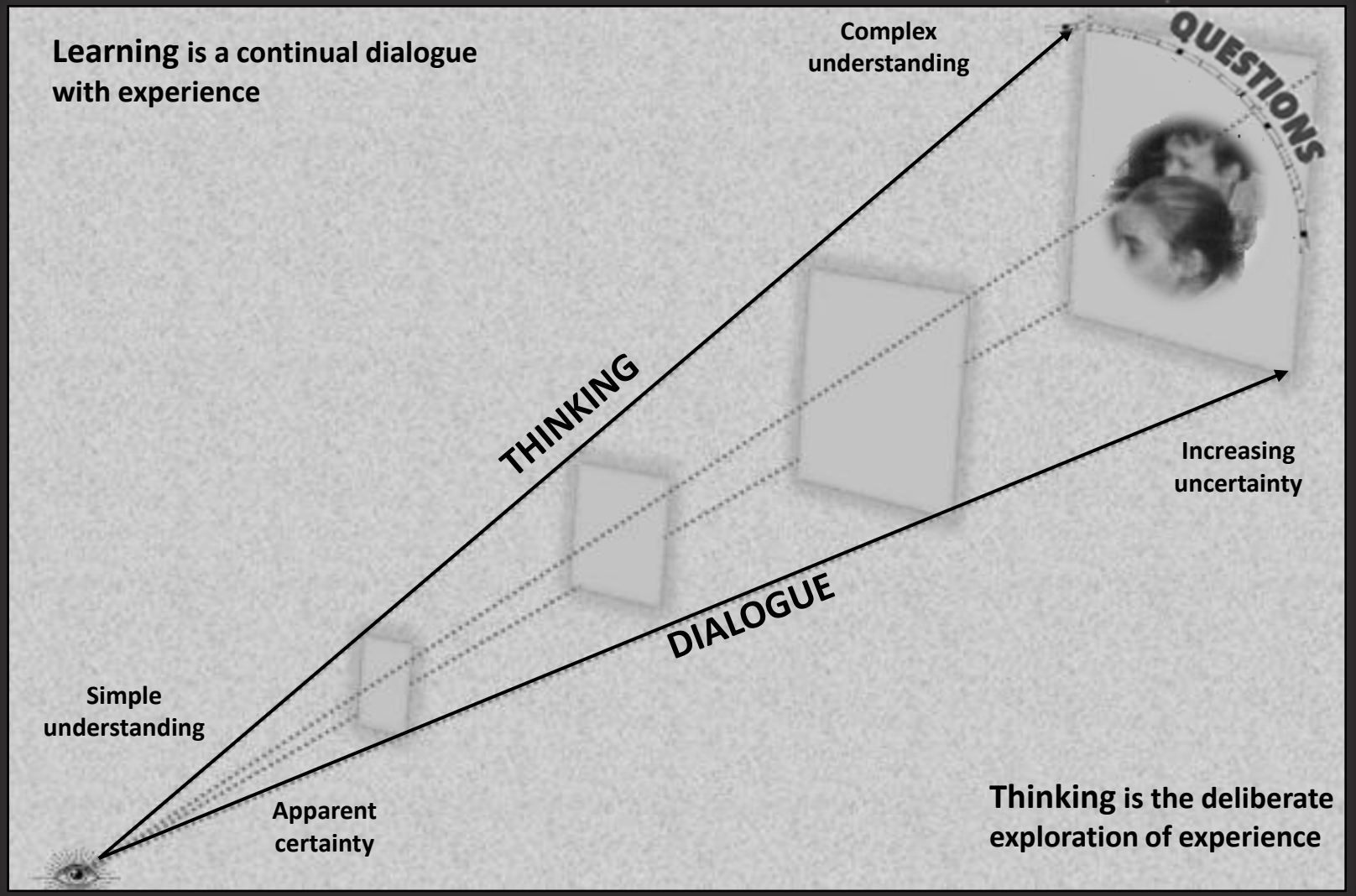
Gateways

Click to access

Five different gateways into the resource.
Choose the one that is best for you

Click here for Glossary

LEARNING FOUNDATIONS
Question-led learning



LEARNING FOUNDATIONS GATEWAY

Contents

Click to access

F = frame number

Note - the changes in referencing some of the frames in the podcasts is due to the addition of new frames in response to ongoing feedback

- ***F11 is referred to as F10 in the podcasts***
- ***F13 is referred to as F12 in the podcasts***

Back

Appreciating insights

People and organizations bring different perceptions

"Education is the most powerful weapon which you can use to change the world."

"Education is the great engine to personal development."

"No country can really develop unless its citizens are educated."

Nelson Mandela

"If you're not prepared to be wrong, you'll never come up with anything original."

"We stigmatize mistakes in school, mistakes are the worst thing you can make. We are educating our kids out of their creative capacities."

Sir Ken Robinson

Knowledge Building and Knowledge Creation: One Concept, Two Hills to Climb.

Carl Berieter & Marlene Scardamalia

"Learning is a treasure that will follow its owner everywhere."

Chinese Proverb

"Tell me and I forget, teach me and I may remember, involve me and I learn."

Benjamin Franklin

To help learners succeed in the future, we need to empower them to break the mold and think creatively.

Square Panda India

Lifelong principles

Courage – Accepting challenges and embracing opportunities.

Growth – Aspiring to learn, and improve even when it is tough.

Respect – Caring for ourselves, each other, and our environment.

Responsibility – Stepping up and doing what is right.

Connection – Building positive relationships and a sense of belonging

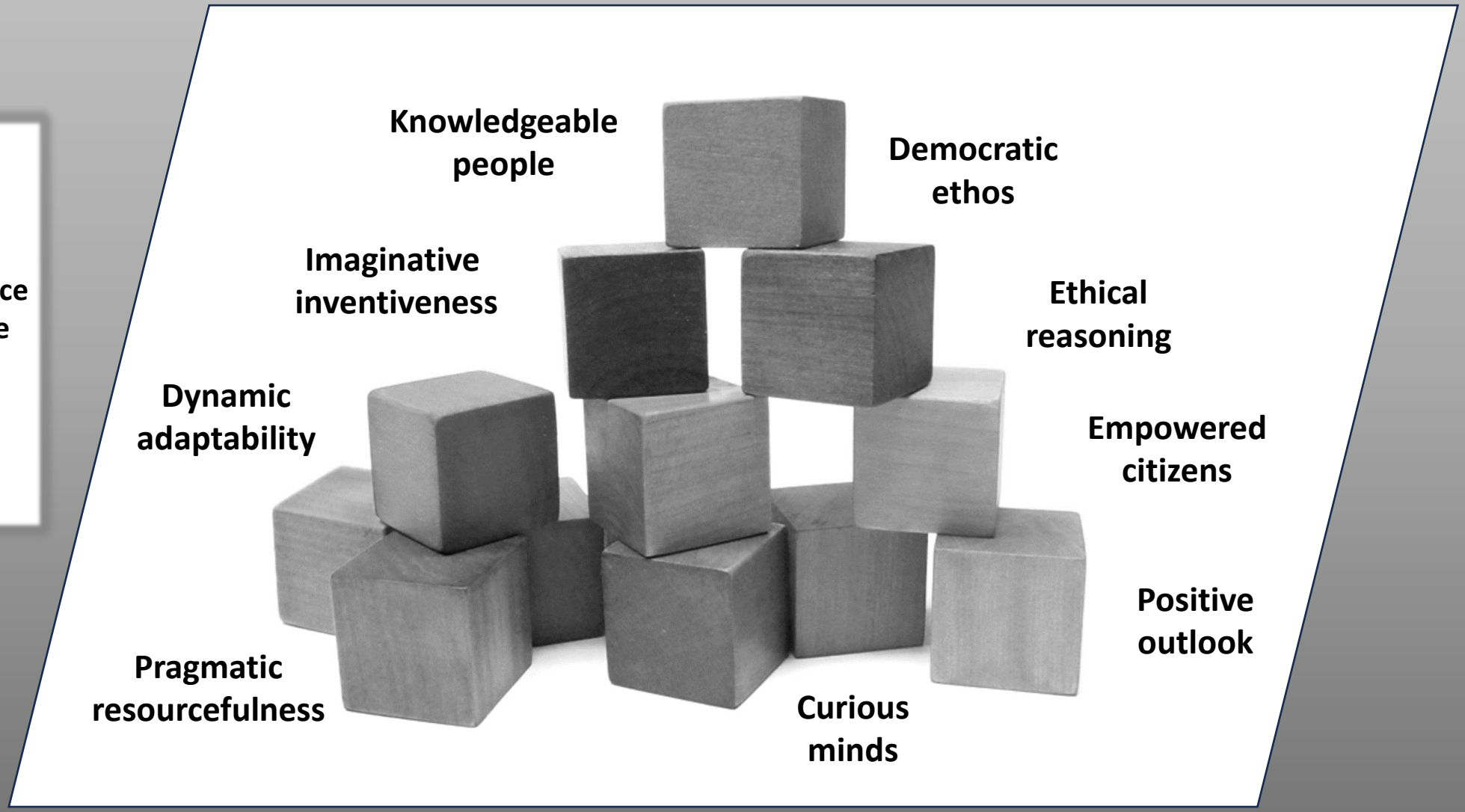
Tasmanian Government

Building valued practices

Different perspectives reflect values.

The values that underpin this resource are identified in the 'big picture'.

Interconnections between the blocks are incited by curiosity



Pinpointing perspectives

Different perspectives reflect values, purposes and experiences

A learning perspective

Curiosity and creativity are **intelligence having fun.**

Albert Einstein

Curiosity is the **engine of achievement.**

Sir Ken Robinson

Curiosity and questions will get you **further than confidence and answers.**

Maxime Lagacé

Much of what I stumbled into by following my curiosity and intuition turned out to be **priceless later on.**

Steve Jobs

We keep moving forward, opening new doors, and trying new things, because we are curious, and curiosity **keeps leading us down new paths**.

Walt Disney

Satisfaction of one's curiosity is one of the **greatest sources of happiness in life.**

Linus Pauling

A societal perspective

Being **democratic**, being **ethical**, being **knowledgeable**, being **imaginative** and being **inventive** are requirements for living and working in modern societies. They provide a raison d'être for curiosity, intelligent thinking and deep understanding.

They create contexts and purposes for thinking and understanding that transcend circumstances, needs or desires.

An expert perspective

A comment attributed to Einstein is particularly pertinent.

If I had an hour to solve a problem, I would spend fifty-five minutes finding the right question and then only need five minutes to solve the problem.

Establishing purposes

Universal purposes that have gained wide acceptance

To know

Rich understandings developed from broad and diverse experiences

To do

Practicable knowledge applied in everyday life and to emerging challenges

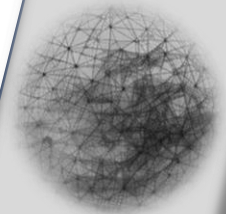
To live together

Social responsibility and wise action in caring communities and environments

To be

Personal strength and community identity expressed in unique and diverse ways

Inform-critique-discern
Transform-create-innovate
in a digital world

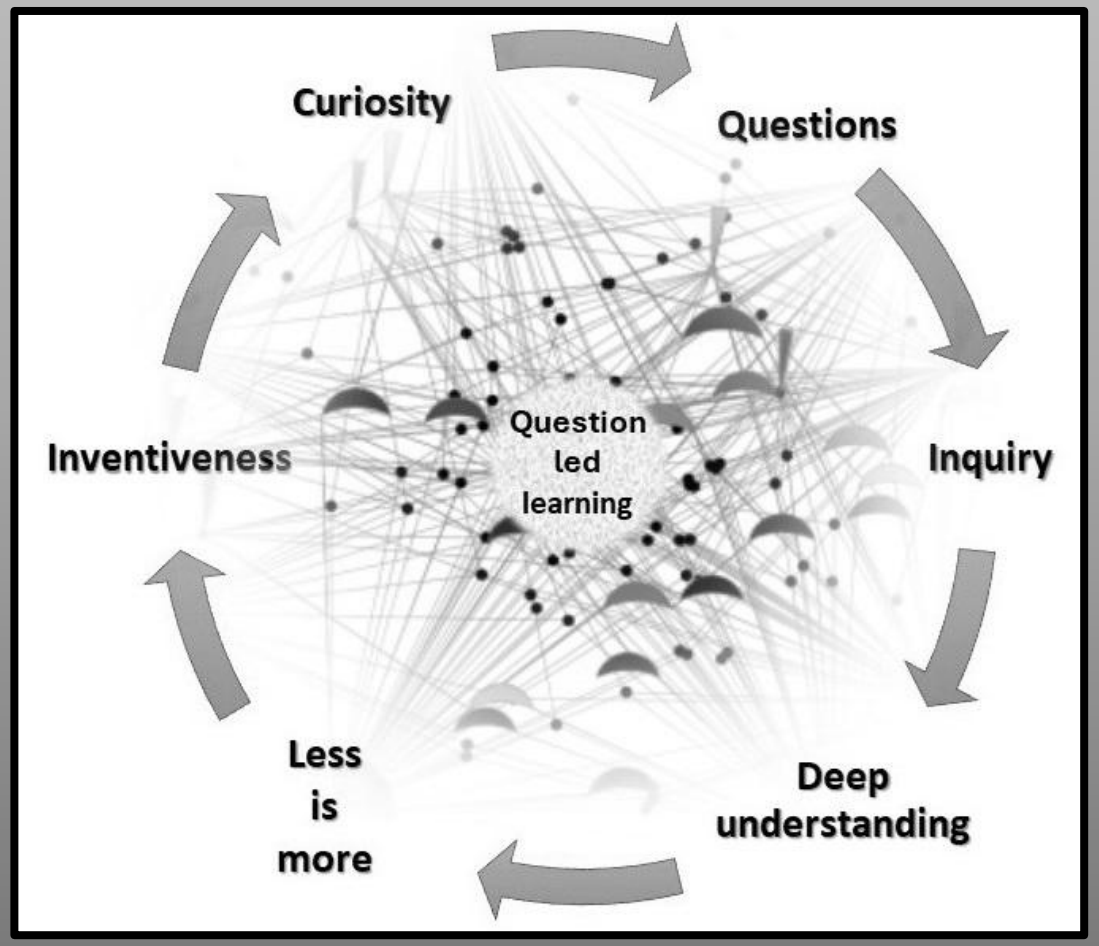


To participate
in a digital world
a 5th pillar?

Intercultural pillars for learning

Active learning

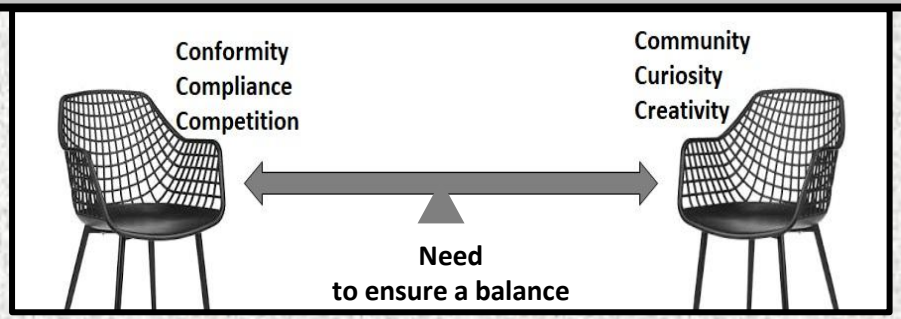
Key elements in dynamic, iterative and evolving learning processes across different domains of human endeavour.



Curiosity	• Generated from real-life experience • Purposeful thought and action • Making sense of the unknown
Questions	• Wonder questions focus on unknowns • Vexing questions focus on dissonance • 'What if' questions focus on possibility
Inquiry	• Structured and detailed investigations • Direct teaching ideas and skills required • Intentional yet open-ended explorations
Deep understanding	• Balance of simple and complex thinking • Development of transferable 'big ideas' • Conceptually and contextually grounded
Less is more	• Real-life connectedness and relevance • Personalised and customised to needs • Refined responses to curious inquiries
Inventiveness	• Discover and design ideas and practices • Generate strategic concepts for action • Develop and enact ideas and practices

Designing programs

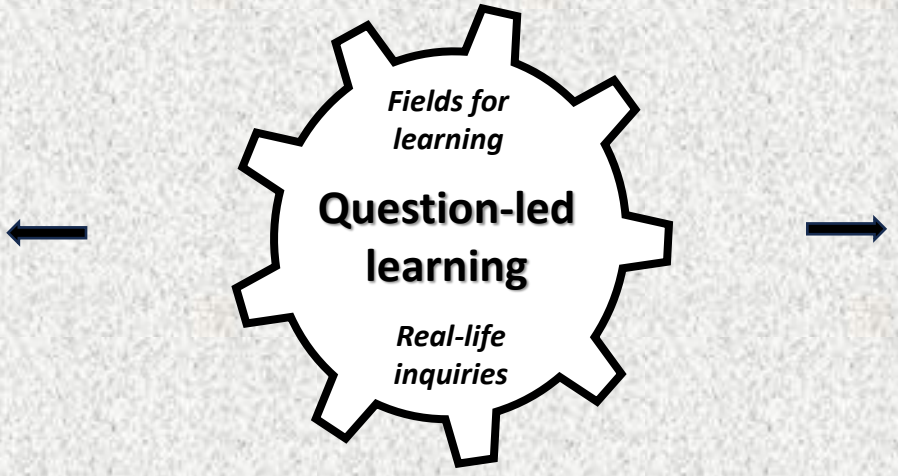
Focus on teaching and learning, not curriculum polemics!

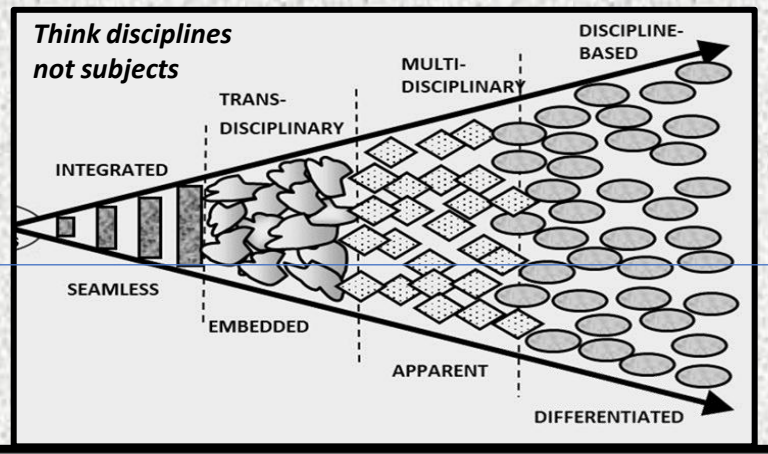


Contradiction

The Global Education Reform Movement (GERM) has led to a proliferation of prescriptive curriculum texts reinforced by standardized testing. With many education programs narrowed and teachers teaching to the tests.

Mandates for creativity and tightly regulated curriculum reform aimed at improving standardized test scores are contradictory. Tension between the two intentions weighs heavily on teachers and educators. Especially if learning to learn and go on learning throughout life is seen as the heart of education.





Shift

Learning led by curious questions is a significant development when juxtaposed against prescriptive content and outcomes-based curriculums. Personalizing learning as well as customizing programs to the circumstances and aspirations of different communities becomes more important.

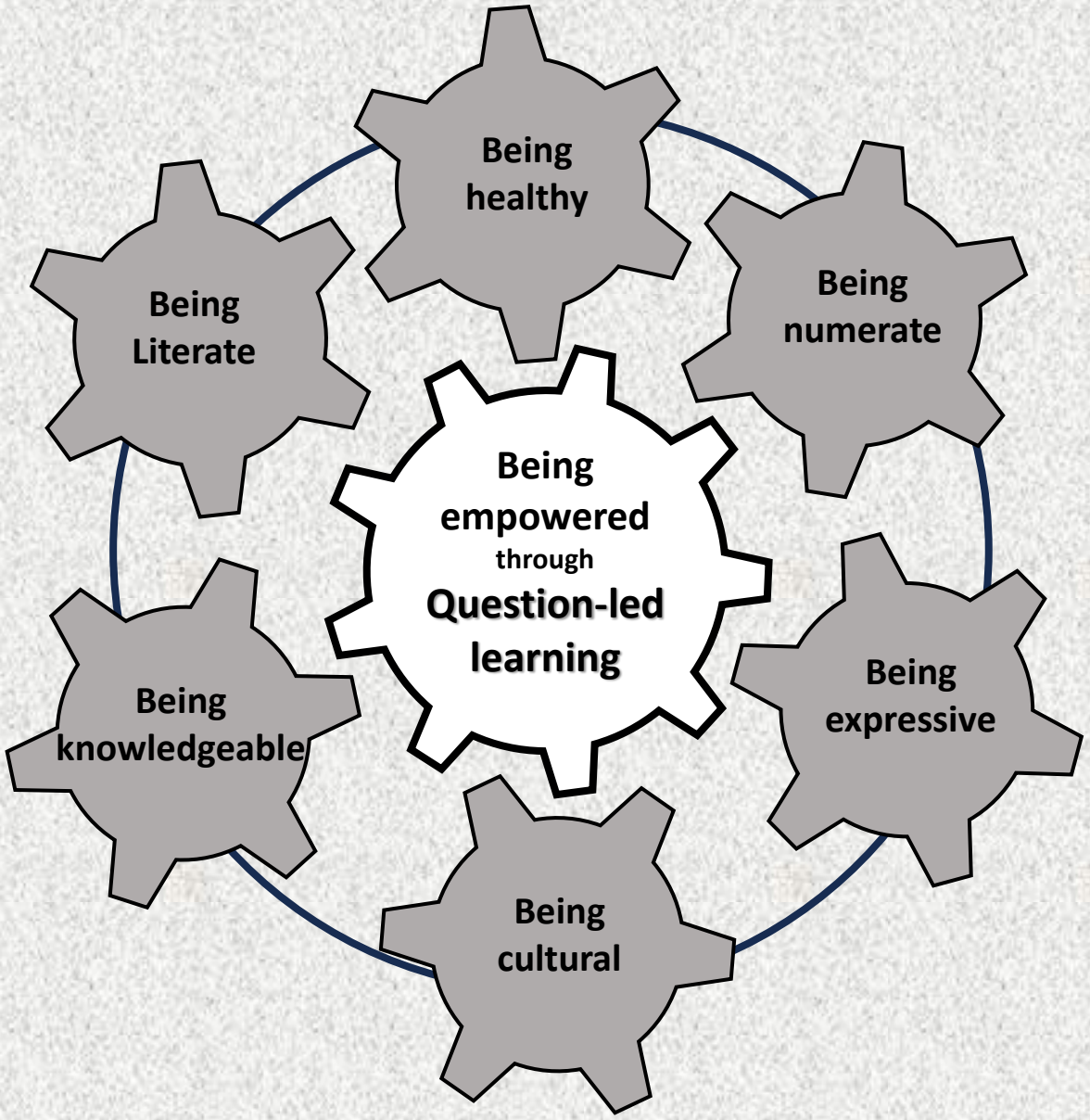
Teaching and learning strategies and processes would need to be made explicit. A move that might bring curriculum into the lifeblood of teaching and learning dialogues, instead of being an imposition or an encumbrance.

Constructing learning

Six
interconnected fields

Question-led learning engages imagination and creativity to generate knowledge, know-how and inventiveness.

It is integral to learning across the Sciences, the Humanities and the Arts.



Clarifying scenarios

Understand the key features of the context of an inquiry

Beware 'analysis paralysis' can sap energy and distract people.

Discover potential

Mindset	Different aspects
Focus ▪ The whole, not just bits and pieces ▪ Depth and subtlety, not simplistic information ▪ Real-life situations, not just a mixture of issues ▪ Innovation, not just an assemblage ideas and practices ▪ Forward thinking, not just a search for destinations. **Principles** ▪ Limit situational analyses to key features ▪ Be descriptive and appreciative, not judgmental ▪ Reveal areas for growth or challenge and commitment ▪ Respect the human and physical resources in play ▪ Generate a culture of open questions and inquiry	**Explore background realities** Listen to expressions of needs and intentions Observe the mix of talents and aspirations Perceive the expectations of people and systems Survey available human and physical resources Identify projected timeframe requirements Recognise political and historical realities **Consider process alternatives** Explore the strategies and tactics being enacted Scope potential for investigation and collaboration Expose innovative design possibilities Identify potential for growth in leadership Observe participation and decision-making possibilities Develop nuanced understanding of practical alternatives **Address action issues** Search for co-construction and co-design potential Appreciate delivery issues and longer-term needs Sense opportunities for spaced inquiry and innovation Observe control and accountability processes in play Identify feasible strategies for enactment of ideas Anticipate possible consequences and responses **Ascertain practicable actions** Determine potential commitment to shared action Give appropriateness and sustainability attention Reveal possibilities for individual and collective growth Identify beneficial action and potential difficulties Negotiate planned processes for improvement Appreciate coherence and continuity in space and time

Ownership perspective

'Situation analyses' are collaborative and cooperative processes.

- They generate ownership and commitment
- They build personal and collective capacity to act wisely
- They add nuance to the designs for improvement and means for action
- They inform and enhance implementation

Explore Features

Simple aspects ***Relatively independent***	**Sense -- categorise -- act**
Interwoven aspects ***Connected yet identifiable***	**Perceive -- analyse -- respond**
Complex aspects ***Layered and interdependent***	**Probe -- discover -- proceed**
Chaotic aspects ***No configuration or identity***	**Act -- discern -- engage**

School perspective

'Situational analysis' of the culture of a school is a starting point for developing and improving practice. The needs-interests-aptitudes-capabilities-knowledge-talents of learners, the capabilities and aspirations of teachers, the availability of resources, and the prevailing socio-economic conditions as well as community expectations and aspirations are all in the mix.

Keep the brush broad to the focus on sensemaking and understanding as distinct from an analysis of variables

Assessment perspective

Assessment is an integral part of learning.

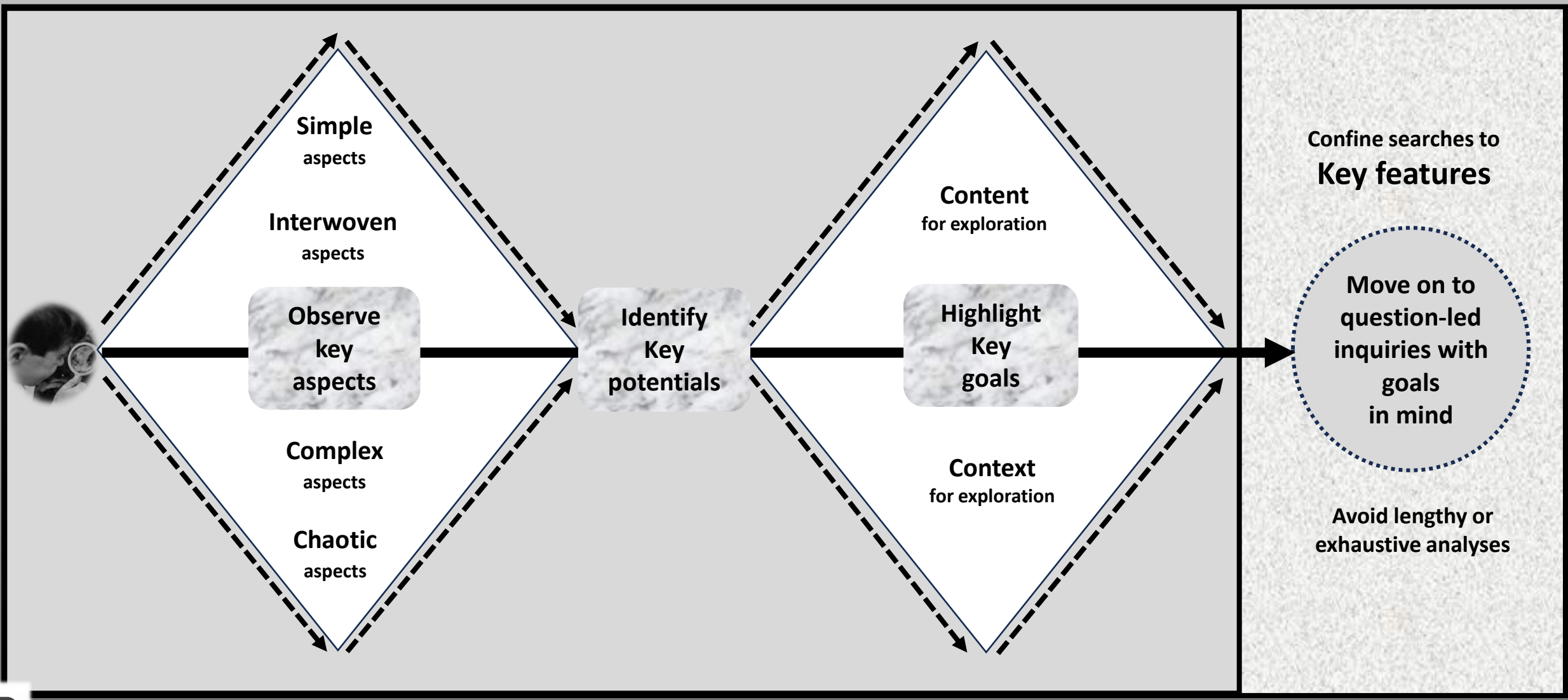
It encompasses-

- An appraisal of how learning is taking place
- A diagnostic assessment of what have been achieved and what is needed
- An assessment of achievement in terms of established criteria and processes

All three are important with an undue focus one likely to skew the overall picture. Reliance on one, such as the hegemony of standardised testing, can lead ito unwise short-term decisions.

Exploring conditions

Explore situations, circumstances, intentions and motivations to ascertain possibilities, potential for growth and realistic goals for inquiry.



Voicing curiosity

Questions are at the heart of curious inquiry.
They reveal the scope of inquires undertaken and the learning they evoked

Curious questions

Questions bespeak curiosity and a life-long dialogue with experience. They signify provocations to understand the world and incitements to create mature communities and societies. They promote deep understanding across the gamut of human experience and endeavour. Yet they often get lost in a maelstrom of answers.

Curiosity and questions are wonders that open minds to different possibilities and sometimes new or different ways of seeing experience. Asking curious questions-

- Enables people to direct their inquiries and drive knowledge construction.
- Fosters discussion and debate thereby enhancing the quality of human discourse and interaction.
- Helps people self-evaluate and monitor growth in their understanding, and
- Increases motivation and inquisitiveness related to the subject matters being explored.

TeacherThought (2019) has an interesting take.

> *Questions are more important than answers because they reflect both understanding and curiosity in equal portions. To ask a question is to see both backward and forward – to make sense of a thing and what you know about it and then extend outward in space and time to imagine what else can be known, or what others might know. To ask a great question is to see the conceptual ecology of the thing.*

Question framing

A set of three types of questions form a frame for building question-led inquiries

- **Generic generative questions** (GGQs) which direct and shape inquiries across all areas of human knowledge, experience, and endeavour.
- They spawn **consequent questions** (CQs) that can be investigated within the content of an inquiry.
- Sometimes, the context of an inquiry evokes more **pointed questions** (PQs) to address specific issues.

The frame creates expansive and searching processes which are particularly germane in a world where pressures for answers, often quick ones, are strong. While conclusions and solutions are important, the development of possibilities precedes reduction to act.

Variety of questions

Questions spark inquiry. Divergent questions open-up possibilities and alternatives. Convergent questions seek to discover ways to explain and act. They are often used in tandem.

Questions can be defined by their intention.

- **Wonderment questions** involve comprehension, prediction, anomaly detection, and application, or strategizing and planning when no procedure is given.
- **Vexing questions** are borne of intellectual dissonance that incites challenge or contradiction in response to specific lines of thinking or action.
- **'What if'** questions stimulate imagination and creativity without any precedent or examples to draw on.

Sensemaking provoked

A set of twelve generic generative questions (GGQs) around issues labelled - form, function, causation, change, connection, place, responsibility, care, ethical, aesthetic, thinking and innovation – cover the broad range of human endeavour. While they indicate scope, they are not a definitive list.

GGQs are generic because they can be applied to almost any situation or challenge. They are generative because they shape inquiries and spawn a myriad of related questions which are ripe for inquiry.

There are at least four ways GGQs can be selected to direct and guide an inquiry

- Nominated by teachers with little or no learner input
- Negotiated through thoughtful discussion between learners and teachers
- Established through collaborative agreement among a group of learners
- Chosen independently by a learner centred around his or her predispositions and interests

Teachers' questions

Teachers ask questions more frequently than learners. Often answering their own questions before learners have had time to construct answers. They often persist with the same question, or variations of it, until they receive answers that match their expectations. This begets a high incidence of closed questions that yield 'correct' answers with few questions that invite a variety of responses. Yet young children ask hundreds of open questions in a day.

Sensemaking questions

Questions open-up the disciplines of mind and understandings inherent in different fields of knowledge and experience

Generic generative questions (GGQs)	Sensemaking *Indicative possibilities*
FORM - What is it like? FUNCTION - How does it work? CAUSATION - Why is it like it is? CHANGE - How is it changing?	ENVIRONMENTAL PERSPECTIVE Systems, Structures, Designs, Roles, Elements, Patterns, Features, Networks, Performances, Situations, Mechanisms, Causes, Effects, Impacts, Dependence, Interoperability, Interdependence, Interactions
CONNECTION - How is it connected to other things? PLACE - What is the role of place here? RESPONSIBILITY - Who might be responsible? CARE - How might people care for each other?	SOCIAL PERSPECTIVE Circumstances, Factors, Sites, Interactions, Interconnectedness, Citizenship, Respect, Compassion, Rights, Justice, Friendships, Organisations, Civilisations, Laws, Needs, Processes, Obligations, Regulations
ETHICAL - Where is the ethical reasoning? AESTHETIC - How is aesthetic sense manifest? THINKING - How is the thinking evolving? INNOVATION - What might innovation add?	CULTURAL PERSPECTIVE Values, Beliefs, Morals, Traditions, Customs, Issues, Empathy, Justice, Principles, Appeal, Style, Artistry, Balance, Nuance, Intelligence, Creativity, Inventiveness, Flexibility, Alternatives, Designs, Potential, Justifications

Sensemaking

The generic generative questions (GGQs) listed cover the broad range of human endeavour. They give question-led learning direction and purpose.

GGQs open-up sensemaking in different fields of knowledge and experience. Indicative possibilities are clustered around three perspectives.

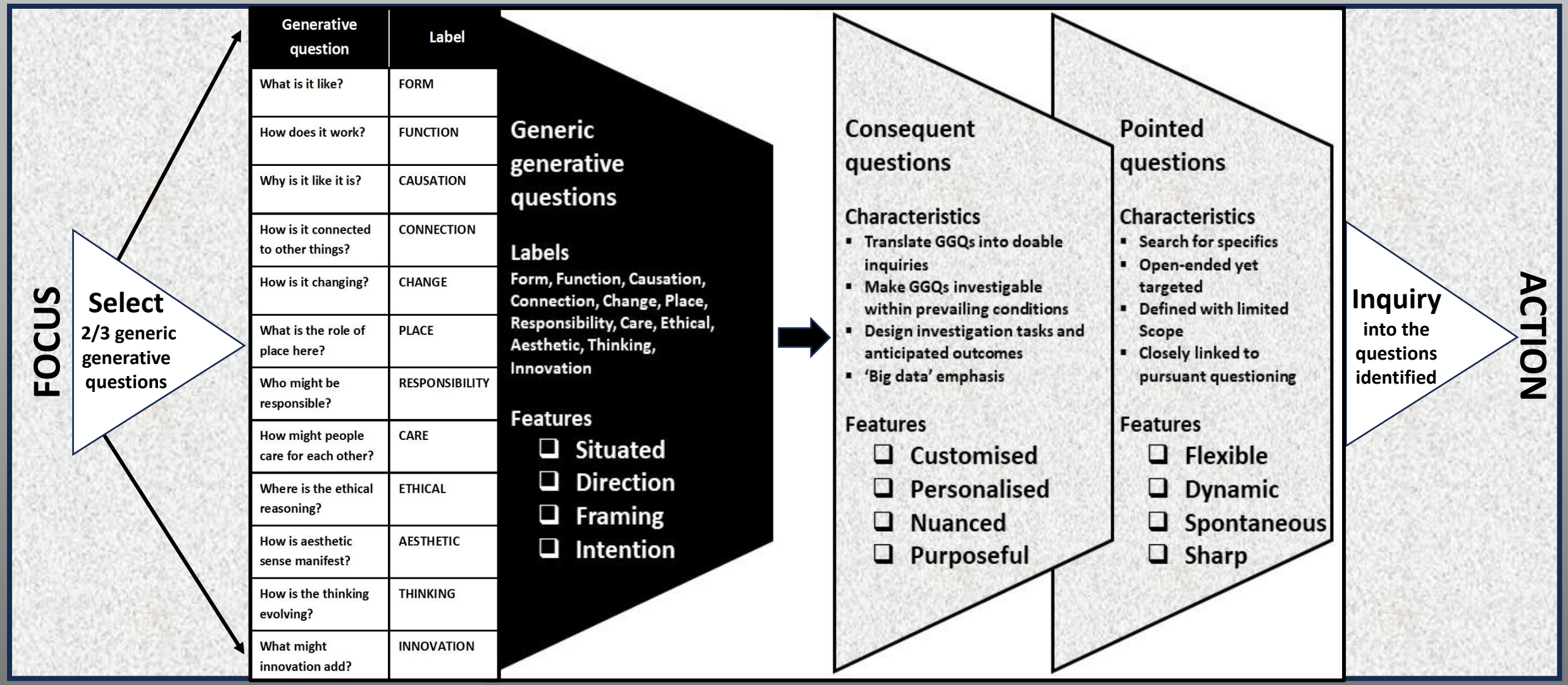
These possibilities point to some of the issues, ideas, and understandings that may be provoked in response to exploring selected GGQs.

Those studied stem from and reflect the content and context of specific inquiries.

Framing questions

A three-fold process for the framing of questions to direct inquiries.

Generic generative questions (GGQs), to consequent Questions (CQs), to pointed questions (PQs)



Enacting question framing

Covid pandemic - Indicative example # 1

Unfolding framework of Generic generative questions (GGQs), Consequent Questions (CQs), and Pointed questions (PQs)

Indicative questions to be transformed and scaled up or down through negotiation with Learners

Situated challenge

FOCUS
The Covid Pandemic

Prior knowledge and experience

Generic generative questions (Selected)

Function
How does it work?

Place
What is the role of place here?

Ethical
Where is the ethical reasoning?

Expand

Expand

CONSEQUENT QUESTIONS

Indicative examples for a Covid19 inquiry

(Translation of GGQs to specific content)

Function
- Could COVID-19 invade the human body by several means?
- Could Covid-19 be transferred from person to person in different ways?
- In what ways could a vaccine against COVID-19 be developed and distributed?

Place
- What might happen if local action were taken to prevent COVID-19 infections?
- Could medical services to deal with COVID-19 infections in our area be improved?
- In what ways might local community practices precipitate a COVID-19 outbreak?

Ethical
- Could ethical attitudes among people and communities affect a COVID-19 outbreak?
- Could enforcing a lockdown become a denial of human rights?
- In what ways might international measures be developed to combat pandemics ?

Contract

Contract

POINTED QUESTIONS

Indicative examples for a Covid19 inquiry

(Attention to contextual conditions)

- What are the routes through which the Covid -19 virus can invade the body?
- Could different solutions for prevention and treatment be needed in different contexts?
- In what ways could faults in preventive strategies be predicted and/or monitored?

- How could gaps be filled between where we are and where we need to be with preventive measures for Covid-19?
- How well are prevention and treatment methods going and how might they be customised for different communities?
- What's the 'best' way to see if preventive measures are carried out properly?

- How might measures to combat Covid-19 be culturally and ecologically acceptable?
- What are the ethical conflicts in dealing with Covid-19 and what underpins them?
- Why should governments intervene when Covid-19 might be better left to take its course?

New challenge

ACTION
Conduct inquiries and implement outcomes

Enhanced understanding

Enacting question framing

Renewable systems - Indicative example # 2

Unfolding the framework of Generic generative questions (GGQs), Consequent Questions (CQs), and Pointed questions (PQs)

Indicative questions to be transformed and scaled up or down through negotiation with Learners

Situated challenge

FOCUS
Sustainable practices

Prior knowledge and experience

Generic generative questions
(Selected)

Connection
How is it connected to other things?

Responsibility
Who might be responsible?

Innovation
What might innovation add?

Expand

Expand

CONSEQUENT QUESTIONS
Indicative examples for a renewable systems inquiry
(Translation of GGQs to specific content)

Connection
- Could renewable systems make the way we live more sustainable?
- Could the applications of renewable systems be extended to benefit everyday life and work?
- If renewable energy is to grow what might be the environmental impacts?

Responsibility
- Who should be accountable for the development of renewable energy?
- What might happen if people and organisations were encouraged to engage in renewable and sustainable practices?
- Might authentic and well researched information aide the introduction of renewable systems?

Innovation
- Might new or improved technological designs for renewable systems help?
- Are there practices around renewables that need to be controlled or eliminated?
- Could 'this or that' alternative provide a more efficient and sustainable system?

Contract

Contract

POINTED QUESTIONS
Indicative examples for a renewable systems inquiry
(Attention to contextual conditions)

- What are the arguments for and against different forms of energy?
- What factors are affecting the introduction and use of renewable systems?
- How are energy systems affecting specific environments and what might need to be done?

- Who is responsible for energy practices that have an adverse effect on our climate?
- What responsibilities do each of us have for encouraging renewable systems?
- How might renewable systems help in keeping local environments clean, looking good, and usable as a resource for recreation?

- What are the benefits and disadvantages of different means for producing energy?
- Why are some renewable systems a better fit than others in different communities?
- Why have some energy systems been adopted, and new ones are being devised?

New challenge

ACTION
Conduct inquiries and implement outcomes

Enhanced understanding

Enacting question framing

Healthy food - Indicative example # 3

Unfolding the framework of Generic generative questions (GGQs), Consequent Questions (CQs), and Pointed questions (PQs)

Indicative questions to be transformed and scaled up or down through negotiation with Learners

Situated challenge

FOCUS
Healthy food

Prior knowledge and experience

Generic generative questions (Selected)

Form
What is like?

Care
How might people care for each other?

Thinking
How is the thinking evolving?

Expand

Expand

CONSEQUENT QUESTIONS

Indicative examples for a healthy food inquiry

(Translation of GGQs to specific content)

Form
- In what ways are some foods better for people than others?
- Could eating a balance of nutritious foods improve our health and well-being?
- Could the convenience of fast foods be outweighed by their effects on individual and community health?

Care
- Could access to good food at an affordable cost help to alleviate poor nutrition?
- For people who do not have enough to eat what can or should be done about it?
- In what ways might attitudes and fashions on social media be affecting food habits?

Thinking
- Could different or better ways to prepare and preserve foods be developed ?
- Might publicity on cooking help prevent loss of nutritional value or food poisoning?
- What might happen if nutritious food were made more attractive and tastier?

Contract

Contract

POINTED QUESTIONS

Indicative examples for a healthy food inquiry

(Attention to contextual conditions)

- What are the food values of vegetables, meats, eggs, and other foods?
- Why are some people malnourished in situations where there is enough for everyone?
- How can people and communities produce their own food, process it and preserve it?
- How can we make sure elderly people who live on their own eat properly?
- How might waste food be kept to a minimum or 'recycled' wherever possible?
- How might schools help to promote good eating habits through their canteen policy?
- What could be done to educate people and communities about different foods and their effects on health?
- How could clean water and its availability for food preparation be improved?
- How could cooking practices be improved or customised to the needs and conditions of specific communities?

New challenge

ACTION
Conduct inquiries and implement outcomes

Enhanced understanding

Inquiry partners

Questions and questioning are different yet partners in inquiries

When people have a questioning attitude, they are expressing disbelief, doubt, or skepticism about something. When they are asking questions, they are expressing interest, curiosity, and wanting to learn. The questions they pose are strategic means of directing and shaping their inquiries, whereas their questioning focuses on processes for actions.
Lenski edited

Question-led inquiries

This resource is anchored around a set of three interdependent questions

- **GGQs which are directional and intentional**
- **CQs which are customised and personalised**
- **PQs which are contextual and flexible**

Origin of questions

The questions people ask reflect personal perceptions of experience, even when they are formulated collaboratively.

Questions asked echo the evolution thinking on the possibilities for action with interpretations of them varying from person to person.

Devising CQs and PQs from selected GGQs

Broad questions as outlined previously include-

- ***Wonderment questions*** involve comprehension, prediction, anomaly detection, application, and strategizing or planning when no procedure is given
- ***Vexing questions*** are borne on intellectual dissonance that incites challenge or contradiction in response to specific lines of thinking or action
- ***'What if' questions*** stimulate imagination and creativity without any precedent or examples to draw on

Focused questions include-

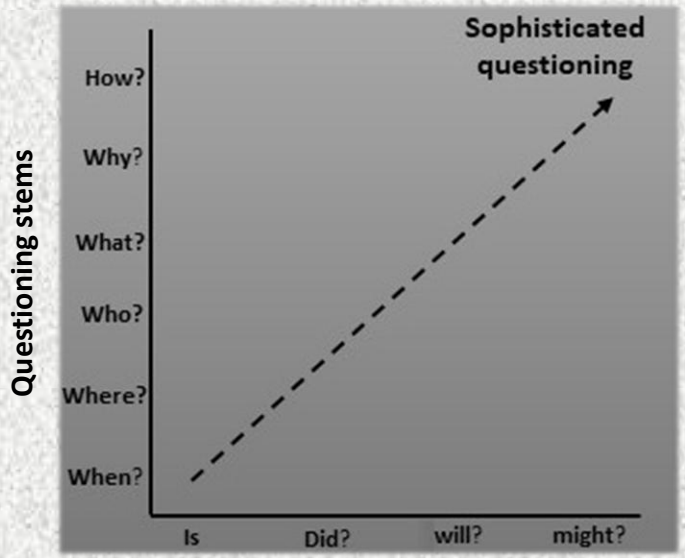
- ***Exploratory questions*** seek to explore or unfold the extent of new knowledge …
- ***Text-based questions*** are a response to reading texts and knowledge-based information …
- ***Investigative questions*** engage learners in designing and performing 'hands-on' inquiries …
- ***Confirmation questions*** seek to clarify information and transform understanding …
- ***Input questions*** recall information and construct ideas and relationships …
- ***Consolidation questions*** seek to expand new ideas and reconcile differences …
- ***Misunderstanding questions*** explore misconceptions and complexities …
- ***Hierarchical questions*** focus on increasingly sophisticated cognitive processes …
- ***'Deep reasoning' questions*** explore antecedents, consequences, procedures, and actions …
- ***Reflective questions*** are constructively critical to review or change mindsets

Tactical questioning

Questioning encompasses many purposes. For example, questioning processes incite-

- **Recognizing, querying, recalling, challenging**
- **Interpreting, exemplifying, classifying, summarizing**
- **Inferring, comparing, explaining, supposing**
- **Trialling, exploring, executing, implementing**
- **Differentiating, organizing, attributing, categorising**
- **Checking, examining, critiquing, evaluating**
- **Constructing, planning, producing, inventing**

A useful aid for the development of sophisticated tactical questioning is outlined below.



Distinguishing questions from questioning

Questions and questioning are often used interchangeably when they are different in nature and effect

Questions provoke imagination and creativity

Wonder questions evoke new thoughts, different ideas and innovative actions

Vexed questions investigate contradictions, uncertainties and problematic issues

'If' questions explore possibilities, alternatives and even crazy ideas

These question types are open-ended with multiple responses, as distinct closed questions that seek a single response

Feature	Questions Strategic thoughtfulness	Questioning Tactical enactment
Intention	Determine directions and shape inquiries	Investigates selected questions in specific situations and contexts
Scope	Focus on issues, ideas, and alternatives	Explores needs, possibilities and practicalities
Emphasis	Promote coherence and purpose	Performs investigative processes and tasks

Questioning processes can have different foci including attention to-

Why
What
How
Where
When
Who

Within the content and context of an inquiry and in ways that seek to investigate possibilities – not simplistic answers

Questions and questioning are different. Yet interdependent and mutually supportive.
In some situations the distinction may be a fine line.

Structuring collaboration

A flexible structures and processes facilitate collaborative inquiry processes

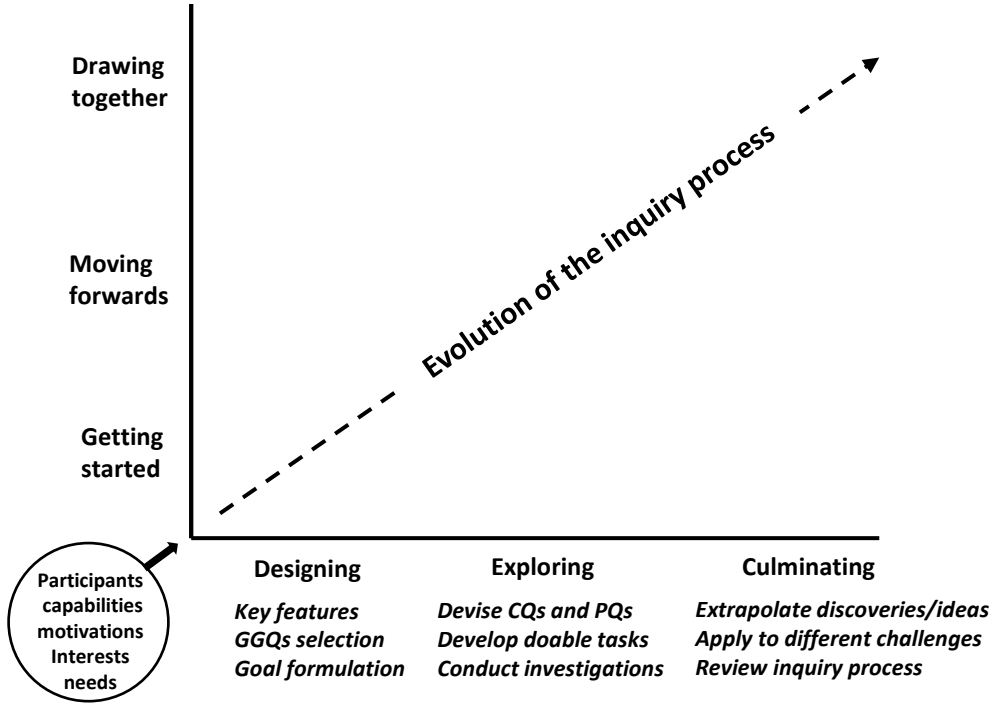
Iterative process

Collaborative communities often benefit from a structure to perform an inquiry. An iterative process, as distinct from a lock-step mechanism, which moves forward in a definite direction is required. The three phases – getting started, moving forwards and drawing together – form a flexible structure that facilitates critical and creative thinking implicit in the exploration of diverse thoughts and possibilities for action.

These 'performances' reflect engagement in purposeful work by doing and interacting with colleagues. Quite different from 'activities' which have a life of their own and can easily become 'busy work' that lacks a sense of direction or purpose.

Negotiated process

The performance processes are based on the premise that they are negotiated at age-appropriate levels with participants across three phases in an inquiry. The first phase is concerned with setting the scene and identifying the goals for inquiry. The second phase focuses on question framing to translate the content and context of the inquiry into doable investigations. The third phase centers on extrapolating what has been discovered or learnt, determining the degree to which the original goals have been achieved, and reflecting on the quality of the inquiry processes employed.



Natural process

Going backwards and forwards between phases within the structure of an inquiry is almost inevitable. It is part of a 'natural attitude' to refine and critique the quality of 'the action' and decide 'where to next'.

If dialogue is a primary means through which people learn and challenges are addressed, collaborative communities of learners, or groups of learners in many school settings, become 'hubs' for question-led inquiries.

The composition of the 'hubs' can be dynamic, not static. With a continuous process of grouping and regrouping participants based on need, performance, motivation, emerging requirements, and the overall evolution of the inquiry in which they are engaged.

Evolving processes

Collaborative inquiry as an iterative process with a clear sense of direction

Structured development of inquiry and sensemaking *An iterative process, not a lock-step mechanism.*	
Getting started formulation	**Positioning performances** - focus on prior learning, knowledge, experience, and interests, and on aspects of challenges that need to be explored or considered. **Opening performances** - select a few relevant GGQs, together with goals for inquiry associated with them, and develop shared understandings of what they mean.
Moving forwards enactment	**Design performances** - devise CQs, and PQs if necessary, for selected GGQs, prioritizing and translating them into practicable inquiries that contain realistic tasks. **Exploring performances** - conduct investigations customised to the demands of the design tasks, the capabilities of individual participants, and their expressed interests.
Drawing together reflection	**Culminating performances** - build on inquiries by extrapolating what has been discovered to different contexts and to new or emerging challenges and so doing by diverse means. **Reviewing performances** - backtrack to the initial questions and goals for an inquiry to determine what has been achieved or needs to be addressed, and where to next.

Engaging in two-cycles

Constructing inquiries in two-cycles promotes inventiveness

Transformative process

Inventiveness is a process through which ideas, imagination and creativity are transformed into innovative ways of responding to challenges and problems**.**

The process has two distinct cycles-

- 'Discover and design'

evolving into

- 'Develop and enact'.

These cycles represent a strategic process that provokes inventiveness.

Each cycle in the double diamond diagram that follows involves a continuous process of opening-up and closing-down to explore, envisage and assess ideas and possibilities**.** The whole process is dynamic and in a continual state of flux.

Broad application

A two-cycle inventiveness process is not confined to scientific and technological innovation. It is equally valuable when writing a book, composing a piece of music, solving an everyday problem, developing a business enterprise, painting a picture, creating a drama, or even quietly reflecting on experience.

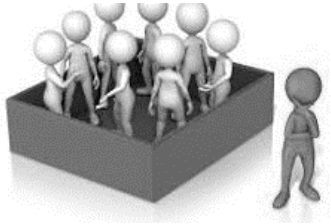
In each case, the outcomes may be unique, or they may be innovative improvisations and transformations of current or previous ideas and practices.

Strategic inquiry – cycle 1 – design and discover

In cycle 1, the focus is on the generation of ideas and practices that address the key features of a challenge with GGQs, CQs and PQs question frames driving the process. As thoughts and possibilities are uncovered, created, and appraised, connections and associations are made in people's minds.

'Curious connections' are constructed with their functional value and intent related to and emerging from the substance of the inquiries in which people are engaged. They embody a sense of practicability that is beyond passive linkage. They enable-

- Order to be created out of disorder.
- Intention to be balanced with perceived value.
- Comprehensible mental images to be created.
- Simple and complex clusters of sense to be framed.
- Understanding and insight to be deepened.
- Imaginative thoughts and ideas to be networked.
- Inventive thoughts and processses to be generated.



Outside the box?

Structure inquiries in two synergistic cycles

Strategic inquiry - cycle 2 – develop and enact

Dialogue around different 'curious connections' reveals congruences, dissonances and possibilities. These conversations reach maturity when the relations between them become sufficiently aligned to form strategic designs that have opportunities and potential for application.

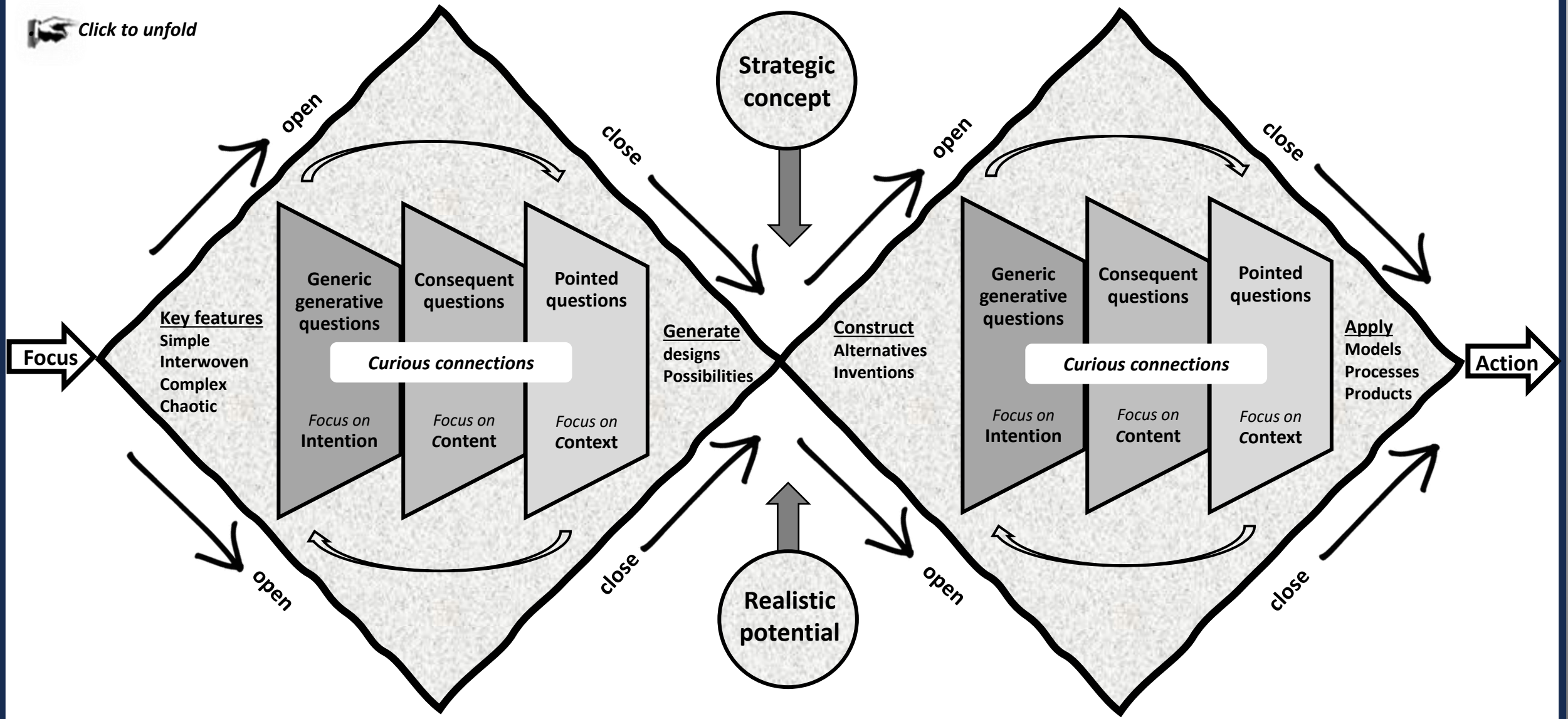
At this point, the envisioning process is ready to move on to cycle 2 – 'develop and enact'. A process like that in cycle 1 evolves, except the focus is on exploring alternatives that lead to practicable actions and solutions. A new or modified set of GGQs, CQs and PQs often evolves to drive the refocused process.

Question-led inventiveness

A two-cycle process of thought and action

Melvin Freestone
www.questionledlearning.org

Click to unfold



Discover and Design
Cycle # 1

Develop and Enact
Cycle # 2

Back

Interacting elements

Thought, action and dialogue led by curious questions

Curious enterprise

GGQs act as drivers of curious inquiry. They encompass and frame the 'ecology' of a challenge. The set of twelve, outlined previously, indicate potential directions an inquiry might take in addressing a specific challenge. Those selected reflect its nature and demands as well as the predispositions, perceptions and motivations of participants.

In contrast, questioning focuses on detailed issues or aspects of an inquiry. They are 'tactics' that aid, indeed incite, exploration and investigation. They range from simple to complex depending upon the nature of the tasks involved and stage(s) an inquiry has reached. Indeed, the clusters outlined in the circular diagram that follows represent increasing levels of cognitive demand.

Collaboration is at the heart of dialogue. Without it curious inquiries can become sterile and limited in their scope of imaginative and creative thinking. As is shown in the circular diagram the dialogical strategies are enormous. They, and others, can be employed singly or in combinations.

Especially if respect is afforded to past and present cultural activity as well as attention given to future potential and possibilities.

Hackneyed word

In education 'integration' has become a malleable word, because it is used to describe a multitude unrelated or different topics. Here it refers the synergistic linkage between questions, questioning and dialogue in addressing challenges and undertaking inquiries. As a 'job lot' the three elements energize curiosity and inventiveness.

Very different from when the word is used to describe interconnected subject matters embedded in an investigation. In real-life situations, subject matters are usually 'integrated', seldom isolated into 'silos' (subjects in educational circles). Hence, breaking challenges into subjects to be dealt with independently can easily detach them from everyday reality.

Question-led inquiries need to employ, and develop, the disciplines of knowledge and experience that have been distilled by humanity from historical times to the present day. Each of these disciplines has characteristic intentions, concepts and processes. They facilitate curiosity and its partner question-led inquiry.

Disciplined, synthesizing, creative, respectful and ethical minds are much more than agglomerations of subject matters. They spawn and integrate knowledge and understanding.

Working synergistically

Useful language

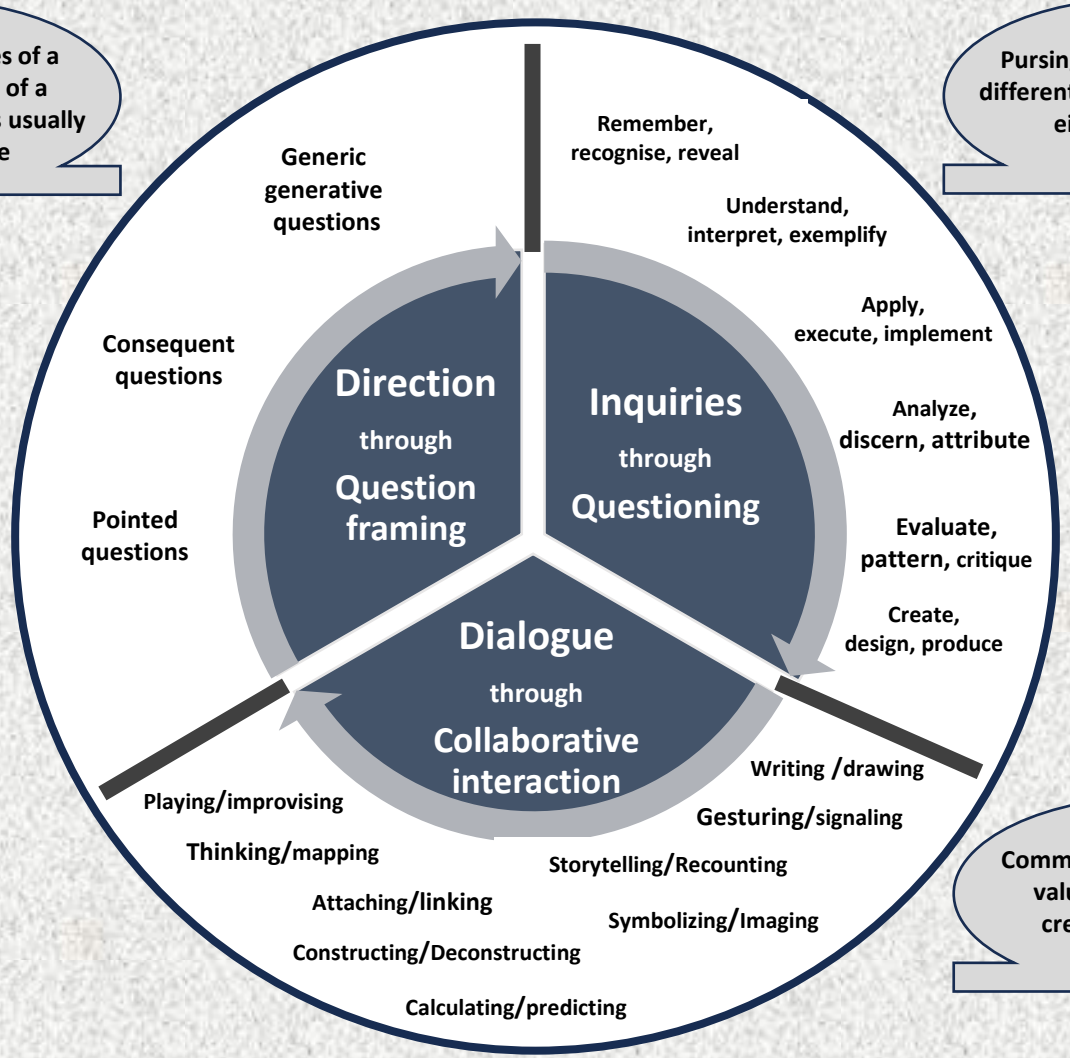
Words like - ***could, might, should, can, would… –*** are useful when framing questions, especially CQs

Incorporation of **'if'** can also be helpful when framing questions.

> ***If*** - <u>proposition</u> - ***would, could, should , why, how, when etc.*** - <u>outcome</u>***?***
>
> ***Or***
>
> ***Would, could, might, should , why, how, when etc.*** - <u>outcome</u> - ***if*** <u>proposition</u>***?***

Traditional question stems like - ***why, what, how, where, when, who… –*** also have value and can often form a bridge between questions and questioning processes

Once the key features of a situation or context of a challenge are clear, it is usually best to start here



Pursing investigations with different focal points in mind – either singly or in combinations

Communicating, thinking and valuing through critical, creative and inventive thinking

Scaffolding inquiries

Question-led scaffolding of learning processes

Scaffolding learning

If language requires structure, development of question-led learning might also be aided by a flexible yet coherent architecture. Four elements –

- ***Situation analysis***
- ***Question framing***
- ***Iterative structures***
- ***Practical inventiveness***

form a doable design for scaffolding inquiries. The process is iterative, not a recipe or a mechanism.

Scaffolding culture

"The role of a creative person *(edit)* is not to have all the ideas; it's to create a culture where everyone can have ideas and feel that they're valued."

And

"If you're not prepared to be wrong, you'll never come up with anything original."

Sir Ken Robinson

Situation analysis

Investigating key features of the context of an inquiry is not in the same mindset as defining the conditions surrounding a curriculum or an education program.

Instead, the purpose is to inform the situated inquiries at hand through the engagement of teachers and learners, and others, in designing and enacting the inquiry processes from the start.

Beware of getting bogged down in never-ending analyses. Keep it to the 'key features' that describe the scope and limits of the challenge or scenario at hand.

Question framing

As has already been emphasized, a crucial issue in framing questions is to distinguish between questions which direct inquiries and questioning which is a tactical means for enacting investigations.

While the development of inquiries needs to go where discoveries and actions lead, it is not a laisse-faire process where anything goes. Incorporating question frames into a comprehensive scaffold adds coherence and purpose to inquiries.

GGQs, CQs and PQs properly enacted represent a frame that gives inquiries structure and direction.

Iterative structures

Question-led inquiries are different from other approaches to scaffolding in education by being structured and constructed around questions, not content requirements. Especially if the questions posed originate from learners and drive their learning.

Knowledge, imagination and creativity are key to the whole enterprise. They need to be given ample time to grow, develop and flourish. Pushing too hard or too fast can be counterproductive.

Practicable inventiveness

Embedding 'practicable inventiveness' within a scaffolding strategy is based on the two-cycle discipline for inventiveness described previously. The cycles dovetail into each other, with the touchstone for movement from one to the other being the evolution of designs which have practicable potential.

Strategic movement between the two cycles helps to bring theory and practice together in creative ways.

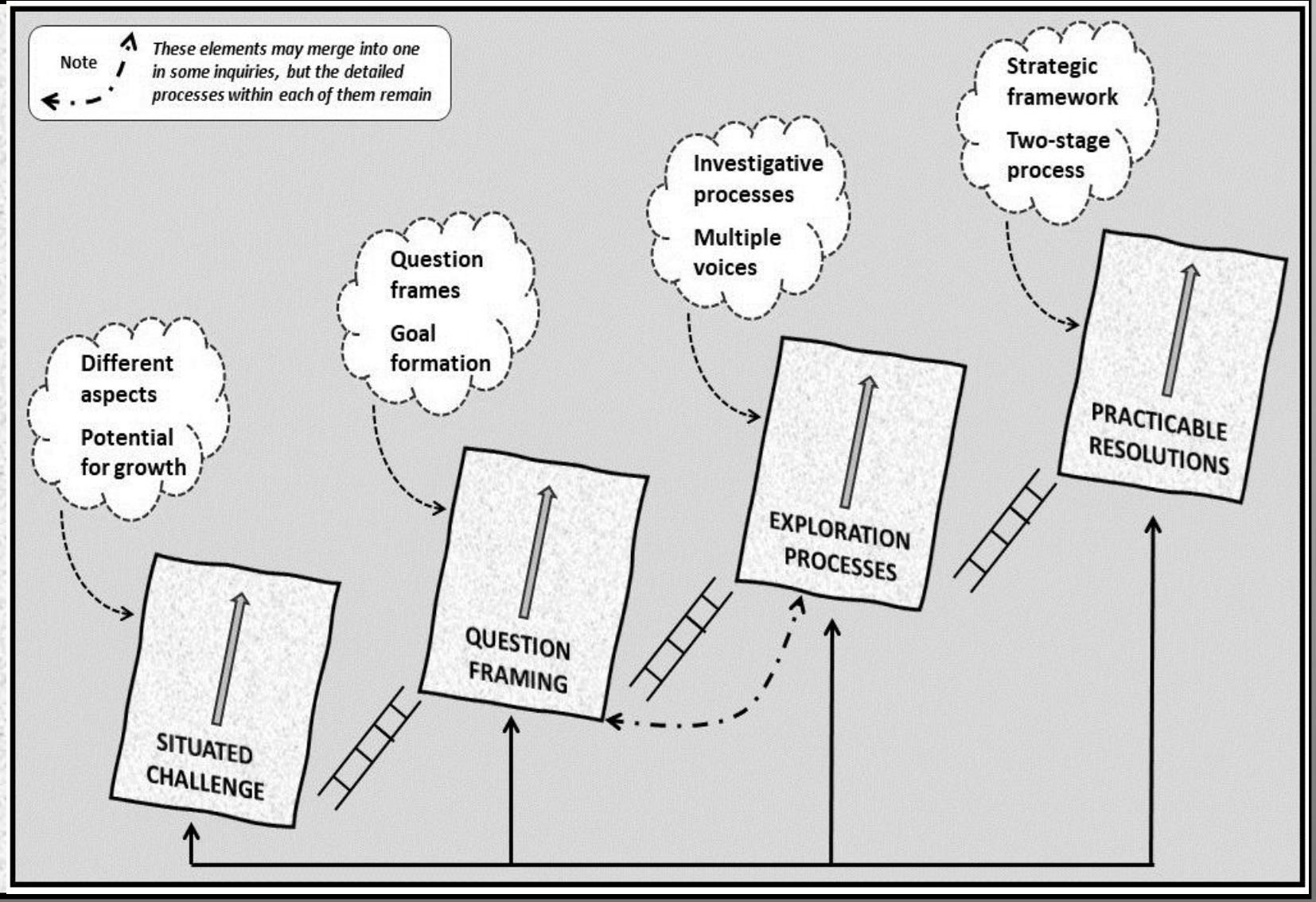
'Practicable inventiveness' – implies shifting endpoints without needing deterministic solutions. Yet movement between 'discover and design' and 'develop and enact' creates conditions for transforming explorations into actions.

Structuring curiosity

A flexible structure that aids coherence and purposefulness

Four
iterative phases
evolve
as curious inquiries proceed

Learner's questions are what really counts
Teacher's questions facilitate learning



Handling dilemmas

Question-led programs need to balance learner's needs with learning requirements

Issues

At times educational discourse seems to be full of dichotomous arguments that entice yes/no decisions. Perennial 'chestnuts' include-

- Skill development versus inquiry learning
- Mixed ability groupings versus streaming
- Horizontal versus vertical communities of learners
- Behavioural objectives versus process approaches to learning
- Prescription versus negotiation with learners
- First-hand experience versus second-hand learning from others
- Learning as enlightenment versus utilitarian competency

These polarities often seem to make taking sides attractive. Yet, depending upon need, circumstance, intention and motivation, desirable resolutions often lie somewhere in between these extremes.

When conversations explore and reveal diverse possibilities, the trap of being seduced by false dichotomies is more likely to be avoided. With nuanced, innovative and practical resolutions discovered and enacted.

Dialogical

ways

Choices

Balanced thoughts, actions and judgements are not a smorgasbord of options or a laissez-faire paradise.

Nelson Mandela sets the scene.
"May your choices reflect your hopes, not your fears."

Henry Giroux identifies the context.
Knowledge is power, and education is the means to empower individuals.

Karen Glass provides a warning.
"Educational trends and fads tend to drive the practices of teachers and schools, making education seem like a frantic pursuit to keep up with something new.

Dialogical

means

Learning programs

Four interdependent and synergistic elements are inherent in a balanced education program.

- **Interdisciplinary inquiry** – where learners encounter established disciplines of mind and fields of knowledge and experience. In so doing they acquire and create knowledge through inquiry
- **Autonomous studies** – development of enabling capabilities and skills require continuing autonomous study. They cannot be left to chance and need ongoing development.
- **Special needs** – where the diverse learning needs of individual learners and groups of learners are addressed. With customised and personalised programs devised to meet the aspirations and circumstances of different learners.
- **Special interests** – where personal talents, needs, predispositions, concerns and curiosities are identified and given expression. With opportunities provided for them to develop in established as well as unique ways.

Collaboration

To establish a collaborative environment where co-design and co-construction can flourish.

- Build a climate that will create a community of inquiry.
- Establish critical dialogue that will support systematic inquiry.
- Nurture a sense of community through expression of group cohesion.
- Encourage and support the progression of inquiry through to resolution.

To resolve dilemmas encountered devise strategic agendas that incorporate a set(s) of evolving processes.

- Establish short term goals together with longer-term intentions
- Research the situation and context to identify key features
- Negotiate a set of agreed principles to guide action
- Explore different possibilities and alternatives
- Decide on the 'best' course of action
- Review the ideas and practices that are enacted against initial intentions
- Determine any modifications and improvements that maybe required.

Balancing the ledger

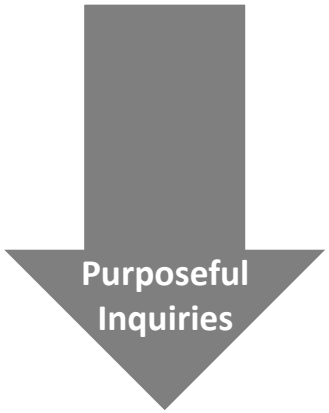
Balancing learners' needs with learning requirements

Deep understandings

Deep understandings embody 'big ideas' that can be applied across different fields of knowledge and experience as well as concepts derived from one or a few fields.

Capabilities needed for specific inquiries, for example digital skills or concepts of percentage, may need to be developed and applied as a question-led inquiry unfolds.

Knowledge and capability are partners in learning.



Deep
Understandings
Broad and generative
Trans-disciplinary
Multiple contexts
Integrated learning
Modular studies

Balanced learning
Continuous development of deep understandings and enabling capabilities

Enabling
Capabilities
Specific knowledge and skills
Targeted learning
Narrow focus
Autonomous delivery
Continuous programs

Enabling Capabilities

Enabling capabilities, for example the capacity to read or computation in mathematics, can not be left to chance. Explicit, coherent and sequenced programs are necessary.

That said, they are best developed through a question-led approach, as distinct from on overdose repetitive exercises.

Yet practice is important, for example in spelling words accurately, but it needs to be used wisely on an 'as needs' basis.

Ongoing assessment

Assessment of need and performance is an integral part of question-led inquiries

Purposes

Assessment is a process of acquiring information and making judgements about learning. It includes.

- Assessment **As** learning which is an integral part of ongoing question-led inquiries
- Assessment **For** learning which focuses on progress and what needs to be done or learnt next
- Assessment **Of** learning which is concerned with identifying and reporting on achievements

While once-off tests may give an estimate of performance against recognized benchmarks at a given moment in time, assessment is a continuous part of learning and teaching.

Assessment assists learners and teachers

- to make judgements about progress and achievements,
- to evaluate the effectiveness of programs and inquiries, and
- to make decisions about future action.

Interpretation

Evidence across the three purposes (As, For and Of learning) needs to be patterned for each learner or group of learners. The patterns that emerge give a picture of progress and achievement over time.

- The cascading movement upwards through zones of proximal development (ZPD) in the diagram that follows bespeaks increasing internalization of intelligence.
- Depth of learning encompasses four levels of sophistication labelled – descriptions, explanations, interrelations and extrapolations
- 'Cycles of learning' within each level signify growth in understanding from simply recognising different aspects of issues and ideas to understanding relations among them.
- The horizontal spiral at each level of sophistication describes movement from enactive or action-based activity to iconic or image-based exploration to symbolic or language-based performance.

This process yields profiles of individual and group performance and attainment.

Evidence

To be authentic and reliable, assessments need to be based a broad range and a continuous flow of evidence. This can come from many sources. For example-

- Portfolios of work
- Data from conferencing
- Peer feedback
- Performance results
- Anecdotal records
- Discursive writings
- Conferencing feedback
- Photographic records
- Multimedia presentations
- Metacognitive perceptions
- Talents expressed
- Story telling or retelling
- Multimedia storyboards
- Self-assessment
- Test data

The evidence needs to be comprehensive and collected over the life of an inquiry. It should genuine, not contrived, with ownership of different items respected and people protected from undue exposure.

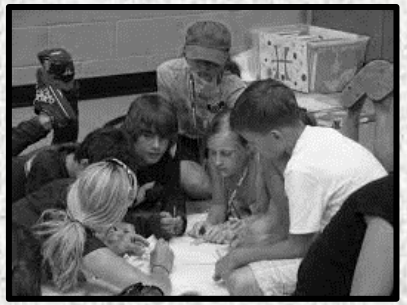
Standards

Identifying and determining standards of performance and achievement are demanding and often contentious issues. Deciding on the focus is the first step. For example-

- What is worthy of understanding and requiring of action?
- What might be evidence for different performances?
- What learning experiences and teaching might promote understanding, interest and excellence.

Once the scenario for assessment is clear, standards of achievement can be ascribed by observing progress in terms of-

- Recall and reproduction
- Development of skills and concepts,
- Growth in strategic thinking,
- Expansion of imaginative and innovative ideas and practices.



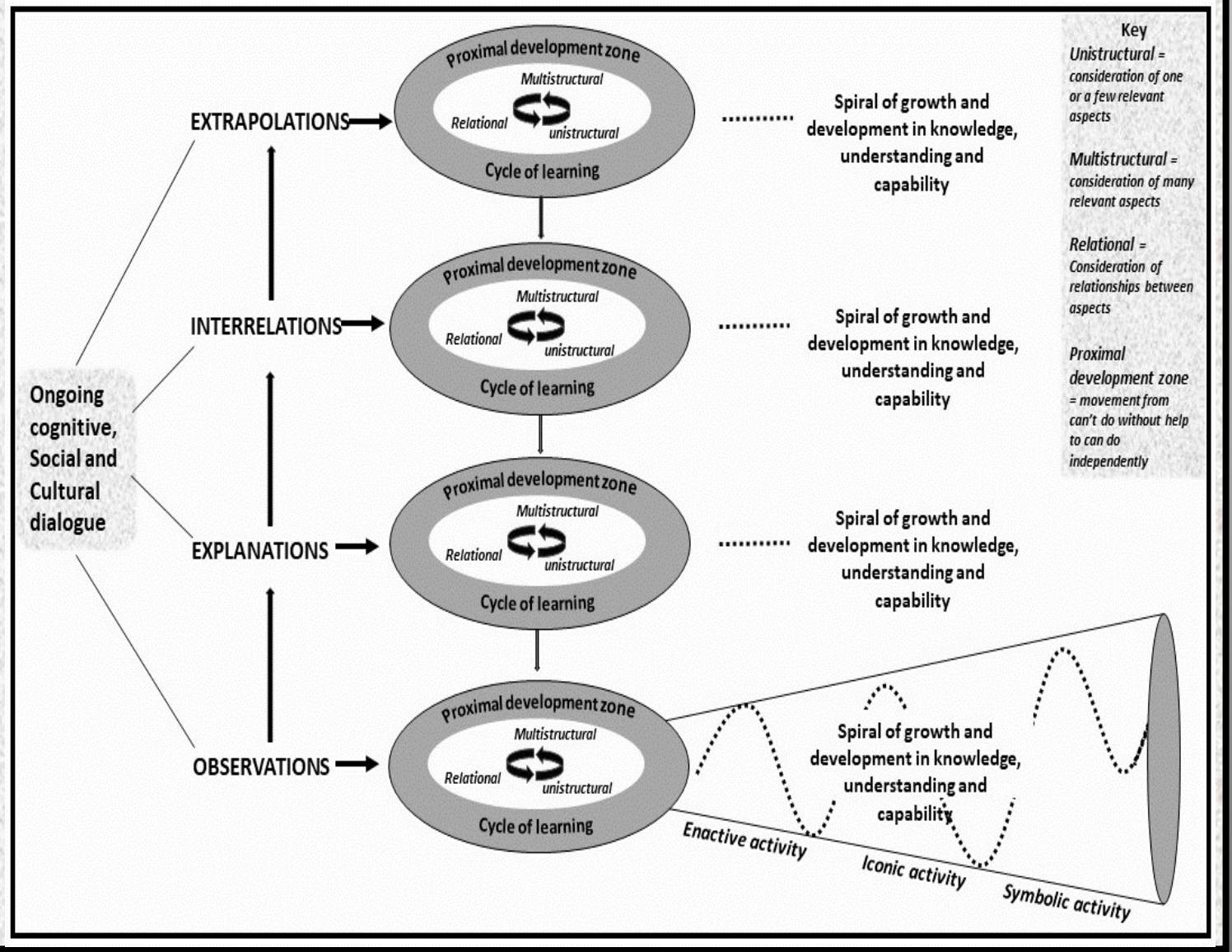
Appraising performance

Assess the quality of learning by three interconnected and interdependent means.

1. **Increasing sophistication** - learning from observations, to explanations, to interrelations to extrapolations.

2. **Cycles of learning** – uni-structural, multi-structural, and relational – within each of the above levels of proximal development

3. **Activity growth** - expanding sophistication from hands-on to image-based to symbol-based learning



Reporting progress

Recording performance needs to support question-led learning not hinder it.

Scenario

In Australia as in other OECD countries the emergence of prescriptive curriculum texts has been accompanied by extensive requirements for assessment and reporting. A snapshot from one state authority illustrates the scope of the task.

- School reports show how well your child is achieving in the Australian Curriculum for their year group.
- School reports are based on a wide range of evidence the teacher collects across the year.
- The 9-point scale shows more specifically where your child is at with his or her learning.

These requirements are linked to the national Australian curriculum and the standards within it. The National Assessment Program in Years 3, 5, 7 and 9 includes.

- An annual standardized test in Literacy and Numeracy (NAPLAN) for all learners, and
- Planned three-yearly sample assessments in science literacy, civics and citizenship, and information and communication technology (ICT) literacy; and communication literacy.

Assessment and reporting are thus demanding tasks, which some people say create almost impossible workloads for teachers and schools. An unbalanced amount of time can easily be taken away from the main task of teaching. In many situations the curriculum has narrowed with much teaching to standardized tests aimed at trying to increase test scores.

Challenge

This scenario presents a provocation for teachers and schools to find ways to enact the sentiments that follow.

- "Things are tied up in a system that is not able to be flexible enough for teachers". (Sahlberg)
- "Teaching is the art which expresses in a form accessible to learners an understanding of the nature of that which is to be learned". (Stenhouse)
- "The ultimate aim of education is to enable individuals to become the architects of their own education and through that process to continually reinvent themselves". (Eisner)

Question-led learning is a creative process not a mechanism to be administered.

Possibility

The visual that follows is a means of summarizing progress in learning. It provides a simplified, non-mechanistic approach to reporting on question-led inquiries. It pictures progress in terms of key criteria with relative performance represented on a seven-point scale of increasing depth and sophistication in learning.

These criteria maybe be derived from the demands and requirements of specific challenges, or they may come from outcome statements in curriculum texts, or both. They represent a selection of learning outcomes for assessment of and reporting on an inquiry or a series of inquiries.

The design of the visualization can also be used to map the key elements in a program or unit of study from a provision of learning experiences perspective. That is, as distinct from a learning outcomes viewpoint. The gradations could represent the relative significance and emphasis of specific intentions and goals embedded in teachers plans.

When these visual maps are juxtaposed for individual learners and groups of learners a **diagnostic picture** of progress and where to next emerges.

Authenticity

Evidence of progress needs to be broad and comprehensive. This means collecting samples of wide variety of each learner's work. Once to hand 'on balance judgements' across a range performances are more reliable than a selection of the best ones.

Collections of learner's work can have two related yet distinct purposes. To record-

- Progress where patterns of growth are key
- Achievements where judgements are key.

If these **records of development** or **records of achievement** respectively are to be doable learners need to take responsibility at age-appropriate levels for collecting and culling their own work. These experiences are valuable in developing learners' self-appraisal capabilities.

Visualizing progress

A large volume of words is surplus to requirements

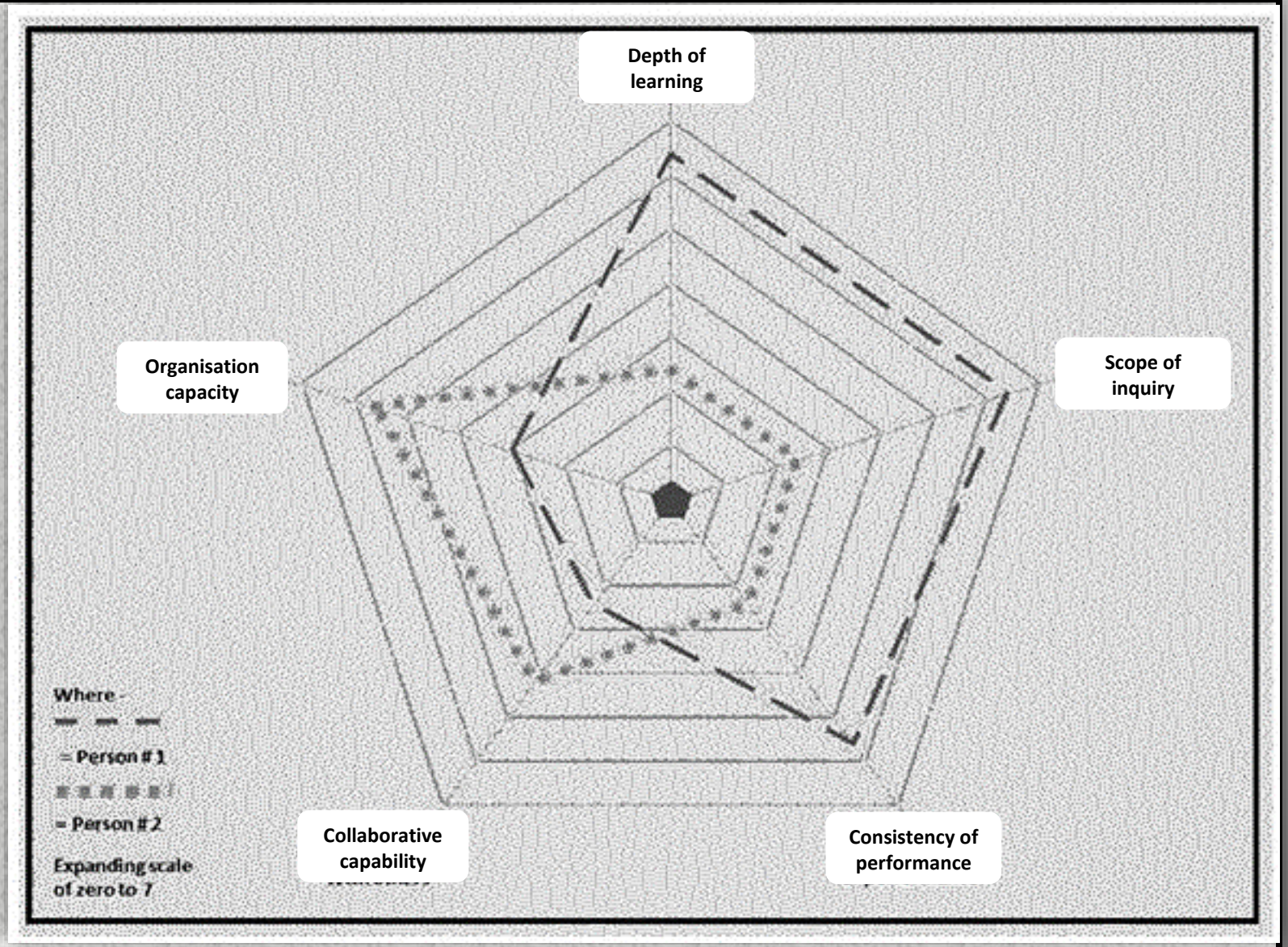
Progress at a glance

Derive a 'picture' from three types of assessment

- **Assessment <u>of</u> learning which is achievement orientated**
- **Assessment <u>for</u> learning which is diagnostic in intent**
- **Assessment <u>as</u> learning which is integral to inquiries undertaken**

The patterns of growth for person 1 and 2 differ over a seven-point scale. With each aspect (indicative only) – depth, scope, consistency, collaboration, and organisation – to be assessed around specific criteria.

Portfolios of learners' written, graphical, pictorial and multimedia work etc. inform the construction of summary pictures.



Promoting deep learning

Maturation of thinking and dialogue in question-led inquiries

Maturation

The development of personal knowledge can be seen as maturation from simple to complex thinking, and movement from certainty to uncertainty in dialogue.

The depth of thought, learning and action can be described in terms of – growth from developing insight, to improving insight and to maturing insight. Each of which has a characteristic set of performance features.

Playful dialogues provoke maturation from simple to complex and from certainty to uncertainty. They precipitate a spike of mental energy.

Assessing the degree of maturation sheds light on where learning has reached and helps to identify where to next.

THINKING

Complex understanding

Maturation

Simple understanding

Functioning	Characteristic processes
Maturing Concern for **Complexity**	**Features** ▪ Possibility - potential and alternatives ▪ Nuance - peculiarities and refinements ▪ Flexibility - personalised and customised
Improving Concern for **Judgement**	**Features** ▪ Reliability – measured and balanced ▪ Dissonance – collaboration and difference ▪ Predictability – assumptions and probability
Developing Concern for **Technicality**	**Features** ▪ Reason – analytical and logical ▪ Coherence– limits and confines ▪ Order – structured and ordered

DIALOGUE

Increasing uncertainty

Maturation

Apparent certainty

Applications

An air of puzzlement fuels motivation to discover new horizons. The ensuing reasoning provokes maturation in thinking and dialogue.

The differentiations in the table can be used for several purposes

- For self-reflection and metacognition
- For determining the degree of sophistication of the conversations among a work group or taskforce
- For assessing the depth and potential of the discussions inherent in the design and enactment of projects

Perceptions of reality differ and when different conceptualisations are shared people and societies become enriched.

Monitoring sophistication

Maturation of thinking and dialogue is joint enterprise

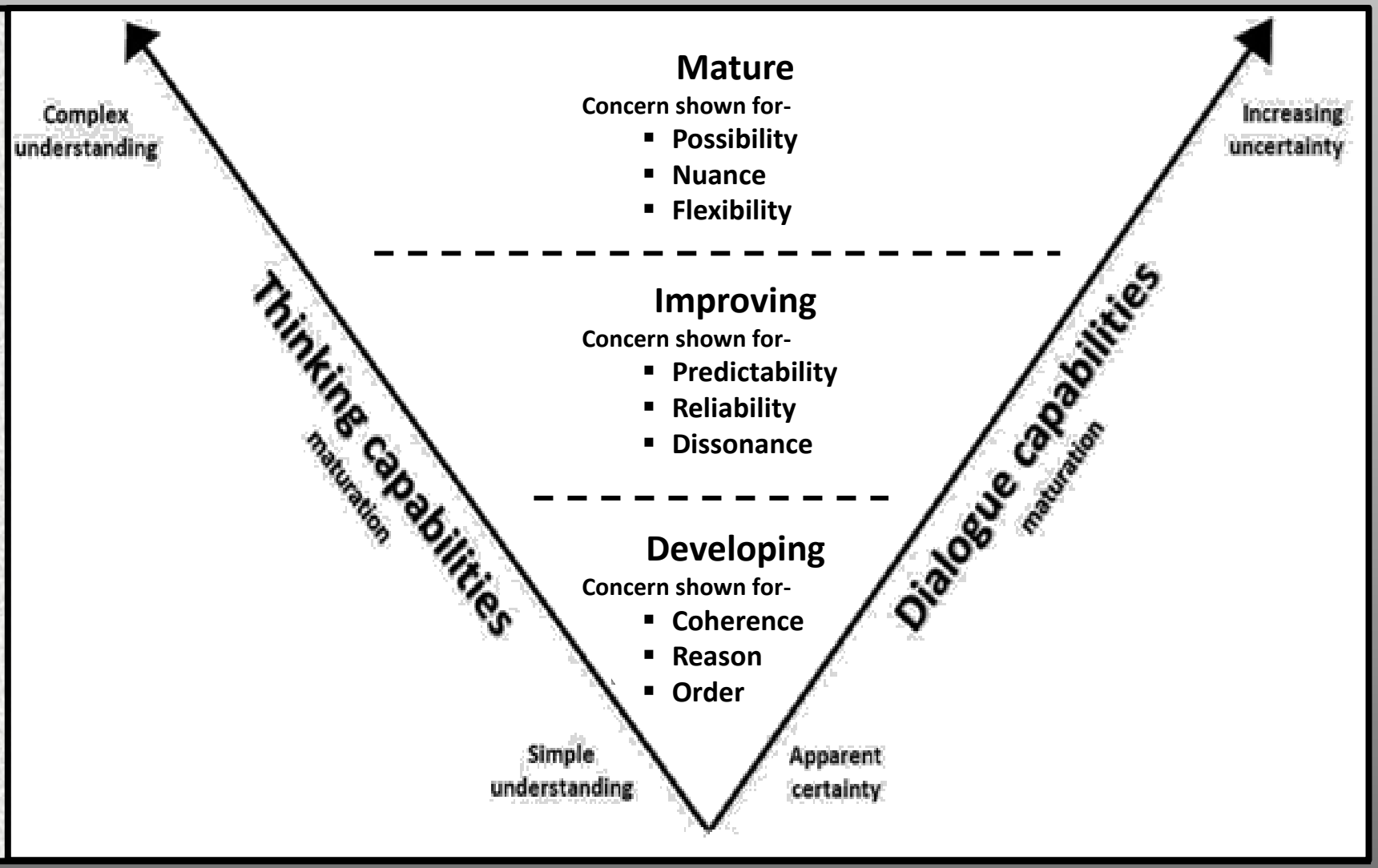
Review maturation in learning from two perspectives.

- Movement from simple to complex
- Movement from certainty to uncertainty

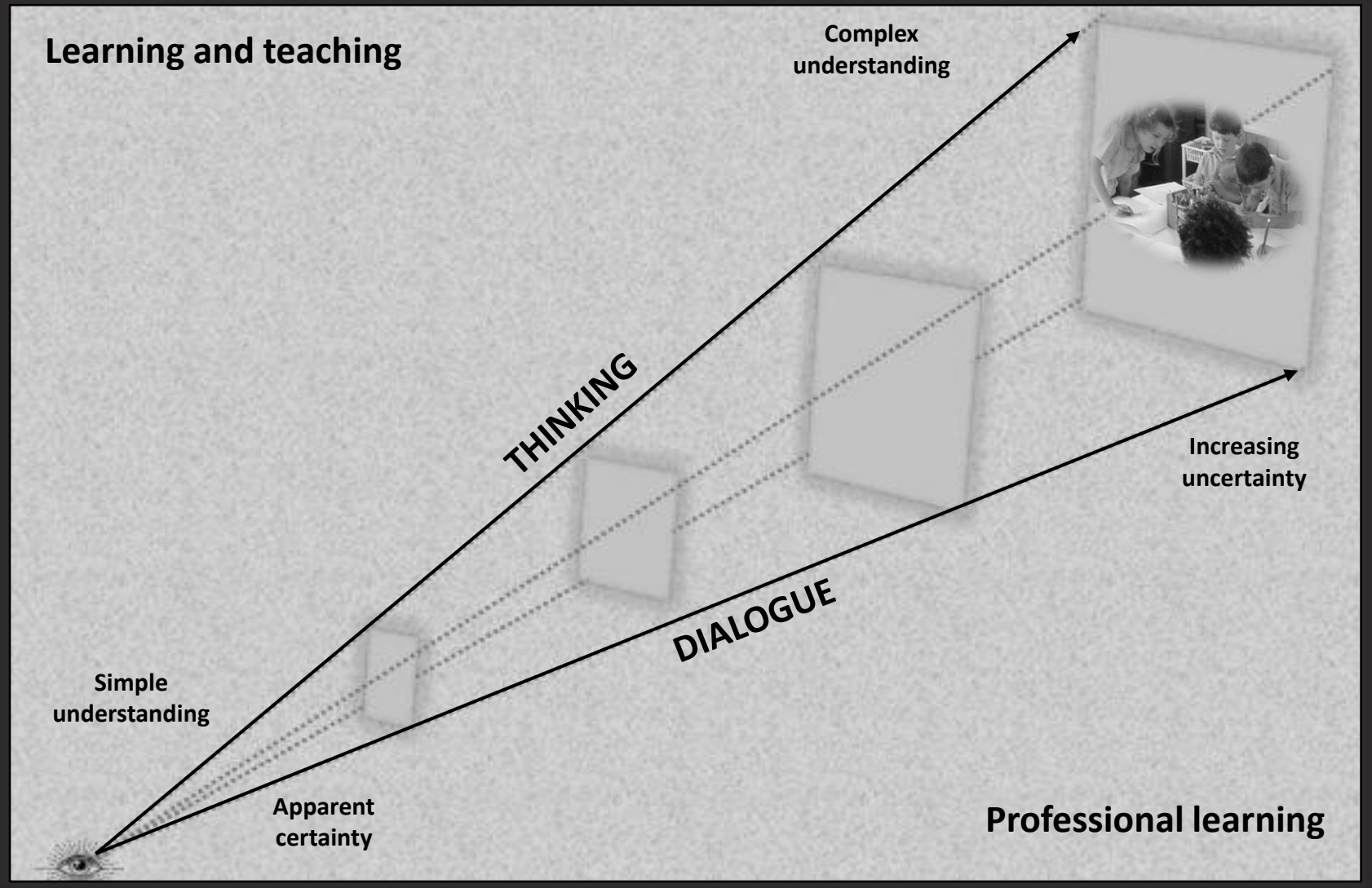
The depth of thought and action can be described in terms of

- Developing
- Improving
- Maturing

Each of these has a characteristic set of performance features (as is outlined in the diagram).



IDEAS INTO PRACTICE
Provoking inquiries



IDEAS INTO PRACTICE GATEWAY
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Indicators of practice

Ideas into action

Possibilities for <u>Question-led learning</u> to provoke thoughtful conversations

Scale as is appropriate

Being cultural

Being literate

Being expressive

Being healthy

Being numerate

Recognizing benefits is one thing – limitations are just as important

- The samples are in a specific format knowing that there are **different ways** to plan for learning
- The samples have a commentary attached which is designed to **incite discussion**
- The samples are **not recipes** instead the ideas in them have value if applied to 'real' inquiries
- The samples need to be **personalised** to learners and **customised** to community expectations
- The samples may have specific foci but the approach to learning is an **integrated one**
- The samples need to be **negotiated** through processes varying from open to guided to directed
- The samples **differ in duration** depending on the content, learning goals and the GGQs selected
- The samples in some cases refer to **useful tools** only to indicate potential possibilities

Being knowledgeable

Question-led inquiry into action

This three-phase process helps to give inquiries purpose and coherence.

The structure and the questions often need to be refined, even transformed, as an inquiry progresses.

The samples that follow enact this process

For details go to – frame 25

#1 – Select generic generative questions (GGQs)

FORM	What is it like?
FUNCTION	How does it work?
CAUSATION	Why is it like it is?
CONNECTION	How is it connected to other things?
CHANGE	How is it changing?
PLACE	What is the role of place here?
RESPONSIBILITY	Who might be responsible?
CARE	How could people care for others?
ETHICAL	Where is the ethical reasoning?
AESTHETIC	How is aesthetic sense manifest?
THINKING	How is the thinking evolving?
INNOVATION	What might innovation add?

For details go to – Frame 16, 17, 18, 19

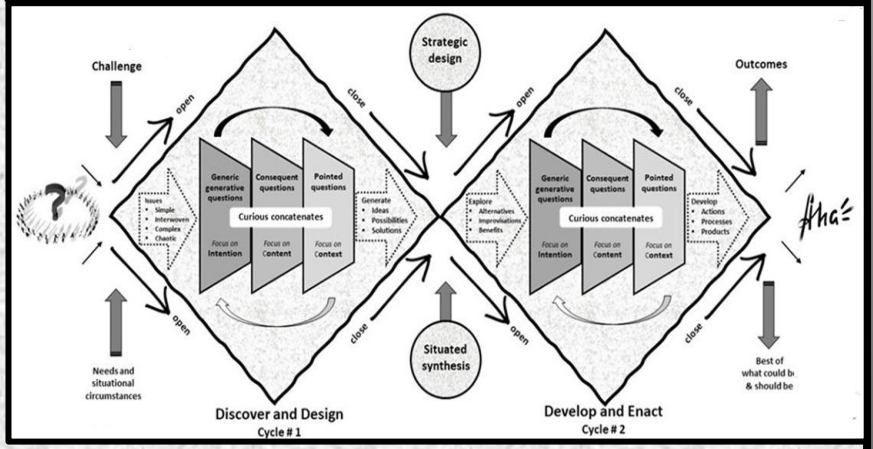
Select only 2 or 3 of the most relevant

2 – Conduct inquiries

Getting started	**Positioning performances** - *focus on prior learning, knowledge, experience, and interests, and on aspects of challenges that need to be explored or considered.* **Opening performances** - *select a few relevant GGQs, together with the goals for inquiry associated with them, and develop shared understandings of what they mean.*
Moving forwards	**Designing performances** - *devise CQs, and PQs if necessary, for selected GGQs, prioritize and translate them into practicable inquiries that contain realistic tasks to enact them.* **Exploring performances** - *conduct investigations customised to the demands of the design tasks, the capabilities of individual participants, and their expressed interests.*
Drawing together	**Culminating performances** - *build on inquiries by extrapolating what has been discovered to different contexts and to new or emerging challenges, and so doing by diverse means.* **Reviewing performances** - *backtrack to the initial questions and goals for inquiry to determine what has been achieved or needs to be addressed, and where to next.*

Conduct inquiries in 2 cycles

3 – Engage in inventiveness



People the world over

Being cultural

Situated scenario
People live in different places

Challenge
Invent ways to build relations among people

The GGQs selected by most learners were - Connection and innovation. The CQs that emanated from these questions identified good 'happenings' as well as 'problems'

Getting started

Positioning
- Show a video on the evolution of global populations
- Invite a refugee or a migrant or a significant community person to talk about their life experience
- Think-pair-share in small groups to identify issues for exploration – board and group learners' perceptions

Opening
- Have learners select two contrasting issues to explore and share the reasons for their choice 1 to 1 in pairs
- Have learners discuss the meaning of a set of GGQs and choose two or three to direct their studies
- Negotiate personal and shared goals in table groups, and post shared goals for each group on a class display board and maybe on the school Intranet 'news' page

The shared goal was to build cultural understanding by exploring differences within and between communities and countries

Moving forwards

Designing
- Brainstorm CQs and PQs that emanate from the selected GGQs, prioritize and then record them in 'my personal log'
- Have each learner produce, and share with a friend, a storyboard of his or her planned inquiries into the most important CQs
- Hold 'table group' conversations to refine individual plans and look for links between the planned inquiries from different table groups

Exploring
- Teacher to direct teach (a) world geography – countries, places, environments and major centres of population and (b) conduct whole class conversations on 'what makes up a community'
- Have learners study the two contrasting issues they selected earlier, and share the outcome in pairs
- Give ample time for learners address their CQs through investigations into one community of their choice
- Encourage learners to seek ideas and information from the Web, videos online and the school Intranet, personal experiences, and library resources etc.
- Ask each learner to produce a brochure of life in their community promoting how it could be enhanced

The direct teaching involved a United Nations documentary – *What is sustainable development.* The geography component included an extended 'mapping exercise'

Drawing together

Culminating
- Have each learner prepare a PowerPoint presentation or a Mandela on improving relations in their selected community
- Negotiate in pairs on writing a letter to a community group or government authority on the need to improve relations among people and how that might be done
- Have each learner write their letter making sure they emphasise connections and areas for development

Reviewing
- Require each table group to produce and post on the class display board a segment of a 'wheels' diagram of key issues in building relationships among people and between communities
- Post a photo of the outcome on the school Intranet asking for comments and suggestions
- Record personal interpretations and reflections in 'my personal log' and retain own work for appraisal and assessment later

The outcomes were extensive with suggestions made in how community relations could be improved. Enthusiasm and commitment was reflected in sticking to the tasks in hand

Two cycle inventiveness
Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Storyboard Contrasting study One community Brochure	PPT presentation Letter Wheels diagram Post

Counting the numbers

Being numerate

Situated scenario

Beyond guesswork to precise predictions

Challenge

Explore percentage (%) and proportion as predictors

Getting sufficient items took time and required advance planning. Much discussion took place individually and in small groups around weight and volume issues

Getting started

Positioning

- Ask learners to bring in all manner of food and household packaging items
- Have learners working in collaborative pairs record weight, volume and proportion of ingredients etc.
- Record the results on a class 'Supermarket' information board

Opening

- Hold a circle group conversation on the meaning and potential impact of the data collected
- Ask each learner to identify at least five of their 'favourites' from the 'Supermarket' board
- Have each learner to rank order their selections from 'least to most' against criteria such as information on weight, volume, ingredients, advertising appeal; and share the result in 'table groups'

The shared goal was to build understanding that numbers like % help to make things precise. The GGQs were function and responsibility

Moving forwards

Designing

- Use the data collected to select GGQs to guide studies on relative proportions of ingredients
- Ask 'table groups' to devise consequent questions (CQs) to guide what information should be included on common food and household items
- Mix one person from each 'table group' into a new discussion group to share their group's 'guidelines'

Exploring

- Teacher to direct teach (a) percentage as a concept of x in 100, how to calculate, graph and use it to make predictions independent from raw data and (b) the connectedness between percentage and proportion
- Have learners individually carry out an exercise through which they translate a set of percentage figures for numbers greater than and less than 100
- Have learners work In pairs to throw a dice 10, 20 30, 40 and 50 times, record results and graph % chance of numbers coming up & determine if there are patterns
- Give learners a batch of data on % from a survey or a competition and have each learner graph the data; and then discuss patterns, trends and predictions in 'table groups'

The direct teaching involved whole class presentation and much conversation among small groups displaying similar levels of need or difficulty

Drawing together

Culminating

- Have learners explain how they have come to understand % and proportion, and display their comments on a class communication board
- Conduct a whole class survey on my 'favourite' from four or five 'goodies' such as Snickers, soft drinks, chocolates and toffees etc., with learners voting 'proportionately' – 1. 2 ,3 . 4 in order of their choice
- Calculate and display the results, and discuss in relation to the functional value of % and proportion

Reviewing

- Relate the way the whole class survey was carried out to the responsibilities involved in conducting surveys on community and national issues
- Have learners record their views on the value of % in making predictions that are reliable and authentic
- Determine whether surveys of opinion in their own class should be a simple majority or based on proportional data

Learners could see that number calculations are not just a question of applying an algorithm. It requires understanding and careful application to lived experience. Learners could see % as a means to establish patterns and relative value

Two cycle inventiveness Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Supermarket data Guidelines % activities Pattern/predict	% & proportion Class survey Responsibilities Voting systems

Keeping fit

Being healthy

Situated scenario

Prevention is better than cure in personal and community health

Challenge

Healthy living is a combined body and mind issue

The shared goal was to build a personal and collective understanding of good health practices and how to enact them

Getting started

Positioning

- **Show and discuss the video 'Well being for children – healthy habits Wellbeing for Children: Healthy Habits (youtube.com)**
- **Have learners in table groups map their health habits and share at circle time as a summary chart or map**
- **Think-pair-share in small groups to identify issues 'I/we would like to explore' – post on 'healthy living display board', organize the range into like groups**

Opening

- **Have learners in table groups select one 'health' issue and one 'conditions' issue to investigate and negotiate personal and shared goals within them**
- **Record 'my goals' and why they are important for me in 'my personal log'**
- **Post shared goals on the healthy living board and see how they fit with intended work among other groups**

The GGQs selected were- causation, connection and innovation. The CQs focused on good 'happenings' and significant health 'problems/conflicts' in communities

Moving forwards

Designing

- **Teacher to lead circle time discussion on GGQs and their meaning, and establish a focus on two or three**
- **With these GGQs in mind, brainstorm CQs and PQs that relate to both physical and mental health – see 'Useful tools' - for an anonymous (private) strategy**
- **Invite a refugee or a migrant person to talk about his or her life health experiences and living conditions**

Exploring

- **Teacher to direct teach (a) parts of the body and their functions and (b) issues that can affect mental health**
- **Have learners investigate the 'health' and the 'condition' issue their table group selected previously**
- **Have each learner carry out action tests for aerobic fitness and weight/height/size ratios, taking care to protect learner's sensitivities and privacy as required**
- **Ask learners to talk in table groups about their favourite sports either as participants and/or viewers, and tabulate the range of interests across all groups**
- **Have each learner select a sports icon/hero and write an illustrated story about him or her, giving reasons why the person is special**

In the direct teaching careful management of the fitness exercises and the sharing of information was needed to limit competition and stigma from being or feeling unhealthy

Drawing together

Culminating

- **Have whole group work as a team to construct a 'daily fitness program' for their school that covers – balance, agility, performance and coordination skills**
- **Produce 'activity cards' for the daily fitness activities for use by other learners, and trial them to determine feasibility and support issues required**
- **Have learners relate physical fitness and mental fitness with feeling good about self, emphasising causes and connections**
- **Encourage each learner to write in their 'personal log' about their health and my future health does/don't's**

Reviewing

- **Reflect in table groups on how the selected GGQs helped in understanding physical and mental health**
- **Present and share table group perceptions by means of a Venn diagram or a Mandala or other visualization**
- **Have each table construct a support poster on ways people can help themselves and others with their health challenges and/or difficulties**

Exploring what might be done to enhance personal health, especially mental health, could be a sensitive issue and challenging at times. The right for people to opt in or out would be ongoing

Two cycle inventiveness
Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Visitor experience Fitness tests Favourite sports Sports icon	Daily fitness Trial program Feeling good Visualization

Artistic exposé

Being expressive

Situated scenario

Appreciating feelings/emotions are a key part of living

Challenge

Explore the emotional and practical impact of caring for animals

Some learners, especially those with reticent personalities, might find talking about their feelings quite challenging. Creating a sensitive and appreciative culture could be demanding, yet essential

Getting started

Positioning

- **Have learners bring photographs of their pets or their favourite animal - *school support service* to scan onto the school Intranet – give ample time for this process**
- **Ask learners to discuss in small groups what makes 'their animal' special to them, and share these feelings with the whole group at circle time**

Opening

- **Ask learners to talk about their emotions during these conversations with the teacher or aide scribing them onto a display board**
- **Arrange for an animal welfare person to talk about caring for animals – the 'good' and 'bad' practices**
- **Have table groups negotiate which group of animals they would like to be the focus for their inquiries**

The shared goal was to understand personal and collective feelings related to caring for animals. The GGQs selected by the teacher were – Responsibility, care and ethical

Moving forwards

Designing

- **Hold circle time for learners to come to understand the meaning of the selected GGQs and how they translate into CQs for caring for animals**
- **Explore the contributions 'Seeing eye dogs' make to people's lives and how dogs give emotional comfort to people, especially sick children and elderly people, either in hospitals or at home**
- **Ask each learner to sketch responsibilities in caring for the animal group selected by the people at their table, and display the sketches as a class montage**

Exploring

- **Teacher to direct teach perspective from two angles - depth in an image or painting and the idea of symmetry and asymmetry**
- **Ask each learner to create a painting or sculpture directed towards 'why I love animals', and write an interpretative commentary to go with their work**
- **Play the music 'Carnival of the Animals' by Saint-Saëns and pose the question – 'what pictures did the music generate for you'? - give time to discuss**
- **Have learners create a short drama in table groups on 'our responsibilities with animals', and perform it at a series of circle times**

The direct teaching involved making connections between different mediums for the expression of personal and collective ideas, feelings, and emotions

Drawing together

Culminating

- **Have learners in groups of three create a visual presentation or video on ways to care for animals and add the final version to the school Intranet**
- **Ask each learner to write a poem about why people and communities should care for animals (ethical) and the responsibilities that are involved (care)**
- **Have table groups produce a brochure (written or electronic) on 'thinking about endangered species'**

Reviewing

- **Require learners to create a concept map that shows responsibilities and ethical issues in caring for animals, and post them as part of a collage on the class display board**
- **Ask learners to extrapolate the values underpinning caring for animals to looking after endangered species, and post them on the class display board**
- **Have learners record personal reflections in 'my personal log' and keep their art for appraisal**

Teacher help was needed in moving thinking towards extrapolation, and for ways to structure a poem. Transformation from personal/direct experience to other scenarios was a key part of enacting the selected GGQs

Two cycle inventiveness Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Seeing eye dogs	PPT presentation
Caring for animals	Poem
Painting/sculpture	Concept mapping
Music and drama	Values behind care

Our big story

Being literate

Situated scenario

Young learners need to know how to write personal stories

Challenge

To build 'my own story' based on a well-known children's story

The concentration span of the young learners was sufficient to view a ten-minute video in one go. The teacher gave them time to talk about the characters and how the story unfolded

Getting started

Positioning

- Show short video of the Jungle book story - FY23Q4 DC AcrobatShowPo VID Story 15s 1 (youtube.com)
- Have teacher lead a conversation on the learner's reactions to the story using a round robin process or similar cooperative strategy

Opening

- Have learners in groups of three talk about the animal characters in the video and how they behaved
- Display the ideas that emerged from each group on 'Our big story thinking wall'
- Ask each learner to draw a picture of one character and place it beside relevant ideas on the display wall
- Use a circle group discussion to identify two characters on which to model 'our big story' – Baloo the bear and Kaa the snake were chosen

The shared goal was learning to write an illustrated story about human behaviour built around an animal character living in today's world.

Moving forwards

Designing

- Teacher selected two GGQs – Care and ethical – to shape how learners would create 'our big story'
- Have learners talk about the 'good' and the 'bad' in the way Baloo and Kaa behaved - listen to the music and words in the Disney songs
- Ask learners to brainstorm CQs, see – useful tools –for strategies on how to structure learners' questions around stories on human behaviour in animal form
- Ask each learner, with these CQs in mind, to design a pictorial story built around the characters of Baloo and Kaa as if they were people living in today's world

Exploring

- Teacher to direct teach (a) basic sentence structure – subject/verb/object and full stops (b) arrange spelling exercises around 20 of the most relevant words
- Have learners practice writing sentences using these 20 words one at a time
- Invite a 'Snake expert' to show live snakes and talk about their behaviour from first-hand experience
- Ask learners to create and share a full draft of their story with a friend seeking feedback and suggestions
- Produce 'my completed story' with all necessary edits
- Have each learner paint a picture with a sentence caption showing the 'message' in his or her story

The story writing was protracted with much one on one 'teaching' support from the teacher aided by designated/capable parents. Some learners needed help in writing an effective caption

Drawing together

Culminating

- Have learners talk about what was 'caring' and what was 'ethical' in the 'Baloo and Kaa' like behaviours in their stories
- Group the outcome of these discussions into categories and display as blocks in 'our big story thinking wall'
- Have learners in groups of three work out and practice how they will present their completed story and paintings at a special assembly for parents

Reviewing

- Take photographs of each learners' work as well as 'action' pictures of when they were working together
- Transform the pictures by putting them in a 'big book' (paper or electronic) on 'how we wrote our animal stories'
- Encourage each learner to produce a page for the big book with explanations in their own words

Connections between the GGQs, the initial opening activity, and the culminating processes was important in giving the learning processes coherence beyond busy work. The early language teaching was deliberate especially as it had to be interwoven with learners' questions

Two cycle inventiveness Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Behaviour in story Pictorial story My story Picture captions	Values blocks Present my story Work photographs 'Big book'

Energy flow

Being knowledgeable

Situated scenario

People live in diverse places with different resources

Challenge

Explore, create and invent sustainable energy systems

It could broaden the study if the spread of GGQs chosen encompassed all twelve GGQs. While form, function, connection, & causation may appear particularly pertinent, the other GGQs are no less significant in their potential impact on energy issues

Getting started

Positioning

- **Show video to stimulate discussion on differences between sustainable and renewable energy - What is sustainable development? (youtube.com)**
- **Have learners work in pairs to produce a fishbone diagram that shows sustainable factors and one side and renewable factors on the other, with each factor containing relevant sub-issues**

Opening

- **Have learners working in teams of three select two or at the most three GGQs to direct their inquiries**
- **Establish work responsibilities for these teams in researching specific aspects of their 'Energy Flow' inquiry and reporting their findings to others**

The shared goal was to explore balancing sustainability and renewability in energy systems within prevailing conditions.

Moving forwards

Designing

- **Have each work team identify and prioritize the CQs around which to plan and undertake their investigations – see 'useful tools' for strategies**
- **Identify criteria, with these CQs in mind, for assessing benefits and dangers of different renewable and sustainability strategies in specific circumstances**

Exploring

- **Teacher to direct teach by means of structured experiments (a) electrical systems and networks and (b) relationships between current, voltage and resistance**
- **Have learners in work teams of three to design and/or construct a circuit board that enables a flow of electricity to produce light, heat and sound signals**
- **Ask these groups to devise a simple robotic system to control the operation of their circuit boards**
- **Discuss the scope and limits of energy storage in terms of the conversion and conservation of energy and relate these issues to local and global energy issues and production processes**
- **Have each work team explore emerging technologies for energy storage and transmission and create a school information board based on their discussions**

Internet access via the school's mobile phones added to a just-in-time dimension as learners engaged in research activities. Criteria for proper and ethical use were made plain and monitored.

Drawing together

Culminating

- **Have each work team create an animated PowerPoint presentation or video on positive actions for renewable and sustainable energy systems emphasising the GGQs they have selected**
- **Ask learners to construct a table model of an energy system they see as desirable for the region in which they live with explanations for why it should be built**
- **Produce a set of guidelines for personal and school use on how to conserve energy and use it wisely**
- **Put the guidelines on the school Intranet and perhaps on the school Internet for community access**

Reviewing

- **Have each work group draw a storyline of their investigations and studies giving particular attention to the key concepts they discovered in relation to the GGQs they selected**
- **Hold an open day for parents and friends to see an exhibition on 'Energy systems and their development' as well as how I/we studied and understood them**

The composition of the work teams was crucial. A balance of capability was needed to encompass analytical skills, linguistic competence, organizational ability, together with a shared aptitude for working together

Two cycle inventiveness

Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Identifying criteria Circuit boards Energy storage School info board	PPT presentation Energy systems Energy guidelines Study storyline '

Global challenge

Being knowledgeable

Situated scenario
Scientific responsibilities are linked to 'world' issues

Challenge
Address the challenge of climate change

The GGQs causation and change were especially pertinent to this inquiry. The CQs devised needed to be capable of research, not re-statements of the GGQs. The emphasis was on doable things.

Getting started

Positioning

- Stimulate inquiry by showing a David Attenborough:video -The Truth About Climate Change (BBC - Part 2) (youtube.com)
- Have learners and groups of learners follow up by studying the situation in Australia with the aid of BTN newsreels from the ABC

Opening

- Identify key issues that need to be addressed and board individual ideas via sticky notes
- Have learners in groups of three select one positive possibility and one negative issue to focus their climate change inquiries, and select two or three GGQs to direct investigations into these issues

The shared goal was to build a deep understanding of how climate change works and the ways human actions are responsible for some of the current climate instability

Moving forwards

Designing

- Have each group of three identify CQs and PQs, and then agree on a prioritized list for each table group
- Hold a whole class circle group discussion to work out how the pieces in the 'jig-saw' might form a comprehensive inquiry and how it might pan out
- Allocate table group tasks with goals made clear and responsibilities negotiated and accepted

Exploring

- Teacher to direct teach (a) heat absorption on light and dark surfaces (b) insulation from heat and cold, and (c) the conditions that affect evaporation
- Have each table group devise 'experiments' to deal with 'heat' in each of these situations using the 'junk boxes' of material available
- Have all table groups conduct the 'common fun task' of keeping a block of ice from melting as long as possible
- Ask learners to create visual maps of different responses to climate change in their own community and globally
- Set up, using a corners strategy or similar, and enact a mock forum on possible actions to limit climate change now and within the next ten years

Some future implications might be upsetting and depressing for some learners. These feelings would need to be sensitively addressed, not hidden. Much attention was given to encouraging 'what if' questions.

Drawing together

Culminating

- Have each table team present their findings and conclusions with a listeners/viewer's Q & A attached
- Require table groups to create a single model or multiple models of climate responsible - buildings, power generation processes and local community actions
- Produce a whole class collage of climate change as an issue and a personal responsibility including the need for national and international cooperation to take up the challenge in desirable and achievable ways

Reviewing

- Have learners tell their stories of how their thinking evolved with focused reference to the GGQs they have selected during the inquiry
- Record their reflections in their 'personal log' illustrated by photographs of their work
- Post photographs of written and model work on the school Intranet together with a list and brief description of the websites accessed

When outcomes from the learners' inquiries were being harvested it was important to keep the conversations on positive and realistic possibilities. Conclusions and suggestions needed to be 'evidence-based', not emotional outbursts.

Two cycle inventiveness **Strategic highlights**	Cycle # 1 Discover & design	Cycle # 2 Develop & enact
	Experimenting 'Fun task' Visual mapping Corners forum	Present findings System models Climate collage Evolved thinking

Discern significance

Multiple areas of learning

Situated scenario

Being discerning is becoming ever more important in a connected digitized world

Challenge

Discern, wonder and determine significance embedded in media productions

Variation in the GGQs selected reflected different perceptions and personal interests. Reorganizing groups took social compatibility and capability into account

Getting started

Positioning

- Introduce three articles for inquiry – such as a news release on sports science, opinion piece from a newspaper, a social magazine, or an online report
- Have each learner at their table group discuss which of these articles interests them most and why
- Negotiate to form new work groups of learners to examine the media article they have selected

Opening

- Ask learners in their new work groups to discuss which of a set of GGQs are most relevant and select two or three of them to direct their investigations
- Have learners, with these GGQs in mind, develop an agenda of issues to be explored and display them on the class 'thinking wall'

The shared goal was to analyze media articles and determine issues that impact on their veracity authenticity, and reliability

Moving forwards

Designing

- Have each work group identify and prioritize the CQs and PQs for exploring – presentation, structure, layout, appeal, linkages, and the flow of ideas
- Have learners in pairs analyze the language and media techniques used, and then share with their work group to produce a consolidated mind-map of issues

Exploring

- Teacher to direct teach (a) how written and visual media are constructed and guiding principles for clarity of meaning (b) introduce issues of bias and deliberate influence
- Have work teams examine - conceptual meaning, feelings and emotions, ethical issues, and empathy embedded in the article they have selected
- Ask learners from different work groups to share ideas on the power and persuasiveness of the article or material they are studying
- Ask each learner to post their three most important reactions (or impacts) on the class 'thinking wall' and then have the whole group categorise all of them according to – clarity, bias, intention and value
- Have each learner re-write or re-design the article or material they have studied to address issues and the principles they have raised

It was important to encourage learners and work groups to postpone hasty judgment before they had undertaken careful research and reflection

Drawing together

Culminating

- Have learners return to original table groups and analyze a BTN news report on TV, or similar, to determine truthfulness, relevance to them, appeal to the target audience, and global significance
- Have each work group prepare a set of guidelines for multimedia productions
- Use corners for individual learners or groups to support or oppose parts of the guidelines
- Share in a whole group – Forum – modelled on a conference style meeting (name tags, circled tables…)

Reviewing

- Have learners return to their table groups and produce a critique of the guidelines from their perspective and share on the school Intranet
- Have each table group create a 'News desk' video to address the issue of discerning viewers – giving careful attention to character roles such as – the anchor person, expert interviewees & interviewers, correspondents, general public etc..

The Forum gave a real-world sense to the media inquiry and an opportunity to model democratic behaviours and structures. Attention was needed to give quiet people a chance to speak

Two cycle inventiveness Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Different sources	Re-write material
Interest studies	Media sources
GGQs coherence	Guidelines forum
CQs/PQs appraisal	Video production

Assessment in action

An invented professional dialogue

Situated scenario

'Assessment' is an integral part of learning, not a tagged-on extra

Challenge

Make assessment a seamless part of strategies and processes for teaching and learning

Assessment proved a contentious subject due to different interpretations of its intentions, impact and implications. The selection of GGQs needed to promote openness to explore alternatives as well as the efficacy of extant practices

Getting started

Positioning

- **Review the impact of extant assessment processes – testing, multiple choice, common assessment tasks, learner's work - on teaching and learning practices**
- **Check out system requirements as well as expressed community expectations and prevailing attitudes**

Opening

- **Research the value of and processes for assessment 'of', 'for' and 'as' learning**
- **Identify attitudes and practices to assessment in different educational settings and select two or three GGQs based on that contextual understanding**

The shared goal was to research and trial ways in which different approaches to assessment might impact on current and future activity. Prominent GGQs included – function, connection and responsibility

Moving forwards

Designing

- **Construct a mind-map of a framework for assessment issues as an ongoing agenda for inquiry**
- **Translate this agenda into CQs for investigation around selected GGQs, group them and then prioritize them within and across groups**
- **Negotiate to establish work teams to take responsibility for specific aspects of the agenda, and the CQs associated with them**

Exploring

- **Survey parents and the community to ascertain their expectations and the kind of information they would like to receive**
- **Research innovative school practices in other situations and online, including alternative assessment processes**
- **Map connections and disconnects between current practice and innovative possibilities**
- **Explore logistical demands and computing systems for collection of learners' work and responding to system and community reporting requirements**
- **Investigate the ways learners' portfolios, records of development and/or achievement might help make assessment integral to teaching and learning processes**

The issue of assessment was a sensitive issue for many teachers due to feelings of exposure and judgement. A culture of support was essential in creating the conditions for hearts and minds to open

Drawing together

Culminating

- **Use a 'corners' structure with each group advocating for and justifying action in <u>one</u> of - the current system, a different system, professional learning required, and computing systems needed**
- **Subject each group's 'arguments' to a SWOT analysis – strengths, weaknesses, opportunities and threats and present a visual summary of the main threads that emerged**
- **Negotiate and develop a realistic strategic plan in the context of the resources that are available or required**
- **Create information sharing processes for parents and the school community**

Reviewing

- **Have participants in pairs and small groups reflect on the personal learning they gained from their assessment inquiries, and the demands on themselves and others for future action**
- **Establish vertical teams across different year levels to provide 'buddy' support and monitor ongoing professional learning needs**

Teachers and learners are partners in assessment that is integral to learning. Tasks such as collection of portfolios and records of development /achievement need to be shared

Two cycle inventiveness
Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Teams Possibilities Survey Logistics	Justification SWOT Strategic plan Reflection

Integration in learning

An invented professional dialogue

Situated scenario

Learning is interconnected, not compartmentalized into silos

Challenge

Explore Integration and connectedness in teaching and learning

When conversations tended to focus excessively on 'what is' the tenor often became defensive. Keeping 'what could be' in the forefront of minds was crucial

Getting started

Positioning

- **Hold a whole school workshop(s) using a small group strategy to consider 'what is' counterbalanced by 'what could be' in our school's teaching practices**
- **Record each idea on a sticky note and board on a 'picture wall' divided into 'what is' and 'what could be'**

Opening

- **Have teachers in work groups of three to discuss the issues that emerged on the 'picture wall' for what 'I do' in my teaching**
- **Have table groups identify a few GGQs to direct further study and negotiate a big picture of the spread of GGQs selected across all table groups**
- **Seek advice from teachers in schools where there is a history of using integrated approaches to learning**

The shared goal was to explore ways in which different approaches to integrated learning might impact on current and future activity in 'my school'. Overall, the GGQs selected by the table groups covered most of those listed

Moving forwards

Designing

- **Identify, pool, share and discuss related CQs and board as a categorized list(s) on the 'picture wall'**
- **Have table group members discuss how their conversations fit with what is known about how children learn – researching the Internet for latest findings as well as relevant theories and practices**
- **Develop a shared view of the values and potential actions required for teaching and learning to become integrated without specific skills being overlooked**

Exploring

- **Investigate how a question-led approach to teaching and learning might foster integration in learning**
- **Examine the difference between questions and questioning, and how they impact program planning, teaching strategies, and social behaviours**
- **Investigate how a focus on concepts or 'big ideas' might lessen content pressures and deepen learning**
- **Explore management issues that enable teachers to strengthen integrated learning in their practices**
- **Have table groups explore 'why' and 'how' integration in learning is important in the modern world and the potential role of question-led inquiry within it**

It was important to keep the tenor of conversations on 'best/good' ideas knowing that they are likely to be modified when put into practice. A key issue was to delve into the theory and practice of integration

Drawing together

Culminating

- **Ask each teacher or team of teachers to prepare an outline plan for an integrated unit of study for the learners they are teaching**
- **Share, critique, and enhance these plans through collaboration in their original work groups of three**
- **Have table groups identify practicable strategies for integration within a question-led learning approach**
- **Produce a set of principles to guide sharing teacher expertise, different groups of learners, and different parts of the curriculum and/or units of study**

Reviewing

- **Form 'buddy partners' to provide personal support when designing, modifying and improving the implementation of learners' question-led inquiries**
- **Set up 'expert' groups based on need/interest to create a 'bank of resources' on questions and questioning strategies that engage learners**
- **Invite contributions to a page on the school Intranet and Internet website that discusses the 'why' and 'how' of teaching and learning in 'my school'**

When working towards a shared set of principles for question-led learning, it was important to promote diversity of ideas and interpretations – that is, a sense of unity within diversity

Two cycle inventiveness
Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
What is & could be GGQs-CQs applied Question-led slant Integration benefit	Teacher planning Guiding principles Resources bank Buddy support

Agile spaces into action

An invented professional dialogue

Situated scenario

Flexible school building designs are replacing boxed layouts

Challenge

Explore ways to use flexible spaces in agile ways

During the envisioning process it was important to focus on future needs and possibilities and not let difficulties take over. Yet problems and impediments were, and needed to be, integral to the conversations

Getting started

Positioning

- **Search the Internet for examples of modern designs for school buildings and environments**
- **Explore the posts on the Internet - Randy Fielding, Author at Getting Smart – with a view to redesigning my classroom and nearby spaces**

Opening

- **Explore different strategies and styles for teaching and the philosophical basis behind each of them**
- **Envision how teaching and learning in 'my school' might change if learning spaces were more flexible**
- **Have teachers in groups identify issues that are inhibiting integration, problem solving inquiries, and question-led learning**

The shared goal was to create 'ideal' designs and models for 21st century teaching and learning. Participants were asked to select one GGQ from each category outlined on frame 14 to direct the envisioning process.

Moving forwards

Designing

- **Work in table groups to select three GGQs (one from each perspective on frame 14) and identify associated CQs/PQs based around redesigning learning spaces**
- **Have each table group produce an outline map or drawing , as detailed as possible, of their ideas on creating flexible spaces and environments for learning**

Exploring

- **Research opportunities learners gain through agile spaces to learn in different settings (modes) and in different ways (modalities) – see frames 119 & 120**
- **Research 'cutting edge' school designs and the functionality of different learning spaces – commons, learning studios, specialist areas, performing arts spaces, and their multi-purpose use**
- **Talk in small groups about differences in preferred ways of learning among the learners 'I teach'**
- **Consider practicalities and benefits of teacher teams - sharing learners, working in collaborative groups, sharing expertise and distributing responsibilities etc.**
- **Make suggestions on how 'I could' team with other teachers and work collaboratively them in planning and implementing inquiries and assessing learners**

Some people found future outlooks challenging, even depressing, and certainly daunting. These feelings had to be sensitively addressed, not hidden. 'What if…' questions helped people see beyond the current horizon

Drawing together

Culminating

- **Develop a set of principles for the design of modern educational facilities and construct a mind-map of how it would transform 'my school'**
- **Make recommendations on strategies for building and supporting collaborative teamwork in 'my school'**
- **Develop a set of flexible procedures to guide how teams of teachers should work together in catering for the diverse learning needs and interest of learners**
- **Build structures and processes for grouping and regrouping learners according the study units or tasks they are undertaking and the learning activities in which they are engaged**

Reviewing

- **Reflect on how 'my understanding' of learners' learning preferences and the flexible grouping of learners has evolved**
- **Review the requirement to balance inquiry-based learning with the sequential and ongoing development of learners' capabilities and skills**

Managing reactions like – 'it's not possible' or 'I doubt I can do it' was delicate. It was also challenging to balance vision with what was doable, and see strategic ways to get there over time

Two cycle inventiveness Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Redesigning space	Change principles
Teaching styles	Collaborative work
Designs trends	Needs grouping
Changing action	Balanced learning

Creative collaboration

An invented professional dialogue

Situated scenario

Collaboration is integral to creativity and innovation

Challenge

Build collaborative cultures in educational settings and strategic processes to enact them

At times it was difficult to keep the concept and principles of collaborative processes in the forefront and coral tendencies to produce a mechanistic process where 'one size fits all'

Getting started

Positioning

- **Ask people to work in small groups and talk about their experiences of collaboration, creativity and innovation**
- **View the video – Seven keys to collaboration by John Spencer– at table groups discuss the implications – benefits and pitfalls - for 'me and my school'**

Opening

- **Ask a person or group from the community to talk about their experience of working collaboratively**
- **Have table groups select two or three GGQs to direct and shape further inquiry into the relationship between creativity and collaboration**

The shared goal was to explore how creativity might be promoted/supported, and the role of collaboration in getting there. The spread of GGQs selected was wide with thinking, responsibility and ethical prominent

Moving forwards

Designing

- **View the video – Do schools kill creativity by Ken Robinson and have table groups record the main thoughts it provoked and display the results on the 'conference thinking wall'**
- **Negotiate CQs and PQs to investigate the ideas raised by the video**

Exploring

- **Provide three different scenarios through which to explore these questions, such as – exploring motivations and energy among learners, preventing bullying, using of outdoor environments for learning…**
- **Have table groups chose one scenario and produce a mind-map of the positive, negative and interesting ideas provoked by the video and post outcomes on the 'conference thinking wall'**
- **Explore in re-mixed small groups possible responses to the 'interesting lists' for each scenario, including 'crazy ideas' out of left field**
- **Work in pairs to create a fishbone diagram with collaboration on one side of the backbone and creativity on the other that shows how they enable learners to 'create something that has value'**

Building a climate of respect for personal endeavours and practices (what is) was a sensitive matter. Substantial conversations around 'what could be' were important

Drawing together

Culminating

- **Discuss at table groups ways and means through which 'I/we might' re-design, modify or transform my/our behaviour with learners and how 'I/we might' redesign parts of our learning program**
- **Produce broad consensus (at least tacit acceptance) of keys aspects of creative collaborations that are – positive, negative and interesting**
- **Use the video – by James Taylor to consider possibilities for enhancing collaborative teams in 'my school', both among teachers and among learners**

Reviewing

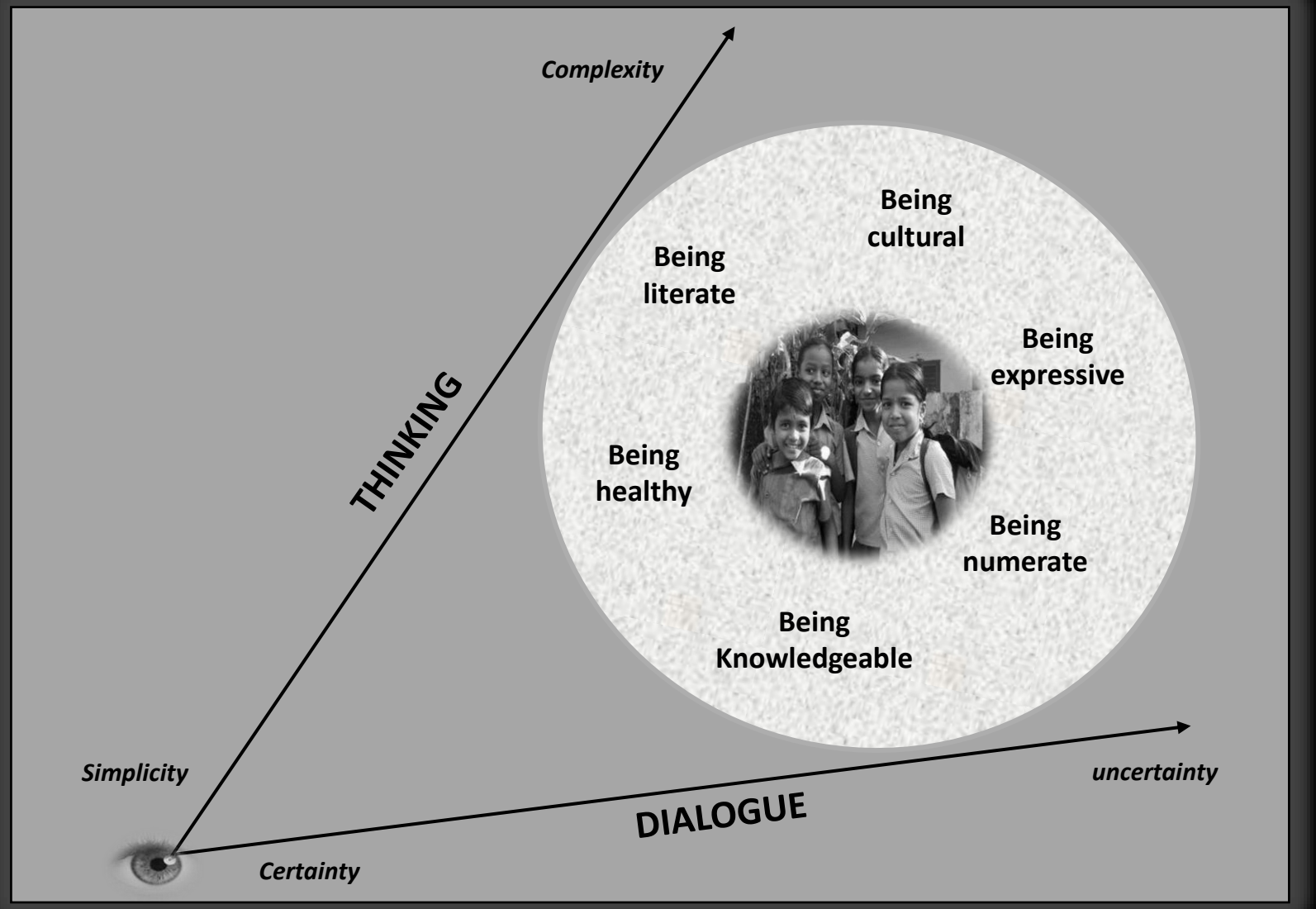
- **Have people share the 'stories of realization' that emerged from the conference deliberations and perhaps one thing I/we intend to work on**
- **Organize or participate in forming networks to continue dialogues to share ideas, solve problems and provide mentor support**
- **Consider the possibility of a 'good practice' website that would build a bank of practicable ideas**

One of the issues was to turn mindsets to possibilities for action and avoid a talkfest. The critical concern was to put theory into practice

Two cycle inventiveness Strategic highlights

Cycle # 1 Discover & design	Cycle # 2 Develop & enact
Collaboration idea	Consequences
Creativity in action	Key aspects
Practical scenarios	My intentions
Principles	Teamwork

TALKING LEARNING
Sharing a language



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TALKING LEARNING GATEWAY
Contents

Click to access

Fields	Learners			
	Early	Transitional	Proficient	Accomplished
Being cultural	← F57, F58, F59 →			
Being literate	F64	F65	F66	F67
Being numerate	F71	F72	F73	F74
Being healthy	F78	F79	F80	F81
Being expressive	F85	F86	F87	F88
Being knowledgeable	F92	F93	F94	F95, F96, F97

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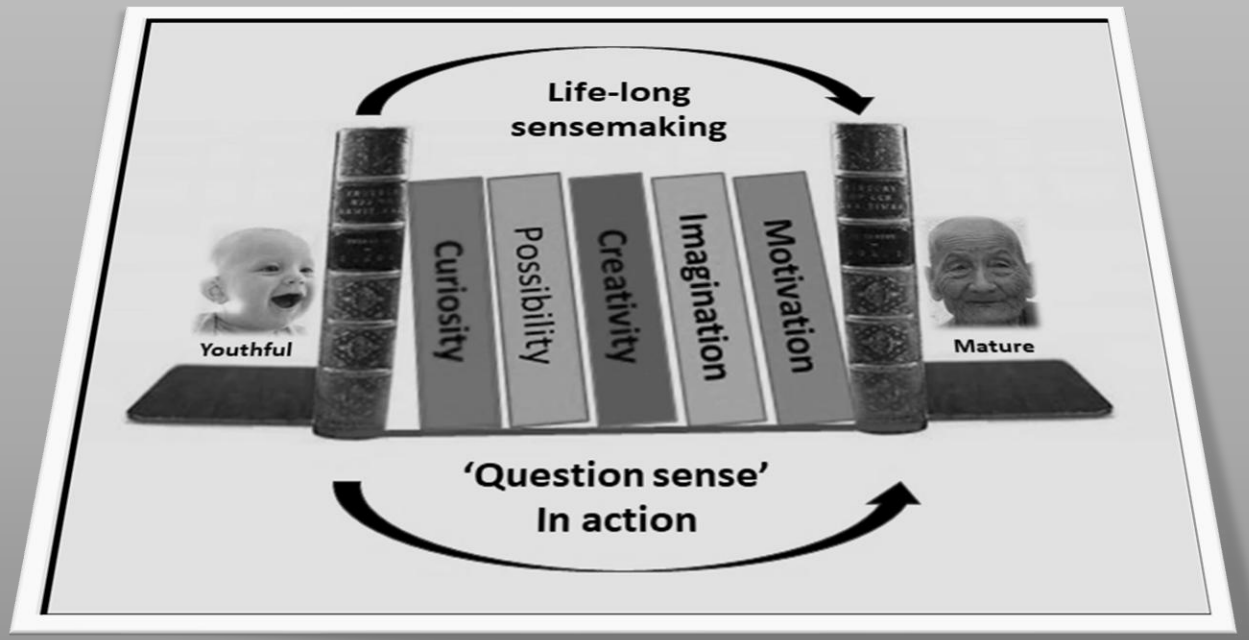
Being cultural

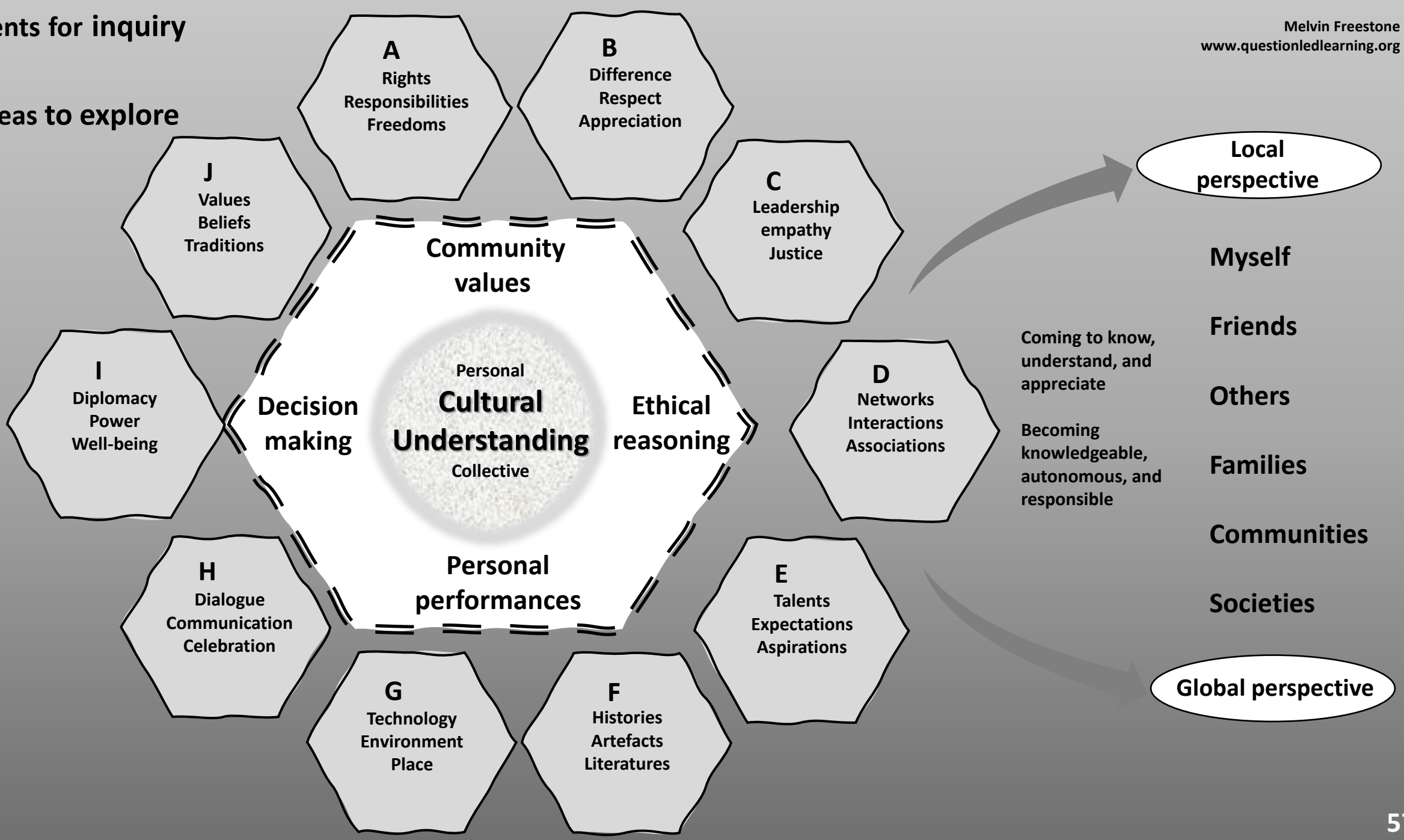


Develop a culture of curiosity and appreciation throughout life

Melvin Freestone
www.questionledlearning.org

Elements for inquiry

Big ideas to explore



Commentary

Being cultural
builds on and extends the approach adopted by the Australian Curriculum and Assessment Authority (ACARA)

ACARA model

Intercultural Understanding
The ACARA national curriculum

In the Australian Curriculum, learners develop intercultural understanding as they learn to value their own cultures, languages and beliefs, and those of others. They come to understand how personal, group and national identities are shaped, and the variable and changing nature of culture. Intercultural understanding involves learners learning about and engaging with diverse cultures in ways that recognise commonalities and differences, create connections with others and cultivate mutual respect.

Intercultural understanding is an essential part of living with others in the diverse world of the twenty-first century. It assists young people to become responsible local and global citizens, equipped through their education for living and working together in an interconnected world.

Intercultural understanding combines personal, interpersonal and social knowledge and skills. It involves learners learning to value and view critically their own cultural perspectives and practices and those of others through their interactions with people, texts and contexts across the curriculum.

Intercultural understanding encourages learners to make connections between their own worlds and the worlds of others, to build on shared interests and commonalities, and to negotiate or mediate difference. It develops learners' abilities to communicate and empathize with others and to analyze intercultural experiences critically. It offers opportunities for them to consider their own beliefs and attitudes in a new light, and so gain insight into themselves and others.

Intercultural understanding stimulates learners' interest in the lives of others. It cultivates values and dispositions such as curiosity, care, empathy, reciprocity, respect and responsibility, open-mindedness and critical awareness, and supports new and positive intercultural behaviours. Though all are significant in learning to live together, three dispositions – expressing empathy, demonstrating respect and taking responsibility – have been identified as critical to the development of Intercultural Understanding in the Australian Curriculum.

A former Secretary-General of the United nations, Kofi Annan, voiced a fundamental principle for living and working a complex and rapidly changing world
"The United Nations was created in the belief that dialogue can triumph over discord, that diversity is a universal virtue and that the peoples of the world are far more united by their common fate than they are divided by their separate identities."

Question-led cultural Inquiries

Needs-based

General inquiry
Focus on all 'Big ideas'

Focus fields
A to J

Attitude-based inquiry
Big idea – Personal performance

Focus fields
E, D & H

Dilemmas-based inquiry
Big idea – Ethical reasoning

Focus fields
A, I & J

Action-based inquiry
Big idea – Decision-making

Focus fields
C, A & E

Circumstance-based inquiry
Big idea – Community values

Focus fields
B, F & G

For details of the letters A to J
See frame 57
(The selections are indicative and not intended to exclude other 'elements' or 'big ideas')

CONSIDER

- Local perspectives
- Myself
- Friends
- Others
- Families
- Communities
- Societies
- Global perspectives

What is OK to ask in one culture may not be appropriate in a different one

Question-led inquiry into action

#1 – Select generic generative questions (GGQs)

FORM	What is it like?
FUNCTION	How does it work?
CAUSATION	Why is it like it is?
CONNECTION	How is it connected to other things?
CHANGE	How is it changing?
PLACE	What is the role of place here?
RESPONSIBILITY	Who might be responsible?
CARE	How could people care for others?
ETHICAL	Where is the ethical reasoning?
AESTHETIC	How is aesthetic sense manifest?
THINKING	How is the thinking evolving?
INNOVATION	What might innovation add?

For details go to – Frame 16, 17, 18, 19

See previous Frame 59 for examples of a needs-based differentiation of inquiries

Select only 2 or 3 of the most relevant

2 – Conduct inquiries

Getting started	**Positioning performances** - *focus on prior learning, knowledge, experience, and the interests, and on aspects of challenges that need to be explored or considered.* **Opening performances** - *select a few relevant GGQs, together with the goals for inquiry associated with them, and develop shared understandings of what they mean.*
Moving forwards	**Designing performances** - *devise CQs, and PQs if necessary, for selected GGQs, prioritize and translate them into practicable inquiries that contain realistic tasks to enact them.* **Exploring performances** - *conduct investigations customised to the demands of the design tasks, the capabilities of individual participants, and their expressed interests.*
Drawing together	**Culminating performances** - *build on inquiries by extrapolating what has been discovered to different contexts and to new or emerging challenges, and so doing by diverse means.* **Reviewing performances** - *backtrack to the initial questions and goals for inquiry to determine what has been achieved or needs to be addressed, and where to next.*

Conduct the inquiry in 2 cycles

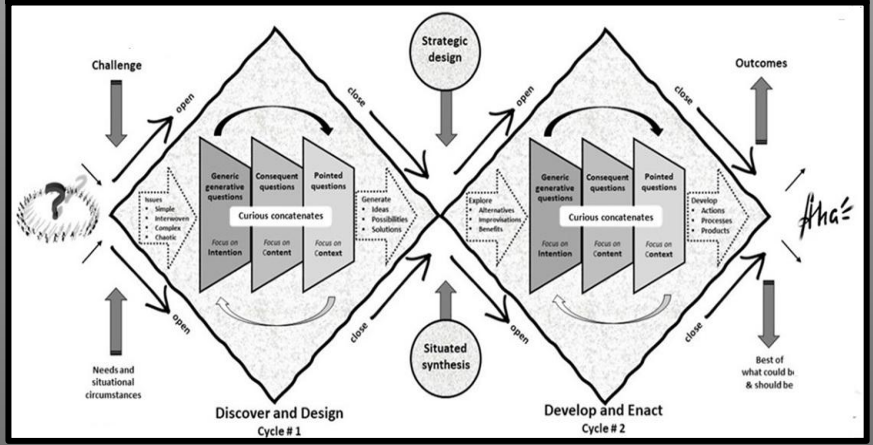
At times and in ways that are age and culturally appropriate, apply this three-phase process to inquiries into the

Elements **of cultural understanding that have been identified with *'big ideas'* in mind**

(See frame – 57)

For details go to – frame 25

3 – Engage in inventiveness



Being Literate

Three interconnected elements

- **Speaking and listening**
- **Reading and viewing**
- **Writing and representing**

Commentary

The detailed charts that follow provide a 'Learning Barometer' to aid question-led teaching and learning. They are NOT inquiries, just possibilities for learning. They complement the Australian Curriculum (ACARA).

Growth in Being Literate – a broad overview

The ACARA national curriculum

Beginning

Learners understand that spoken words connect us with others. They realise that the sounds of language are a symbolic way of representing ideas, objects and feelings.

Through speaking, listening and asking questions they realise that people share thoughts and feelings. They comprehend and create a small range of simply structured spoken and written texts for informative and literary purposes. They interact with family, peers and small groups using relatively straightforward expression of opinions and feelings.

They should experience fiction, non-fiction, poetry, film as well as multimodal and digital texts that deal with familiar and personal content and some imaginative content. These texts are relatively predictable and contain easy to follow sequences of events and a small number of characters who are simply represented.

Developing

Learners understand that spoken language varies according to purpose and audience. They read and view familiar and/or predictable texts, which have spoken language patterns, repeated words, phrases or sentences, and often include rhyme and rhythm. They enjoy a range of texts that are short, clearly structured, deal with familiar ideas or known topics often supported by photographs or illustrations.

They experiment with different forms of communication, often incorporating them to their classroom and play activities. They use drawing, computer graphics and written symbols to represent ideas. They create signs and write simple print-based materials and texts, using graphics and digital media to represent ideas and information in text forms. They become familiar with commonly used ICT resources, including computers, mobile phones and cameras, and enjoy films, stories, music and television programs.

They create a range of simple texts in print and electronic forms about topics of personal significance. They understand different types of text serve different purposes. They plan their writing and reread it to check that it makes sense. They begin to edit and proofread their own writing, using resources such as word walls and spell-checking software.

They speak and listen through conversation, discussion and informal presentations. They communicate in group situations, making comments, explaining how to do things, expressing opinions and asking questions.

Maturing

Learners reflect on what they hear and say in making judgements and forming opinions. They comprehend, create, evaluate and explicitly discuss a variety of written, spoken, visual and multimodal texts for literary, informative and persuasive purposes, including texts that involve several stages and phases.

They should read fiction, non-fiction, poetry, film and multimodal, media and digital texts which deal with less familiar subject matters in terms of historical, geographical or cultural context and impact... They scan for meaning and understand texts are written for specific audiences.

They write independently and with confidence. They think about the perspective of audiences and how that helps them communicate more effectively and appropriately.

Their interactions with others involve working in small and large discussion groups and offering opinions, and through these conversations recognising the importance of authenticity.

Question-led inquiry into action

The generic three-stage process helps to give inquiries purpose and coherence.

The structure and the questions often need to be refined, even transformed, as an inquiry progresses.

Apply to

Being literate

For details go to – frame 25

#1 – Select Generic Generative Questions (GGQs)

FORM	What is it like?
FUNCTION	How does it work?
CAUSATION	Why is it like it is?
CONNECTION	How is it connected to other things?
CHANGE	How is it changing?
PLACE	What is the role of place here?
RESPONSIBILITY	Who might be responsible?
CARE	How could people care for others?
ETHICAL	Where is the ethical reasoning?
AESTHETIC	How is aesthetic sense manifest?
THINKING	How is the thinking evolving?
INNOVATION	What might innovation add?

For details go to – Frame 16, 17, 18, 19

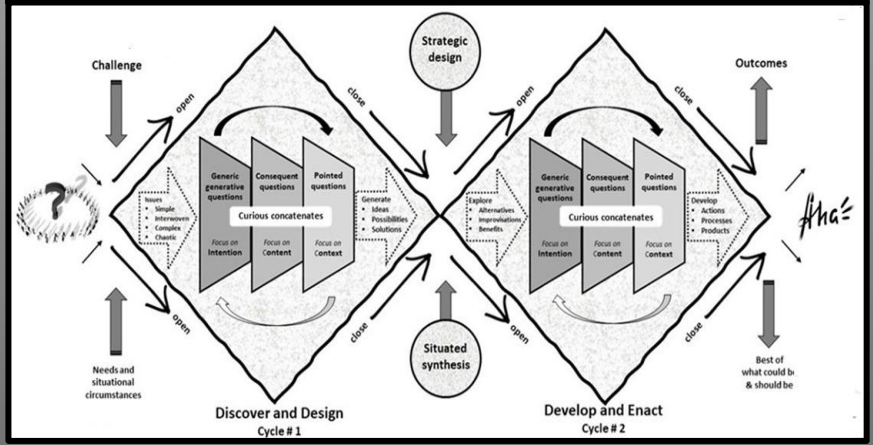
Select only 2 or 3 of the most relevant

2 – Conduct inquiries

Getting started	**Positioning performances** - *focus on the prior learning, knowledge, experience, and interests, and on the aspects of challenges that need to be explored or considered.* **Opening performances** - *select a few relevant GGQs, together with the goals for inquiry associated with them, and develop shared understandings of what they mean.*
Moving forwards	**Designing performances** - *devise CQs, and PQs if necessary, for selected GGQs and translate them into practicable inquiries that contain realistic tasks to enact them.* **Exploring performances** - *conduct investigations customised to the demands of the design tasks, the capabilities of individual participants, and their expressed interests.*
Drawing together	**Culminating performances** - *build on inquiries by extrapolating what has been discovered to different contexts and to new or emerging challenges, and so doing by diverse means.* **Reviewing performances** - *backtrack to the initial questions and goals for inquiry to determine what has been achieved or needs to be addressed, and where to next.*

Conduct the inquiry in 2 cycles

3 – Engage in inventiveness



Early learners
A learning barometer!

Question-led learning builds language knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Speaking and listening

- Using gesture, actions and body language to express their thoughts and feelings.
- Listening and responding to the content of spoken texts that use everyday language and familiar vocabulary.
- Discussing ideas, events and details from texts listened to or viewed with peers, teachers and known adults.
- Talking about how texts convey meaning and can take many forms.
- Engaging in pair, small and large group discussions as part of undertaking shared tasks with others.
- Speaking clearly and adjusting the volume of speech to their audience and purpose.
- Using widening vocabulary and extended sentence patterns to share ideas and feelings in texts
- Recognising rhymes, syllables and single sounds in spoken words.
- Choosing, using and pronouncing words properly
- Talking about familiar topics and making presentations of a few connected sentences to tell others about them
- Asking simple questions in areas of personal interest to clarify meaning and seek more information and ideas.
- Discussing own paintings, drawings, models, toys and photographs with peers and known adults.
- Giving constructive feedback on work their peers have created or things that interest their peers.
- Listening and responding to a range of spoken texts in informal and some more formal situations.
- Remembering and following multi-step instructions and following prompts in multimodal texts.
- Using different interaction conventions such as asking questions, offering comments and constructive criticism.
- Reciting poems, rhymes and songs with meaning.
- Providing personal and constructive comments on visual material such as film, video, photographs and graphics.

Reading and viewing

- Using early reading strategies such as re-reading to maintain meaning.
- Navigating different types of print and visual and digital texts using basic concepts about print.
- Using meaning, visual, contextual and memory cues when participating in shared reading.
- Reading aloud texts with extended sentence patterns and responding to sentence boundary punctuation.
- Retelling the story in a print, multimodal or multimedia text giving details of events and characters.
- Recognising, naming and sounding letters, and combinations letters, in the context of particular words.
- Knowing the meaning of most high frequency sight words and using this knowledge to read new texts.
- Working out short regular words using context, grammatical and phonic knowledge.
- Revealing own feelings in response to print texts, visual texts, photographs and presentations.
- Predicting what might happen next in print and visual texts by making inferences about characters and events.
- Viewing multimodal texts, computer-based texts and educational games, and sharing opinions about them.
- Beginning to discuss different text forms such as how factual texts differ from imaginative texts.
- Showing understanding of how a multimodal or a visual text conveys meaning and influences behaviour.
- Participating in discussions about text content, plot, characters, feelings and setting, and retelling stories.
- Identifying words and images that represent people, things, actions, feelings and emotions.
- Using context, grammatical and phonic knowledge to predict and confirm when working out unfamiliar words.
- Making connections between personal experience and characters in story books and multimedia texts.

Writing and representing

- Developing handwriting skills using correct strokes for most lower case and upper case letters.
- Using left to right directionality, return sweep and spaces between words. capital letters and full stops.
- Using simple word processing functions and the keyboard for most letters when composing short texts.
- Talking about ideas they going to write about and seeking suggestions from peers and known adults.
- Writing short texts of a few sentences to retell events and experiences to a small range of audiences.
- Comprehending concepts about print such as letters, words, sentences and the incorporation of pictures and simple graphics such as arrows.
- Using sound-letter knowledge to spell common and unknown words, including a number of irregular words.
- Observing how their teacher writes 'stories' and making helpful suggestions when participating in shared writing.
- Describing events or factors in their writing and drawings to others and seeking suggestions.
- Creating simple multimodal texts with pictures and drawings placed in an appropriate order or sequence.
- Understanding the basic conventions of written texts such as sequence, pacing, directionality and audience.
- Creating short imaginative and information texts for a small range of purposes.
- Incorporating familiar ideas into their writing based on an understanding of simple text structures and features.
- Using lower case and upper-case letters appropriately in their print and multimodal texts.
- Using some recognised strategies, when prompted, to edit their work for meaning, spelling and punctuation.
- Choosing appropriate visual material to include in multimodal and multimedia texts they have created.
- Celebrating own written work and the work of others.

Transitional learners
A learning barometer!

Question-led learning builds language knowledge and skills
Indicative experiences are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Speaking and listening

- Talking about stories, writing, pictures, videos and models they behave created.
- Listening to a range of spoken and multimedia texts on familiar and learned topics.
- Retelling main ideas and talking about their thoughts, feelings and emotions related to them.
- Listening for details and instructions on what needs to be done and how it should done.
- Asking and answering questions, picking out main ideas and engaging in talk-based learning tasks.
- Speaking confidently to groups and adapting their language to suit their audience and purpose.
- Using every day talk and specific vocabulary to discuss ideas related to areas of personal interest.
- Designing and making oral presentations that contain some detail and use formal language.
- Presenting thoughts and feelings with conscious attention to voice, eye contact and gesture.
- Discussing how to interact differently with different people out of respect for them.
- Predicting likely endings and outcomes from listening to parts of a print or multimedia text.
- Contributing to group discussions, asking relevant questions, building on others' ideas and providing helpful feedback.
- Identifying and using turn-taking patterns in groups and pairs to explore and conference ideas and possible actions.
- Understanding the interactive nature of spoken language and explaining how this differs from written language.
- Speaking clearly and expressively with details in logical sequence as well as with appropriate eye contact, volume and pace to enhance meaning.
- Distinguishing differences in spoken language for use in informal and personal contexts from those suited for formal and public situations.

Reading and viewing

- Navigating texts using the title, table of contents, headings and subheadings, indexes and screen conventions
- Reading and viewing longer narrative and information texts, and extracting meaning from them.
- Discussing possible meanings and predicting likely events as they read a text and relating them to own experience.
- Reading texts with some complex language, ideas and vocabulary to find information on a range of topics.
- Making inferences about the actions and motivations of characters in texts they have read or are reading.
- Connecting texts they are reading to other texts they have read or those that have been read to them.
- Identifying most common irregular words in a range of different texts with explanations of how they are used.
- Using syllabification and morphemes to read simple multisyllabic words.
- Reading aloud with fluency and intonation, self-correcting based on the context, grammatical and phonic knowledge.
- Recognising and understanding the meaning high frequency sight words in the context of texts they have read.
- Viewing visual information and asking relevant questions to reveal possible meaning and make interpretations.
- Reading, viewing, navigating and responding to imaginative, informative and persuasive texts.
- Recognising differences between fiction and non-fiction, between literal and figurative language.
- Locating literal information and making inferences about it by referring to relevant print and visual information.
- Using word attack strategies, monitoring their own reading, and self-correcting to maintain meaning.
- Justifying predictions, interpretations and conclusions gleaned from reading print and multimedia texts.
- Making inferences about motives, causes, effects and consequences and responding to the viewpoints of others.
- Identifying simple literary and visual devices used by authors to generate meaning and create atmosphere.
- Observing bookmarking features for categorisation of texts.

Writing and representing

- Writing legibly with joined letters of consistent size and slope, and using word processing programs with growing efficiency.
- Creating imaginative and informative print and multimodal texts for different purposes and a widening range of audiences.
- Using sentences with correct tense and headings, boundary punctuation, capital letters, exclamation and question marks.
- Creating texts that display control over sentence structures with the appropriate use of, verbs, nouns and noun phrases.
- Discussing their choice of language structures and features in order to receive feedback and suggestions.
- Spelling accurately most common irregular words.
- Demonstrating an increasing ability to spell unknown words using sound-letter correspondence and visual knowledge.
- Reading and editing their work for meaning, spelling and punctuation.
- Incorporating visual material such as photographs and graphics into own writing to enhance meaning.
- Sequencing arrangements of visual material such photographs and diagrams to create descriptive texts with helpful captions.
- Creating texts that inform, narrate or persuade, giving reasons for their choice of text in terms of audience and purpose.
- Writing about familiar ideas, experiences, events and information with developed characters, ideas and events.
- Organising texts in paragraphs composed of logically grouped sentences dealing with one aspect of a topic.
- Understanding how detailed ideas can be expressed through the careful choice of verbs and adverbs and nouns and adjectives.
- Using simple punctuation correctly including apostrophes to mark contractions and commas to separate items in lists.
- Using a variety of spelling strategies to spell high frequency words correctly, including syllabication to spell complex words.
- Creating multimodal texts incorporating written, visual and sound language.
- Producing digital texts to convey ideas and feelings in ways that address the characteristics of particular audiences.
- Re-reading own writing to check accuracy and to improve meaning, purpose and appropriateness to their audience.

Proficient learners
A learning barometer!

Question-led learning builds language knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Speaking and listening

- Responding constructively to presentations, offering relevant challenges and suggestions on key points.
- Identifying key ideas and details in presentations with a concern for accuracy and a respect for their source.
- Summarising and presenting ideas for others in ways that stimulate interest and provide clarity.
- Using open questions to prompt speakers to provide more information and extend their ideas.
- Ordering ideas and information in appropriate sequences when giving oral presentations to particular audiences.
- Using appropriate strategies to ask for information or make requests or suggestions or justify arguments.
- Considering audience needs when planning, preparing and rehearsing informative or dramatic presentations.
- Employing variations in volume and pace, pausing for effect and waiting for audience reaction.
- Arguing sensitively and persuasively to advance or defend information, ideas, different viewpoints and perspectives.
- Critiquing the appeal of a visual text in terms its impact on them and its connection with their personal preferences.
- Listening appreciatively to live and recorded spoken and multimodal texts to identify key points and messages.
- Distinguishing between relevant and irrelevant detail as well as the difference between substance and padding.
- Talking openly about own feelings and emotions to public audiences and listening to what others have to say.
- Selecting relevant visual resources and procedures to support oral presentations for particular audiences.
- Talking to clarify ideas and arguments, to share and evaluate experiences, and to contribute to discussions.
- Adopting various roles in group discussions to maintain the flow of ideas and explore different points of view.
- Making informed statements and selecting specific details to sustain a point of view in an oral presentation.
- Experimenting with structures and features of spoken language to influence audiences and share points of view.
- Adjusting register, tone, volume, pace and gestures for audiences.

Reading and viewing

- Reading, viewing, navigating and responding to a broad range of literary, informative and persuasive texts in print and digital formats that present complex ideas and themes from different historical, geographical and cultural contexts.
- Identifying how the choice of text structures and language features meets the contextual needs and purposes of different texts and their authors.
- Drawing informed conclusions and making inferences based on literal and 'hidden meanings' implied in texts.
- Interpreting, critiquing and synthesising ideas and information in a text or a selection of texts by reference to evidence derived from them.
- Recognising and describing how language choices and techniques influence audiences and reflect the author's intentions.
- Identifying ways individual values and experiences shape own and others' interpretations of texts.
- Using a range of research strategies and resources to explore issues or synthesise ideas or reflect on feelings.
- Locating information on a topic from multiple sources by previewing, skimming and reading selectively.
- Determining the authenticity, reliability and relevance of material read in print and electronic media.
- Using appropriate strategies to synthesise and summarise information on a particular topic from several texts, and make valid generalisations about the topic.
- Assessing ways material read in print and electronic tests can be enhanced to better convey the author's message, story or point of view.
- Evaluating and comparing different perspectives presented in print and digital texts through analysis of the language and design elements used.
- Explaining how written information and visual images are integrated in texts to shape meaning.
- Evaluating the structures and language features of texts selected to influence and persuade audiences.
- Using evaluative library and online research processes to source and select specific information.
- Explaining how relevant personal experiences can add to the meaning of a film/movie or other forms of visual text.
- Recognising that different readers often make different interpretations of the same text in terms of emphasis, meaning and message.

Writing and representing

- Composing a variety of imaginative, informative and persuasive texts for different purposes and audiences.
- Selecting information and ideas from personal, literary and researched resources for a chosen audience.
- Developing coherent texts by varying sentences and paragraphs for specific effect and by using coordinating conjunctions and linking prepositions.
- Selecting precise vocabulary to express and develop ideas, to engage and persuade readers and to convey emotions.
- Writing well-structured and sequenced sentences that are grammatically correct, including punctuation that adds precision such as apostrophes and bullet points.
- Spelling a wide range of words accurately and using appropriate strategies to decode new words.
- Editing own writing to check for meaning, spelling, punctuation errors, omissions, repetitions, and syntax.
- Integrating the features of word processing functions fluently and accurately to achieve their purposes.
- Acknowledging all print and digital sources of information used or referred to in own texts.
- Creating multimodal and multimedia texts to inform, persuade, explain, speculate and entertain.
- Justifying opinions expressed in own writing with relevant supporting ideas and information.
- Drawing on literary elements and devices to compose imaginative print and digital texts for a given audience.
- Selecting text structures, language and grammatical features such as modality to influence audiences.
- Attempting to use complex sentences to add coherence and depth to their writing.
- Choosing subject-specific vocabulary and sentences to add clarity and coherence to their writing.
- Using brackets to enclose additional information, quotation marks for direct speech, titles and commas to mark clauses.
- Seeking and responding to feedback when planning, drafting, editing and proofreading own writing to enhance meaning and purpose.
- Referencing all sources of information according to recognised codes and conventions.

Accomplished learners
A learning barometer!

Question-led learning builds language knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
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Speaking and listening

- Listening to spoken and multimodal texts to identify key information and ideas, and the language choices used.
- Asking relevant questions to present accurate summaries and develop presentations for particular audiences.
- Examining how verbal and non-verbal communication elements in digital texts create meaning and influence audiences.
- Creating imaginative, informative and persuasive oral texts with awareness of the language and structural choices made and the reasons behind these choices.
- Explaining how spoken language can create imaginative worlds through which personal experiences can be described and social issues can be explored or explained.
- Interacting with others to report information, discuss ideas and issues, and interpret differing perspectives.
- Planning, revising and rehearsing oral presentations for accuracy, clarity and 'strength' of message.
- Giving others adequate time to say what they have to say without the pressure of intervention through an appreciation of the value of pause and 'silent' thinking.
- Creating a range of spoken texts for specific purposes and audiences to be presented in diverse formal and informal contexts, as well as delivered to small and large groups.
- Explaining the effectiveness of language and structural choices made to convey meaning and content.
- Using language effectively to express and develop ideas, to create identities and to position themselves and others as speakers and listeners.
- Interacting with others confidently to report information, discuss ideas and opinions, debate issues and evaluate differing perspectives and the value of what is being said.
- Using appropriate strategies and protocols for participating in discussions and negotiations, and for collaborating with others to reach shared decisions and actions.
- Planning and rehearsing oral presentations for accuracy, style, timing and mode of delivery

Assessing the impact of discussions and presentations on different audiences and the reasons those impacts

Reading and viewing

- Reading, viewing, navigating and responding to imaginative, informative and persuasive texts drawn from a range of contexts that cover a wide range of topics of personal, social, cultural and historical significance.
- Identifying the main ideas in texts, making inferences about characters, settings, events and issues, drawing on textual evidence to support judgments.
- Interpreting and integrating various viewpoints in a text about human experience and different cultures.
- Drawing conclusions and where appropriate challenging the main ideas, concepts, arguments and presentation styles used in particular printed and digital texts.
- Comparing structural and language features of texts written in different genres
- Explaining how authors influence readers and viewers by making strategic language and vocabulary choices.
- Identifying combinations of written, visual and auditory elements in digital texts and the reasons behind them.
- Explaining how the different elements in printed and electronic texts contribute to meaning and affect own responses and the responses of others.
- Collecting ideas and information from a range of sources including books, websites, search engines and databases… .
- Evaluating the authenticity, validity, relevance and background of printed and electronic material.
- Reading and interpreting literary works and classical literature for substance, style and cultural importance.
- Exploring different viewpoints about human experience by drawing on textual evidence to support their opinions.
- Comparing and contrasting structural and language features including vocabulary of significant literary texts.
- Explaining how structure, language and style are designed and used in different text genres to influence readers and viewers.
- Interpreting literal and non-literal language in print, multimodal and digital texts, and their effects on readers.
- Considering how combinations of written, visual, auditory and symbolic elements can make meaning, achieve author's purposes, and build relationships with audiences.

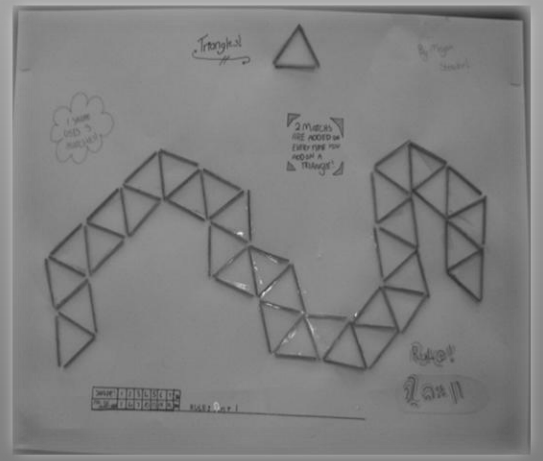
Writing and representing

- Creating well-structured and sequenced print and multimedia texts for imaginative, informative and persuasive purposes.
- Selecting genres that are appropriate for particular purposes and the audience for whom they are written.
- Creating imaginative texts and presenting points of view that sustain meaning, reasoning, interest and structure.
- Guiding readers through their texts using introductions, topic sentences in paragraphs, modality, verb groups and clauses.
- Choosing appropriate content and vocabulary to express and develop ideas as well as create interest and entertain.
- Using design and editing computer software and equipment to create effects in digital texts that address particular purposes and have specific impacts.
- Making texts flow through the use of sentence levels, paragraphs, headings structure and sequencing.
- Planning, drafting, editing and proofreading for appropriateness and accuracy of the language as well as clarity of the content and possibilities for improvement.
- Storying boarding the structure and sequence, language and graphics as well as the production process for the creation of multimedia texts.
- Exploring the characteristic features of different genres and how significant authors have employed them.
- Producing print and multimedia texts that challenge ideas, report events, reflect on human relationships, express opinions, and respond to the views of others… .
- Creating literary texts that select digital elements which are designed to produce special effects, meanings and atmosphere for specified audiences and contexts.
- Using a variety of sentence levels and clause combinations, supported by correct punctuation and appropriate sequencing to create clear and coherent texts.
- Using a range of spelling conventions to check accuracy and decipher the spelling of complex/technical words.
- Creating texts modelled on literature that has been read, particularly texts of cultural and historical importance.

Being Numerate

Four interconnected elements

- **Number**
- **Spatial awareness**
- **Measurement**
- **Chance and data**



Commentary

The detailed charts that follow provide a '<u>Learning Barometer</u>' to aid question-led teaching and learning. They are NOT inquiries, just possibilities for learning. They complement the Australian Curriculum (ACARA).

Growth in Being Numerate – a broad overview

The ACARA national curriculum

Beginning

Learners realise that people collect information to make sense of their world. They understand that mathematical language and ideas can be used to describe situations encountered through play and interaction with the environment. They understand information can be organised and structured to reveal relationships. They use mathematical language and ideas to describe situations encountered in their everyday lives.

They count and estimate numbers and sizes of objects they encounter in everyday experience. They begin to use mathematical vocabulary to talk about quantities and spatial relations, They talk about quantities and spatial relations sufficient to communicate their mathematical perceptions to others. They collect information from everyday events as well as from chance experiments and experience.

They are become increasingly precise in their mathematical thinking. They often explain their thinking by means of concrete materials such as making a model with construction materials as well as through oral descriptions and drawings. They organise data in different ways according to the nature of the information and their intention.

Developing

Learners are becoming more precise in their use mathematical language and ideas to describe situations encountered in their everyday lives. They count and estimate numbers and sizes of objects and use appropriate mathematical vocabulary to talk about quantities and spatial relations.

They are becoming more accurate in quantifying events, objects and relations and more proficient in calculating mentally. They recognise pattern in number and spatial arrangements. They explain their thinking through models as well as through oral descriptions and drawings.

Maturing

Learners study coherent, meaningful and purposeful mathematical concepts and practices that are relevant to their lives. They often require active experiences that allow them to construct key mathematical ideas. There is a trend to use models, pictures and symbols to represent these ideas.

They develop an understanding of whole numbers sufficient to build reasoning in fractions and decimals and develop their conceptual understanding of place value. With these understandings, they develop proportional reasoning and flexibility with number through mental computation skills.

They come to understand relationships between ratio, proportion and percentage, and how they apply to everyday situations, events and systems. In this sense an appreciation of number as a language for life is enhanced.

Question-led inquiry into action

#1 – Select generic generative questions (GGQs)

FORM	What is it like?
FUNCTION	How does it work?
CAUSATION	Why is it like it is?
CONNECTION	How is it connected to other things?
CHANGE	How is it changing?
PLACE	What is the role of place here?
RESPONSIBILITY	Who might be responsible?
CARE	How could people care for others?
ETHICAL	Where is the ethical reasoning?
AESTHETIC	How is aesthetic sense manifest?
THINKING	How is the thinking evolving?
INNOVATION	What might innovation add?

For details go to – Frame 16, 17, 18, 19

Select only 2 or 3 of the most relevant

2 – Conduct inquiries

Getting started	**Positioning performances** - *focus on prior learning, knowledge, experience, and interests, and on aspects of challenges that need to be explored or considered.* **Opening performances** - *select a few relevant GGQs, together with the goals for inquiry associated with them, and develop shared understandings of what they mean.*
Moving forwards	**Designing performances** - *devise CQs, and PQs if necessary, for selected GGQs, prioritize and translate them into practicable inquiries that contain realistic tasks to enact them.* **Exploring performances** - *conduct investigations customised to the demands of the design tasks, the capabilities of individual participants, and their expressed interests.*
Drawing together	**Culminating performances** - *build on inquiries by extrapolating what has been discovered to different contexts and to new or emerging challenges, and so doing by diverse means.* **Reviewing performances** - *backtrack to the initial questions and goals for inquiry to determine what has been achieved or needs to be addressed, and where to next.*

Conduct the inquiry in 2 cycles

The three-stage process helps to give inquiries purpose and coherence.

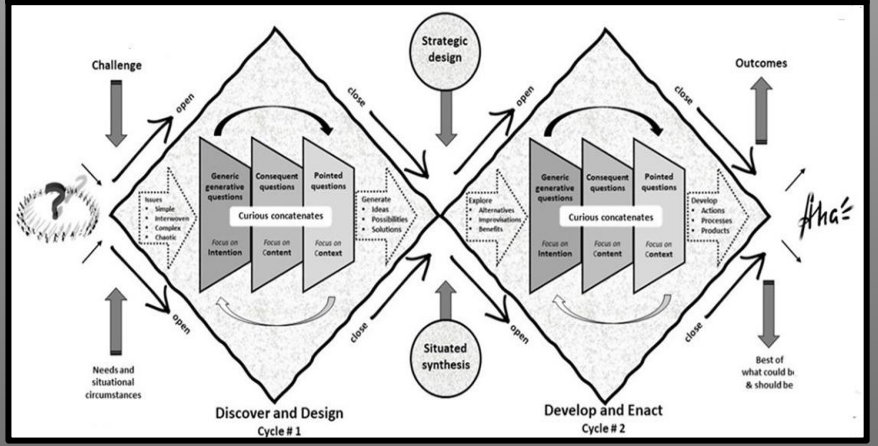
The structure and the questions often need to be refined, even transformed, as an inquiry progresses.

Apply to

Being numerate

For details go to – frame 25

3 – Engage in inventiveness



Early learners
A learning barometer!

Question-led learning builds mathematical knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Number

- Understanding that for a set of objects the number name of the last object counted describes the quantity of the set.
- Identifying 1-to-1 correspondence among groups of objects.
- Counting forwards and backwards to 50 identifying the odd and even numbers.
- Describing number patterns such as odd and even, skip counting forwards and backwards in 2s, 5s and 10s to 100.
- Using mathematical language to compare quantities such as more, less, first, second, greater than, less than, equal to.
- Recognising zero as “nothing” or “none” when counting or adding and subtracting it from a number.
- Writing numerals up to ninety-nine and cardinal numbers up to 10, relating the numerals to the cardinal numbers
- Exploring sequences of positive whole numbers from zero to 100 and beyond using a 'number line' to aid sequencing.
- Identifying missing numbers, and before and after numbers, in sequences up to 100.
- Counting out quantities in combinations to 10s, 2s and 5s and recording the results with number symbols.
- Adding and subtracting two digit numbers by means of representations of 10s and 1s with and without regrouping.
- Adding and subtracting single digit numbers to and from numbers up to 20.
- Adding to and subtracting from numbers greater than 11 in 10s
- Recognising the relationship between addition and subtraction.
- Partitioning numbers to 10 and beyond and exchanging small quantities in ones and tens.
- Understanding that two-digit numbers are comprised of units of tens and ones.
- Distinguishing between 99 and 100 in terms of 10s.
- Counting forwards in 2s, 3s, 4s, 5s and 10s with and without the aid of objects.
- Using knowledge of the relationship between addition and subtraction to solve simple additive problems.
- Copying, continuing and describing patterns with objects and numbers to 100.
- Understanding one half as one of two equal parts and one quarter as one of four equal parts.

Spatial awareness

- Understanding shapes can be described by their properties.
- Describing the orientation of an object relative to itself and other objects
- Describing the position objects relative to each other in terms of more than one attribute or feature.
- Matching objects according the attributes of shape and size.
- Recognising how different shapes and objects can be fitted together.
- Recognising 2D shapes as being ‘flat’.
- Understanding relationships between 2D and 3D shapes.
- Understanding how 2D and 3D shapes can be put together or taken apart.
- Using directions to describe pathways and boundaries in their environment.
- Identifying the features of 2D shapes such as rectangle, square, triangle, circle...
- Identifying the features of 3D shapes such as cuboid, cylinder, cone, sphere.
- Tracing 2D outlines of 3D objects when viewed from different angles.
- Fitting different shapes together to make patterns and tessellations.
- Observing and describing the way shapes affect the movement of objects such as in rolling and sliding.
- Distinguishing straight and curved lines and relating them to the shape of objects.
- Drawing horizontal, vertical and slant lines free hand when representing objects and events.
- Following simple instructions and maps to find objects and places.

Measurement

- Understanding measurement involves comparing objects and events according to particular attributes.
- Using everyday language to describe measurements found by direct comparison
- Sorting objects according to their relative size, shape, corners, angles, slope and faces.
- Distinguishing between properties such as empty/full, hot/cold, heavy/light, long/short.
- Distinguishing relative distance such as near, far, thick, thin, tall, short, high, and low.
- Comparing objects by weight, size, capacity and internal volume.
- Estimating length using non-uniform informal units of measurement
- Using uniform formal units to measure length, distance and capacity to the nearest unit
- Describing events in time such as early, later, short and long duration.
- Reading time on analogue and digital clocks to the half-hour.
- Describing duration using months, weeks, days and hours, with calendars and clocks.
- Describing and comparing events in terms of relative time such as early, later, short and long duration.
- Estimating measurements of length, mass, capacity, temperature and money.
- Using measurements of objects to determine the 'best fit' in solving problems related to size and shape.

Chance and data

- Recognising some events in everyday life involve chance.
- Understanding that some events are more likely than others.
- Collecting data about themselves and familiar events and representing it in lists, tables and pictographs.
- Devising simple surveys to collect data.
- Identifying and recording different attributes in a collection of data.
- Organising and grouping data with assistance.
- Describing sequences and patterns in shapes and in numbers.
- Recognising patterns in everyday life such as in sounds. movement, objects and nature.
- Creating pictographs and using tally marks to record data observations and data patterns.
- Using data to tell mathematical stories as part of solving mathematical problems.
- Reading and making connections between lists, tables and pictographs.
- Searching for patterns in different ways numbers and quantities in data collections can be split.
- Identifying outcomes from familiar chance events using everyday language to describe them such as yes, no, maybe.
- Representing relationships between objects using tree and Venn diagrams.

Transitional learners
A learning barometer!

Question-led learning builds mathematical knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Number

- Reasoning around number sequences that increase and decrease by 2s, 5s and 10s, from any starting point.
- Counting fluently larger collections up to 1000, with grouping and counting in hundreds and tens.
- Representing collections larger than 100 by partitioning them into 100s, 10s and 1s.
- Describing and connecting patterns in 7s, 8s and 9s.
- Using place value to partition and regroup numbers to 1000.
- Using a 'number line' to represent positive and negative whole numbers from zero.
- Understanding the relationship between positive and negative numbers with the aid of linear representations.
- Understanding the role of place value in addition and subtraction.
- Adding and subtracting two digit numbers and solving addition and subtraction problems.
- Constructing multiplication tables and multiples up to two digit numbers.
- Multiplying two digit numbers by one digit numbers and two digit numbers.
- Explaining the meaning of multiplication as repeated addition, and division as equal grouping.
- Knowing and using multiplication facts up to 10 X 10.
- Dividing a given number by another number by grouping, using multiplication facts and by repeated subtraction.
- Solving problems involving multiplication and division
- Recognising common uses of halves, quarters and thirds.
- Using concepts of place value to 1000 in standard algorithm problems for addition and subtraction.
- Using calculators to assist with additive and multiplication problems involving large numbers.
- Solving problems involving everyday uses of fractions as equal parts of regular shapes, collections and as numbers.
- Building connections between the number of parts and the size of fractions.

Solving everyday problems that involve quarter and half turns.

Spatial awareness

- Identifying, describing, representing and visualising the properties of shapes and objects.
- Using and/or constructing simple maps and plans to find places, give directions and identify key features.
- Describing and comparing features of 2D and 3D objects.
- Describing two dimensional shapes by their sides, corners, diagonals, radius, diameter, centre.
- Distinguishing between shapes that tile and do not tile, or tessellate.
- Predicting the effect of one step sliding, flipping and turning of shapes and objects.
- Rotating geometric shapes and objects with the aid of digital technology.
- Distinguishing between line, line segments and rays.
- Identifying half and quarter turns from any starting point.
- Describing and measuring angles, using formal language to categorise them such as acute, obtuse, right angle and 180^{o}
- Identifying simple symmetrical shapes and patterns.
- Representing visual patterns in drawings and diagrams.
- Drawing intuitively the plan, elevation and side view of simple objects.
- Measuring and drawing dimensions angles, triangles, squares and circles.
- Identifying different types of square and triangular shapes.
- Identifying symmetry of positions and directions in designs, plans, shapes and patterns.

Measurement

- Using standard metric units to measure and compare objects and their properties.
- Verifying estimates of length and mass by measuring a number of times in standard units to ensure consistency and accuracy.
- Determining the sum and difference between repeated measurements of length, mass and capacity of a given object.
- Understanding relationships between different standard units used to measure the same attributes.
- Understanding and using standard metric units such as centimetre, metre, kilogram, litre to measure length, mass and capacity.
- Understanding that measures can fall between two numbers – 3 ½ Kg or metres and so on.
- Converting between different divisions within metric units of measurement such as metres to centimetres.
- Measuring area and perimeter using standard units.
- Comparing the area and dimensions of regular and irregular shapes.
- Recognising concepts conservation of weight and volume irrespective of size and shape.
- Recording the time on analogue and digital clocks to the quarter hour.
- Expressing time as ‘am’ and ‘pm’ and as 24 hour time.
- Identifying the current date, name and order weeks and months, and seasons of the year on a calendar.
- Estimating the duration of events and the approximate time elapsed between events.

Chance and data

- Understanding data can be organised and structured in different ways.
- Describing events produced by simple chance devices.
- Recording data produced by simple chance devises and events.
- Devising surveys that investigate more than one issue or question.
- Using tallies with a range of multiples to record data from chance events and surveys.
- Representing data in pictographs, tables, bar and column graphs, and diagrams.
- Realising that likelihood and chance can be expressed numerically.
- Predicting likely and unlikely events from chance devices and events.
- Partitioning numbers in different ways to show relationships in a collection of data.
- Recognising that there is likely to be variation in results and expected outcomes of chance events.
- Drawing inferences from data and making predictions about what the data shows or means.
- Creating repeating patterns in different sequences and arrangements with regular and irregular shapes.
- Understanding different forms of graph of the same data can highlight particular aspects and lead to different interpretations.

Proficient learners
A learning barometer!

Question-led learning builds mathematical knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Number

- Consolidating the sense of number up to 5 digits and exploring large numbers up to 8 digits.
- Exploring even/odd and prime/composite numbers and prime factorisation.
- Describing the place value system for whole numbers and applying it to two decimal places.
- Appreciating the role of place value in addition, subtraction and multiplication.
- Identifying whole numbers on a 'number line' as part of addition and subtraction tasks that involve positive and negative whole numbers
- Solving additive problems with fractions.
- Relating fractions to decimals and percentages, and making equivalence comparisons.
- Working with fractions and decimals to thousandths, applying place value to establish equivalences.
- Estimating the degree of closeness of a fraction to known fractions such as a quarter and a half.
- Relating percentage to parts of 100 and hundredths when solving everyday problems.
- Analysing patterns and creating rules for patterns from which predictions can be made.
- Using brackets and simplification of brackets for patterns of divisibility as a basis of factorisation.
- Conducting multiplication and division tasks that involve positive and negative whole numbers.
- Working with decimal numbers to thousands, including multiplying and dividing decimals by whole numbers.
- Solving problems involving rate and ratio with and without the aid of calculators.
- Understanding squares and cubes of whole numbers.
- Expanding numbers in squares, as well as reading and writing simple equations.

Spatial awareness

- Describing different transformations of objects and shapes, and their effects.
- Describing locations-routes-compass directions using coordinate maps
- Exploring rotation, translation, reflection, symmetry in 2D & 3D shapes.
- Understanding that lines and axes of reflective and rotational symmetry assist the construction of shapes.
- Comparing angles in terms of right, acute and obtuse angles, supplementary and complementary.
- Constructing the shapes of cubes, cylinders and cones with the aid of protractors and other line-based tools.
- Exploring different ways of calculating the perimeter and area of rectangles and the volume of regular prisms.
- Understanding patterns & relationships in square and triangular numbers.
- Visualising and solving problems relating to packing and stacking.
- Relating concepts of 2D shapes to linear and curved lines, line segment, ray, open and closed figures, interior and exterior, angles, sides, altitude, sector.
- Comparing with precision the linear dimensions, area, and volume of shapes and objects.
- Exploring different quadrilateral shapes such as trapezium, parallelogram, rectangle, square, and rhombus.
- Identifying a wide range of 3D shapes such as cubes, cylinders, spheres, cones, prisms, and pyramids.
- Using and creating maps and diagrams which show scale and direction and use standardised mapping symbols.

Measurement

- Understanding relationships between units for measurement such as metre, centimetre and millimetre; kilogram, gram and milligram; kilolitre, litre and millilitre.
- Devising and using efficient ways to calculate perimeter, area and volume.
- Reading and interpreting scales using whole numbers of metric units for length, capacity (volume), mass (weight) and temperature.
- Using whole numbers and decimals when converting between metric units for length, capacity and mass.
- Estimating mass of objects and capacity of liquids, and verifying by measuring in standard units.
- Reading analogue and digital clocks to the nearest hour and minute, distinguishing between 12-hour time and 24-hour time.
- Using addition and subtraction in finding time intervals and relative time taken.
- Creating and interpreting timetables and timelines, and calculating elapsed time.
- Visualising, translating and measuring the dimensions of 2D and 3D shapes and objects.
- Interpreting scales and legends on maps into 2D and 3D realities.
- Seeing how algebra can apply to measurement by means of formulas to measure perimeter, area and volume
- Using formulas for calculating perimeters and areas of rectangles and polygons and the volume of rectangular prisms.
- Measuring accurately angles, lines, pairs of lines, areas and volumes
- Relating angles to concepts of right, acute and obtuse.

Chance and data

- Understanding that a major purpose of a database is to answer questions and solve problems.
- Designing surveys to collect and record data for particular purposes and audiences.
- Using representations of single variable data to describe distributions including the use of average, median, mode and range.
- Collecting two-dimensional quantitative data and representing it in tabular form.
- Selecting appropriate graphs to display single variable data.
- Understanding scale represents different quantities in graphical representations.
- Identifying trends in data sets over time and/or changes due to conditions.
- Carrying out investigations and reporting the results as data and interpretations of data.
- Using ICT to represent graphical data in different ways and for different purposes.
- Drawing inferences about the relationships between variables, justifying the conclusions.
- Representing data through appropriate displays including stem and leaf plots.
- Identifying misleading representations of data and data sets.
- Exploring concepts of variation and error by collecting repeated measurements.
- Distinguishing between samples and populations with a concern for reliable data.
- Choosing data to collect as part of examining a hypothesis or a performance.
- Beginning to quantify probability in terms of ratio, proportion and percentage.
- Quantifying probabilities by means of simple fractions, decimals and percentages, and applying the outcomes to complementary events.

Accomplished learners
A learning barometer!

Question-led learning builds mathematical knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Number

- Describing properties of prime, composite and square numbers.
- Using multiplication and division facts to solve realistic problems and justify solutions.
- Calculating accurately with whole numbers, fractions and decimals, and applying this knowledge in real-life situations.
- Recognising, representing and ordering numbers involving thousandths and connecting them to fractions
- Comparing and contrasting fractions using equivalence.
- Solving additive problems involving fractions with unrelated denominators
- Justifying uses of the place value system to partition and regroup decimal numbers to thousandths and beyond.
- Recognising and solving problems involving unit ratio, rates, proportion and percentage.
- Exploring relationships between ratio, proportion and percentage.
- Solving problems that involve percentage rates of increase and decrease over time and in particular situations.
- Using the unitary method to explain and judge reasonableness of results.
- Understanding integers in the context of the laws of exponents with integral powers.
- Understanding, describing and using generalisations of the index laws with positive integral indices.
- Estimating and calculating squares and square roots, cubes and cube roots.
- Selecting and applying relevant formulas and simple equations for specific tasks.
- Generalising arithmetic patterns, including linear functions, to represent them algebraically and graphically.
- Generalising the distributive law to expansion and factorisation of simple algebraic expressions.
- Understanding formulas that apply to many different situations are generalised algebraic representations.
- Creating, solving and interpreting linear equations, including those that use realistic algebraic and graphical techniques.

Spatial awareness

- Drawing 3D figures in 2D showing hidden faces and counting vertices, edges, faces, and nets.
- Comparing and measuring angles to describe slope and relative positions.
- Describing patterns in terms of reflection, rotational symmetry, and translations.
- Using ICT to generate graphical representations of reflection, rotational symmetry and equivalent transformations
- Using scales, legends, compass points, distances, and grid references to describe and interpret locations on maps and plans.
- Constructing maps and plans to scale using standard symbols.
- Interpreting contour maps to give a 3D picture of the terrain
- Creating and interpreting plans projections, and isometric views of 3D objects.
- Using the Pythagoras theorem to solve problems involving right-angled triangular shapes.
- Generalising formulas for the perimeter for triangles and rectangles to other quadrilaterals.
- Investigating the features of symmetric and asymmetric shapes and their possible transformations.
- Creating patterns and sequences with 2D regular and irregular shapes.
- Generating formulae to describe the construction of repeating patterns.

Measurement

- Solving problems that require comparisons of length, area, volume and other attributes
- Selecting appropriate tools, scales and metric units for measuring with the required accuracy.
- Converting between metric units of length, capacity and mass by means of whole numbers and decimals.
- Creating and interpreting timetables and timelines, and adjusting them to allow for elapsed or lost time.
- Comparing perimeters, areas and volume of rectangular areas and rectangular prisms.
- Investigating relationships between the area of quadrilaterals and volumes of triangular prisms.
- Investigating the relationship between the features of circles such as radius, diameter, circumference.
- Measuring area of trapeziums, cubes, cuboids, cylindrical objects.
- Reconstructing scale models of objects and systems derived from dimensions in plans and drawings.
- Calculating gradients from data on contour maps, plans and drawings.
- Expanding and contracting scaled drawings of 2D and 3D objects.
- Using coordinates to describe transformations of plane figures.
- Understanding size of objects in our solar system relative to each other
- Understanding relative distances in our solar system and time taken to cover those distances.

Chance and data

- Conducting data-based inquiries that examine a number of variables.
- Choosing measures to represent spread and centre within a data set.
- Constructing, reading and interpreting a range of tabular and graphical representations of data sets.
- Interpreting secondary data and identifying misleading representations.
- Understanding effects of sample size for a survey in terms of validity and reliability.
- Exploring concepts of variation and error.
- Identifying complementary events, patterns and trends in data collections.
- Interrogating data analyses to assess the validity and authenticity of conclusions.
- Using a mean or median from a sample to estimate the mean or median of a population.
- Using relative frequency of events in raw data and percentage data to predict likely 'happenings' in the future.
- Using and interpreting numerical and graphical summaries of data to draw conclusions and calculate probabilities.
- Identifying equally and less likely events or outcomes by calculating their probabilities and relative frequencies.
- Checking out probabilities against the facts that probabilities range between 0 and 1 and sum to 1 over the sample space.
- Connecting tabular, graphical and algebraic representations of linear functions.
- Using Venn diagrams or two-way tables to illustrate criteria as well as to calculate simple probabilities.

Being Healthy

Three interconnected elements

- **Personal and social development**
- **Movement and physical activity**
- **Well-being and identity**

Commentary

The detailed charts that follow provide a 'Learning Barometer' to aid question-led teaching and learning. They are NOT inquiries, just possibilities for learning. They complement the Australian Curriculum (ACARA).

Growth in Being Healthy – a broad overview

The ACARA national curriculum

Beginning

Learners are beginning to understand about their body and refine their physical coordination skills. They begin to understand factors that are important in a healthy lifestyle and what it means to be healthy. They participate with others, build relationships and share in decisions. They understand that respect for others is important as is sharing and interacting with others. They are coming to understand that care for others is a responsibility everyone shares.

They explore and investigate their ideas, feelings and attitudes about major life events. They perform movement patterns with and without equipment and become increasingly aware of how their bodies feel before and after exercise. They recognise actions that need to be taken to help ensure personal and community health and hygiene. Their understanding of factors that affect lifestyles and well-being is increasing, and they are beginning to develop concepts of physical, emotional and mental health. They recognise that people share responsibility to care for the well-being of others.

Developing

Learners understand that many health needs are common for all people and that some people have additional or different needs. They understand that the body changes as people grow and age. They make simple connections between types of foods and their role in maintaining good health and appreciate the benefits of eating a variety of nutritious foods. They consolidate basic movement skills by applying them to different situations in areas including play, games, dance, gymnastics and aquatics. They are learning to recognise and value relationships and people in their lives as well as respect the feelings, moods and needs of others.

They understand what being healthy means and identify some personal and social factors that influence their health. They demonstrate a growing sense of identity and self-esteem and discuss similarities and differences between themselves and others. They understand that how they think and feel about themselves affects them. They demonstrate a growing sense of identity, self-esteem and self-worth, and learn strategies that promote them. They explore how personal qualities such as rights and responsibilities contribute to their identity and connections with other people.

Maturing

Learners are learning about the importance of taking personal responsibility for their own health and wellbeing. They understand that all the dimensions of health are important to maintain a healthy lifestyle. They understand that people grow at different rates. They recognise and compare physiological changes that occur at each major life stage including conception, birth, puberty and aging. They learn how food habits relate to health and wellbeing. They realise the need to take personal responsibility for their own health and well-being.

They understand that being healthy and being well can be described in particular ways by different people at different times in their lives. They learn how some behaviours such as smoking and drug addiction can negatively influence health. They learn how food habits and regular physical exercise relate to health and wellbeing. They identify harmful, risky and unsafe situations and behaviours, and become aware of a wider range of factors that influence their health.

Question-led inquiry into action

The three-stage process helps to give inquiries purpose and coherence.

The structure and the questions often need to be refined, even transformed, as an inquiry progresses.

Apply to

Being healthy

For details go to – frame 25

#1 – Select generic generative questions (GGQs)

FORM	What is it like?
FUNCTION	How does it work?
CAUSATION	Why is it like it is?
CONNECTION	How is it connected to other things?
CHANGE	How is it changing?
PLACE	What is the role of place here?
RESPONSIBILITY	Who might be responsible?
CARE	How could people care for others?
ETHICAL	Where is the ethical reasoning?
AESTHETIC	How is aesthetic sense manifest?
THINKING	How is the thinking evolving?
INNOVATION	What might innovation add?

For details go to – Frame 16, 17, 18, 19

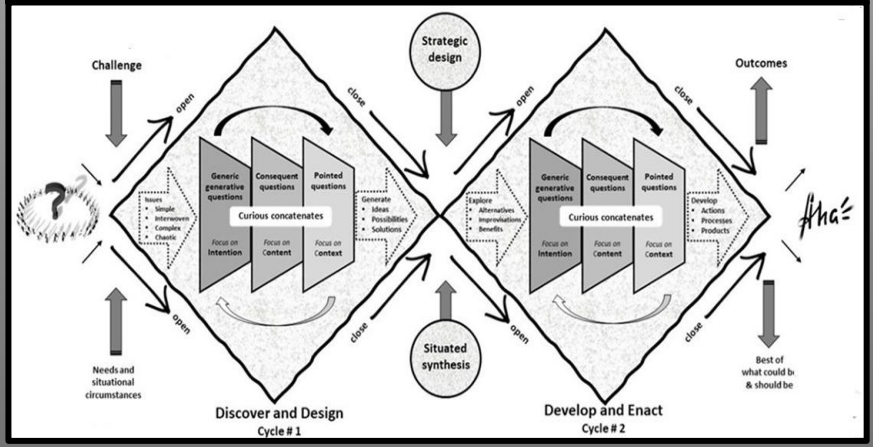
Select only 2 or 3 of the most relevant

2 – Conduct inquiries

Getting started	**Positioning performances** - *focus on prior learning, knowledge, experience, and interests, and on aspects of challenges that need to be explored or considered.* **Opening performances** - *select a few relevant GGQs, together with the goals for inquiry associated with them, and develop shared understandings of what they mean.*
Moving forwards	**Designing performances** - *devise CQs, and PQs if necessary, for selected GGQs, prioritize and translate them into practicable inquiries that contain realistic tasks to enact them.* **Exploring performances** - *conduct investigations customised to the demands of the design tasks, the capabilities of individual participants, and their expressed interests.*
Drawing together	**Culminating performances** - *build on inquiries by extrapolating what has been discovered to different contexts and to new or emerging challenges, and so doing by diverse means.* **Reviewing performances** - *backtrack to the initial questions and goals for inquiry to determine what has been achieved or needs to be addressed, and where to next.*

Conduct the inquiry in 2 cycles

3 – Engage in inventiveness



Early learners
A learning barometer!

Question-led learning builds being healthy knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Personal and social development

- Developing an appreciation of own personal likes and dislikes, interests, preferences and how they change.
- Understanding positive thoughts and feelings help people develop a positive attitude.
- Reflecting on own experiences to understand the strengths, interests and preferences in self and others.
- Describing some physical and personal characteristics, and being positive when faced with challenges.
- Appreciating that self and others have positive and negative feelings as well as rights and needs.
- Working constructively with others by relating to each other in socially functional and acceptable ways.
- Acting fairly in ways that recognise the importance of respect and trust in relationships.
- Making shared decisions and organising self and others to get things done with goals and tasks achieved.
- Recognising changes in their own capacities compared to the recent past.
- Recognising risks to others created by rapid, unexpected or rough actions.
- Comparing events and relationships which make us happy or unhappy, suggesting reasons for mood and attitude changes.
- Relating body signals to physical and/or emotional stress and identifying possible causes in self and others.
- Identifying when help is needed and when people need to act independently.
- Showing care when interacting with friends as well as when interacting with others
- Relating positively when with others by identifying strategies that can help overcome negative feelings.
- Being optimistic when faced with challenges and difficulties, and when taking risks.
- Recognising actions that build trust and respect are those which are most likely to enhance relations.

Movement and physical activity

- Understanding how our daily lifestyles and practices can impact on our well-being and physical health.
- Understanding some of the impacts sleep, nutrition, exercise and relaxation can have on physical and mental health.
- Understanding how food choices affect health in terms of personal well-being and fitness
- Improving gross and fine motor movements required for catching, throwing, kicking, jumping, and hopping.
- Refining fine motor movements for tasks that require precise movement such as cutting, drawing, and balancing.
- Realising how bodily coordination is involved in movement and how we can move creatively in response to stimuli.
- Responding to movement demands in defined spaces and for defined purposes.
- Recognising basic parts of own body, realising what can be done with them and observing changes during exercise.
- Locating different external and internal body parts and describing their functions.
- Identifying personal improvements in movement by means of physical exercises, games and dance activities.
- Identifying personal likes, dislikes and talents in physical activities including, sports, movement, and outdoor activities.
- Practising separate movement patterns and joining them in a sequence to achieve particular purposes and effects.
- Monitoring exertion and observing fitness requirements in different physical activities and sports.
- Understanding how rules are needed to ensure games and physical activities are fair, safe and encourage people to cooperate individually and as members of a team.
- Enacting the rules and spirit of games they have created as well as rules and acceptable practices that are well known in established sports and community activities.
- Pursuing personal interests in particular physical activities, sports and recreational activities, and persevering with them in good times and difficult times.
- Taking more responsibility for own physical health and fitness.

Well-being and identity

- Understanding that each person is an individual with differing needs and interests, talents and capabilities
- Understanding that developing independence builds self-worth and personal responsibility.
- Realising that internal factors such as need, personal attitudes, talents and interests affect well-being.
- Realising that external factors such as atmosphere, surroundings and human interaction affect well-being.
- Being aware of how feelings and emotions in self and others change in response to external and internal factors.
- Recognising our need for good food, personal hygiene, cleanliness and responsible social habits.
- Becoming increasingly aware of how relationships affect our sense of well-being and happiness
- Recognising personal feelings and emotions affect our sense of self-worth and well-being.
- Accepting personal responsibility to work and play with others in ways that recognise their feelings and emotions.
- Identifying features in communities that affect the way we live and impact on our sense of well-being.
- Understanding there are many physical, social and emotional factors that contribute to a person's identity.
- Demonstrating hygiene behaviours in food preparation, personal habits and keeping living conditions clean.
- Distinguishing between situations where free choice is appropriate and those in which group consensus is needed.
- Comparing school, home and community rules and practices, explaining why they are different.
- Respecting the choices of others without criticism and beginning to recognise why those choices are made.
- Appreciating how personal likes and dislikes as well as attitudes affect participation in everyday life.
- Taking greater responsibility for looking after own health and fitness.
- Taking action to enhance collaboration among friends and peers, and thereby promote positive feelings and attitudes

Transitional learners
A learning barometer!

Question-led learning builds being healthy knowledge and skills
Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Personal and social development

- Cooperating and collaborating with friends and peers in ways that generate positive interaction.
- Supporting the special talents, feelings and aspirations of people as well as generating optimism
- Understanding self knowledge allows us to embrace new situations with confidence and take risks.
- Understanding personality features in self and others including strengths and less strong qualities.
- Talking about changes that have occurred in their bodies and the function of body parts.
- Recognising conditions and circumstances that make us happy or unhappy and cause mood and attitude changes in self and others.
- Recognising signals and possible causes of physical and emotional stress in particular situations.
- Predicting negative feelings and how self and others might overcome or cope with them.
- Displaying optimism when faced with new situations, difficulties and conflicts of opinion.
- Building trust and respect in personal relationships as well as in team or cooperative situations.
- Understanding how embracing optimism gives us confidence in ourselves and our future.
- Examining views about men and women and the effects of stereotypes on girls and boys.
- Encouraging effort and assisting less skilled and less motivated peers to engage in group activities.
- Explaining ways our lives are made interesting and varied by having females and males involved.
- Identifying values other than their own and suggesting ways to be appreciative and minimise inappropriate negative reactions.
- Discussing how relationships are influenced by the roles ~~of~~ people play and the degrees of friendliness.
- Negotiating with peers and others to find common ground, seek agreements, and discover shared action.

Movement and physical activity

- Understanding how participation in regular exercise and physical activities improves fitness and body skills.
- Recognising the value of participation in sport, leisure and recreation activities in enhancing health and well-being
- Understanding how people go through different stages and develop at different rates from one another.
- Practising gross and fine motor skills through movement sequences and by using equipment in defined spaces.
- Adapting movement patterns to account for changes in surface characteristics and obstacles.
- Understanding how the rules, routines and safety procedures in sports, games and physical activities make them safe, fair and enjoyable.
- Understanding how sleep, nutrition, exercise and relaxation are important to physical, emotional and mental health
- Developing own skills in goal and target driven ways within physical and recreational activities of personal interest.
- Understanding how particular physical activities can affect and place demands on the body in terms of hydration, nutrition and rest.
- Understanding how participation in physical activities impacts on mental and emotional health.
- Describing what fitness is in terms of its effect on the body, why it is important, and requirements for keeping fit and healthy.
- Practising movement changes and patterns in a variety of physical activities.
- Refining and sequencing speed, direction and levels of movement in games, dance and other activities.
- Understanding and respecting why some people participate more frequently in physical activities than others.
- Understanding the importance of teamwork in sports, group games, recreational activities including adventure activities.
- Identifying strategies and tactics that enhance teamwork and those that are unhelpful.
- Reflecting on personal responsibilities in being a 'team player' and acting in ways that benefit a team as a whole.

Well-being and identity

- Understanding how a person's self-concept can change and grow with experience and time, and be inspired by others.
- Identifying aspects about physical activities that make self and others feel healthy and positive about themselves.
- Explaining the effect of good and poor hygiene practices on personal and community health and well-being
- Identifying specific issues in food hygiene behaviours, personal habits and clean living conditions.
- Understanding the key elements in a balanced diet and combinations of foods that fulfil this requirement.
- Recognising when group decision making is required in order to achieve shared outcomes and be fair to others.
- Explaining and justifying the reasons for rules and regulations in particular sports and recreational activities, and their benefits.
- Understanding how personal likes, dislikes and behaviours can impact on attitudes to participation in everyday life.
- Taking responsibility for looking after own health and fitness by taking and persevering with appropriate action.
- Using collaborative skills when working with peers to build trust, reach agreements and resolve conflicts.
- Recognising how different ideas, feelings and attitudes are reflected in the actions and behaviours of self and others.
- Starting to understand that a person's identity evolves as a result of many cultural influences.
- Predicting how choices of friends, study options and work can influence own health and the health of others.
- Discussing past choices and their effects, and predicting the potential effect of choices on future health and well-being.
- Indicating what can be done and what has been done to contribute to the safety of others.
- Adapting rules and regulations to meet the needs of particular situations and the capabilities of others.
- Understanding that constructive criticism benefits self and others by helping to improve what we are doing or can do.

Proficient learners
A learning barometer!

Question-led learning builds being healthy knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
www.questionledlearning.org

Personal and social development

- Understanding self-worth affects what we think and feel about ourselves which impacts on our motivation and behaviour.
- Describing links between own behaviour and relationships that have been or are being established with others.
- Relating how self-concept is enhanced by interactions with friends, family, teachers and neighbours.
- Comparing a view of self from earlier years with the present, giving reasons for changes.
- Exploring different parts of the body and their functioning both as individual 'units' and as parts of a whole system.
- Understanding the influence of hormones on development of the body, their effect on mood and perceptions of self.
- Describing ways of maintaining effective body functions as a result of proper care.
- Applying plans to increase positive interactions and minimise undesirable effects or avoid negative and unhealthy interactions.
- Showing preparedness to work with others who are different in ways that are inclusive as distinct from exclusive.
- Recognising positive features in valued relationships and the need to respect the rights and feelings of those involved.
- Identifying personal characteristics which lead to particular friendships and group memberships.
- Identifying significant people in areas of family, school and community life who are available to help when needed.
- Supporting a view held by others which may be contrary to own view or preferences.
- Exploring the concept of resilience in meeting challenges and difficulties of everyday life.
- Explaining the function of the human reproductive system and issues related to population control.
- Demonstrating through role play and dialogue actions to resist unwanted sexual advances.
- Explaining influences in own life that affect views about masculinity and femininity.
- entifying ways to maintain and enhance personal resilience and deal with lversity.

Movement and physical activity

- Setting personal goals and developing plans to enhance performance and expertise with specific skills.
- Reflecting and acting upon own preferences for physical activity and how this contributes to personal well-being and self-image
- Using different pieces of equipment and techniques for particular purposes in different sports and physical activities.
- Demonstrating through performance over time that personal goals for movement and fitness have been achieved.
- Explaining safety practices and equipment used for a range of activities and assessing the risks of particular actions and activities.
- Explaining the benefits of showering, hair washing and personal hygiene after exercise, and the need to clean and wash equipment.
- Relating incidents in which injuries and emotional stresses have occurred through not showing adequate respect and care.
- Maintaining a personally tailored program for fitness which is enjoyable, flexible and developmental.
- Practising positional play in sports and games, giving proper attention to fair play and sportsmanship in all these activities.
- Taking on leadership and supporting roles as a member of a team as required.
- Understanding the benefits of teamwork and why it is important in many sports and recreational activities.
- Understanding there are substances that can cause harm to personal and community health.
- Explaining how coaches, videos, books, teachers and peers are used to develop and help practise skills.
- Showing willingness to persist when physical comfort zones are exceeded.
- Showing willingness to support and commend effort even if results are not always as expected or desired.
- Considering specific physiological benefits of fitness which can improve concentration, relaxation, sleep and digestive functions.
- Monitoring fitness programs in terms of the balance between the capabilities of participants, activity levels and food intake.

Well-being and identity

- Understanding different cultures influence the formation of personal and group identities.
- Recognising that stereotyping can put pressure on people which can lead to misconceptions and stress.
- Realising that persisting with tasks enhances own self-reliance and makes people more autonomous.
- Describing damaging behaviours in schools and communities which impact on personal health.
- Explaining how physical fitness relates to overall health and expectations of what 'I can do'.
- Distinguishing the nutritional value of foods, making own choices and accepting responsibility for them.
- Describing ways of maintaining effective body functions through care, observation and monitoring.
- Describing how holding and advocating particular values and beliefs is part of a positive self-concept.
- Understanding that factors such as gender influence how people grow and change.
- Realising that the ways we display our 'motivation' reveals our intentions, personality and values.
- Examining factors that shape views gender, sexuality, nationality, language and culture.
- Recognising own qualities, strengths and limitations, and how these contribute to our concepts of self.
- Relating how interactions with friends, family, teachers and neighbours enhances self-concept.
- Recognising role models among family, friends, community and significant others.
- Understanding own role in maintaining own health and well-being as well as in making a positive contribution to the health and well-being of others.
- Reflecting on self-worth with a view to further growth and how it affects responses to particular situations and environments.
- Identifying own personality traits and how they are expressed in different situations.

Accomplished learners
A learning barometer!

Question-led learning builds being healthy knowledge and skills
Indicative <u>experiences</u> are listed without any priority order

Melvin Freestone
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Personal and social development

- Identifying some physical, social and emotional changes related to early and late adolescence.
- Understanding the development of primary and secondary sexual characteristics and physiological responses involved.
- Recognising issues and choices during adolescence that can lead to positive outcomes or lead to stress and conflict.
- Understanding and dealing with positive and negative consequences of fantasy in relationships.
- Practising strategies that enhance personal and group resilience and displaying empathy and respect for others.
- Linking individual behaviours to particular values and beliefs, considering personal responsibility and choice.
- Reflecting on personal strategies for balancing study, sleep, good eating, family commitments and friendships.
- Identifying adolescent health and community services in their local community.
- Understanding the benefits of prescribed medicines for pain relief, immunisation and minor illnesses.
- Explaining personal and community responsibilities to promote preventive health strategies such as immunisation and the dangers of inappropriate use of drugs and alcohol.
- Discussing ways to avoid unhealthy lifestyles and communities
- Recognising the difference between decisions made hastily and those that are made calmly without pressure.
- Accepting compliments for praiseworthy decisions and actions, and complimenting others for similar reasons.
- Contributing to the development of strategies that support others and deal with individual and group harassment.
- Growing a sense of self-worth and resilience to deal with challenges, adverse situations and stressful environments.
- Developing personal plans for dealing with extreme emotional responses and avoiding damaging behaviours.
- xploring the benefits of calm and considered decision making as opposed to ecisions made ‘in the heat of the moment’.

Movement and physical activity

- Transferring basic movement skills and concepts to sport specific situations tasks and strategies.
- Displaying independence and self-motivation when refining existing skills and developing new skills.
- Applying movement concepts and patterns to devise movement sequences in physical activities and dance.
- Identifying sport specific thinking strategies for game tactics and for developing team cultures.
- Practising and monitoring fitness and sport specific skills by applying them in particular contexts.
- Setting fitness goals as well as participating in and persevering with a personalised fitness program.
- Understanding the effect of healthy eating, balanced diet and regular meals on bodily performance and health.
- Reflecting on the influence peer choices, advertising and family can have on eating habits and food choices.
- Exploring the benefits of using technology to monitor and analyse fitness levels and personal health
- Applying concepts of fair play and sportsmanship and their associated behaviours as an 'attitude of mind'.
- Applying decision making and negotiation processes to improve team performance.
- Recognising the importance of safety in physical activities and taking the necessary steps as required.
- Encouraging others to participate in sports, adventure and recreational activities.
- Conducting safety audits on sports and recreational activities, procedures and equipment.
- Differentiating between skills others use and skills which are compatible with own personality and capabilities.
- Recognising the value attached to and gained from particular physical, sports and recreational activities in different cultures and environments.

Well-being and identity

- Understanding how physical and emotional changes during puberty can affect self and peers
- Identifying situations where personal responsibility builds health and well-being,
- Recognising own emotional responses in particular situations and ways of acting effectively and appropriately.
- Understanding why health information and services change in response to need and new ways to support people and communities.
- Recognising how the generic issue of 'balance' impacts on different aspects of personal and community health.
- Understanding how to set and enact personal healthy eating goals and how to make strategic plans for future action.
- Recognising that to take risks demands personal resilience and perseverance, which may lead to positive, negative or unexpected outcomes.
- Defining own values and beliefs on significant issues and explaining how they have changed since childhood.
- Appreciating own personal physical, social , emotional qualities and having confidence in their expression.
- Developing an understanding of own personality and how own actions affect and impact on others
- Understanding a balance between– physical, mental, emotional and spiritual – health leads to personal well-being.
- Debating health and well-being issues and providing information to others on strategies for personal and community growth and development.
- Accepting compliments as well as a reasonable level of critical feedback.
- Discussing the benefits to self and community of the diverse talents and understandings of all community members.
- Supporting others in ways that create a sense of collegiality among groups and enhance the well-being of members.
- Displaying a strong sense of citizenship and responsibility among friends and in the community.

Being Expressive

Five interconnected elements

- **Visual arts**
- **Music**
- **Drama**
- **Dance**
- **Media**

Commentary

The detailed charts that follow provide a 'Learning Barometer' to aid question-led teaching and learning. They are NOT inquiries, just possibilities for learning. They complement the Australian Curriculum (ACARA).

Growth in Being Expressive – a broad overview

The ACARA national curriculum

Beginning

Learners are beginning to respond to and enjoy different art forms. They recognise that art is a means of expression. They begin to use the different art forms in intentional ways to express their perceptions of experience and their feelings in particular situations and as a whole. They use colour, shape and movement to convey their ideas and in so doing create 'works' for others to view and appreciate. Painting, drawing, role playing and dancing are prominent and sources of much enjoyment and personal pleasure. They begin to understand people make meaning through the use of symbols.

They use colour, shape and movement to convey their ideas and in so doing create 'works' for others to view and appreciate. Painting, drawing, role playing and dancing are prominent and provide much enjoyment and personal pleasure. They learn a simple language for talking about the arts and begin to form basic concepts relating to aesthetic values.

Developing

Learners become more selective in what they use in their arts works and become more intentional in their art making. They use both actual experiences and imagination as a basis for making arts works. They express ideas and feelings by selecting, emphasising and organising arts elements in different ways. They reflect on their own arts works and those of others. They respond to the most apparent features of the works and show how some key elements such as shape, form, repetition and time have been used. They talk about their preferences and why they like or dislike particular works and begin to discriminate between different arts styles.

Learners prepare and present their works for others to appreciate. They recognise that arts works are made for different purposes, such as entertainment, celebration or to express ideas and feelings. They discuss the purposes of the arts in their community and different ways arts works are made as well as the contribution they make to communities and cultures.

Maturing

Learners explore issues, beliefs, values and experiences through the arts. They experiment with ideas, explore feelings and persist to find satisfactory solutions to tasks. They carefully choose, combine and manipulate arts elements to explore effects created with different approaches. They use a range of presentational skills to plan and present their works for different audiences or purposes. They understand that the arts may be shared with others in diverse ways. They analyse content of arts works and discuss their basic ideas; and share their responses to their own arts works and those of others. They show an understanding of the arts of different social and cultural groups, at local and global levels.

They appreciate that creation and interpretation of art works deepens our understanding of ourselves and the world around us. They talk and write informally about arts works, noticing how elements are used for specific expressive effects. They offer interpretations of arts works' meanings or ideas and speculate about artists' intentions. They look for clues to help identify the country, cultural context, religious purpose or historical period in which works were made.

Question-led inquiry into action

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Apply to

Being expressive

For details go to – frame 25

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RESPONSIBILITY	Who might be responsible?
CARE	How could people care for others?
ETHICAL	Where is the ethical reasoning?
AESTHETIC	How is aesthetic sense manifest?
THINKING	How is the thinking evolving?
INNOVATION	What might innovation add?

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2 – Conduct inquiries

Getting started	**Positioning performances** - *focus on prior learning, knowledge, experience, and interests, and on aspects of challenges that need to be explored or considered.* **Opening performances** - *select a few relevant GGQs, together with the goals for inquiry associated with them, and develop shared understandings of what they mean.*
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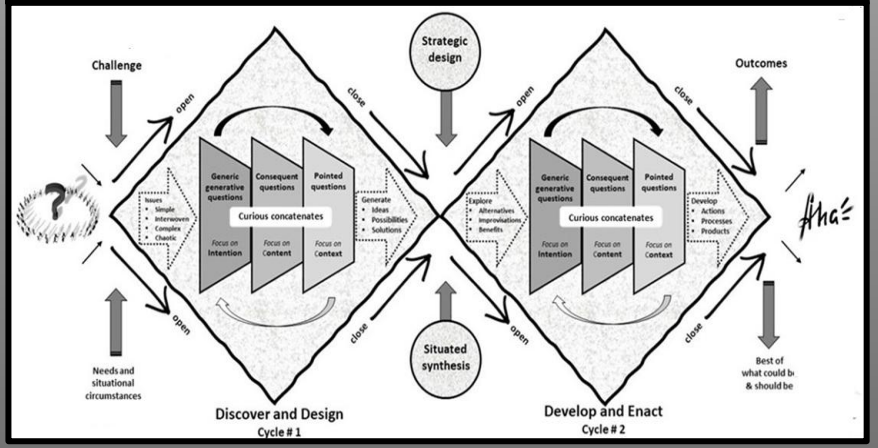

Early learners
A learning barometer!

Question-led learning builds being expressive knowledge and skills

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Visual arts

- Telling stories through paintings, photographs, drawings, collages and combinations of them.
- Identifying the materials and processes used in art works.
- Experimenting with different materials, colours and textures, and possibilities with 3D shapes.
- Recognising the primary colours as distinct from colours that are combination of them.
- Appreciating that people see (interpret) their visual creations in different ways.
- Describing their visual art works to others in terms of their meaning and the pleasure they had creating them.
- Using the work of familiar artists to inform their art making.
- Starting to order their art making by controlling and manipulating materials.
- Identifying some elements and principles of art such as composition, tone, colour, form, shape, texture and balance.
- Asking questions about why art works are made and the meaning behind them.
- Understanding that different people and different cultures have their own stories and traditions to tell through art.

Music

- Making and exploring a range of sounds with different instruments and materials.
- Identifying and responding through movement to musical rhythms and tunes.
- Recognising the 'line' in a piece of music and 'patterns' in rhythm.
- Developing capabilities to play particular rhythms on percussion instruments.
- Singing songs in tune or close to it individually and in groups.
- Responding through movement to different styles of music.
- Recognising and appreciating how music can stimulate and express feelings and emotions.
- Choosing particular forms of music to create an 'atmosphere'.
- Working in small and large groups to learn basic instrumental skills.
- Interpreting rhythmic symbols from a graphic score and being aware of conventional notation.
- Demonstrating awareness of different musical styles.
- Using simple musical vocabulary such as high/low, loud/soft, slow/fast.
- Demonstrating a sense of audience and occasion during performances.

Drama

- Responding to performances, stories and plays from other times and places.
- Pretending to be imaginary characters and acting out what they are like.
- Selecting characters from their experience and telling 'their story' through dramatic activity.
- Portraying a stereotype or particular kind of action through movement and voice.
- Taking the role of audience in listening and viewing dramatic performances by others.
- Participating in forms of drama such as mime, role play, teacher-in-role, expressive movement.
- Asking questions to gain insight into intentions of performers.
- Translating imaginative play from their own culture into a dramatic performance.
- Understanding simple sequences and causal relationships and a sense of an ending.
- Developing vocabulary for dynamic movement such as speed. force, shape, aesthetics.
- Starting to identify character, time, place and narrative when designing own works.
- Performing simple scripts and presenting work to entertain.

Dance

- Showing curiosity about live and recorded dance performances.
- Displaying etiquette such as watching, listening and responding to a performance.
- Translating movements observed in the environment into dance movements.
- Exploring the elements of dance such as action, space, time and energy.
- Moving different parts of the body in time to musical tunes and rhythms.
- Making dance movement choices that seem 'right' or are preferred and are intentional.
- Experimenting with dance movements from different cultures and communities.
- Responding in dance to a particular experience, emotion or stimulus.
- Explaining why particular body postures and movements communicate certain ideas and feelings.
- Using dance elements such as actions, space and energy in response to music and events.
- Understanding that music, costuming and props are important in their drama works.
- Exploring and showing interest in others' cultural dance styles.

Media

- Creating symbolic representations and images of their world.
- Observing symbolic features in digital resources, products and networks.
- Realising how different media products use different forms of symbolism.
- Creating simple media works with voice, text, colour, graphics, pictures, music and different textures.
- Becoming familiar with how to access, use and navigate digital software.
- Selecting media forms that describe particular characters, features, feelings and personal experiences
- Identifying messages in media products and materials.
- Understanding processes for planning media texts such as storyboards.
- Designing texts for a purpose such as a narrative, a recipe, an interview, a demonstration.
- Articulating what they like about media products created by others.
- Using key terms when making media texts such as image, colour, zoom movement, foreground, background.
- Describing the basic stylistic elements of different texts such as fantasy, documentary, and drama.
- Using strategies to develop and select ideas such as brainstorming, concept mapping, PMI, and the like.
- Understanding reactions to media products vary between individuals

Transitional learners
A learning barometer!

Question-led learning builds being expressive knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

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Visual arts

- Producing art works that tell personal stories with an eye for detail and meaning.
- Selecting art materials and processes for their purposes
- Incorporating ideas and styles from artists in own art works.
- Using observation and perception to make visual art.
- Controlling and manipulating materials for particular purposes.
- Using tone, colour, form, shape, texture and balance to achieve particular effects.
- Understanding that artists work within a given medium such landscape, portrait, still life.
- Understanding that people make art for different reasons and that art works have a history.
- Producing art works that reflect a personal point of view.
- Developing a basic vocabulary of visual art.
- Recognising art elements such as proportion, scale, composition and perspective.
- Discussing why particular art works have been created and the meaning behind them.
- Being influenced by popular culture when developing preferences for art works.
- Understanding there is diversity in art works within own culture.

Music

- Exploring musical responses to a narrated story or event.
- Singing playing and performing musical works and songs in groups and individually.
- Responding through movement to different rhythms and tunes.
- Working in small and large groups to learn the skills to play a musical instrument.
- Understanding purposes and symbols of musical notation.
- Using the basic structure of conventional notation while continuing to use graphic scores.
- Interpreting rhythmic symbols and dynamic markings in performances.
- Responding to a wide range of musical styles and recognising personal preferences.
- Choosing sounds, voices and instruments to achieve particular effects in own music making.
- Showing awareness of structure when creating musical patterns.
- Learning the conventions of improvisation and making basic aesthetic choices.
- Understanding reasons behind the placement of voices and instruments for a performance.
- Recognising the characteristic styles of music from different cultures, places and communities.

Drama

- Using drama to tell stories about people and events.
- Designing works that draw on sources for content such as films, stories, events, and experiences.
- Using a repertoire of movement skills such as ‘canon’, ‘position’ and ‘flowing'.
- Discussing character, props, costume and sound, and their contribution to a performance.
- Creating simple sequences of related elements that have a sense of an ending.
- Developing skills of voice, mime and gesture to narrate personal stories and stories from literature.
- Recognising the role of time, character, place and narrative when designing own works.
- Explaining own emotional response to a drama work and the feelings portrayed in it.
- Performing scripts and freeze frames linked with a few words for retelling a story or mime.
- Comparing varied styles in performances of dramas from their own culture.
- Explaining ways ideas, feelings and experiences can be communicated through drama.
- Understanding that suspension of belief and aesthetic choices are basic to drama.

Dance

- Creating movement and dance sequences in response to music, emotions and events.
- Identifying dance components such as rhythm and use of space.
- Using movement phrases such as changes in level and speed, dynamics and balance.
- Demonstrating persistence and resilience learning to move the body for specific purposes.
- Using music, costuming and props in their drama works to achieve their purposes.
- Recognising and describing the movement and design choices in own and others’ works.
- Extending sequences observed in the natural world and in performance by others.
- Understanding different cultures and eras have particular movement styles.
- Presenting dance works that focus on different dance styles.
- Comparing historical dance genres to contemporary forms.
- Understanding some of the codes for making a dance.
- Modifying dance works to fit particular performance spaces.
- Responding to stimuli in ways that are both personal and relevant to a particular context.

Media

- Creating narratives, recipes, interviews, demonstrations and film sequences for specific purposes.
- Recognising the potential and limitations in media products.
- Selecting equipment and processes that best convey a given message.
- Using image, colour, movement, zoom, foreground, background to achieve particular purposes and effects.
- Recognising technical elements such a sequencing, colour, camera effects..., and how they help convey a message.
- Talking about the stylistic elements in fantasy, documentary, drama, film...
- Becoming skilful in using computer based hardware and software through experimentation and selection.
- Seeking guidance when planning and editing or needing technical support.
- Following media processes such as storyboarding to develop media products.
- Creating multimedia texts in a variety of genres and making the necessary technical choices.
- Understanding that materials used affect aesthetic outcomes and influence meaning.
- Recognising that ‘reading’ of a media texts is influenced by own point of view.
- Recognising the influence of media products on contemporary lifestyles

Proficient learners
A learning barometer!

Question-led learning builds being expressive knowledge and skills

Indicative experiences are listed without any priority order

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Visual arts

- Making informed choices about materials and techniques based on their benefits and limitations.
- Experimenting with structural devises such as juxtaposition, overlay and appropriation.
- Developing a high skill level within own preferred genre which is manifest in art works produced.
- Using art specific vocabulary to describe processes used in art.
- Valuing realistic representations and relating codes and conventions used by artists to own work.
- Investigating what artists are trying to convey in art works.
- Understanding how technologies available at the time affect art works that are created.
- Exploring contexts in which art works were, and are being, created.
- Understanding personal ways artists communicate ideas and generate stylistic preferences.
- Recognising art works have multiple meanings depending on the context people view them.
- Developing awareness of the significance of cultural symbols.
- Understanding there is diversity of art works within own culture.
- Comparing, contrasting and categorising art works from a range of cultures, places and times.

Music

- Reflecting on how music can express their personal voice as well as impact on others.
- Developing a musical vocabulary for particular musical styles and using it appropriately
- Reading and using conventional and graphic notation competently.
- Practising singing and playing an instrument to reach the desired consistency and standard.
- Singing individually and in groups with accuracy, control and expression.
- Developing a high degree of control over chosen instruments.
- Making choices about roles of performer, composer, director, producer, listener and consumer.
- Composing with intent using a range of structural elements.
- Using dynamics, tempo, texture, timbre, pitch to achieve purposes and effects in own music.
- Showing awareness of the social, cultural and historical contexts of music making and composition.
- Analysing different compositions in terms of their musical elements and audience appeal.
- Performing music in different styles recognising unique features.
- Making work available to others by recording it in varying forms.
- Appreciating and enjoying 'high quality' performances of music.

Drama

- Discussing aspects of drama that illustrate relationships between culture, history and locations.
- Controlling movement to portray emotive concepts such as friendship and bullying.
- Selecting a form and style suited to the dramatic story being told.
- Clarifying emotional responses to a performance.
- Appreciating drama from diverse times, cultures and social contexts and applying this in their work.
- Exploring how dramatic meaning illustrates values, beliefs and observations.
- Enhancing characterisation by introducing timing and spatial awareness to performances.
- Using selectively a repertoire of movement skills such as canon, position, flow and sequence.
- Accepting responsibility to support others in maintaining the suspension of belief.
- Understanding rules and conventions behind different styles and forms of drama.
- Presenting dramatic texts in ways that are faithful to its perceived intentions.
- Making clear aesthetic choices using appropriate language to explain those choices.

Dance

- Recognising that dance plays an innovative role in communicating ideas within cultures and societies.
- Creating dance works with attention to structure, cohesion and audience.
- Applying codes and conventions to develop an idea with an increasing grasp of technical language
- Demonstrating kinaesthetic awareness, emerging technical skills and a willingness to explore new ways of moving.
- Developing dance skills which broaden own dance vocabulary.
- Understanding production elements such as costume, music and props and use them purposefully.
- Using mirroring, canon, unison, tableau and transition to achieve own or group purposes.
- Developing an understanding of motif and symbolism in movement.
- Forming opinions and making value judgements about the success of dance works.
- Performing dance works of others in ways that communicate personal interpretations.
- Demonstrating preferences for particular dance styles and genres.
- Making connections with cultural and historical dance forms.
- Combining choreographic devices to achieve particular effects.

Media

- Making technical decisions to achieve intentions and desired effects.
- Employing technical knowledge when ideas are conceived and media products designed.
- Creating complex media texts in variety of genres around popular and contemporary culture.
- Understanding media texts carry multiple meanings and messages.
- Applying storyboarding, lighting, sound, camera angles and digital software to create media works.
- Editing work to refine mood, and atmosphere, and check the credits, titles and copyright.
- Identifying conventions of genre within multimedia texts and how they are used to support purpose.
- Articulating considered responses to media products, justifying own position and/or that of others.
- Analysing key cultural, social and historical perspectives in texts from different media genres.
- Providing feedback to enhance the making of media products and the translation of authors' intentions.
- Understanding roles in media production, and organising self and others in production teams.
- Recognising the influence of media products on lifestyles and values.

Accomplished learners
A learning barometer!

Question-led learning builds being expressive knowledge and skills

Indicative <u>experiences</u> are listed without any priority order

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Visual arts

- Understanding art works express a personal view or perception of experience.
- Understanding art generates meanings beyond the literal for many different purposes.
- Understanding that artists make stylistic and technical choices to support their intentions.
- Developing expertise across a repertoire of techniques based on own preference and intention.
- Using juxtaposition, overlay and appropriation with skill and purpose.
- Understanding how design elements combine to produce pattern, harmony, and contrast.
- Selecting materials appropriate to aesthetic ideas and intentions.
- Engaging with a range of genres beyond own preferences
- Making responses to art works informed by insights into styles and past movements in art.
- Using arts vocabulary to describe form, connections, structure, patterns in art works.
- Recognising different eras, movements and styles of art making.
- Understanding the making of art has evolved in response to technological and social change.

Music

- Using conventional notation when composing own music.
- Reading, writing and using conventional and graphical notation competently.
- Making considered choices when selecting musical components.
- Shaping musical works according to a predefined scheme.
- Performing music of different styles, demonstrating a greater knowledge of stylistic features.
- Persevering to develop technical skill and control of their chosen instrument.
- Deconstructing musical works in terms of the musical elements and the composer's intentions.
- Understanding the structure, conventions, mood and purpose of different musical styles.
- Understanding the social, cultural and historical context of the music being played.
- Developing musical works based on contemporary culture.
- Making choices about roles as performer, composer, director, producer, listener/consumer.
- Arranging and writing musical pieces for a selected groups in conventional notation.
- Responding to nuance in direction as leader or soloist or accompanist or group member.

Drama

- Drawing on stimuli such as work of others, research, stories, articles and documentary evidence.
- Enhancing characterisation by through timing, use of space, sophistication and improvisation.
- Understanding symbols include props, costume, gesture, voice, sound, lighting, and staging.
- Selecting props to generate meaning and atmosphere.
- Understanding elements that provide clues about context (who, where, what, why, when).
- Using knowledge of time, place, people and culture to bring meaning to performances.
- Analysing diverse times, cultures and social contexts and applying this knowledge to own work.
- Portraying a character in a way that places them in a historical, social or political context.
- Experimenting with technical elements such as light and sound to enhance message.
- Analysing the effectiveness of performances, expressing observations and opinions.
- Justifying own aesthetic choices and the choices made by others.
- Considering the nature of different audiences when creating, designing and staging dramatic performances.

Dance

- Creating dance works with structure, coherence and style.
- Responding to stimuli in ways that reflect own values and experiences
- Presenting polished work with the physical skill required.
- Demonstrating an increasing grasp of technical language.
- Making judgements about dance works in terms of the codes and conventions used.
- Using original conventions and characteristics when arranging works created by others.
- Connecting the origins of dance and the reasons why people dance to their own dance-making.
- Reflecting personal strengths and stylistic preferences through movement.
- Justifying the selection and arrangement of movements to communicate an idea.
- Understanding and using symbolism in dance movement sequences
- Combining the choreographic devices of canon, abstraction, improvisation and accumulation.
- Appreciating dance traditions and repertoire among different social and cultural groups.
- Creating dance works with particular audiences in mind.

Media

- Designing multimedia sequences that convey a 'point of view' within a media product
- Controlling equipment and design elements to produce coherent and extended media texts.
- Assessing style and effectiveness of a media product in terms of the conventions of different genres.
- Deconstructing a media text for meaning, the techniques used and the relationship between elements.
- Responding to a multimedia text by describing structures and features that impressed self and/or others.
- Constructing multimedia texts with the cultural values and experiences of the audience in mind.
- Understanding roles in a media production and organising them within teams – producer, director, camera operator, editor… .
- Recognising cultural, social and historical differences in media texts and the nature of different genres.
- Understanding cultural symbols and histories reflect political, social, commercial, and religious purposes and practices.
- Understanding histories and cultural traditions are recorded and constructed in media.
- Interpret and describe the design, stylistic, technical, expressive and aesthetic features of works created by different people.

Being Knowledgeable

Three interconnected elements

Scientific inquiries
Five Aspects
- Acting scientifically
- Energy and force
- Matter
- Living things
- Earth and space

Societal inquiries
Six Aspects
- Acting socio-culturally
- Identity, relationships and culture
- Democratic values and processes
- Interconnections between systems
- Responsible citizenship
- Historical perspective

Environmental inquiries
Five Aspects
- Acting environmentally
- Sustainability
- Impact
- Survival
- Interaction

Commentary

The detailed charts that follow provide a 'Learning Barometer' to aid question-led teaching and learning. They are NOT inquiries, just possibilities for learning. They complement the Australian Curriculum (ACARA).

Growth in Being Knowledgeable – a broad overview

The ACARA national curriculum

Beginning

Learners explore and investigate their world as 'our world'. They do not see it as divided into specific areas. Instead, they see it as learning about real life experiences, processes, events and significant occasions. To them 'our world' encompasses experience inside and outside school. Inquiries might, for example, explore questions like - *How the world works? How we care for our world? Where we are?*, and *How we organise ourselves?.*

Inquiries need to be substantial, but not last too long. Care is also required to keep them within the sphere of interest and experience of the learners, and to carefully adjust them to the potential development of the individual and collective capabilities of learners.

Developing

Learners continue to explore and investigate their world as 'our world'. They do not see it as divided into specific areas. Instead, they see it as learning about real life experiences, processes, events and significant occasions. To them 'our world' encompasses experience inside and outside school. Their investigations of questions like - *How the world works? How we care for our world? Where we are?*, and *How we organise ourselves?.* become more systematic with a greater appreciation of teamwork.

The primary focus is on personal experience inside and outside school. At same time learners at this level develop a growing awareness of the wider world with investigations being more intentional. Information, opinions and possibilities are used in processes that make sense of experience and develop understandings. They are beginning to perceive that there are different fields of knowledge and experience

Inquiries need to be substantial yet doable within a reasonable amount of time. Care is also required to keep them within the sphere of interest and experience of the learners, and to carefully adjust them to the potential development of the individual and collective capabilities of learners.

Maturing

At this level learners learn through lived experience from which they generate understandings that inform their everyday lives. 'Lived experience' enables them to experience and encounter disciplines of inquiry that are characteristic of different fields of knowledge and experience. They progressively develop their competence in disciplined inquiry; and at the same time, they come to understand ideas and concepts that are associated with specific disciplines.

While they are beginning to differentiate their learning into different disciplines this need not detract from the multi-disciplinary nature of their learning and inquiries. Their knowledge is also expanding beyond their immediate experience to considerations at a more global level.

They begin to explore the 'big ideas' and concepts embedded in the fields of scientific, societal and environmental studies as well as inquiry skills characteristic of disciplines related to these studies. In addition, they encounter and explore, an age-appropriate level, the design and technological processes relevant to each of these fields.

Design and technology

Being Knowledgeable enables learners to develop understandings and appreciations of - technology in society, engineering principles, materials and resources, and technological specialisations. The process of **design-make-appraise** is key. Learners build their capabilities for investigating, generating, devising, creating, producing, implementing, evaluating, collaborating and managing.. They develop and apply understandings and capabilities that emanate from and apply to the gamut of scientific, societal and environmental fields of knowledge and experience, now and in the future.

Question-led inquiry into action

The three-stage process helps to give inquiries purpose and coherence.

The structure and the questions often need to be refined, even transformed, as an inquiry progresses.

Apply to

Being knowledgeable

#1 – Select generic generative questions (GGQs)

FORM	What is it like?
FUNCTION	How does it work?
CAUSATION	Why is it like it is?
CONNECTION	How is it connected to other things?
CHANGE	How is it changing?
PLACE	What is the role of place here?
RESPONSIBILITY	Who might be responsible?
CARE	How could people care for others?
ETHICAL	Where is the ethical reasoning?
AESTHETIC	How is aesthetic sense manifest?
THINKING	How is the thinking evolving?
INNOVATION	What might innovation add?

For details go to – Frame 16, 17, 18, 19

Select only 2 or 3 of the most relevant

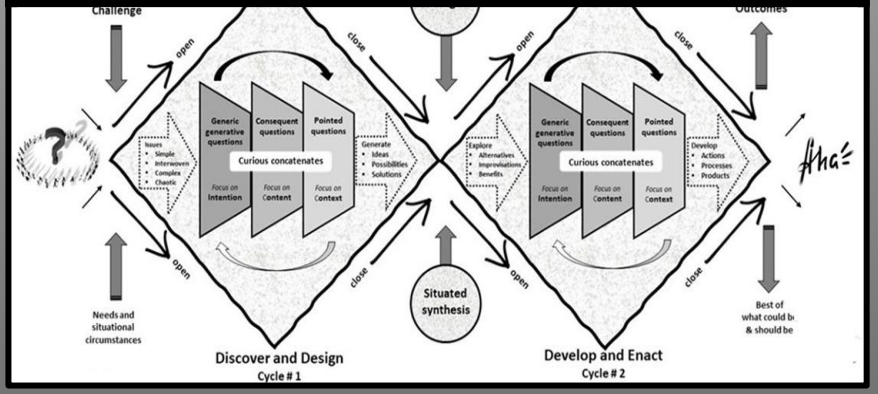
2 – Conduct inquiries

Getting started	**Positioning performances** - *focus on prior learning, knowledge, experience, and interests, and on aspects of challenges that need to be explored or considered.* **Opening performances** - *select a few relevant GGQs, together with the goals for inquiry associated with them, and develop shared understandings of what they mean.*
Moving forwards	**Designing performances** - *devise CQs, and PQs if necessary, for selected GGQs, prioritize and translate them into practicable inquiries that contain realistic tasks to enact them.* **Exploring performances** - *conduct investigations customised to the demands of the design tasks, the capabilities of individual participants, and their expressed interests.*
Drawing together	**Culminating performances** - *build on inquiries by extrapolating what has been discovered to different contexts and to new or emerging challenges, and so doing by diverse means.* **Reviewing performances** - *backtrack to the initial questions and goals for inquiry to determine what has been achieved or needs to be addressed, and where to next.*

Conduct the inquiry in 2 cycles

For details go to – frame 25

3 – Engage in inventiveness



Early learners

A learning barometer!

Question-led learning involves - investigating, experimenting, hypothesising, designing, making, predicting, and reflecting. ***Indicative experiences are listed without any priority order***

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How the world works

- Observing, monitoring and recording changes in the world around them.
- Realising predictions can be made from observing the world around them.
- Identifying characteristic features in nature, and in simple constructions and machines.
- Describing simple patterns in natural events
- Recognising cycles in the growth and habits of living things.
- Recognising that weather and other natural events have great force and energy
- Realising how the survival of communities depends on cycles in nature.
- Making simple inferences from data on climate and weather
- Recognising how cycles in nature determine how people live.
- Understanding people have evolved ways and roles to deal with climatic and environmental conditions
- Realising how our patterns of life reflect what happens in nature.
- Exploring how things can move and adapt or change for particular purposes.
- Investigating how the properties of things affects what can be done with them.
- Understanding people around the world adapt the way they live to their environment
- Investigating how 'pushing and pulling' can be used to make things move.
- Realising that energy is involved in 'pushing and pulling'.
- Illustrating patterns in our natural and constructed worlds through graphical images, diagrams, images and pictures.
- Making drawings and paintings that show sequences of events and how things work.
- Becoming aware many Art works feature our environment, weather, climate and industrial practices Designing and constructing objects and systems for particular purposes.

How we care for our world

- Observing common and unique features in plants and animals.
- Realising that plants and animals need particular conditions to live in and survive such as food and shelter.
- Recognising habitats are where plants and animals live.
- Investigating the habits of living things and the environments in which they live.
- Exploring the features of constructed environments and their purposes.
- Conducting investigations to reveal how habitats and living communities work.
- Understanding how we can care for our surroundings – facilities, places of worship, services, institutions...
- Realising conflicts can occur between people in how best to care for natural and constructed environments.
- Appreciating the diversity of living things and how human action can affect their survival.
- Recognising energy is an important resource for living things and the way we live.
- Comprehending how plants supply the food needs for many animals.
- Understanding the basic concept of a simple food chain in which plants and animals depend on each other.
- Realising people choose which plants and animals to grow in large quantities.
- Exploring ways of looking after and maintaining our living conditions.
- Exploring infrastructures including their development and maintenance.
- Using visual and/or dramatic means to show tensions and conflicts in our surroundings.
- Using paintings, drawings and photographs to show the functional and aesthetic features in natural and constructed worlds.
- Becoming aware plants and animals are the subject of many Art works.
- Designing and making 'models' to show how systems in the world work.

Where we are

- Observing features and patterns in different natural and social environments.
- Appreciating ways people make use of land and water and other facilities.
- Recognising pictures, diagrams, labels and sentences explain family histories.
- Appreciating people in families have different features and personal characteristics.
- Understanding members within a family have shared and different responsibilities.
- Recognising relationships between and within families.
- Understanding families develop and evolve characteristic attitudes and ways of behaving.
- Recognising people have feelings that are not always the same as their own.
- Identifying key features in natural and constructed environments.
- Recognising relationships between size and shape in how spaces are used
- Exploring different ways things and environments are used.
- Recognising the importance of land use and that people make choices in how they use it
- Identifying different systems for transport and communication in local communities.
- Recognising that people have personal responsibilities in moving from place to place.
- Making personal choices in organising journeys and communicating with others.
- Realising that safe behaviour is important for self and others when moving from place to place.
- Using photographs, pictures and drawings to record where people have been, are now or hope to be in the future.
- Using stories and anecdotes to tell about journeys, how land is or could be used... .
- Realising that self-perception of who and where we are generates personal identity and resilience.

How we organise ourselves

- Observing what people do when they are getting organised.
- Identifying guidelines and rules that affect how people are organised and work.
- Realising the ways scientific and technological inventions affect our everyday lives.
- Realising different sources of energy are used in how we live our everyday lives.
- Understanding the properties of materials are used for particular purposes.
- Identifying what is required when working with or using facilities in own community.
- Discussing problems in order to reach shared perceptions and solutions.
- Building relationships with friends and people they have met recently.
- Using listening skills as part of working with people and in getting tasks done.
- Exercising self-management to give other people a 'fair go' and access to opportunities.
- Persevering to do and complete tasks well.
- Recognising the system and services needs of people depend on their circumstances.
- Understanding people need to cooperate in the safe and effective use of systems and services.
- Identifying the sequence of steps in getting designing and making tasks done.
- Posing questions to improve the way designing and making tasks are carried out.
- Helping others to get tasks done especially when they are having difficulty.
- Working fairly and constructively with others in carrying out shared tasks.
- Realising that different places and contexts need specific guidelines and rules.
- Producing charts, diagrams and 'maps' of steps involved in tasks and activities.
- Constructing visual and dramatic representations of the consequences of unsafe and harmful practices.

Transitional learners

A learning barometer!

Question-led learning involves - investigating, experimenting, hypothesising, designing, making, predicting, and reflecting. ***Indicative experiences are listed without any priority order***

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How the world works

- Recognising everyday materials have observable properties which can change over time.
- Realising particular materials are used for particular purposes.
- Recognising choices are made in the materials used in structures and constructions in the natural and constructed world.
- Understanding the relative strength of a material enables it to withstand forces and stresses
- Understanding issues of force, strength and stress affect how things are constructed.
- Realising changes in construction designs and practices can be mapped over time.
- Appreciating constructions, places and environments have particular features.
- Appreciating different communities care for places and structures in different ways.
- Understanding designs are influenced by the needs and purposes of particular groups and communities.
- Recognising construction designs reflect their purposes, expectations, the availability of materials and the technologies used.
- Realising that energy is needed and used to make things work.
- Understanding energy exists in many forms and can be used in many ways.
- Understanding energy is a precious resource that needs to be used wisely.
- Understanding design plans are drawn to scale using standard codes and conventions.
- Recognising different forms and media are used to visualise designs and constructions in 2D and 3D formats.
- Understanding the planets in our solar system in terms of size, distance and order.
- Explaining how day and night and the seasons of the year work.
- Realising strong forces can cause changes in the earth with effects on land, water and air.

How we care for our world

- Understanding living things share a similar set of requirements to stay alive and survive.
- Recognising living thing things have external and internal parts.
- Identifying important unique features in particular natural and constructed environments.
- Understanding ecosystems evolve and adapt over time to changing conditions.
- Understanding pollutants damage our environment and affect living things.
- Identifying substances, materials and processes which are potential pollutants.
- Realising reduce-reuse-recycle is caring for living things and the environment.
- Recognising guidelines are needed to encourage people to reduce-reuse-recycle.
- Understanding the importance of safe disposal wastes and minimisation of waste.
- Realising personal choices impact on other people and whole communities.
- Appreciating self and others have similar and different views on environmental issues and practices.
- Understanding looking after our surroundings is an ethical responsibility now and in the future.
- Recognising health issues and challenges in particular communities, conditions and circumstances.
- Understanding the importance of good food, clean water and adequate sewage in healthy living conditions.
- Recognising the impact exercise and a positive attitude can have on personal and community health.
- Understanding the role of sports in personal and community health.
- Being aware environmental factors, impacts and consequences are depicted in Art works.
- Appreciating many Art forms and media can be used to explain changes within ecosystems in the natural and constructed world.

Where we are

- Realising some changes in our environment are obvious, other less so.
- Recognising places and 'things' have features in common as well as unique features.
- Mapping 'things' in local environments showing their features and uses.
- Mapping the states and regions in our country showing the basic features.
- Understanding land and water are used in different ways for different purposes.
- Understanding familiar materials are suited to particular purposes.
- Investigating scientific and technological applications that help us live and work.
- Recognising evidence helps us understand events and predicting future consequences.
- Understanding information and events can be sequenced over time.
- Understanding people and groups interact in characteristic, often different, ways.
- Understanding choices are made about the use of physical resources – land, water, sea, earth, air - as well as human resources.
- Recognising land is developed and used in different ways for different purposes.
- Appreciating past, present and future choices affect the future health of people and communities.
- Investigating the contributions of valued people in our society including scientists, artists, religious and political people.
- Recognising the nature of significant places in our community and their role.
- Understanding the lives of people and events have unique histories.
- Appreciating different places and communities have unique music, drama and dance traditions and practices.
- Realising people and communities develop a heritage of Art works overtime.

How we organise ourselves

- Understanding how systems in the human body process and use our food.
- Investigating farming processes and sustainable production processes/methods.
- Understanding people trade to acquire the foods and health related services they need.
- Understanding rights and responsibilities in fair trading are interconnected.
- Understanding the components of balanced diets and their effect on our health.
- Exploring different ways to prepare food and preserve food.
- Appreciating the effects of food habits and preferences on healthy living.
- Recognising the effect of cultural differences on food production and presentation.
- Identifying human and physical resources in particular communities and environments.
- Recognising prevention as the primary way to deal with health issues and disease.
- Understanding the role of clean water in the health and well-being of communities.
- Understanding past and present changes in human and physical infrastructure systems.
- Realising that people feel good when they have a say in planning processes and actions
- Understanding simple plans for action often involve a number of steps carried out in sequence.
- Recognising the importance of short and long term planning in developing infrastructure.
- Realising scientific evidence helps to determine the value, effectiveness and impact of services.
- Realising technical terms are often used to describe scientific and technological properties.
- Recognising graphical techniques are effective ways to show design plans and the steps involved in managing resources.
- Appreciating Art works often depict the history of scientific and technological developments.

Proficient learners
A learning barometer!

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Scientific Inquiries — emphasis on evidence

Acting scientifically

- Planning and carrying out inquiries that involve sequential steps and suggesting alternative methodologies.
- Setting up 'fair tests' with appropriate equipment to produce information from which conclusions and predictions can be made.
- Posing questions that can be investigated using available equipment and resources to produce relevant information.
- Using scientific properties when designing systems and products.

Energy and force

- Investigating types of force, relationships between force, pressure and movement, difference between force and energy.
- Exploring ways in which energy can be produced and stored – batteries, the sun, power stations, renewable sources...
- Exploring and constructing simple 'machines' that use force and energy – levers, pulleys, moving vehicles, electrical circuits...
- Investigating ways to save energy – switch it off, use insulation, make use of the sun and other renewable sources.

Matter

- Observing how substances can change physically from solid to liquid to gas such as in the water cycle.
- Investigating 'chemical reactions' that change substances permanently such as rust, corrosion, combustion... .
- Determining the properties of everyday materials such as hard/soft, heavy/light, shiny/dull, sharp/smooth, grainy.. .
- Exploring what happens when substances are mixed.
- Investigating the positive value and potential dangers of different materials and chemicals.

Living things

- Investigating the habitats of living things – their features, living things found there and how their needs are met...
- Exploring interactions between living things such as food chains, examples of interdependence, and plants as the base.
- Exploring adaptation and variation in plants and animals as well as heredity and genetic similarities & differences.
- Exploring the structure and function of human body systems.

Earth and space

- Investigating different sources of water – places, seasonal variation, and our uses of water...
- Exploring instances of nature's 'severe' events on earth and in the solar system, and explaining how they happen.
- Investigating the place of earth in our solar system – moon, eclipses, satellites, gravitational/magnetic field conditions.

Societal Inquiries — emphasis on relationships

Acting socio-culturally

- Observing social interactions in groups and communities and the operation of social systems.
- Asking challenging questions to assess the relevance, and authenticity of ideas and information.
- Comparing different pieces and sources of information on an issue.
- Designing processes and products to meet specified social and community needs.

Identity , relationships and culture

- Exploring family relationships – members and roles, family trees, likes and dislikes, size of people, houses & occupations.
- Investigating family and community eating patterns and preferences – foods, recipes, eating places, and celebrations.
- Realising the social and cultural diversity of communities and nations, including traditions and places in the world
- Investigating the nature of past and present societies from 'high-tech' communities to hunter gather to early farming... .

Democratic values and processes

- Identifying the main elements in own country's growth and independence including leadership, living conditions, rights...
- Exploring how decisions are made in our school and community.
- Investigating ways to include people inside and outside school – seeking opinions, accepting difference, managing conflicts...
- Understanding the main features of national, state and local government in own country and other countries

Interconnections between systems

- Investigating changing farming processes in relation to crop production, harvesting, food storage and distribution.
- Exploring the effects of movement on own community – transport of goods and services, movement of people.
- Identifying the role of different industries in the economy – farming, manufacturing, high-tech, entertainment, media...

Responsible citizenship

- Exploring different ways to work constructively with others – offering help, taking advice, listening to concerns... .
- Considering ways to improve our local surroundings – litter and garbage clean up, growing trees and flowers, walkways... .
- Exploring rights and responsibilities in school and the community.

Historical perspective

- Investigating significant historical and modern buildings - their origins, functions, maintenance and preservation... .
- Examining the nature and history of 'freedom and democracy'.

Environmental Inquiries — emphasis on systems

Acting environmentally

- Observing components, factors, conditions and circumstances in different environments and cultures.
- Collecting balanced information related to the issues and actions under investigation including different points of view.
- Focusing on interactions and consequences through unbiased use of information
- Designing solutions to environmental issues and problems.

Sustainability

- Investigating clean and dirty water, and ways to make water clean from sewage and garbage pollution, boiling and bottling water, water flow and stagnation, water borne diseases... .
- Investigating how food can spoil such as decay, hot conditions, unclean preparation, reheating cooked food.
- Investigating endangered species and actions humans can take to protect animals and plants, ecosystems and habitats.
- Examining renewable sources of energy and how they work – wind power, solar energy, wave power, recycling...

Impact

- Investigating the role of transport in our lives such as the use of animals, trains/buses/cars/airplanes/boats, walking... .
- Examining changes in the built environments around own village/town/city such as buildings, infrastructure, air quality.
- Exploring human impact on ecosystems through farming practices, use of land resources, development activities... .

Survival

- Examining the parts and features of plants and animals to find out how they aid survival in particular environments
- Investigating forests in the past, present and future – native forests, plantations, timber uses, degradation, firewood...
- Exploring issues of extinction and change over geological time.
- Investigating the importance of biodiversity in the survival of ecosystems – dependence and interdependence

Interaction

- Exploring how people in communities engage with each other in teams, sports and recreation, leadership by respected and elderly people, community leaders and 'heroes'.
- Examining choices people can make in how earth's resources are used such as fossil fuels/renewable energy, diesel/petrol, plastic derivatives, minerals and metals. land and water usage... .
- Observing how plants and animals interact with each other in terms of their interdependence for food, water and shelter.

Accomplished learners
A learning barometer!

Question-led learning involves - investigating, experimenting, hypothesising, designing, making, predicting, and reflecting. ***Indicative experiences are listed without any priority order***

Melvin Freestone
www.questionledlearning.org

Scientific Inquiries emphasis on evidence

Acting scientifically

- Designing and carrying out scientific and technological inquiries making reasoned predictions based on analysis of data and scientific concepts they have met.
- Using concepts underlying scientific processes such as attention to variables, controls and consideration of hypotheses.
- Designing and carrying out experiments with fair tests that account for different variables.
- Explaining patterns in data drawing conclusions, making predictions and forming hypotheses from it.
- Formulating and refining questions for further investigation,and devising means to carry out inquiries that result.
- Designing and making systems, prototypes and functional objects that meet specified criteria.

Energy and force

- Investigating the effects of forces supporting or opposing each other as in floating and sinking, simple machines, speed and motion, friction and resistance... .
- Investigating how force, pressure and motion are interconnected.
- Exploring how to every action there is an equal and opposite reaction.
- Describing what is meant by gravity and its effects on objects and movement.
- Exploring forces that attract and/or repel as in magnetism and electricity.
- Exploring how forms of energy differ in the way they are transferred and stored.
- Comparing how different renewable and non-renewable energy sources and systems are used.
- Investigating ways the properties of objects affect how forces act on them - strength, durability, conductivity... .
- Describing systems that capture, transform and use energy into different forms for particular purposes.
- Setting up electrical circuits in series and parallel as well as in robotic devices.
- Exploring different IT devices and networks to improve connectivity and efficiency.

Matter

- Investigating how the properties of substances and materials vary in composition and the arrangement of elements within them.
- Investigating how the properties of materials can be used in industrial and technological applications.
- Investigating physical and chemical changes - reversibility and applications in natural and constructed systems.
- Investigating the nature, components and sources of light and how it travels
- Exploring how light interacts with different surfaces - reflection, lenses, refraction, forming coloured images...
- Investigating the physical and chemical properties of materials in terms of hardness, conductivity, malleability, corrosiveness,
- Exploring processes of evaporating, condensing, concentrating, dissolving, decanting, filtering, separating...
- Analysing conditions that cause substances to react/change/transform and ways to prevent these effects.
- Investigating movement of the air to create wind, weather patterns, sound waves of varied pitch and volume.... .

Living things

- Identifying characteristics of plant and animal cells, recognising the cell as the basic unit of all living things.
- Exploring different ways plants can reproduce and specialised structures they have for this purpose
- Constructing and interpreting food chains and webs as part of modelling relationships in ecosystems.
- Exploring how different reproductive methods have particular advantages in terms of species survival.
- Applying established systems of classification to differentiate living things into groups with like features.
- Investigating some structural, physiological and behavioural adaptations that help ensure survival
- Understanding human reproduction in terms of fertilisation, growth of embryo, nutrition for mother and baby
- Exploring the 'living conditions' that enhance growth and development in particular plants and animals.
- Investigating genetic variation, genes, DNA coding and replication.
- Exploring the meaning of diversity of species and genetic engineering

Earth and space

- Explaining and modelling the orbits of the Earth, Moon and Sun based on effects observable from Earth and space.
- Investigating the properties and behaviour of components in our solar system.
- Realising gravity is analogous to movement in 'bent space' which helps to keep objects in the solar system in orbit.
- Understanding gravity as a force of attraction between small and large bodies.
- Examining processes involved in the water cycle, carbon cycle, weather cycles, formation of rocks and new stars.
- Investigating earth's resources in terms of those that are reusable or renewable and why this is the case.
- Using geological evidence to explain changes in the earth including tectonic plate movements and volcanic activity.
- Comparing the composition, properties and origins of different types of rock.
- Examining processes of erosion and land formation in different geological periods.
- Investigating the composition, properties and behaviour of earth's atmosphere, and how it is changing.
- Exploring conditions for life on earth in different periods of geological time

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Societal Inquiries emphasis on relationships

Acting sociologically

- Distinguishing between fact and opinion when searching for bias, assumptions, validity and credibility in information.
- Understanding how information is influenced by context, values and beliefs, and how reasonable conclusions can be reached.
- Understanding how background, experience and culture influence the interpretation of information and the application of ideas.
- Analysing information sources for reliability, and seeking alternative viewpoints and explanations.
- Creating purposeful communication products with careful attention to the expectations and perceptions of audiences.
- Designing human systems to deal with social issues, environmental challenges and personal health needs.

Identity , relationships and culture

- Examining values and beliefs of different cultural groups and how they reflect identity
- Investigating how values and identity have developed in own and other societies.
- Understanding the value of diversity and respect for difference in societies.
- Recognising issues equity and equality, human rights and responsibilities in societies.
- Realising how groups can and do influence social cohesion, mobility and conflict.
- Identifying changes in attitudes towards different cultural and ethnic groups.
- Evaluating the way inequities can be addressed at national and international levels.
- Investigating ways to express own identity, preferences, talents, and aptitudes.
- Exploring ways social media can affect personal or group identities and relationships.

Democratic values and processes

- Understanding how values affect individual and group beliefs, and shape concepts of democracy.
- Understanding democratic systems in terms of levels of government, rule of law, power relationships... .
- Understanding the nature and significance of constitutions in democratic systems
- Examining how democratic rights and responsibilities are afforded in own and other countries.
- Investigating how laws evolve in response to social, cultural and economic change.
- Realising that changes in laws are sometimes desirable, necessary and unavoidable.
- Identifying key features in different democratic systems and processes
- Analysing the decision making and voting processes, procedures and patterns in democratic systems.
- Exploring the role of international agencies in development programs and in the resolution of conflicts, and in providing humanitarian aid.
- Conducting surveys of opinion and need, and debating the findings.

Interconnections between systems

- Distinguishing between needs and wants, and how individuals or groups respond to them.
- Understanding how services meet needs and wants of particular groups in society.
- Understanding how providers of goods and services respond to demand and market their services.
- Investigating how the media functions, its role in society and its influence on everyday life.
- Understanding how changes in laws reflect social, cultural and economic needs and conditions.
- Understanding access to goods and services can reflect socio-economic status and privilege.
- Exploring legal systems for regulating the development and use of resources.
- Examining the current and potential role of 'high tech' in our community and country.
- Investigating how health programs and systems benefit people and societies

Responsible citizenship

- Understanding how individuals and groups play a part in community life.
- Examining political, social, gender and environmental - issues, views, and perspectives.
- Identifying benefits from diverse groups participating in community decisions.
- Exploring how democratic processes can address socio-cultural issues... .
- Considering citizenship as an attitude of mind to help and care for others.
- Recognising the value and importance of voluntary work and voluntary agencies.
- Realising that 'citizenship' confers rights obligations and responsibilities on people.
- Examining how the rule of law can protect human rights, and govern/promote appropriate behaviours.
- Investigating 'citizenship' as displayed by internationally renowned people and groups.

Historical perspective

- Applying historical analyses to past and emerging issues, ideas or events.
- Investigating different versions of historical events and issues
- Exploring how past actions and choices can inform the future directions and actions.
- Assessing historical information for credibility, reliability and authenticity.
- Establishing historical fact, opinion or speculation from primary and secondary data.
- Developing a sense of historical perspective that informs present and future directions and actions
- Examining histories and evolutions in own culture and literature over time
- Investigating changes in social structures, industries, manufacturing and management practices.
- Exploring the history of local, national and international organisations.

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Environmental Inquiries emphasis on systems

Acting environmentally

- Analysing components, factors, conditions and circumstances that affect environments in particular situations.
- Interpreting information bias and credibility, and synthesising information from varied sources.
- Assessing interactions and predicting likely consequences and impacts.
- Making suggestions for improving investigations based on feedback and the emergence of new information.
- Understanding and synthesising information from varied sources and producing preferred as well as alternative explanations.
- Synthesising balanced interpretations and conclusions from relevant data to improve environmental practices and safeguards.
- Designing and trialling solutions to biological and social challenges and existing or emerging environmental issues.

Sustainability

- Examining interactions in ecosystems related to biodiversity, community and interdependence.
- Investigating how combinations of factors make up the environmental conditions in particular situations.
- Exploring credible evidence to predict changes in local and global environments and weather patterns.
- Exploring human use of materials/resources in terms of being reusable, renewable, biodegradable, toxic... .
- Exploring options for dealing with environmental issues in particular situations and synthesising responses.
- Examining ways to resolve issues such as energy from fossil and/or nuclear fuels and/or renewable sources.
- Exploring environmental 'disasters' that have taken place and measures to prevent them in the future.
- Considering own environmental responsibilities, choices and actions in personal and community life.
- Investigating ways to treat atmospheric, water and land based pollutants and toxic wastes.
- Exploring the potential of genetic engineering in bacteria and viruses, plants and other animals.

Impact

- Exploring current and potential impacts of human and natural processes on climate and ecosystems.
- Investigating benefits of clean air and water, and healthy lifestyles on people and communities.
- Investigating issues of habitat protection, environmental conservation and control of pollution.
- Exploring processes and practices for sustainable land use, maintenance of biodiversity, and safe use of resources
- Identifying human impacts on living things and communities, and on the features of non-living environments.
- Examining how natural and built places change over time and the effects of those changes.
- Investigating past and present conflicts, or potential conflicts, in land use and environmental protection.
- Examining effects of technology on health promotion, aged care, drugs, treatments, antibiotic resistance,... .
- Exploring how computer based technologies are changing lifestyles and the conduct of human affairs.

Survival

- Exploring how food chains, variation and adaptation help organisms address physical and competitive challenges.
- Investigating potential effects of human population size and projected growth in different parts of the world.
- Exploring industrial and technological developments in terms of potential effects on the human condition.
- Investigating how to improve the allocation of and shared access to water resources.
- Investigating ways to prevent water loss, recycle water, treat sewage and clean polluted water.
- Exploring how climate change may affect land use and its availability for human habitation.
- Examining how human activity in particular situations can or may impact on biodiversity and lifestyles.
- Investigating factors that can improve or degrade environments and their potential effects on the survival of species.
- Examining examples of 'extinction', conditions at the time, and reasons for the death of particular species.

Interaction

- Examining past ,present and future implications of growth and development of built environments on lifestyles.
- Investigating evidence for changing climates and potential physical and human consequences.
- Using geographic, topographical and mapping processes to show how natural elements affect human activity.
- Recognising interactions in specific ecosystems including issues related to interdependence and community.
- Investigating potential effects and/or benefits of genetically engineered organisms on other living things including humans.
- Comparing how changing or conflicting values influence choices and decisions in particular places and contexts.
- Exploring different strategies to promote human interaction and the sharing of ideas and practices.
- Generating supportive environments where people are prepared to take risks and present alternative points of view.
- Seeking ways for people to 'have a voice' and share in decision making about life, work and environmental management of the natural and constructed worlds.

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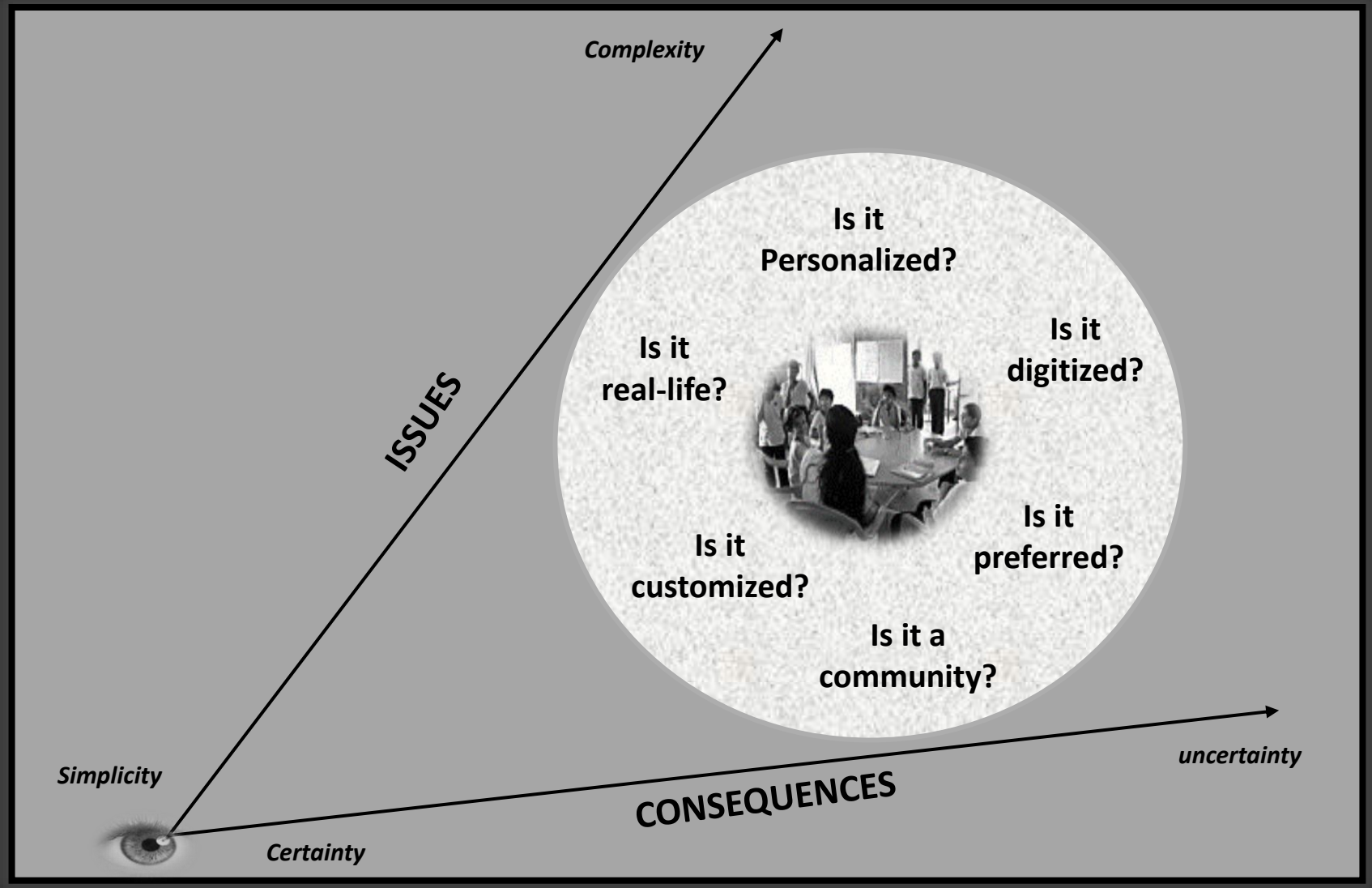
PRACTICAL CONSIDERATIONS
Facilitating learning



PRACTICAL CONSIDERATIONS GATEWAY

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Exploring five minds

Five Minds for the Future - Howard Gardner

A precise of his thinking

Howard Gardner has described five minds, encapsulating crucial skills, values, attitudes and knowledge. They are - the disciplined mind, the synthesizing mind, the respectful mind, the creating mind, the ethical mind. When conditions in the world are changing, educational change must happen, yet the current school system is preparing learners for the past, not the future.

The Disciplined Mind

A disciplined mind is proficient at ways of thinking within a specific discipline or knowledge perspective. Gardner makes a distinction between the subject matter (facts) and the discipline (the thinking behind a subject). For example, science as a discipline involves thought processes such as investigation, analysis, questioning and the generation and testing of hypotheses, and attitudes such as curiosity, as well as scientific facts.

Schools should provide learners with a taste of what it is to think like and feel like a scientist, a historian, an engineer, a lawyer, or whatever. By studying a limited number of key topics in depth, substantial chunks of deep learning are encountered rather than vast swathes of shallow, fact-filled learning. Knowledge gained through chunks of deep learning are meaningful, which breeds a desire for more knowledge. How to achieve a disciplined mind? Identify significant, consequential topics or concepts within a discipline and study them deeply.

The Synthesizing Mind

Individuals without synthesizing capabilities will be overwhelmed by information and unable to make judicious decisions about personal or professional matters. The synthesizing mind takes information from disparate sources, understands and evaluates that information (working out what's important and reliable and what's not), and puts the pieces together in a way that is meaningful to the synthesizer. Gardner suggests learners should generate several representations of a synthesis to deepen understanding.

Synthesis gets little attention in schools. Yet projects and theme-based curricula in schools are good ways to develop synthesizing minds. Explicit instructions, for example, on how to create rich narratives, powerful metaphors and non-linguistic representations are helpful and necessary. Learners should aim to generate several representations of a synthesis to deepen understanding.

The Creating Mind

A creating mind puts forward new ideas, poses unfamiliar questions, suggests fresh ways of thinking and generates unexpected answers. Creativity is essential as it allows us to keep one step ahead of computers and robots, and the like. Creativity is not something that can be turned into routines. Individuals without creative capacities are likely be replaced by computers.

Gardner explains that we should see creativity in a broad sense (not the Edward de Bono one-size-fits-all approach). Problem solving is a creative endeavour whereas creativity in a person is about temperament, not skill. A creative person is dissatisfied with current work, current standards, current questions, current answers, and strikes out in unfamiliar directions and enjoys – or at least accepts being different.

The implications for schools are clear: risk-taking and failure are natural parts of the creative process and perhaps those bored by school, and drop out, are the very ones who need an infusion of creativity in their learning. Gardner points out, young children are natural creators – the task of the teacher is to nurture this natural creativity (but, sadly, school squeezes it out of them).

The Respectful Mind

Individuals without respect will be not worthy of respect by others and will poison the workplace and the commons. A respectful mind notes, welcomes and responds sympathetically and constructively to differences between people and cultures. It seeks to understand different cultures and to work effectively with them. In our globalized, connected world, a respectful mind is essential.

The Ethical Mind

Individuals without ethics will yield a world devoid of decent workers and responsible citizens: none of us will want to live on that desolate planet. The ethical mind is more abstract than the respectful mind. It is more about meaning: our role as a learner, future worker and citizen. How we can serve a greater common good that goes beyond self-interest.

Employing different ‘mindsets’

Food for thought
Click to access

Thoughtfulness can be ‘shaped’ by engaging with-

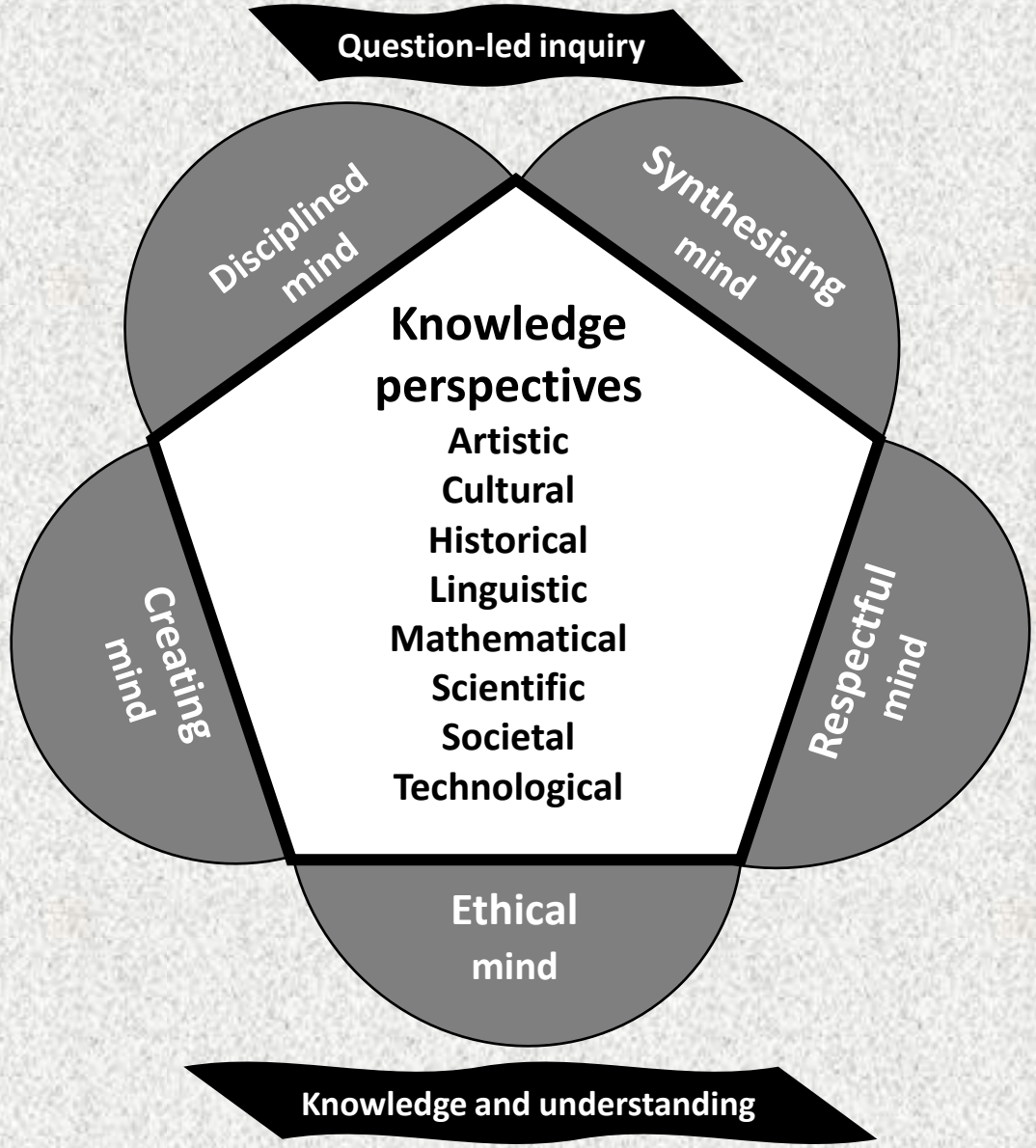
- Disciplines of knowledge and experience
- Synthesising ideas and information
- Respecting ideas and people
- Thinking and valuing ethically
- Creating something ‘new’ or different

Each of these five ‘mind sets’ can be applied through different perspectives from which understanding and experience has been developed. The perspectives may be explored individually or in combinations.

Teachers need to have expertise across these domains

Disciplines of mind are ways of thinking about and investigating experience. They are not subjects or subject matters.

Each knowledge perspective features characteristic intentions and processes, unique concepts and understandings.



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Building collaborative partnerships

Facilitating question-led inquiries

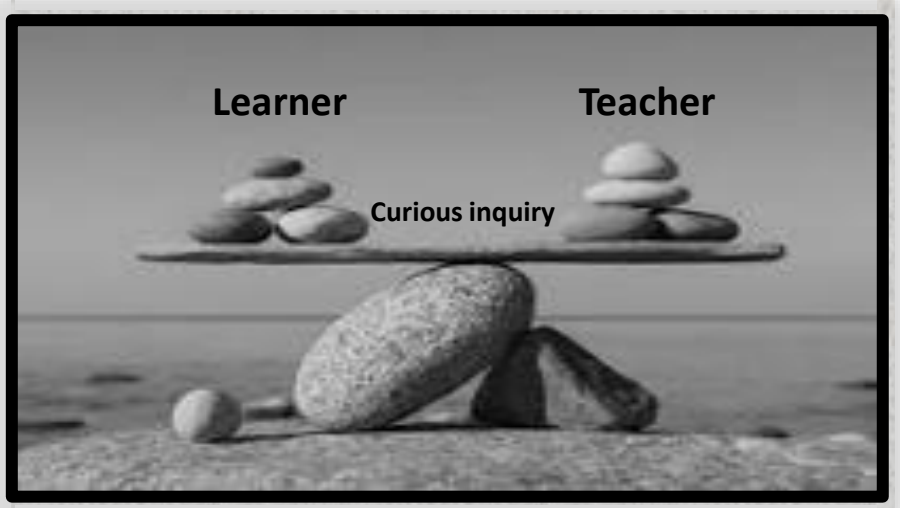
A shared enterprise

Participation in a shared enterprise is the privilege that emanates from teachers and learners working together. They inform and stimulate each other. Even though they come with different experiences and diverse expectations. It's a two-way street.

A dialogical process

Talk may be the primary medium, but emotional and non-verbal communication is just as important. Listening is key with talking and other forms of communication adjuncts to the sharing of ideas thoughts and feelings.

Nowadays, the digital world has broadened the possibilities and potential in ways that would have been unimaginable a decade ago.



A requirement

Collaborative question-led inquiries need to explore distilled knowledge and wisdom, and innovative or emerging possibilities. And do so across the gamut of knowledge and experience.

The quality of these inquiries reflects the knowledge, understandings, and know-how explored. Knowledge among teachers and skill in inquiry processes are critical ingredients in the mix.

A cultural experience

At the heart of facilitation is sharing minds through collaboration. It is a sensitive process where principles of equity, fairness, openness and honesty are important. An ambiance that needs to be worked on, cherished and protected against damaging or disrespectful behaviours.

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Learning cooperatively

Food for thought
Click to access

Question-led learning uncovers the unknown through knowing and understanding. In the process learners and teachers can facilitate each others learning

With the rider

No two people learn in the same way or at the same rate, or by means of identical experiences

Facilitation of learning requires 'orbiting' the needs and intentions of learners, and intervening in appropriate ways when the time is right

FACILITATION

Complex — **Uncertainty**

On request intervention
Focus on nuanced issues

Needs based intervention
Focus on developmental issues

Direct intervention
Focus on Technical issues

THINKING — **DIALOGUE**

Simple — **Certainty**

Teacher perspective

" Teaching is the art which expresses in a form accessible to learners an understanding of the nature of that which is to be learned".

Laurence Stenhouse

Learner perspective

"The ultimate aim of education is to enable individuals to become the architects of their own education and through that process to continually reinvent themselves".

Elliot Eisner

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Exploring real-life

Inquiry designs

Customised

Real-life challenges bring learning into the orbit of a learner's experience, as distinct from being something that appears 'foreign' or imposed. It becomes especially powerful when constructed around the expressed needs, experiences, circumstances and aspirations of learners.

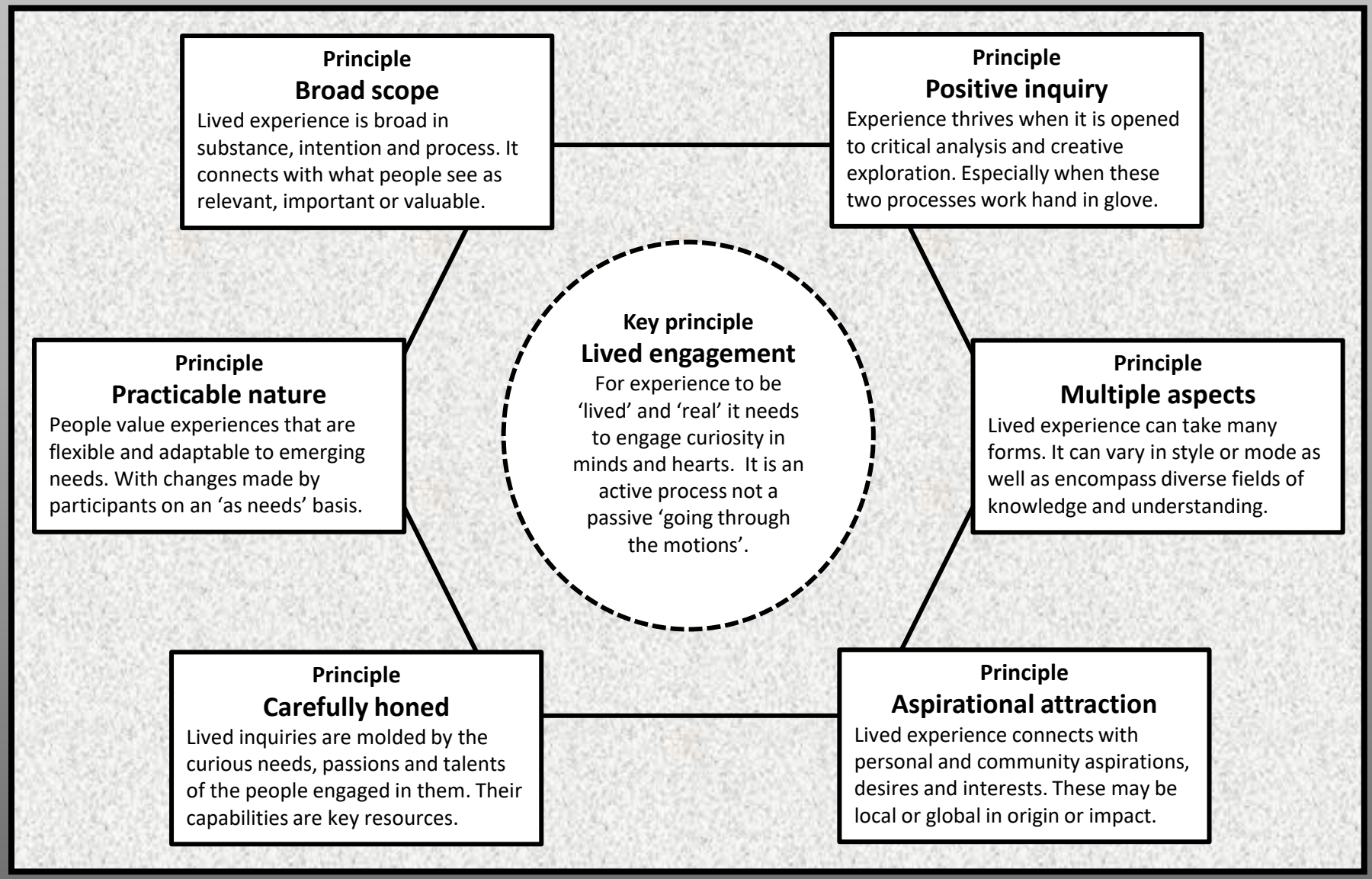
Personalised

Personalised learning requires differentiation of inquiries to meet the differing needs, interests and aspirations of learners. It often involves development of 'modular' or 'unitized' programs which have short term goals and diverse content from which learners can chose. Yet an entire 'modular' series forms a coherent and interconnected whole.

Question-led

Question-led learning, almost de facto, customizes learning programs and personalizes inquiries. Especially if the questions come from learners or result from negotiation between learners and teachers. Collaborative decision-making around GGQs and CQs is particularly valuable for gaining clarity and attuning learning to the needs, interests and aspirations of those involved. As a consequence, motivation to learn and pursue challenges is enhanced.

Principles for a continuing dialogue with 'real-life' experience.



Personalizing and customizing learning

Food for thought
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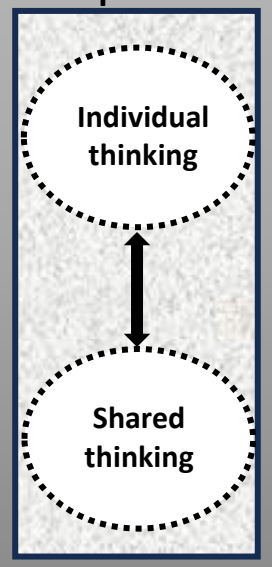
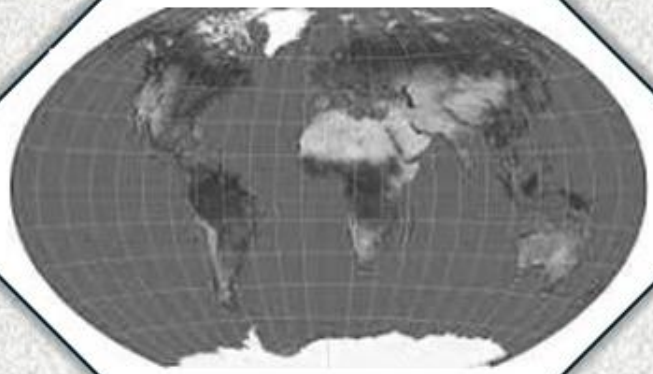
Keep in mind



Focused
- Personal issues and needs
- Local contexts and situations
- Global challenges and tasks

Relevant
Challenging



Purposeful
Personalized

Collaborative
- Individualized choice
- Cooperative teamwork
- Peer and multi-age work

Customized
- Prior learning and interests
- Personal and group understandings
- Talents and aspirations
- Learning needs

Motivation to learn and go on learning throughout life!

Meaningful
- Personal issues and needs
- Local contexts and situations
- Global challenges and tasks

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Encouraging deep learning

Multifaceted mysteries

“The most beautiful experience we can have is the mysterious

Albert Einstein

Knowledge issues

Is knowledge about coverage of subject matters embedded in different key learning areas (subjects)? Or, is it about building deep understanding that can be creatively applied?

In an increasingly diverse and complex world LESS IS MORE. Superficial understanding is inadequate, and a smorgasbord of glimpsed experience is not enough. Furthermore, the explosion in knowledge has made ‘complete’ coverage a forlorn hope.

Deep conceptual knowledge transcends immediate experience from which it is derived. It can be extrapolated to different situations and contexts. And importantly, it can be related to other understandings and creatively applied to new or emerging challenges

Growing understanding

Deep learning stems from curious question-led inquiry. It is built by making sense of experience which is then applied to create knowledge that has meaning and value for individual people and/or collective groups of people.

There are two bookends - generic generative questions and disciplines of mind through which these questions can be explored. The connections made may be concepts confined to specific fields of inquiry or ‘big ideas’ transferable across different fields of inquiry.

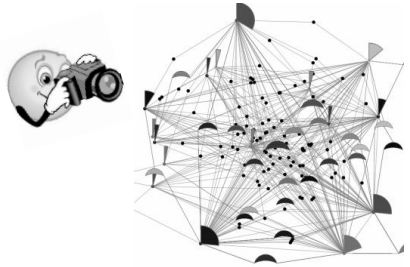
Either way the knowledge and understanding that accrues creates a platform from which inventive ideas and practices can grow.

Note: the meaning attached here to ’deep learning’ is quite different from when it is used in reference to AI.

Continual growth

The development of deep learning is never static. It is continually expanding in response to new experiences and new challenges. And to changed perceptions of extant experience and shifting connections between different aspects of that experience.

Indeed, continual cognitive networking and social interaction generate dialogues that fuel and characterise deep learning. The process represents ways and means curiosity can be engaged and enacted.



Learning deeply

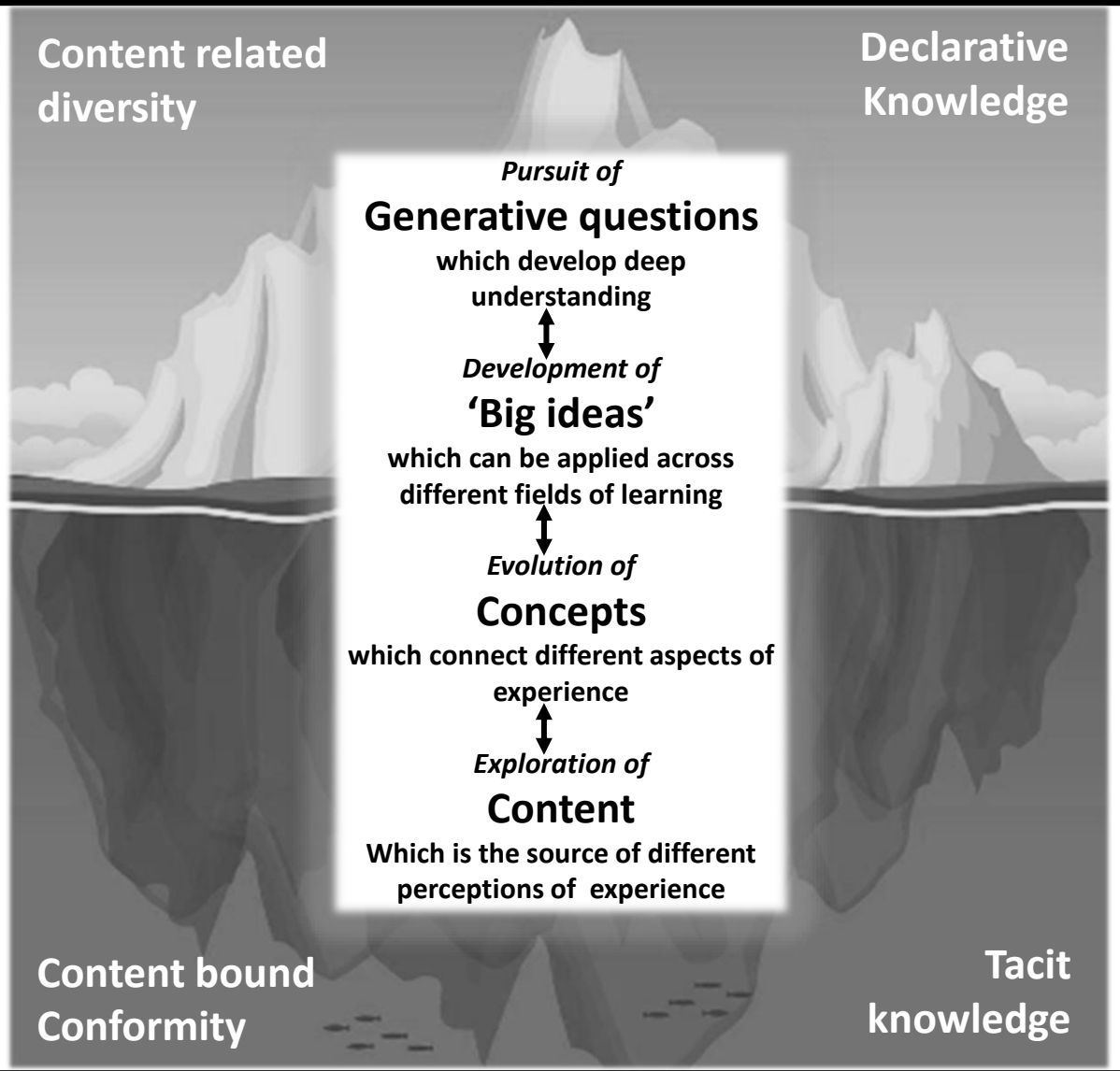
Deep learning is a requirement in a complex and rapidly changing world

Food for thought
Click to access

Questions are gateways to the expression of curiosity and building deep understanding

Less is more provokes deep learning

Superficial learning
More is less



Less is more
Deep learning

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Being aware

Stay human and avoid becoming another machine sitting in front of a box.

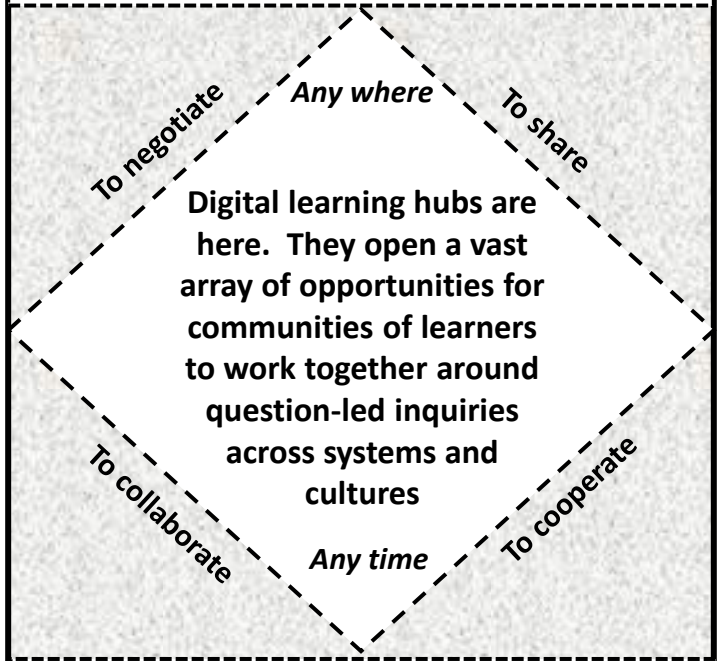
Diverse outlooks

There are many perceptions about the relationship between education and technology. For instance-

- "Technology is just a tool. In terms of getting the kids working together and motivating them, the teacher is most important." – Bill Gates
- "If we teach today as we taught yesterday, we rob our children of tomorrow." – John Dewey
- "Do not confine your children to your own learning, for they were born in another time." – Chinese Proverb
- "I have never let my schooling interfere with my education." – Mark Twain
- "We need technology in every classroom and in every student and teacher's hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world." – David Warlick
- "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn." – Alvin Toffler
- "The great aim of education is not knowledge, but action." – Herbert Spencer
- "Tech gives the quietest student a voice." – Jerry Blumengarten
- "Technology will never replace great teachers, but in the hands of great teachers, it's transformational." – George Couros
- "Education is the most powerful weapon that we can use to change the world." – Nelson Mandela

To keep up with the future of technology, we must be willing to change our old mindsets and move towards innovation.

What is desirable and ethical in teaching and learning are key questions now and in the future?



How should education take on board emerging technologies in the world of tomorrow?

Challenging predictions

Predicting technological advancements over the next 10-15 years is challenging. Based on current trends and ongoing research, here are some areas that are likely to be the focus of much innovation.

- Artificial Intelligence (AI) Advancements
- 5G and Beyond
- Renewable Energy Innovations
- Quantum Computing
- Biotechnology and Healthcare
- Autonomous Vehicles
- Advanced Robotics.
- Space Exploration
- Sustainability and Climate Tech
- Neurotechnology
- Smart Cities
- Augmented Reality (AR) and Virtual Reality (VR)
- Advanced Materials
- Cybersecurity Innovations
- Blockchain Applications

Creating digital environments

Food for thought
Click to access

Ethical issues and AI developments

Flow of Software development

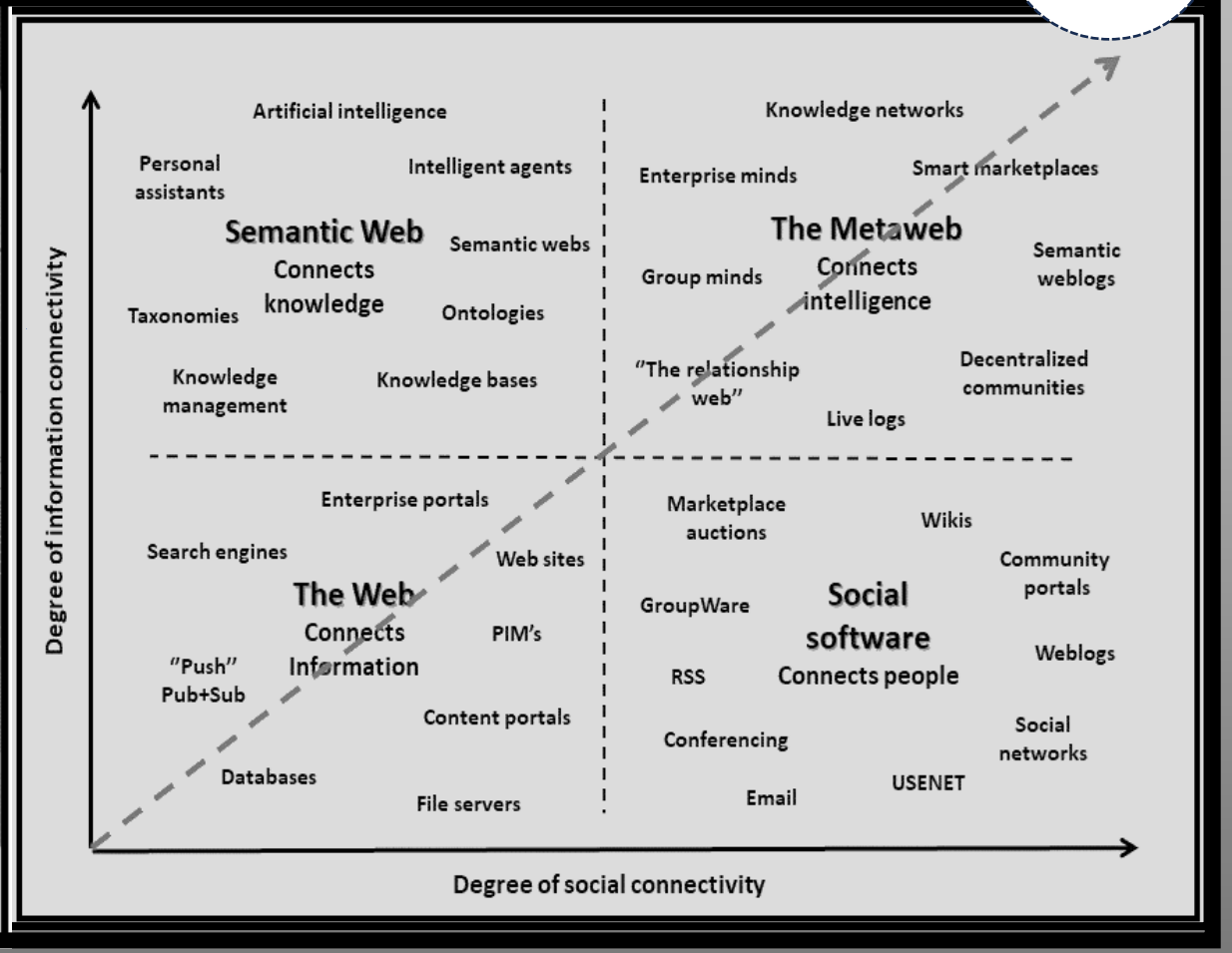
Learning through networking any where and at any time in an interconnected world

Pattern of evolution in digital environments

Progression	Search	Social	Smart
Main vehicles	Internet access	Customised connection	Artificial intelligence Big data
Key features	Information Contacts Extant ideas	Networks Shared Multimedia	Intelligent Remote Control

Delayed time 1950s | Real time Today | Virtual Future

ICT and AI systems – today and tomorrow



ICT Dialogue capability – today and tomorrow

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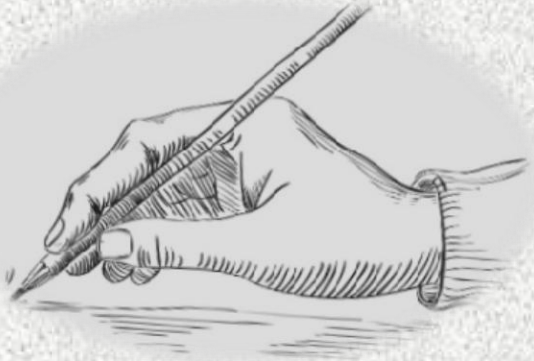
Using digital technologies

Digital technologies have many applications in question-led learning.

Multiple resources with multiple possibilities for application in question-led inquiries



Selection of computer-based tools that facilitate and enhance learning requires wise choices

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Build digital hubs

Digital hubs are becoming part of information and knowledge-based societies.

Local Intranets are analogous to digital libraries which can become dynamic learning hubs

Customised resource
A school Intranet is analogous to a digital library or hub tailor-made for needs of learners and learning communities. It provides a secure source of multimedia resources available 'on tap' to teachers and learners. It can be accessed at any time and anywhere inside school, and if electronic security systems permit in learner's homes outside school.

Dynamic content
School Intranets are user driven and can be upgraded on an 'as needs' basis. If, for example, a collaborative planning meeting of teachers or a community of learners requests an 'on-line' bank of specific resources, they can be made available in a matter of hours. Acceptable contributions and work from learners can also be continually uploaded on an 'as needs' basis and ongoing question-led projects networked.

Effective use
School intranets help to minimize overloading available bandwidth by discouraging wasteful ramblings on the world-wide-web. Yet that does not necessarily preclude access to the huge variety of Internet sites on the web. Should it be considered desirable entrée can be limited to 'acceptable sites'.

Regular monitoring
Being hosted on the school's server aids monitoring inappropriate use that is outside the agreements set out in a school's 'Computer Passport' or similar. The 'passport' can be given 'added authority' if it is formally signed by learners and their parents or guardians and countersigned by the school principal.

Digital capability has become a key requirement in the modern world

Creating digital libraries

Food for thought
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Provide access to text-based, multimedia and digital resources

School-based Intranet - Indicative example of possibilities

TODAY	INFORMATION	RESOURCES	ON-LINE
Weather Map	Department of Education	E-Centre Department's 'one stop shop'	Hot Sites
Satellite Image	Classes	Resources for Teaching and Learning	Useful Internet Sites
Daily News	Student Share	Useful sources	Web Quests
Attendance	Staff Share	Extended Learning	ABC On-Line
Newsletter Publisher Document	School Information	Photos	Education Network of Australia (EdNA)
Mercury	School Internet	Rivers	Reuters Newsagency
My H-Drive	Student Information	Kids Stuff	Student Forums
Help Desk	School Library	Web Tools	Student Mail
Searching tips	Encarta		
Copyright			

System and school-based
Digital libraries in the 'cloud'

Provide digitized materials
- Reading program resources
- Stories and novels
- Information and data resources
- Graphical representations
- Learning programs

Make available resources
- Films and documentaries
- TV - live and stored series
- Blogs, podcasts and wikis
- Sports & recreation activities

Network learner's work
- Investigation studies/products
- Personal and group stories
- Chat forums on key issues
- Collaborative projects and tasks

Develop secure education Intranets for teachers and learners

Back

Avoiding misconceptions

Beware of confusing rhetoric

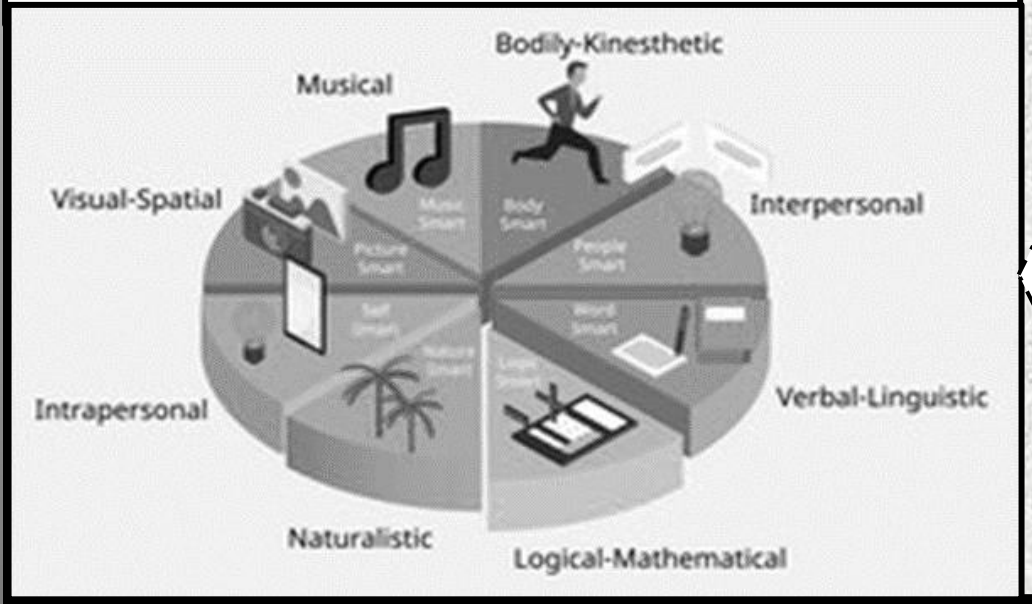
Multiple intelligence

These quotes from Howard Gardner give context to the theory of multiple intelligence.

"It's not how smart you are that matters, what really counts is how you are smart"

"Anything that is worth teaching can be presented in many different ways. These multiple ways can make use of our multiple intelligences"

"The goal of education is to help people use their minds better"

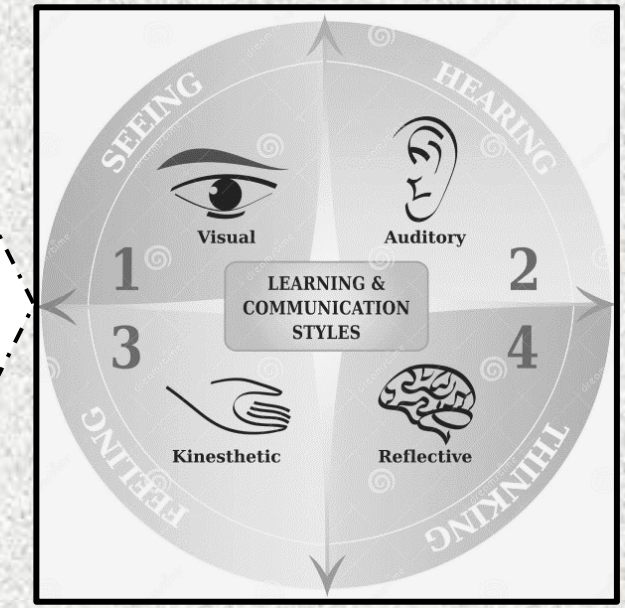


Common misconceptions

Multiple intelligence is often spoken of as being the same as learning style, learning disposition, and learning modality. In fact, they are different.

- **Multiple intelligence** represents different intellectual abilities and functioning
- **Learning styles** are ways in which an individual approaches a range of tasks.
- **Learning dispositions** denote personal preferences for learning
- **Learning modalities** comprise means for learning using the senses for learning.

"We are always faced with the limits of language and language's inability to represent the unspeakable".
Daniel Borzutzky



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Learning preferences

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Accommodate and build on diversity.

Different learning Processes	Different fields of Intelligence	Reflected in	Different learning Preferences	
Collaboration	Naturalist		Word smart learners	Like to – Read. Write. Tell stories. Explore meaning.
Discussion	Musical		Logic smart learners	Like to – Experiment. Figure things out. Work with numbers. Query.
Storytelling	Logical-mathematical		Picture smart learners	Like to – View pictures/slides. Watch movies. Play with machines..
Reflection	Existential		Music smart learners	Like to – Sing/hum/listen. Play instruments. Respond to music..
Inquiry	Interpersonal		Body smart learners	Like to – Move around. Touch and talk. Use body language.
Instruction	Bodily-kinaesthetic		People smart learners	Like to – Have lots of friends. Talk to people. Join groups.
Demonstration	Linguistic		Self smart learners	Like to – Work alone. Pursue own interests. Independent
Presentation	Intra-personal		Eco smart learners	Like to – Observe things. Recognise things. Analyse things.
Visualization	Emotional			
Experimentation	Visual			
Nonverbal				

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Supporting learning communities

Rationale

Learning communities enable values, ideas and capabilities to be expressed, developed and shared in ways that enhance question-led inquiries.

A set of design principles and action features to guide the construction learning communities and facilitate work within them is outlined in the table.

The two sets underpin the theory and practice of collaborative and cooperative learning. They have universal application across the gamut of intelligent inquiry within and between diverse cultures.

Design principles *Enacting values*	Action features *Building capability*
Connectedness Develop a sense of community through friendship, care, compassion, cooperation, acceptance, belonging and sharing.	**Being imaginative** Think analytically and creatively to devise alternative possibilities, multiple solutions, and inventive options.
Resilience Recognise strengths and potential, developing self-management, self-confidence and self-respect, and nurturing optimism together with perseverance and well-being.	**Being enterprising** Act as self-starters who work cooperatively with others and collaboratively in teams to devise and implement ideas.
Achievement Attain personal success across a range of human endeavour, pursuing individual excellence, and displaying pride and satisfaction in personal achievement.	**Being respectful** Act in reliable and responsible ways with a strong sense of justice based on what is considered right and wrong.
Creativity Value original ideas, demonstrating enterprise and innovation, and engaging with and responding to the aesthetic qualities of the natural and constructed world.	**Being ethical** Develop moral autonomy to debate different points of view and come to understand the values and moral dilemmas implicit in specific situations and communities.
Integrity Act honestly, ethically, and consistently as well as developing trust through personal actions.	**Being knowledgeable** Make sense of experience by formulating connections that network thoughts in ways that balance simplicity and complexity yet open-up more of the unknown.
Responsibility Accept both individual and collective responsibility and contribute to sustainable community development.	**Being democratic** Participate as a responsible citizen to generate informed, nuanced and socially responsible decisions and actions that are grounded in the equity of human rights.
Equity Develop tolerance and a commitment to social justice, acknowledging diversity, respecting difference, and encouraging distinctiveness.	**Being empowered** Act resourcefully and intelligently in dealing with challenges, problems, and uncertainties as well as being responsive to changing needs and environmental requirements.

Establishing learning communities

Food for thought
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Provoke collaborative and cooperative learning

Negotiate principles of performance
- Promote personal excellences
- Build respect for differences
- Inspire care for others
- Promote sharing with others

Build empathetic sensitivities
- Recognise feelings and emotions
- Seek other people's insights
- Celebrate own and others efforts
- Create space and voice for all

Establish expectations & consequences
- Clarify rules and work requirements
- Follow up issues thoroughly
- Negotiate consequences to fit
- Ensure consistency in application

Back

Creating interactive environments

Food for thought
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Feel safe, take risks, ask questions, make mistakes, learn to trust and share feelings

A good education can change anyone. A good teacher can change everything!

Negotiate principles for good relations, cooperation and collaboration

Participant rights	Personal responsibilities	Teamwork culture	Resilience qualities
Respect the right to-	**Recognise the need to-**	**Accept responsibility to-**	**Support people to be-**
▪ Have different views ▪ Remain quiet ▪ Look for alternatives ▪ Agree or disagree ▪ Stop contributing	▪ Listen ▪ Respect ▪ Participate ▪ Appreciate ▪ Reflect	▪ Negotiate ▪ Share ▪ Value ▪ Commit ▪ Own	▪ Autonomous ▪ Socially competent ▪ Purposeful ▪ Creative ▪ Caring

Back

Benefitting from flexible spaces

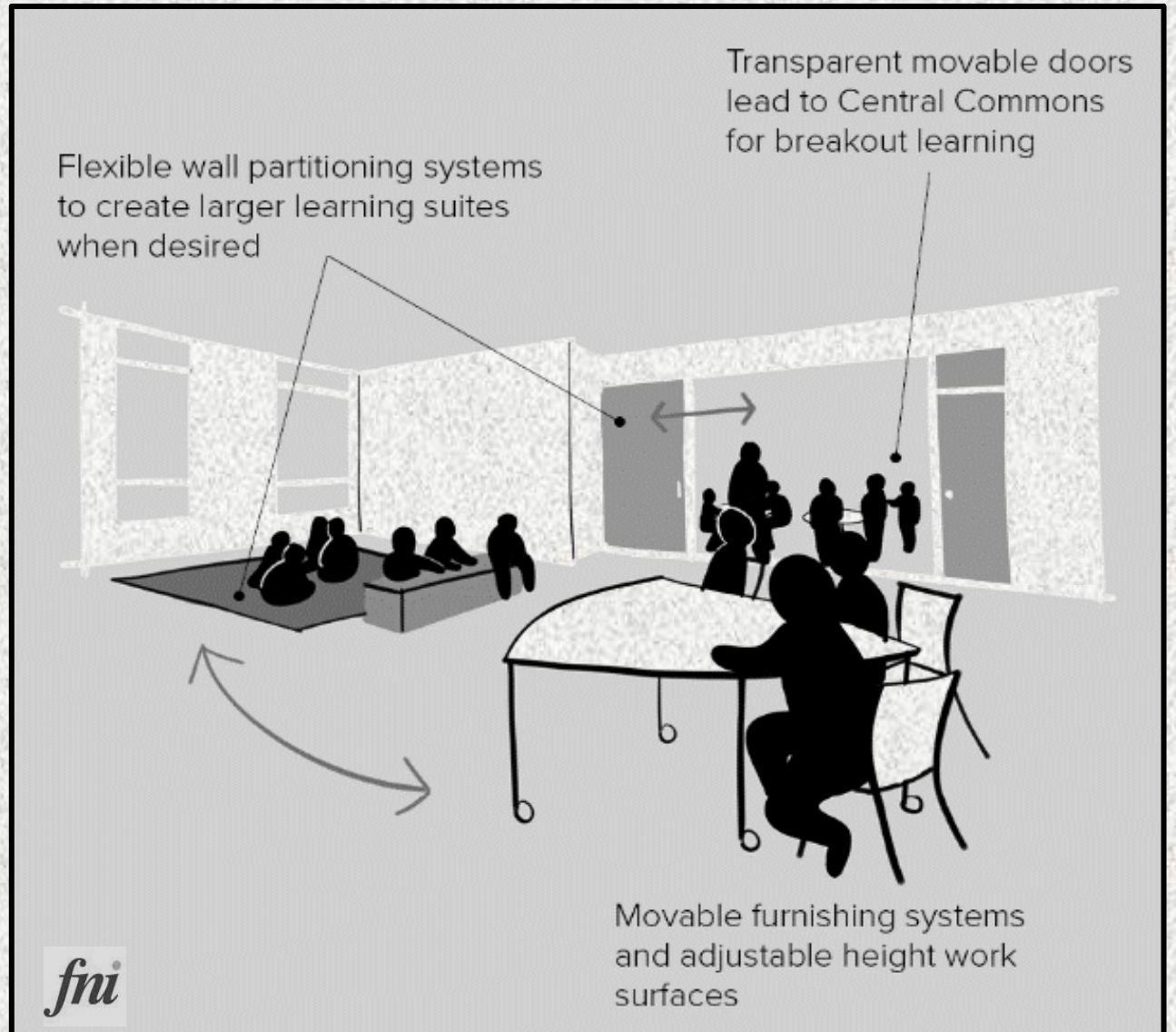
Agile learning spaces

Flexible multidisciplinary spaces are predicated on collaborative learning through which contributions to learning can be drawn from many quarters. Thereby enabling creative ideas and practices to gain expression and be shared through question-led inquiries across the gamut of the Sciences, the Humanities, and the Arts. The opportunities for individual learners and groups of learners include.

- Drawing on the complete range of multiple intelligences
- Working in different modes, styles and modalities
- Participating in personalised and customised of programs

Modern designs have opened-up the potential of flexible learning spaces far beyond anything envisaged during the 'Open Plan' movement of the 1970s. Nowadays learning spaces are custom designed for specific purposes such as – commons, breakout areas, secluded areas, learning studios and outdoor areas.

Teaching and learning issues need to be front and centre of conversations about the design of spaces. With the attractive glitz of novel spaces played down.



A state of mind

It is relatively easy to create flexible opportunities for learning in custom designed spaces.

But even in traditional spaces corridors, nooks, corner spaces, purpose designed furniture, and outdoor areas can be set up in ways that are motivated by the sentiments in the diagram.

An ongoing sense of agility helps to create dynamic and vibrant learning communities.

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Exploiting agile spaces

Food for thought
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Agile learning spaces are responsive, adaptable & flexible

Move away from school as a place - make it an experience

Create diverse spaces for learning

- Individual study spaces
- Breakout and workshop spaces
- Direct teaching areas
- Collaborative commons spaces
- Specialist areas
- Digital hubs
- Performance and presentation areas
- Outdoor spaces

Provide multiple ways to learn

By different Means	In different Ways
Independent study	Specialist learning
Technology-based learning	Teacher based learning
Small group activity	Project based learning
Student presentation	Large group instruction
Play-based learning	Collaborative workshops
Question-led inquiry	Special needs/interests learning

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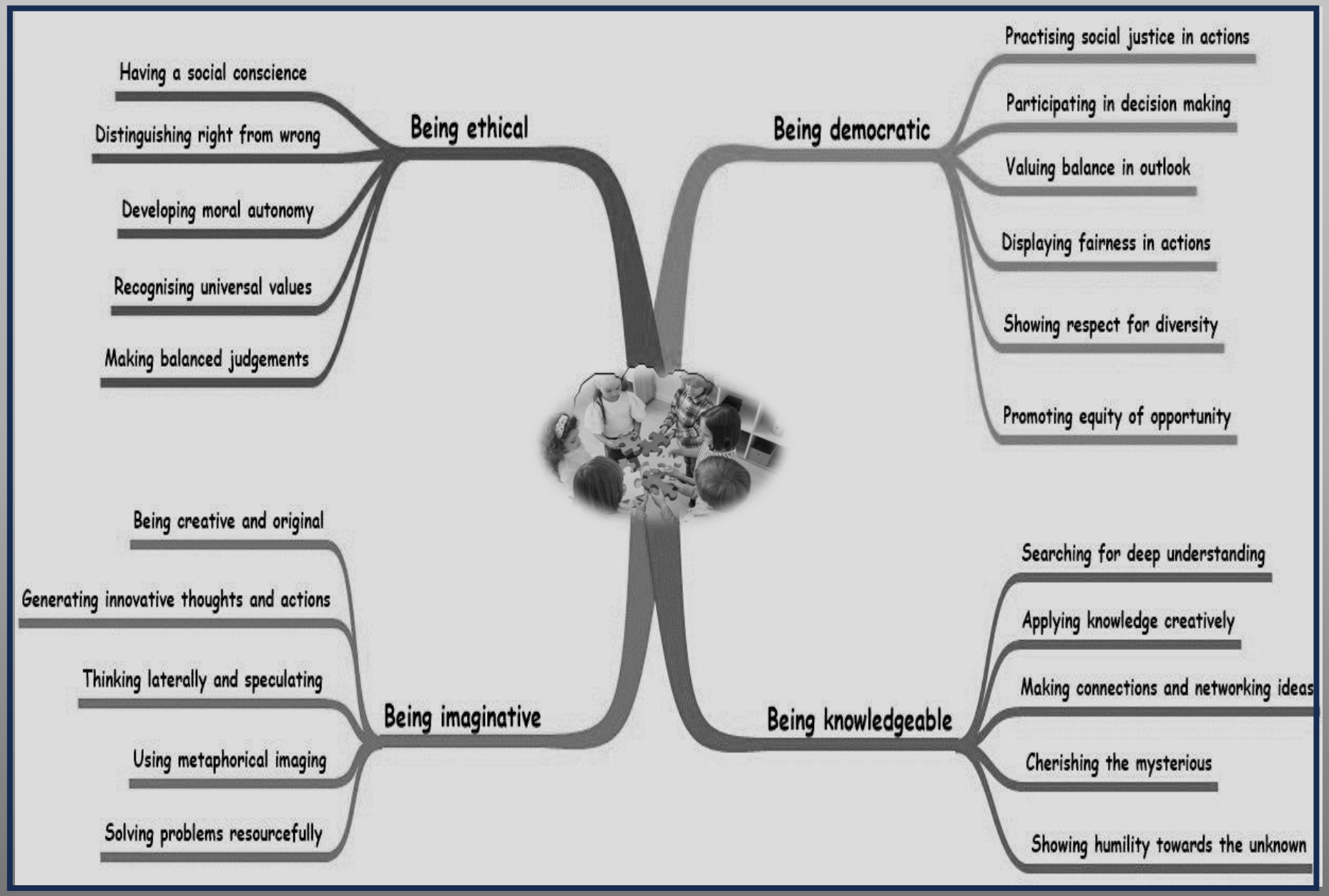
Developing Citizenship

Citizenship for the foreseeable future even though no one really knows what life will be like ten years from now!



A global culture
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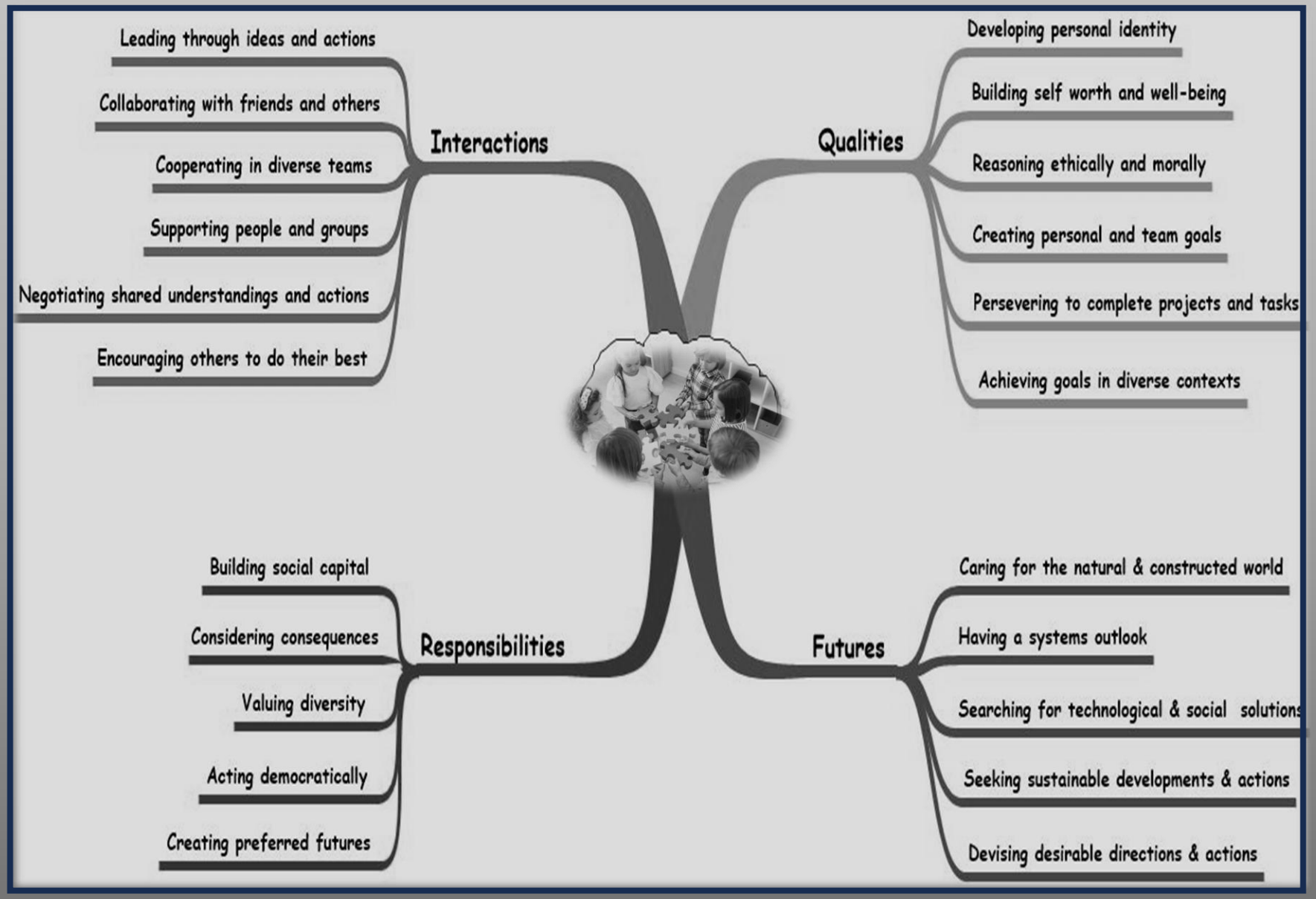
Developing Resourcefulness

Resourcefulness for the foreseeable future even though no one really knows what life will be like ten years from now!



Raising resilient kids
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Building a curriculum around questions – maybe a possibility?

Melvin Freestone
www.melvinfreestone.org

GGQs Indicative examples	CQs Indicative examples	PQs Indicative examples
Focus on - BEING LITERATE – early learners' example		
Causation *Why is it like it is?* In what ways can simple multimodal texts and pictures be constructed?	▪ What are the ideas behind the story? ▪ How could the text and pictures be sequenced? ▪ Are there any graphic 'tools' that could be used to give direction to reader?	▪ Are there different ways to organise the text and pictures? ▪ What would improve the sentence structure?
Focus on – BEING NUMERATE – transitional learners' example		
Function *How does it work?* In what ways does a 'number line' show a relationship between positive and negative numbers?	▪ Why is zero placed in the middle of a 'number line'? ▪ Are there different ways zero can be understood? ▪ How could 100s. 10s and 1s be represented on a 'number line'?	▪ How might a 'number line' be used to help manage pocket money and family budgets? ▪ How might 'number lines' work for keeping positive and negative scores in games?
Focus on – BEING HEALTHY – transitional learners' example		
Care *How might people care for each other?* In what ways might ideas, feelings and attitudes affect how people behave and act?	▪ How might likes, dislikes and preferences affect a person's actions? ▪ Could a person's behaviour be predicted without making a judgement? ▪ Could cultural differences be reflected in how people think and act?	▪ What might be influencing the choices of friends or people who are not liked? ▪ Could taking responsibility for one's own actions help?
Focus on -– BEING EXPRESSIVE – proficient learners' example		
Innovation *What might innovation add?* In what ways might informed choices be made about designs, materials, and techniques in an artwork?	▪ Could experimenting with different structures, images and overlays help? ▪ Could exploring and comparing what artists had done in the past inform the work? ▪ What is it that needs to be or could be better expressed in the images being created?	▪ How might the specific skills required be developed and practised? ▪ Is there any specific art vocabulary to help in telling others about the ideas and processes used?
Focus on - BEING KNOWLEDGEABLE - accomplished learners' example		
Thinking *How is the thinking evolving?* In what ways are force, pressure and motion interconnected in how systems operate?	▪ In what ways do different objects and materials react when they collide? ▪ Could the state of a material affect the way it reacts to force and pressure? ▪ In what ways does moving objects up or down use force and pressure?	▪ How is pressure involved in moving specific objects to achieve a specified outcome? ▪ Why is pressure and force important in the design and construction of structures?

We need creativity to break free from the temporary structures that have been set up by a particular sequence of experience.

Edward De Bono

In true dialogue, both sides are willing to change.

Thich Nhat Hanh

The power of ummmm...
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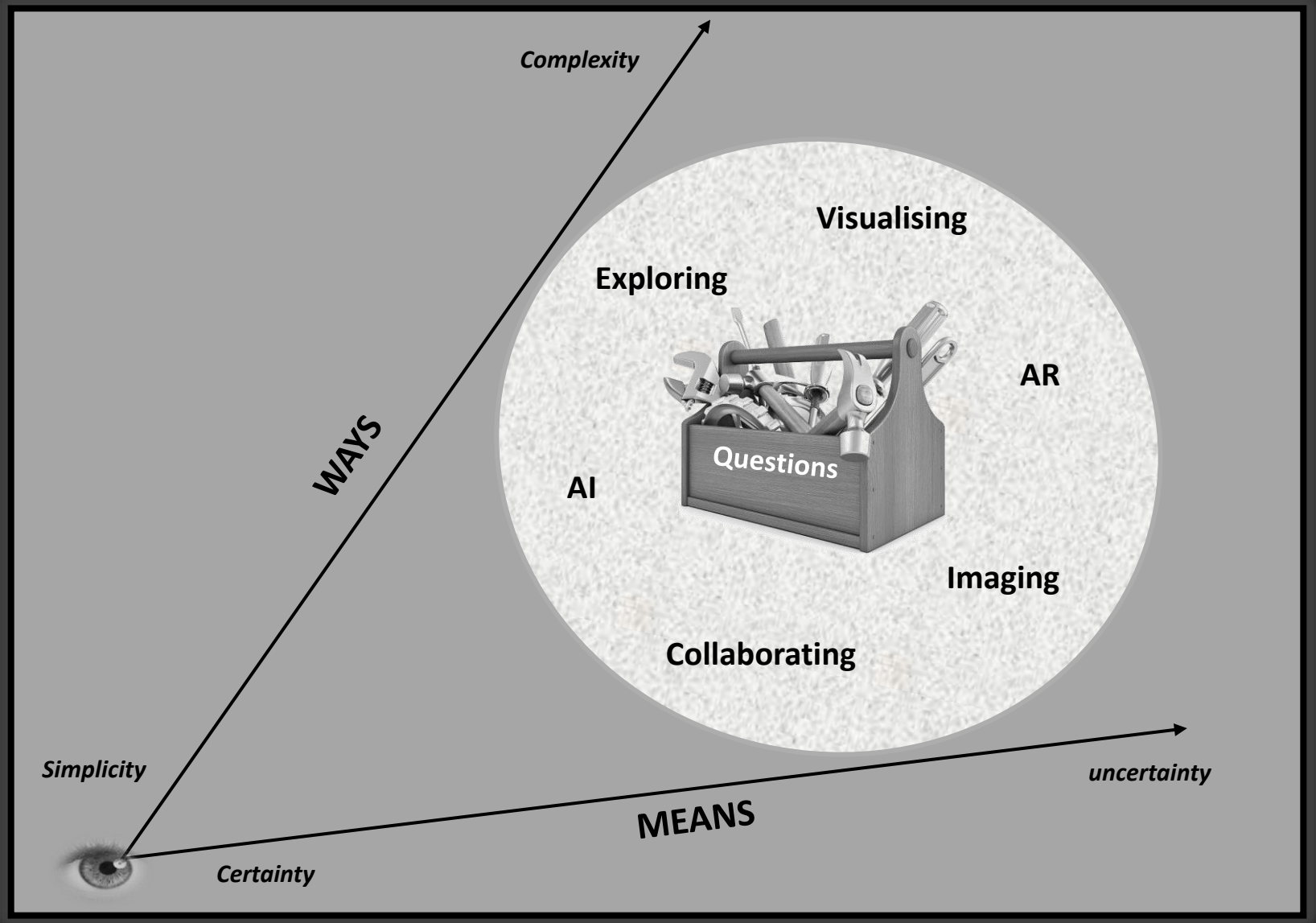
USEFUL TOOLS
Finding ways and means



USEFUL TOOLS GATEWAY
Contents

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F = frame number

Thinking focus

Representing focus

Participating focus

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Constructing ‘effective’ questions

Provide opportunities for all voices to be heard

Phase 1 – Select 2 or 3 Generative questions

FORM	What is it like?
FUNCTION	How does it work?
CAUSATION	Why is it like it is?
CONNECTION	How is it connected to other things?
CHANGE	How is it changing?
PLACE	What is the role of place here?
RESPONSIBILITY	Who might be responsible?
CARE	How could people care for others?
ETHICAL	Where is the ethical reasoning?
AESTHETIC	How is aesthetic sense manifest?
THINKING	How is the thinking evolving?
INNOVATION	What might innovation add?

Phase 2 – Identify consequent questions

Generic strategies

Wonder questions-**vexed** questions-**what ‘if’** questions

Strategic focus

Generate fluency	▪ Multiple questions and ideas ▪ Many potential solutions ▪ Lots of possibilities to explore ▪ Various incongruities to consider
Enhance diversity	▪ Diverse ideas, values and opinions… ▪ Alternative views of ‘what’ and ‘how’… ▪ Dynamic, creative and adaptable thoughts… ▪ Responsiveness to changing conditions…
Provoke originality	▪ New questions and ideas spawned ▪ Better questions and ideas identified ▪ Unusual questions and ideas revealed ▪ Nuanced questions and ideas generated
Trigger detail	▪ More detailed questions and ideas ▪ Questions and ideas better clarified ▪ Greater sense of contextual issues ▪ Different complexities for reflection

Use these strategies, and others, singly or in combinations but make sure

<u>Purposes are clear</u>

Phase 3 – Group consequent questions

Group questions that address similar issues, thoughts or perspectives. In some situations, it may be helpful to give a ‘title’ that describes to each grouping.

Phase 4 – Refine consequent questions

Engage in conversations to review the questions and where necessary refine or modify them. On occasion it may be best to leave these arguments unresolved.

Phase 5 – Prioritise consequent questions

Record the group ‘titles’ and their contents. This represents a template for prioritizing.

- Number each item displayed
- Give the same number of ‘dot stickers’ (physical or electronic) to everyone involved. Limit the number to four to six to promote careful thought
- Place the ‘dot stickers’ adjacent to the items considered to be most important
- Count the ‘dot stickers’ to calculate the priority order.

‘Sticky notes’ are a good way to conduct this process. They can be displayed for all to see and easily moved around as required. And their original source can be kept private

Exploring different Perspectives

Edward De Bono's *Thinking Hats* promote different kinds of thinking which generate a vast array of questions.

The Hats can be applied singly or in combinations provided the characteristic intention behind each one remains clear

White hat	Red hat	Black hat	Yellow hat	Green hat	Blue hat
Virgin white, pure facts, figures and information	Seeing red, emotions and feelings, hunches and intuitions	Devil's advocate, negative judgement, why it will not work	Sunshine, brightness and optimism, positive, constructive	Fertile, creative, plants springing from seeds, movement and provocation	Cool and control, orchestration, thinking about thinking
▪ Distinguishing parts ▪ Focusing questions ▪ Proving facts ▪ Establishing authenticity	▪ Exploring feelings ▪ Contemplating emotions ▪ Being personal ▪ Escaping logic	▪ Examining fit ▪ Pursuing errors ▪ Investigating limitations ▪ Identifying faults	▪ Seeing value ▪ Considering benefits ▪ Generating proposals ▪ Seeking opportunities	▪ Exploring alternatives ▪ Challenging ideas ▪ Moving forward ▪ Postponing judgement	▪ Defining problems ▪ Monitoring processes ▪ Sequencing actions ▪ Summarizing situations
Fact Quest	**Emotion** Quest	**Judgement** Quest	**Optimism** Quest	**Creativity** Quest	**Reflection** Quest

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Streaming questions

A note of value

The most valuable thing a teacher can impart to children is not knowledge and understanding per se but a longing for knowledge and understanding, and an appreciation for intellectual values, whether they be artistic, scientific, or moral. It is the supreme art of the teacher to awaken joy in creative expression and knowledge…. .

Albert Einstein

Streaming focused questions

Intentional, analytical and speculative processes

Intention Indicative list only	Wetlands management Illustrative example
Support questions Follow thoughts and information	▪ What's the reasoning behind the proposal to control salt levels and the impact of arguments against it?
'Check out' questions Explore accuracy and reliability	▪ How reliable is the information on rising salt levels in arid areas and is it sufficient?
Concern questions Raise arguments and conflicts	▪ How might the views of stakeholders opposed to the proposed development affect the outcome?
Follow up questions Emphasise prediction and impact	▪ What are the likely consequences for survival of the wildlife and drainage of salty water?
Creative questions Spawn ideas and possibilities	▪ What might happen if ecological principles were applied to land management and conservation
Crazy questions Consider surprises and risks	▪ Could an analysis of desert environments provide some clues

A note of caution

"In 80% of Socrates' dialogues there was no constructive outcome. He saw his role as simply pointing out what was wrong."

Edward De Bono

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Being clear-minded

Select questions to fit purpose

There are many different types of question which are distinguished one from the other by their purpose.

A key issue is to decide on the purpose and select to most appropriate questions

A key corollary is to avoid being trapped by that decision and still consider other potential questions

Investigative questions
to design 'hands-on' activities and experiments

Exploratory questions
to unfold new knowledge and ideas

Wonder questions
to proposition and speculate

Misunderstanding questions
to explore misconceptions and complexities

Text-based questions
to respond to texts and messages

The lines indicate potential flows

Actual flows are determined by intention

'What if' questions
to stimulate imagination and creativity

Hierarchical questions
to differentiate and assess sophistication

Vexed questions
to challenge and contradict

Reflective questions
to review and transform mindsets

Confirmation questions
to clarify information and ideas

'Deep reasoning' questions
to reveal thinking and conceivable action

Input questions
to recall and construct relationships

Consolidation questions
to bring together and extend

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Devising questions – different modes of thinking when devising consequent questions (CQs) and pointed questions (PQs) to explore selected generic generating questions (GGQs)

Indicative examples	**Wonderment questions** – searching for ideas, researching propositions, exploring the unknown…	
Steam ahead *Strategic focus – How does it work? (Function)* **Where does steam come from when water is boiled?**	**Healthy living** *Strategic focus – What is it like? (Form)* **What are the foods people need to be heathy and why are they needed?**	**Positive relations** *Strategic focus – How might people care for each other? (Care)* **Why might people who are angry, anxious, bullied or low in self-worth need support?**
Indicative examples	**Vexing questions** – addressing dissonance, challenging explanations, evolving different possibilities…	
Steam ahead *Strategic focus – Why is it like it is? (Causation)* **Why does height above sea-level affect the boiling point of water?**	**Healthy living** *Strategic focus – How is it connected to other things? (Connection)* **Why is so much food wasted when some people are malnourished?**	**Positive relations** *Strategic focus – How is it changing? (Change)* **How can people be encouraged to face up to issues that are stressful or troubling?**
Indicative examples	**'What if' questions** – exploring potential, considering alternatives, generating innovative solutions	
Steam ahead *Strategic focus - What might innovation add (Innovation)* **What if steam used in technological systems could be recycled for reuse?**	**Healthy living** *Strategic focus – Who might be responsible? (Responsibility)* **Might lifestyles improve if we were to review or revise our eating habits?**	**Positive relations** *Strategic focus – How is the thinking evolving? (Thinking)* **If we were to engage in projects and sports activities how might our self-worth grow?**

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Speculating hypothetically

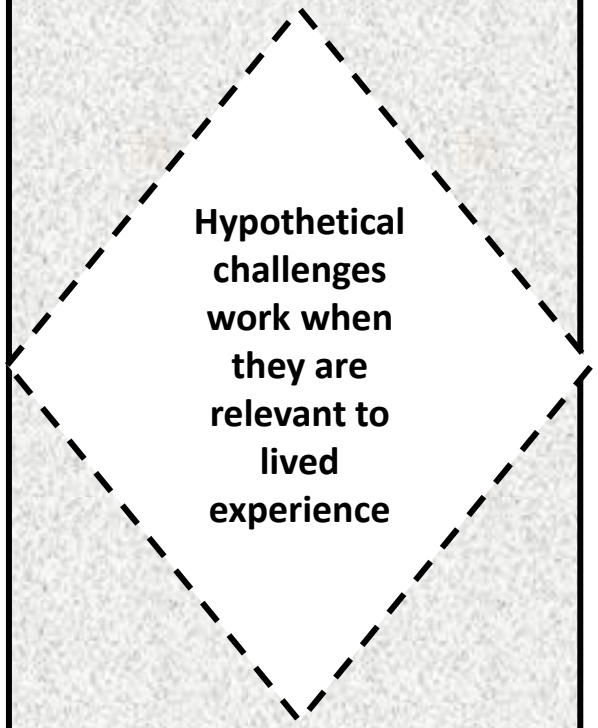
Hypotheticals

A hypothetical is a proposition that requires a considered response.

Depending upon the complexity of the proposition, participants may need to identify and address questions and issues, explore possibilities and alternative solutions, examine human values and socio-cultural issues, and consider solutions in terms of their practicability.

A hypothetical is a challenge that focuses on – 'what if…??? It is a valuable means of testing out possibilities, potential benefits, and difficulties inherent in ideas and practical actions.

Hypotheticals tend to raise more questions than answers



'What if…' questions

Indicative examples

- **If you were able to live on any planet in the solar system, where would you live?**
- **If you could go back in time to any point in history, where would you go?**
- **If you had the ability to make yourself invisible, what would you do?**
- **If you could be any character from a movie, which character would you be?**
- **If you could control your dreams, what would you dream about?**
- **If you could live inside a computer game, which game would you choose?**
- **If you could remove one of your personal characteristics, what would you choose?**
- **If you did not need to sleep, what would you do during the night to fill your time?**
- **If every human on Earth jumped into the sea at the same time, what would happen?**

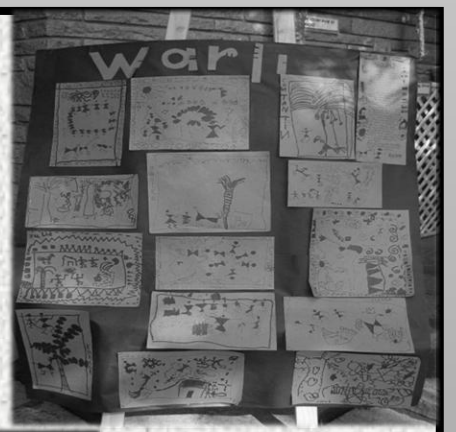
Visualizing perceptions

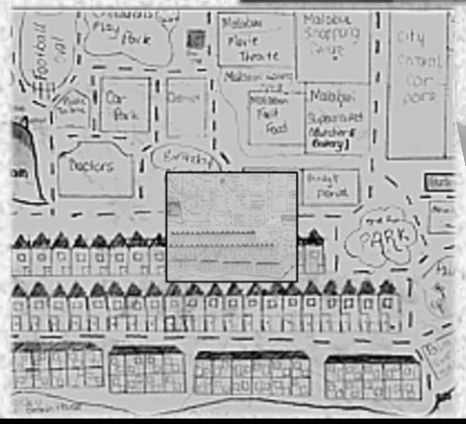
Visual representations

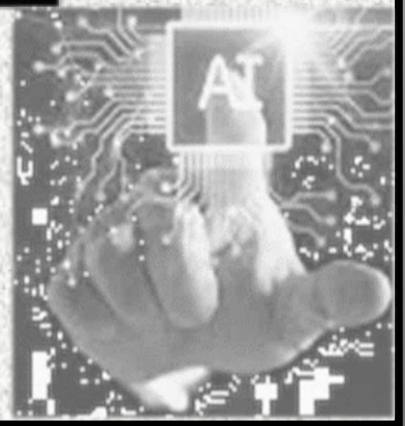
Visual perceptions can take many forms from paintings to film to virtual reality to artificial intelligence (AI).

They can be applied for a myriad of purposes encompassing the expression of conceptual ideas and practices as well as feelings and emotions

They reveal different perceptions of experience and create focal points for dialogue.





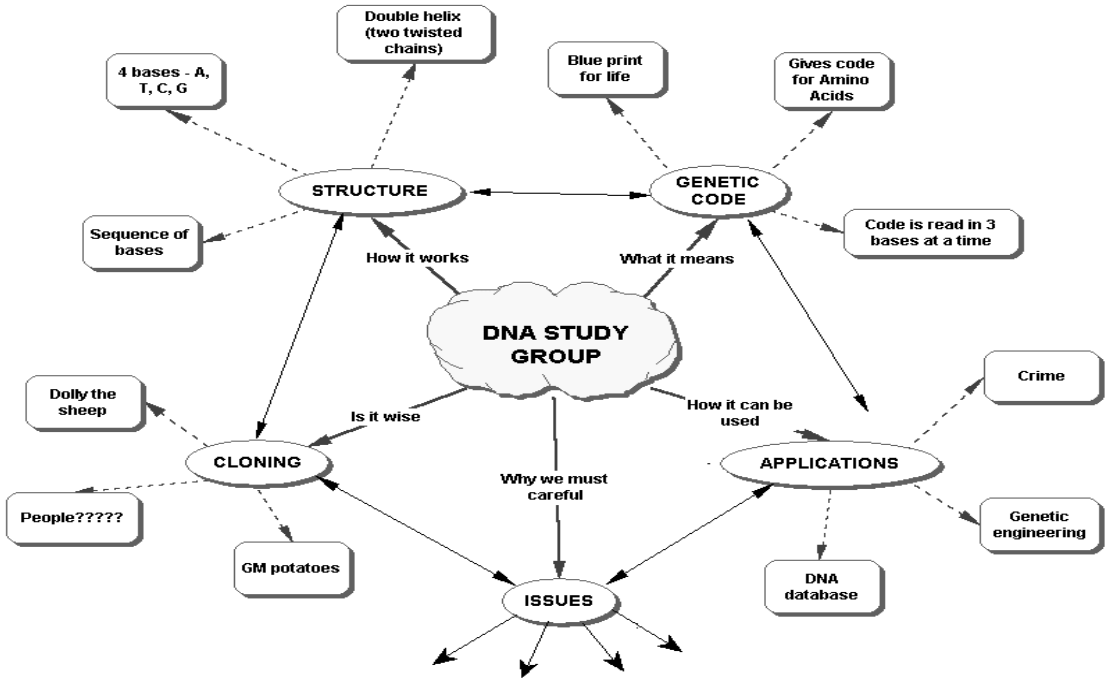


Mapping conceptual thinking

Mind maps and concept maps are cognitive tools. They help people gather, organize and process information and ideas, and in so doing generate insights.

Concept map

These maps reveal interrelationships and layers of thinking and understanding. In the example below the weighting of the arrows indicates relative significance and some of them have descriptive remarks attached to them.



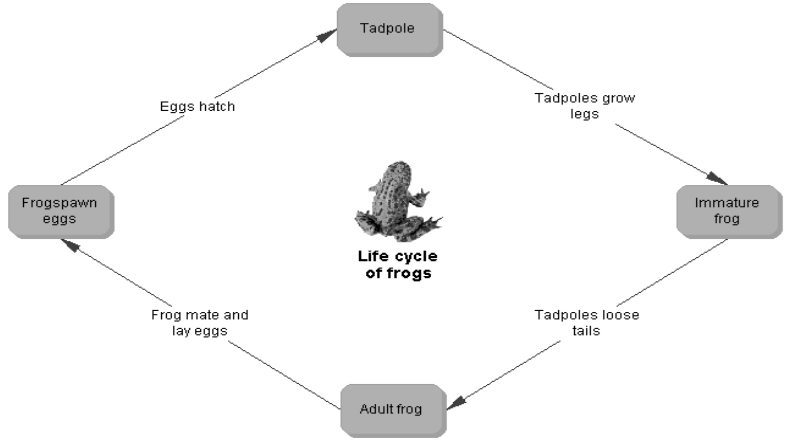
Diagrammatic representations depict

- **Relationships between causes and effects**
- **Patterns of thinking involved in generating ideas**
- **Sequences taken in making decisions and arriving at solutions**
- **Consequences of taking specific paths or actions**
- **Steps taken in carrying out plans or activities.**

The pictures that emerge reveal different perceptions of experience and create focal points for dialogue.

Cyclical map

The main question or topic or idea is placed at the centre with the cyclical movement elements around it. The flow and chain of events are the key issues.



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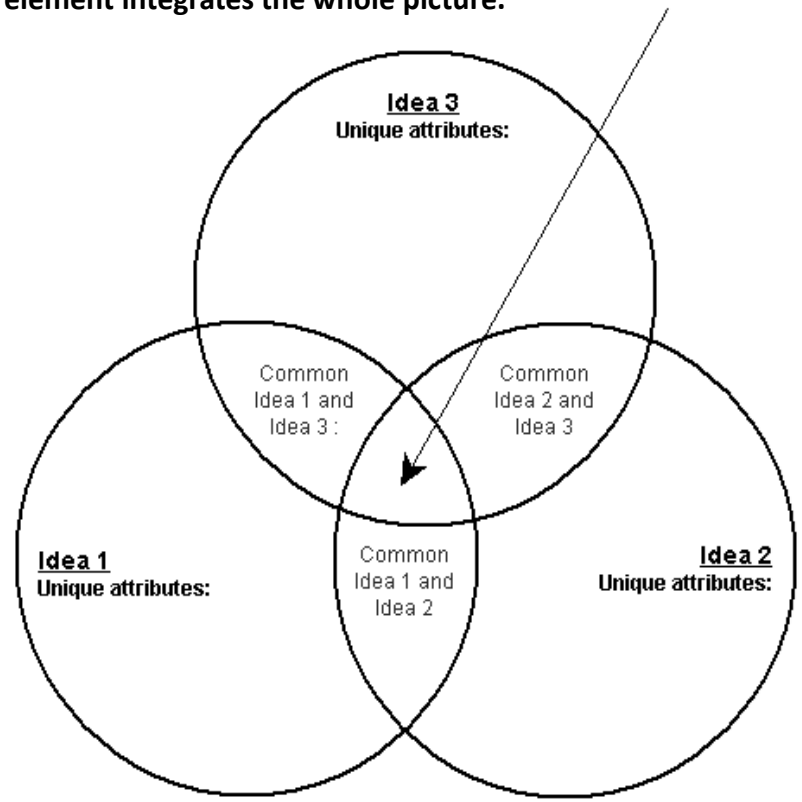
Patterning relationships

Venn Diagrams

Venn diagrams show interrelationships. They may consist of two, three, four or more circles depending on the number of 'main elements' involved. Simple Venn diagrams put these elements into linked circles with an explanation of their characteristic attributes. More complete Venn diagrams show what is common at the intersections between the circles. The central element integrates the whole picture.



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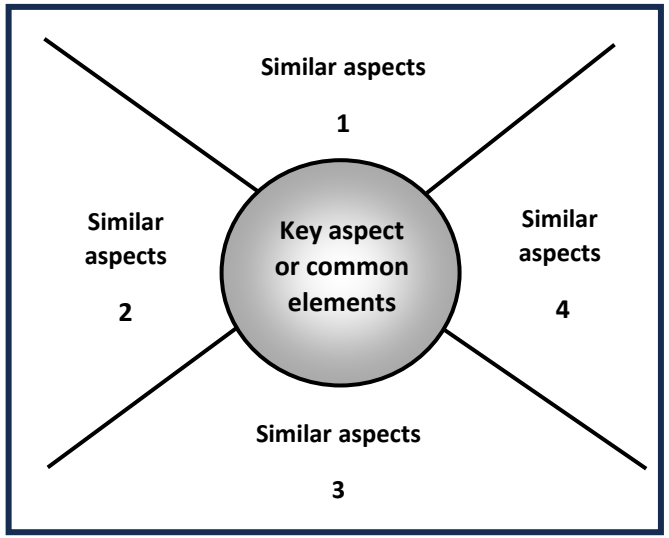
The pictures that emerge reveal different perceptions of experience and create focal points for dialogue.

Placemats

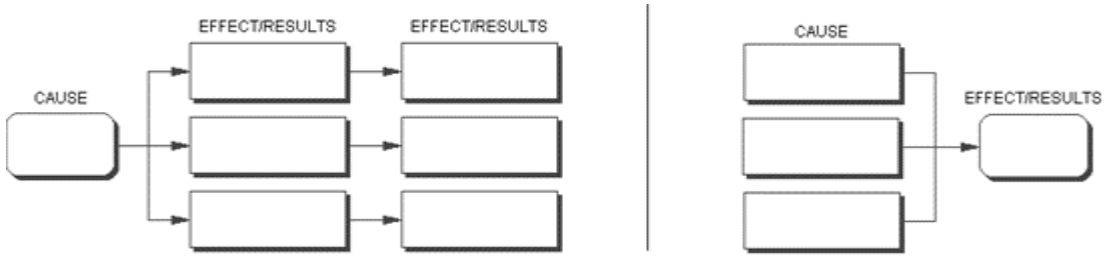
Placemats are a variation on a simple Venn diagram. They are a useful means of distinguishing between major and minor aspects of a question, an issue, or an idea, an event or a problem.



Representing flow

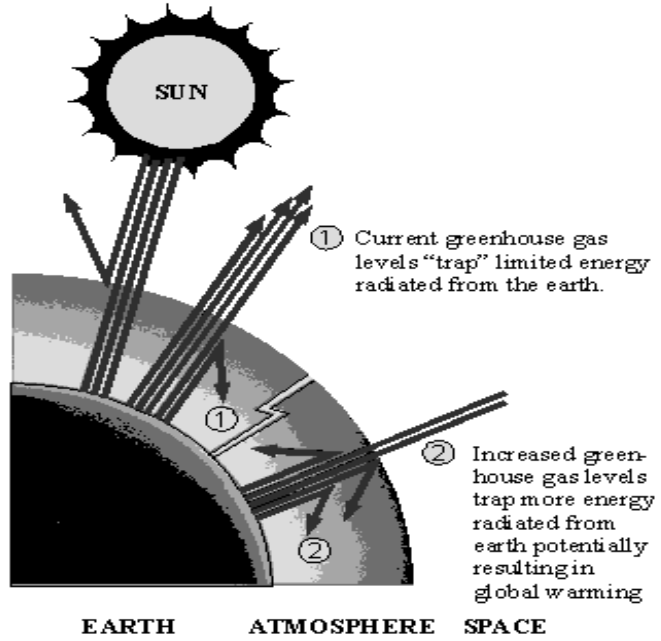
Linear arrangements

Show cause and effect, where one step leads directly to another. Complex flow charts have 'branched structures' containing different pathways depending on responses to previous steps in the sequence. One cause or issue may have multiple effects, or one effect may have multiple causes.



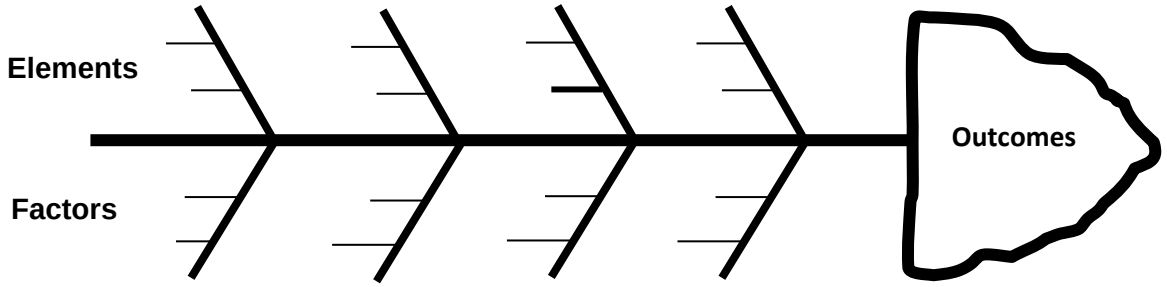
Schematic diagrams

Schematic diagrams summarize complex issues and ideas



Fishbone diagrams

Describe a question or a situation or a challenge in terms of the issues involved. Elements and factors are recorded either side of the central arrow. Relevant components within each of these are recorded on the finer lateral 'bones' of the fish. The overall outcome is recorded in the head of the fish.



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Imaging metaphorically

Mental imaging

When people make connections, they formulate mental images, which are continually changing as experience unfolds and understandings develop. Mental images can be thought of as 'footprints' that symbolize experience and understanding. They may be expressed in combinations of verbal, textual, graphical and pictorial representations.

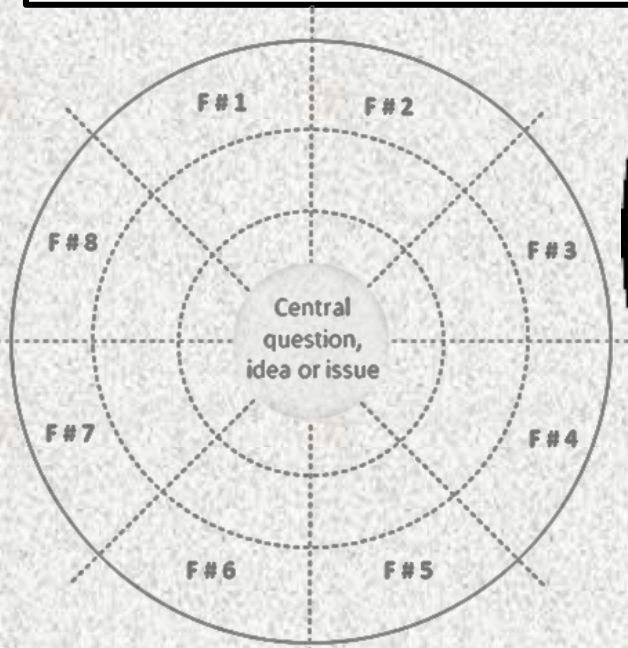
Avenues for thinking metaphorically include.

- Extensions that enhance understanding through expansion or substitution
- Similes that evoke resemblance through 'like' features
- Analogies that symbolise thoughts, situations or actions
- Metaphors that describe thoughts in terms of something they are not.

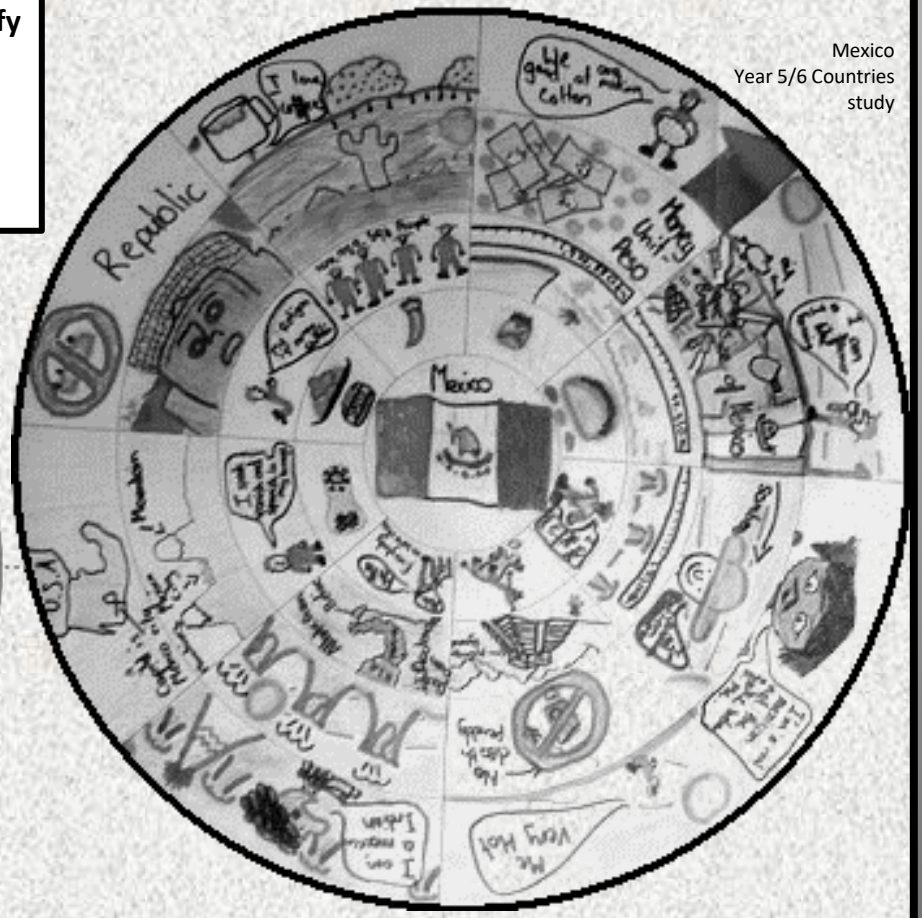
These processes fuel our imagination and creativity. Indeed, some people argue much human consciousness is formulated through metaphorical imaging.

Mandalas

Mandalas have special value in helping to visualize aspects or outcomes from inquiries. They can be used to represent different features of questions, inquiries, experiences, concepts, values, cultures, propositions, or whatever. They may signify cognitive reasoning, feelings, emotions, empathy and ethical intention. Either expressed singly or more likely in combinations.



Overall design F = features



Mexico
Year 5/6 Countries study

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Keeping possibilities open

Thinking is often based on a process of

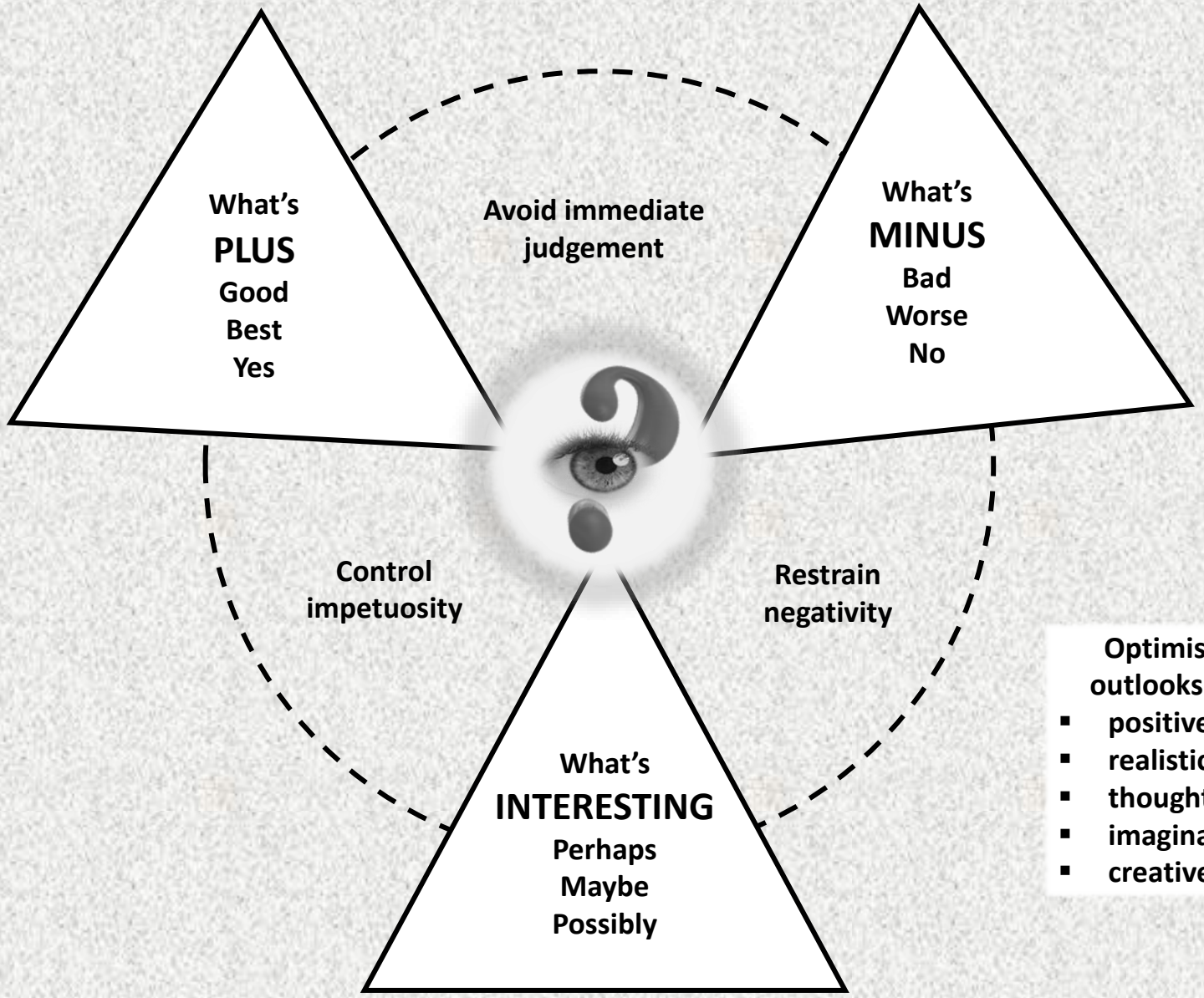
<u>Yes-No-Judgement</u>

Consequently, creativity tends to be quietened.

Alternatively, if the process is

<u>Yes-No-Possibly-Judgment</u>

creativity tends to be in full voice.



Optimistic outlooks are

- **positive**
- **realistic**
- **thoughtful**
- **imaginative**
- **creative**

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Adjusting inquiry tactics

Inquiry strategies need to be shaped and adjusted to meet intentions and requirements.

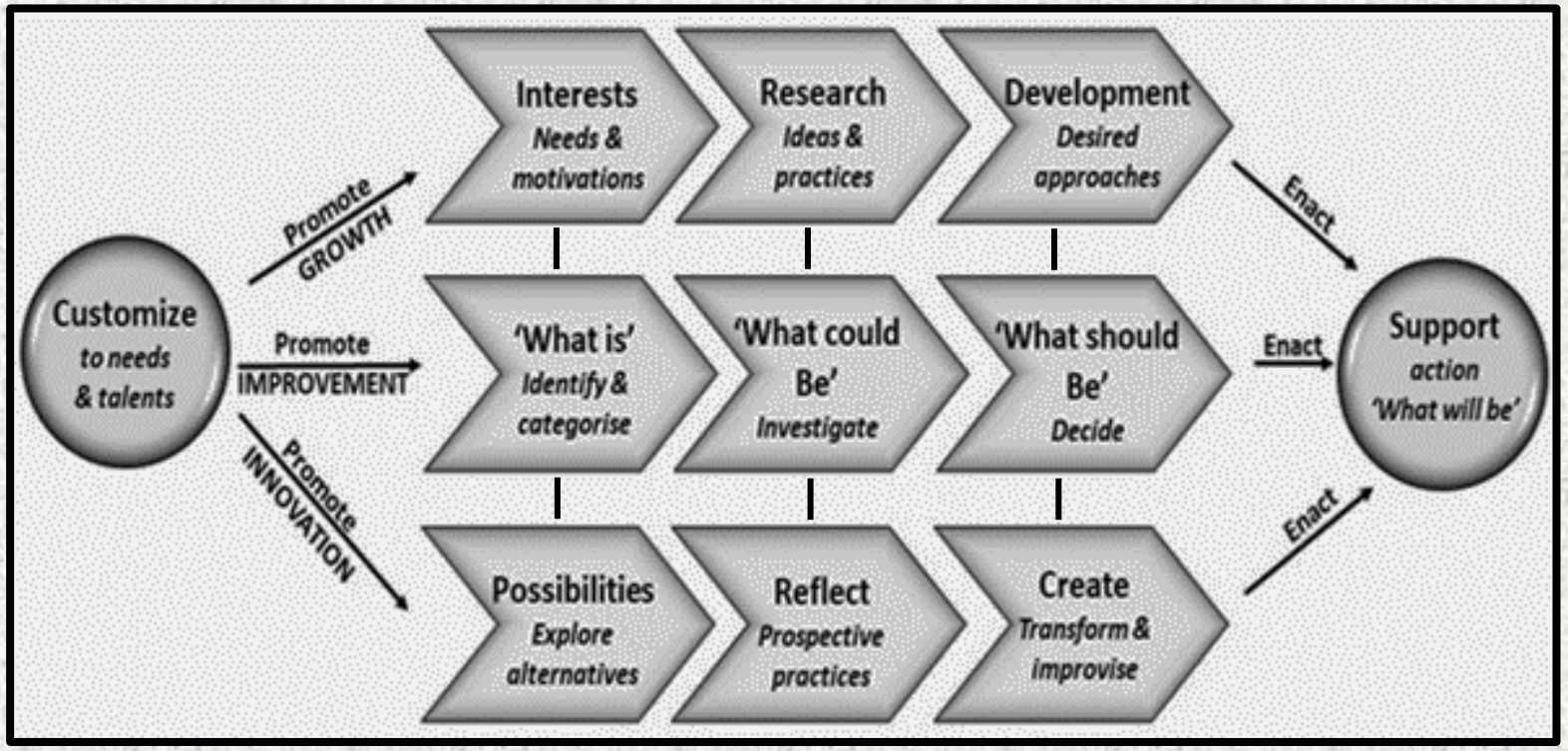
For instance, three different intentions are to promote-

- GROWTH
- IMPROVEMENT
- INNOVATION

The beginning strategies, the middle strategies and the culminating ones differ in response the each of these intentions.

Yet the generic process is similar for each of them.

Customize inquiries to intention and need



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Using action research

Action research has two interdependent dimensions.

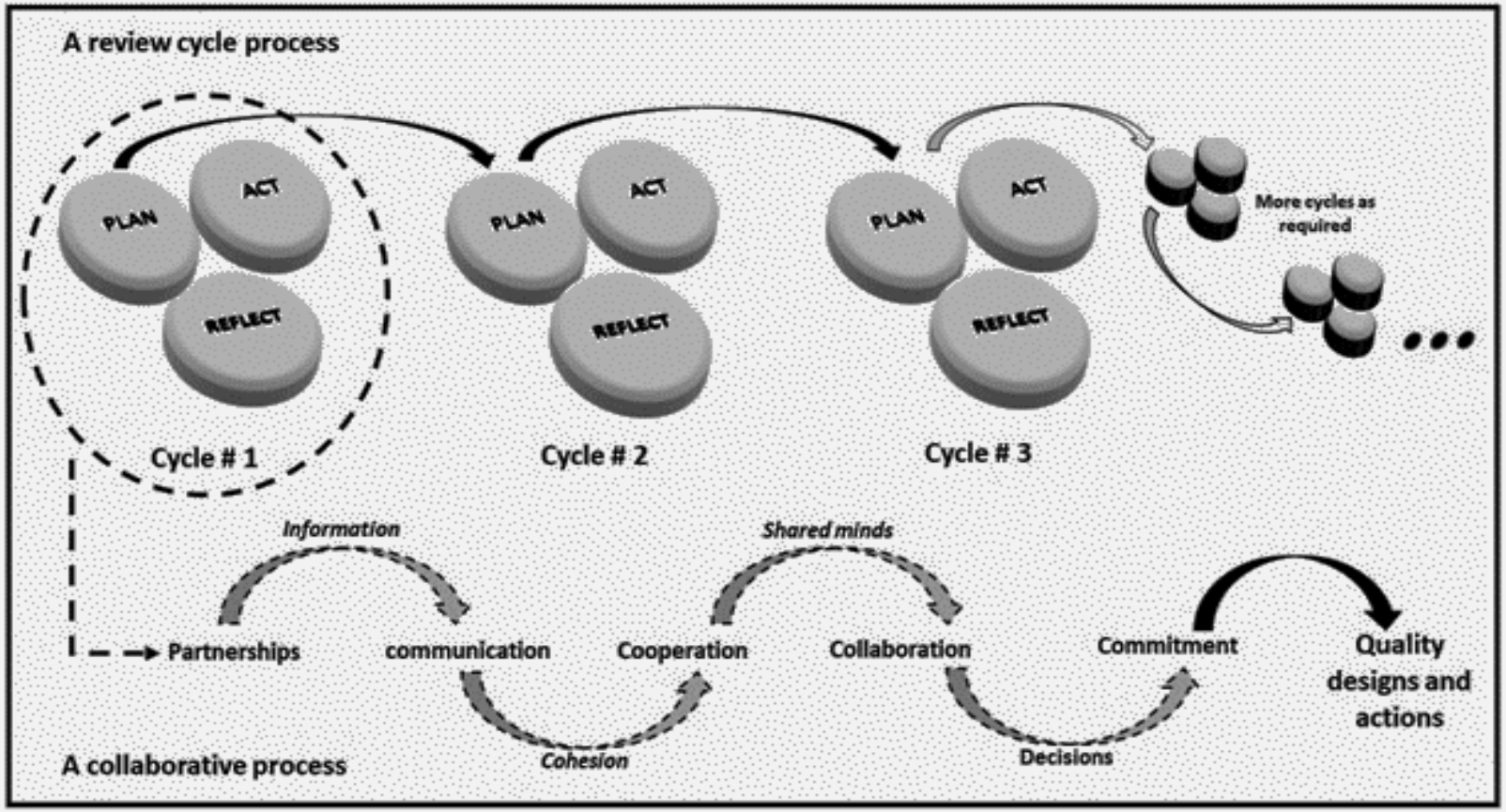
1. A <u>cyclical</u> process of PLAN-REFLECT- ACT

2. A <u>collaborative</u> process of partnerships that shares information, ideas, minds, decisions and actions

The two processes are integral one to the other.

Action research is an ongoing process designed to improve ideas and practices

Shared minds support quality action



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Working with artificial intelligence

Balance potential benefits with risks

Diversity of tools

Chatbots (ChatGPT, Claude, Bing AI, Zapier Central)
Content creation (Jasper, Copy.ai, Anyword)
Grammar checkers and rewording tools (Grammarly, Wordtune, ProWritingAid)
Video creation and editing (Descript, Wondershare Filmora, Runway)
Image generation (DALL·E 3, Midjourney, Stable Diffusion)
Voice and music generation (Murf, Splash Pro, AIVA)
Knowledge management and AI grounding (Mem, Notion AI Q&A, Personal AI)
Task and project management (Asana, Any.do, BeeDone)
Transcription and meeting assistants (Fireflies, Airgram, Krisp)
Scheduling (Reclaim, Clockwise, Motion)
Email inbox management (SaneBox, Mailbutler, EmailTree)
Slide decks and presentations (Decktopus, Beautiful.ai, Slidesgo)
Automation (Zapier)
Other AI productivity tools

Caveats

- **Awareness of value and limitations instructs wise use**
- **Intelligent systems , yes – intelligence , no**
- **Applications must be ethical and responsible**
- **Everyone has personal responsibility to use AI wisely**
- **Beware of misinformation and disinformation**
- **The artistry of teachers and learners is paramount**

No substitute for developing personal capability and imagination

Educational possibilities

- **Synthesize** ideas through access to information and practices from international data banks
- **Manage** personal and community information and ideas to enhance access and retrieval
- **Identify** innovative possibilities inspired by ideas and practices stored in international data banks
- **Analyze** patterns among issues and practices in own data and international data banks
- **Enhance** the presentation and production of text, sound, visual, and other multimedia material

Mind's eye potential

- **Incite active learning -** Encourage learners to explore, practice and struggle with timely feedback
- **Manage cognitive load -** Present relevant, well-structured information in multiple modalities
- **Adapt to learners -** Adjust to the goals and needs of learners by grounding inquiries in relevant materials
- **Support curiosity -** Inspire learners through purposeful inquiries that can access a wide range of digital tools
- **Deepen metacognition -** Plan, monitor and help learners reflect on progress as well as their future needs

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Being discerning

Discern, analyze, interpret, appraise and evaluate all forms of media and media sources

Step 1 - Discern meaning

Select	Consider
Select relevant material that conveys key meanings, such as a- ▪ word or phrase or sentence ▪ question or an issue ▪ feature or a component ▪ sequence or an event ▪ picture or a graphic ▪ video or film segment ▪ new idea or innovation ▪ or whatever	Talk about the material and different aspects of it, and how it is constructed to convey meaning. Such as- ▪ Presentation styles and effects ▪ Organizational structure ▪ Visual appeal and insight ▪ Categorisations and linkages ▪ Combinations of media selected ▪ Layout and appearance ▪ Sequences and flow of ideas

Click image for an illustration

Step 2 - Wonder and speculate to determine value

Analyze	Assess
Analyze the challenges, messages, purposes, and the 'sub-texts' to determine ▪ The conceptual reasoning exhibited ▪ The feelings and emotional issues involved ▪ The explicit or implicit ethical intentions ▪ The empathy, compassion and understanding displayed ▪ The scope of possibilities opened-up or explored ▪ The amount of detail and its relevance	Make judgements in terms of - ▪ The power of the argument and its persuasiveness ▪ The appropriateness and value for specific audiences and communities ▪ The authenticity and integrity of the ideas and information and issues raised ▪ The values and attitudes promulgated ▪ The veracity and reliability of sources and inputs ▪ The authenticity and truthfulness

Read on the line
Examine between the lines
Go behind the lines

in a digital world
inform-critique-discern
Transform-create-innovate

Back

Working cooperatively

Cooperative structures can be used as part of the strategies that have been already outlined

Melvin Freestone
www.questionledlearning.org

Think-Pair-Share

Partners think privately about a question, issue, situation, or idea, and then discuss their responses with one another.

Formulate-Share-Listen-Create

Work in pairs or groups of three over four sequential steps.

1. formulate questions or answers individually – 2. share your questions and answers with a partner – 3. Listen carefully to your partner's questions and answers - 4. Create new questions and answers through discussion.

Say and Switch

Partners take turns responding to a question, a challenge or a topic at signaled intervals. The first partner responds while the second listens. At the signal, such as a defined period of time, roles switch, and the second partner responds while the first listens. When the switch occurs, the second partner has to continue or complete the first partner's line of thought before introducing new ideas.

Roundtable

A piece of paper and a pencil is systematically passed around the group. One partner writes a question or an idea, and then passes the paper and pencil to the person next to him or her. The process continues until no more contributions are forthcoming. A variation is to have each partner use a different coloured writing tool, which visually encourages all participants to contribute and identifies their contributions.

Round robin

Round robin is the oral form of Roundtable. Each participant verbally contributes a question or an idea to the group in a systematic, around-the group fashion. The conversation continues until contributions are exhausted.

Plus-Minus-Interesting

The process of identifying – positive, negative and interesting – elements in an inquiry, which keeps possibilities open when exploring ideas and potential actions, and the efficacy or value of practices.

Corners

Corners enables people to explore a particular aspect of a question or topic. First different dimensions of a question or topic are identified and posted in designated corners of the room. Then, each person chooses a particular dimension and moves to the appropriate corner. After extended discussion in their corner, pairs are selected from each corner to report their thinking to the whole group. By having representatives from each corner present their viewpoints, varying perspectives and rationales emerge.

Jigsaw

Jigsaw is designed to help participants within a group become expert on different aspects of a question or set of questions, or different dimensions of a topic or a group of related topics.

Step 1: Arrange cooperative groups and assign material - *Within each cooperative group, participants are assigned different material to learn and present to one another.*

Step 2: Form expert groups and prepare presentations - *Expert groups are formed by pairing learners from different groups who have been assigned the same material. The material is then discussed in detail to develop knowledge and understanding of questions, issues, ideas and practices embedded in it.*

Step 3:Teach original cooperative group to become expert - *Individuals return to their original cooperative group. They present their 'discovered' thoughts. The intention is for all group members to develop an understanding of the material presented*

Step 4: Demonstrate understanding - *Having become 'expert' individuals may now demonstrate their understanding by applying it to the inquiry questions being addressed.*

Action Research

Engage in an evolving series of – plan/act/review – cycles by engaging in processes that share information, analyze ideas and practices, and make decisions about extant and future actions.

Appreciative Inquiry

An iterative process of 'What is' – 'What could be'- 'What should be'- 'What will be' – which respects extant practice and builds on participants ideas, suggestions, and their situated expertise.

Strengths, weaknesses, opportunities, threats (SWOT)

Strengths, Weaknesses, Opportunities and Threats is a useful process for summarizing and/or analysing situations or prospective courses of action, especially where realistic appraisal is required.

Personal journals

Introspection and 'talking to myself' often provides the safety and quiet time needed to absorb cooperative experiences as well as contemplate new ideas including their implications and possibilities.

United Nations
World Bank (International Bank for Reconstruction and Development)
Executive Director

Discern, analyze, interpret, appraise and evaluate all forms of media and media sources

Dear Sir/Madam
I am writing to present to you a request for a large sum of money. The Bhopal (India) disaster of 1984 is said to be the worst ever industrial disaster. It was caused by the accidental release of forty metric tons of Methyl Isocyanate from a pesticide plant six kilometres from the heart of Bhopal city, in the State of Madhya Pradesh. As a result, 2000 people have died. Twenty years later the residents of Bhopal are still seeing results of this tragedy

Although Tasmania is only asking for a small amount of money - $50 000 - I strongly believe that a radio station would not fix their problem. Like someone taking a painkiller for their headache instead of finding what caused the headache and fixing it. You would have to find the source of the problem, which in this case is presumed by many to be boredom. But supposing it's not, then a radio station that's supposed to help teenage crime would make no difference at all. The teenage crime could be caused by a whole range of things other than boredom - such as family issues.

If you were to give us the money, we are planning to give people enough money to pay for as much medicine as is necessary for their specific needs. The amount you might be giving us will not go straight to the patients. We have to buy the medicines, pay to get them over there and pay the doctors. And when that is under control all the excess money will go into a major clean-up project for all the thousands of metric tons of toxic chemicals, including benzene hexachloride and mercury, held in open containers or loose on the ground. After rainfall these chemicals leach into the ground passing into local dams and water wells. A BBC test has shown that the ground water is 500 times more contaminated than the legal limit.

Although it might be true that not all Australians have everything they could need, they have clean air and water. In contrast, Bhopal in India has such dangerously toxic air and water that there is a very high chance of getting potentially life-threatening diseases.

We want to provide medical support to these people. After all this death and destruction, the amount of poisonous gas contained within supposedly air-tight tanks is extremely large. But the tanks are not stable and at anytime they could leak, bringing back the terrible tragedy that occurred twenty years ago. We can't stand by and let this happen. We must respond to this urgent cause and play a crucial role in saving lives.

Thank you for taking time to consider our large ask.
Yours sincerely

Montagu Bay School
Disasters project
Year 5/6

Glossary

Abbreviations

GGQ
Generic generative question

CQ
Consequent question

PQ
Pointed question

Definition

Culture **refers to the ways of life a person or a community has developed over time.**

ACARA
Australian Curriculum. Assessment and Reporting Authority

Terms	Meaning
Ambition	A strong desire to do or achieve something of value
Artefact	An object or system that has contextual and/or cultural significance
Aspiration	A goal or objective that is strongly desired
Belief	An opinion or custom or practice considered acceptable and/or true
Community	A group of people living in the same place and/or having shared characteristics
Concatenate	A grouping or an association that has functional value in understanding experience
Cultural	A collection of behaviors and beliefs associated with excellence in artistic, social and societal activities
Dialogue	An exchange of ideas, opinions and ways of acting between two or more people
Empathy	An ability to understand and appreciate another person's feeling from their perspective
Equity	A principle that seeks fair access, opportunity and advancement for everyone
Heritage	A combination of historical and contemporary traditions, objects, behaviours and activities
Identity	A condition of being oneself or itself, and not another
Interaction	A process of communication with a person or a group, or direct involvement with an environment
Literature	A body writing or multimedia presentations that have contextual, conceptual and artistic value
Media	A means of mass communication which may inform, entertain, educate, persuade, unite or divide
Modality	A way or a means in which something exists or is done
Mode	A way something occurs or is experienced and expressed,
Multiple intelligence	A group of qualities that encompass the different ways people think and explore experience
Responsibility	A state of being answerable or accountable for something within one's power, control, or management
Rights	A set of freedoms that are protected and enshrined in the rule of law
Talent	A natural skill or aptitude to be good at something without necessarily requiring instruction
Technological	A system or a process designed to meet specific needs and purposes in particular contexts
Tradition	A belief or behaviour or custom that endures and is transmitted from one generation to another
Values	A set of principles and practices that guide individual and collective thoughts and actions