
Inquiring Minds

INQUIRY FRAMEWORK for Early Childhood Education



CREATING THINKERS BY FOSTERING INQUIRING MINDS



2015

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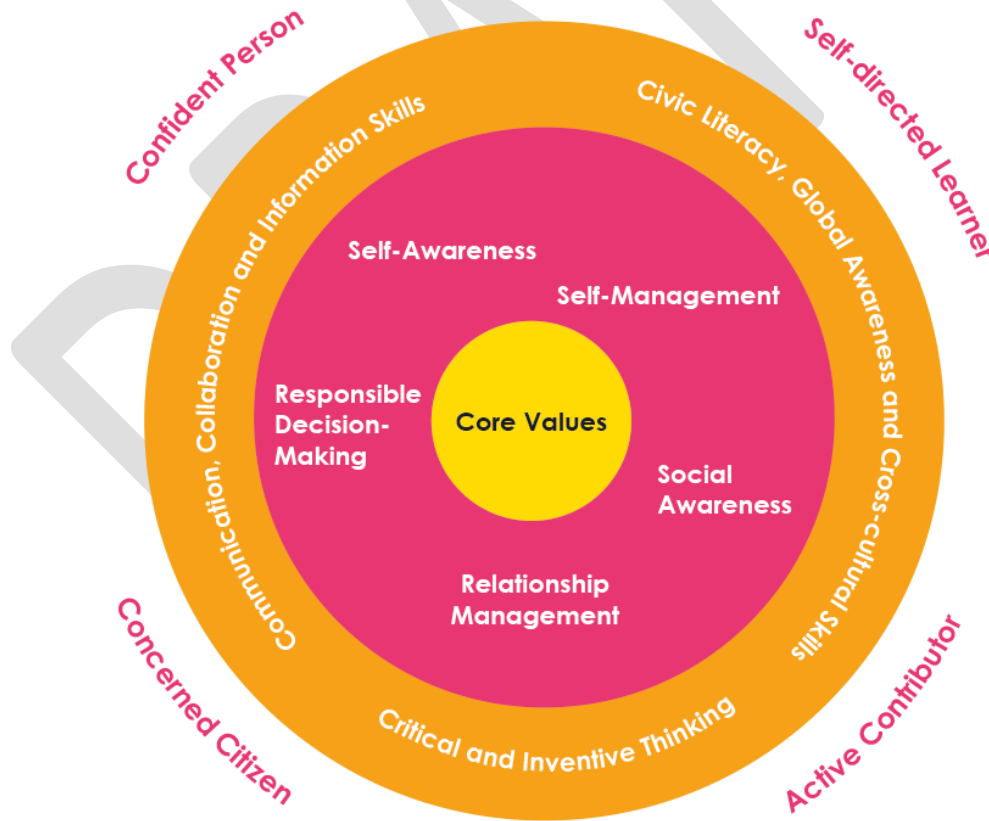
THE INQUIRY FRAMEWORK

Inquiring Minds, Bermuda's Early Childhood Inquiry Framework has been designed to provide a pathway for 21st century critical and creative thinking skills, starting in preschool and continuing to primary three.

The Vision

Bermuda's children will ask questions that matter. They will explore, investigate, inquire, develop theories, engage in collaborative conversations and build collective understandings. Skilled teachers will facilitate children's learning by designing rich authentic learning opportunities that will build on children's informal knowledge and challenge high-level thinking. Bermuda's interesting local landscape, cultures and traditions will be the subject of their studies.

Our goal in promoting inquiry as a pedagogical framework for teaching and learning in the preschool and early primary levels is to ensure that Bermuda's children will be self-directed learners, confident people, concerned citizens and active contributors in the 21st century.



In the 21st century, technology has made facts and information readily available. Youth today are connected, socially conscious, and inventing new ways of thinking about the issues of the day. What is important now is not what you know but what you do with what you know, and being able to think critically about the information at your fingertips. 'Complex thinking, communicating, problem solving and mental flexibility are the skills' that are required for the youth of today (Autor, 2007).

In order for Bermuda's young children to be meaningfully engaged in learning as citizens of the 21st century, we must modernize our methods of teaching in preschools and primary schools to promote critical thinking, problem solving, imagination, creativity, innovation and collaboration ~ the skills of the 21st century.

The pedagogical approach we will employ to achieve this aim is inquiry-based learning builds life-long learning skills which transcend content mastery. Inquiry-based learning that honors children's questions, increases their motivation, leads to higher levels of engagement, as well as improving understanding and promoting a love of learning. Inquiry based learning stimulates curiosity and learning, and leads to progressively deeper questions and habitual critical thinking (Natural Curiosity, 2011).

The *Inquiring Minds* document provides an overview of this pedagogical framework for preschool through primary 3. This document will guide engaging professional development.

2015-16: Teachers and administrators will have opportunities to learn from one another at monthly professional learning sessions, as well as a mid-year conference and an end of year expo. At the learning sessions, strategies and examples from classrooms will be modelled and showcased. The expectation is that teachers and administrators will take and apply new learning in their classrooms and at their schools. Leaders are encouraged to form a professional learning group at their own schools and plan regular meetings so that teachers can share your own inquiry examples, and discuss and reflect on new learning throughout the year.

Readers can follow our journey at <https://inquiringmindsinbermuda.wordpress.com> where presentations and participants work has been posted. The pinterest site <https://www.pinterest.com/bpssinguirring/> has been developed to collect ideas and insights into what is going on in inquiry in and outside of Bermuda.

2016-17: Teachers and administrators will dig more deeply into what it means to be an inquiry teacher and how to assess inquiry learning in the classroom. Lesson planning and rubrics for inquiry consistent with the Danielson Framework will be used. Resources such as inquiry math kits will be developed and distributed to schools. Professional networks will continue by zone, driven by the interest of teachers. System staff will support and coach as required as teachers develop their own action research questions and bring and share examples of inquiry for professional development purposes with their colleagues.

2017 and beyond: Recognizing that implementation of any new comprehensive strategy Going forward, teachers and administrators will be supported by content specialists in math, literacy, science and social studies.

WHY INQUIRY?

The art of research already exists in the hands of children acutely sensitive to the pleasure of surprise. The wonder of learning, of knowing, of understanding is one of the first, fundamental sensations each human being expects from experiences faced alone or with others (Malaguzzi).



Developmental psychology research has made it clear that in the first three years of life a child already has an enormously complex and inter-linked knowledge based about the world (NSCDC, 2005, 2004a, 2004b) - a knowledge base acquired in highly informal ways (OECD, 2007)

Young children are natural researchers. They design and conduct mini-experiments and use what they learn from these experiments to construct schema or mental maps about the way the world works. These maps help them navigate in the physical and social world. In school, children draw on their schema to comprehend subjects such as reading and writing, as well as, math and science. In this way, early experience lays the foundation for thinking and learning throughout their lives.

Bermuda's children have a natural propensity and capacity for inquiry and research. They are open to new experiences and ideas, taking in an abundance of information through their senses, and actively constructing meaning, building connections and relationships with their peers. They are capable of asking questions that matter and carrying on investigations that lead to satisfactory theories. The following are some examples posed by 4 year olds in government preschools:

- Does the magnet (force) go through the water? (physics)
- Do caterpillars get wet in the rain? (biology)
- How many is two tens (holding two hands up with fingers spread)? (mathematics – multiples)
- How do snakes slither?
- Why do dogs wag their tails? Do they have feelings like us?
- How are racoons dangerous?

- Is a geoboard a musical instrument?

On average, children between the ages of 3 and 5 ask about 300 questions a day! Then, they stop. Why? There are lots of reasons, however, the one that concerns us is that school and teachers are usually looking for answers from children and not questions. In Alford's (2006) review of typical classroom discourse he found that, "the majority of questions asked in class discussion and on worksheets were factual, knowledge based questions that involve recalling information such as "list 4 facts about the animal's shelter". In his recent book, *A More Beautiful Question: The Power of Inquiry to Spark Breakthrough Ideas* (2015), Berger claims that wondering why? what if ? and how? are critical skills of our time; skills of the 21st century. Berger's message is that we need to cultivate children' natural curiosity and questioning disposition in schools.

For more information on Berger, his message and questioning processes click here

<http://amorebeautifulquestion.com/book-on-questioning-by-warren-berger/>

The impact that inquiry learning has for children is significant, transforming them from doers and responders to thinkers. When children are able to pursue investigations based on their own unique interests, strengths and talents, their identity and feelings of competence are enhanced. As a member of a group, with shared responsibility for collaboration and research, they experience a sense of belonging. Inquiry experiences contribute to engagement, motivation, positive dispositions for learning and creative thinking. Inquiry provides children with the opportunity to connect with people, places, technologies and materials. Inquiry stimulates the effective use of technology, as children access information, investigate and express their ideas using a range of 'languages' to represent their thinking and understanding (from Early Childhood Australia: A Voice for Young Children, Inquiry Learning is Deep Learning, Vol. 18, No. 2)

To read this article

<http://www.earlychildhoodaustralia.org.au/our-publications/every-child-magazine/every-child-index/every-child-vol-18-2-2012/inquiry-learning-deep-learning-free-article/>

The vision, strategies and the corresponding image of the child required for effective implementation of this framework, calls for a shift in practice in government schools in preschool into the early primary levels, from an instructive model to a constructive model of teaching and learning, consistent with the Danielson Framework for teaching and learning.

For more information on the Danielson Framework:

<https://www.danielsongroup.org/framework/>

Our aim is that children will be active agents in their own learning that this learning will occur through small groups projects and investigations. This vision requires a shift in practice from teaching to a focus on learning, which begins with teachers observing and listening to what children already know and are thinking about.

Stand aside for a while and leave room for learning, observe carefully what children do, and then, if you have understood well, perhaps teaching will be different from before. ~ Loris Malaguzzi

WHAT IS INQUIRY



Inquiry is not about getting the right answers but rather asking really good questions (Inquire Within blog <https://inquiryblog.wordpress.com>)

Inquiry is a dynamic process of being open to wonder and puzzlement and coming to know and understand the world. As such, it is a stance that pervades all aspects of life and is essential to the way in which knowledge is created. Inquiry is based on the belief that understanding is constructed in the process of people working and conversing together as they pose and solve problems, make discoveries and rigorously testing the discoveries that arise in the course of shared activities. ~ Galileo Educational Network, 2004, <http://galileo.org>)

The model of inquiry we are proposing for use in preschool through primary two employs abductive reasoning because abductive reasoning mimics the way that young children learns, taking into account the procedures and processes that the child constructs while learning.

Abduction is the art of the detective, who is looking for traces, clues, and fingerprints and is always open for constant modifications of his strategy and thoughts (Malaguzzi).

Different from inductive and deductive approaches that gear us towards pre-determined and particular outcomes, the abductive approach leads to new ideas and oftentimes surprising results.

For more on the various forms of reasoning click here <http://www.education.com/reference/article/reasoning/>

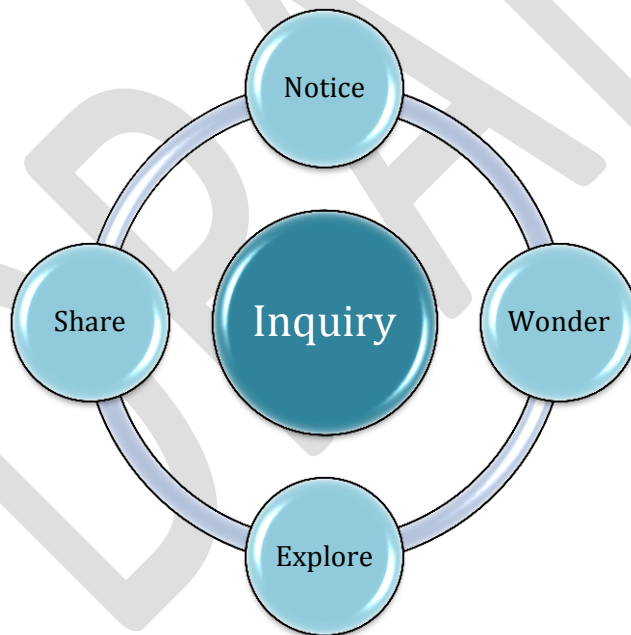
While teachers are guided by curriculum when designing and proposing learning experiences and inquiries, they allow for the ideas and input of the children, who will have their own ideas and interests. Teachers place the emphasis on the process of learning, of gathering information, listening to multiple perspectives and to developing a well thought out theory that with new information that will be modified over time.

We are not proposing a fixed programme but a process that is modified by and with children. In a sense this is a pedagogy of improvisation ~ “a readiness to become involved in the interests and moments of wonder suddenly arising from the child” ~ Malaguzzi

The Inquiry Model

While researchers have found that inquirers follow a general cognitive and affective pattern, the inquiry process is not linear or lock step. It is highly individual, nonlinear, flexible and more recursive than might be suggested in traditional models of the research process. Experienced inquirers tend to do more “looping back” since they are comfortable with the nonlinear, individual, flexible and recursive nature of inquiry.” (Focus on Inquiry, 2004
<http://galileo.org/focus-on-inquiry/>)

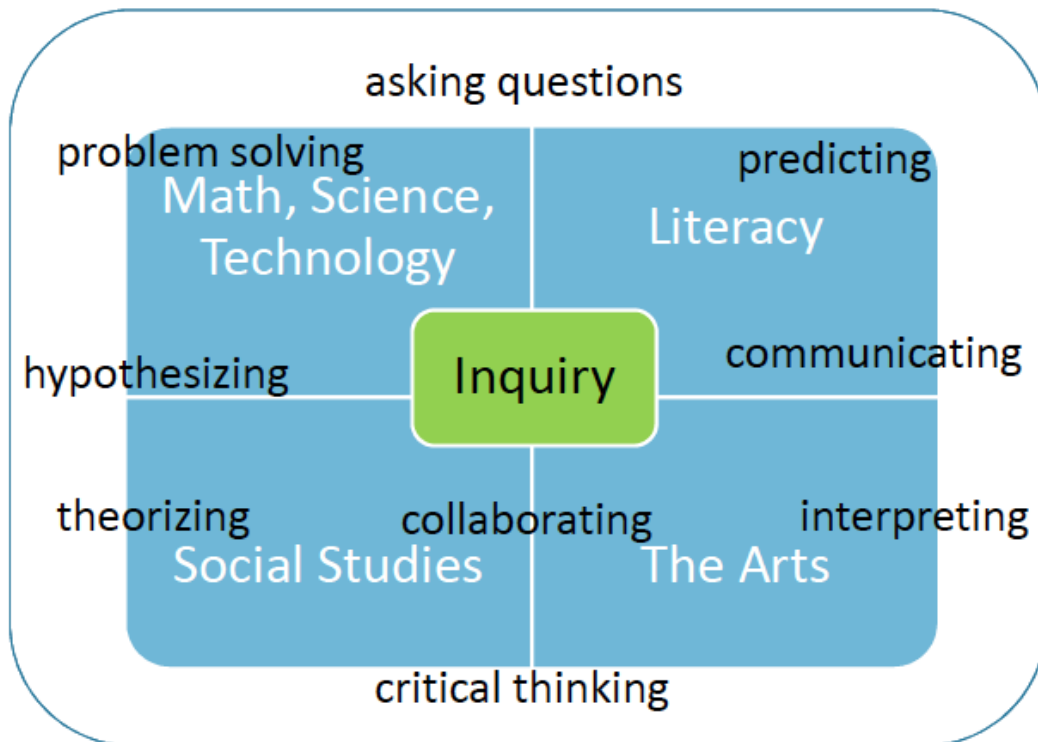
Our model of inquiry should not be interpreted as linear either. It has been constructed in order to help teachers think more deeply about the processes that inquirers use and to assist them in planning for inquiry. Children, guided by their teachers, may go through the sequence or jump from one phase to another during the course of one lesson, most definitely over the course of longer projects. This model is equally valid for a single lessons or longer projects.



Inquiry is fundamental to all subjects and therefore applicable to all subject areas. The skills that children develop through inquiry are the twenty-first century skills.

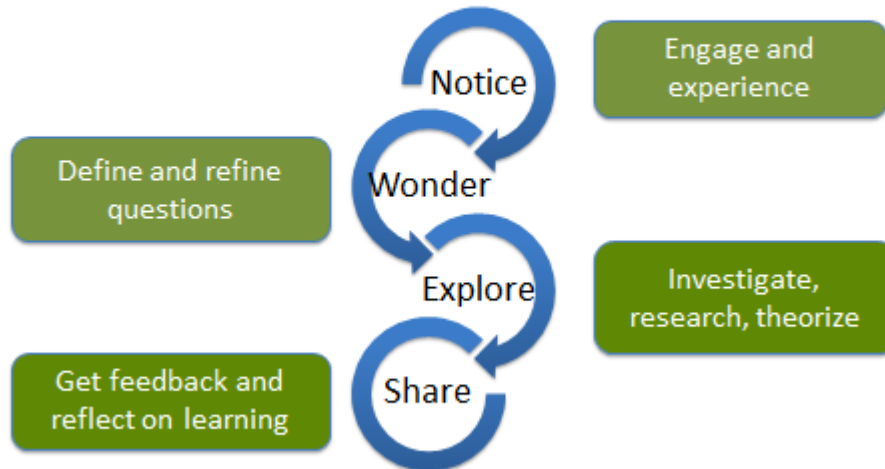
The inquiry framework is consistent with the processes outlined in Bermuda's National Mathematics and Literacy Strategies as well as in the strategies in science, social studies and the arts.

Cross Curricular Connections



The Inquiry Framework

The Inquiry Framework



Notice and Wonder

Engaging and Experiencing Phase

Children are naturally curious, they love novel materials, interesting experiences, as well as puzzles and problems to solve. Teachers capitalize on children's natural curiosity by providing interesting materials and opened opportunities to explore and discover, and by designing experiences to provoke questions and problematizing tasks to cause children to wonder. A book, a walk outside, a sorting task can all cause children to wonder. An observant teacher notices the energy that a particular idea has evoked in children and asks, 'What do you see? What do you notice? What are you wondering?' Teachers make notes on what children share, recording this information and referring to these notes when planning and later when assessing learning.

Wonder and Explore

Defining and Refining Questions Phase

Children have lots of questions, some they will articulate, while other questions are evident in their actions. An astute teacher listens and observes and recognizes children's wonderings and reflects these back to children. Teachers and children brainstorm all of their questions about a particular topic of interest. They talk about which questions they think are worthy of further investigation. They refine these questions to come up with just the right one. The teacher keeps a record of the list of questions generated, as well as, issues and problems that arise during the course of a study. During the course of an inquiry, the teacher may invite children to consider a new

question in light of the other questions to make determination about the direction the inquiry will take.

Explore and Share

Investigating, Hypothesizing and Theorizing Phase

In order to find out more about the questions they are posing, individuals and small groups of children, will have ideas of things they would like to try for example books to read, people to talk to, models to build and experiments to try. Teachers ensure children have time during the day to work on their inquiries. Oftentimes parents get involved at home, assisting children to collect materials, and find information to bring back to school. This helps children make connections between their inquiry work at school and outside of school. The teacher helps children organize the information – compare, contrast and synthesizes the information they are collecting. Teachers encourage children to make their theories and ideas concrete. For example by having each child draw their idea or theory, and then represent it using open-ended materials that promote expression of their ideas. Making theories concrete gives children an opportunity to think more about their ideas and to test them out when they eventually share them with the group.

Share and Wonder

Discuss and Pose New Questions Phase

Children are eager to share what they are learning with their peers and with adults. As children reflect on what they have learned, new questions come up that may be used to start a new inquiry or to extend the one they have been working on. Teachers can support children's reflection on their learning by making children's learning visible through displays that include photos, quotes and text that synthesizes the learning. Teachers create forums for children to share their learning with others for example, parents or local experts could be invited to an expo, a gallery- walk, or to view a video and to provide feedback. Children reflect on their experiences and what they have learned about themselves as inquirers.

Observe and listen to children because when they ask “why?” they are not simply asking for the answer from you. They are requesting the courage to find a collection of possible answers (Rinaldi, 2004, <http://www.reggioalliance.org/downloads/relationship:rinaldi.pdf>).

HOW DO WE DO INQUIRY?

The following strategies distinguish the inquiry approach from other teaching methodologies. Inquiry teachers implement these inquiry teaching strategies daily in their classrooms.

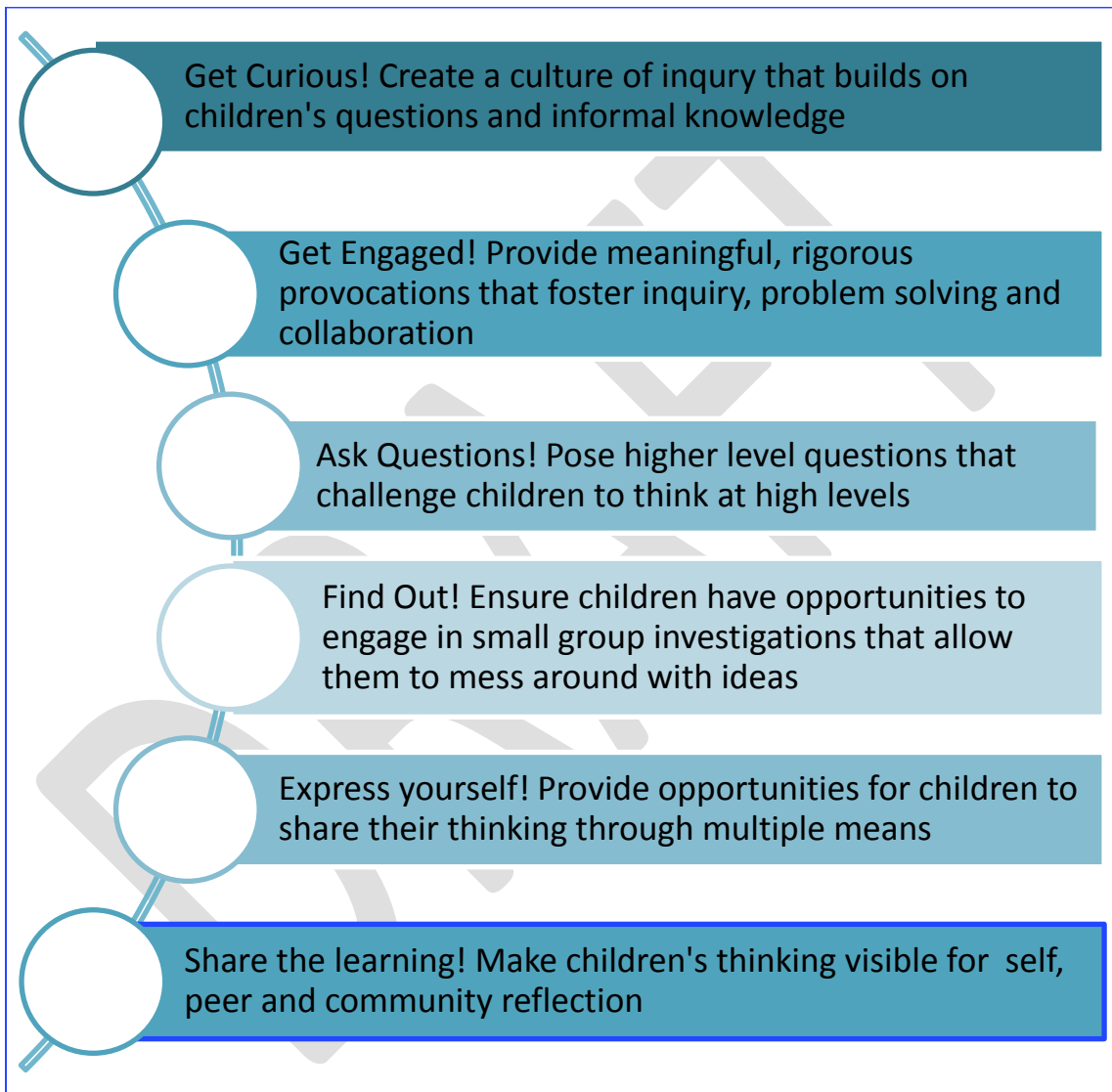


FIGURE 1

STRATEGY 1

Get Curious! Create a culture of inquiry that builds on children's questions and informal knowledge

This first strategy is about creating a culture of inquiry whereby teachers build on children's questions and informal knowledge by modeling an inquiry stance and creating supportive classroom structures. These structures include establishing protocols for listening and participating, and providing space, resources and materials for children to do the work of inquiry, while ensuring sufficient time to investigate topics.



We want to instil in children the desire, will and pleasure that comes from being the author of their own learning ~ Malaguzzi

Inquiry yourself – Inquiry starts with you!

In a classroom where inquiry is the approach to learning and teaching, the teacher's role is of a fellow inquirer. Teachers, who are curious themselves respond to children's curiosity, and their questions with genuine interest and a desire to learn something new by saying, "Let's find out", "I am curious", and "I am wondering." Children benefit when adults model the attitudes and skills of inquiry such as being curious, asking questions, researching, considering multiple perspectives, hypothesizing, theorizing, predicting, investigating, and drawing provisional conclusions. The effect is that children are more willing to share their learning and their thinking – to take learning risks – and teachers get an inside track on what children currently know and how their thinking changes over the course of a study or investigation.

Create spaces for inquiry



Well-designed classroom environments support inquiry learning. The design should include spaces where children can meet in small groups, ideally in twos or threes, to work together and discuss their work. Children become more independent and take more ownership for their own learning when resources are readily available to them, and when they know where they can go to get what they need. We recommend that teachers develop the following four resources centres in the classroom stocked with information and materials required to allow children to follow a line of inquiry and to conduct investigations.

- A research centre: access to a computer, smart board or ipad, resource books, picture books, maps or a globe.
- An art centre: materials to represent, design and test ideas such as recycled

boxes for 3D sculptures, yarn, scissors, glue, tape, painting and craft paper, paint, plasticene or clay

- A writing centre: tools to record and communicate ideas such as a variety of types of paper, pencils, markers, and key vocabulary lists
- A discovery centre: tools pertaining to the study, for example plants, parts of trees and magnifying glasses, a microscope

In an inquiry classroom, bulletin boards can be dedicated to keeping a record of the progress of inquiries and the key findings. This audit trail of learning could include copies of the questions posed by children, the books read, key pieces of information learned, as well as quotes children, artifacts, and drawings, theories and representations by children.

Ensure sufficient time

Teachers allocate a block of time each day when children can work on their inquiries and they allow the work to extend from one day to the next. In preschool, inquiry occurs throughout the day as children engage in studies and as incidental learning occurs that captures their interest. Inquiry also occurs during play, outdoors, field trips and daily read-alouds. In the primary grades, inquiry is the foundation of all subjects including math, literacy, social studies, science, art and physical education. Studies can be designed that integrates components from different subject areas for example a study of living things, may include observational drawings (art), experiments with growing (science) and reading from informational texts (literacy).

Wonder together

Curiosities supported by positive relationships foster natural inquiry and enhance personalised learning ~ Early Childhood Australia

By establishing protocols for listening and participating, teachers create a culture in the classroom where children listen to each other and to various perspectives. Teachers can model the language children can use during small group conversations that furthers knowledge building and collective understandings. The following are some examples:

“I agree with...”

“I would like to build onto what you said.”

“Something that I have tried is...”

“I have a matching idea...” or “I have a tag idea...”

“Can I ask a question?”

“I have a different idea...” or “Another idea I had...”

“My theory is...”

A culture of inquiry is a safe place where children feel they can make a point, raise a question, admit what they do not know and be assured what that they are heard by the group. In a culture of inquiry, children begin to recognize that others have different ideas from their own and that have a variety of perspectives enhances everyone’s understanding. Once children develop the skill of listening and responding in small groups they are ready to participate in larger group discussions.

For more information on knowledge building circles and discourses connect to Natural Curiosity: A Resource for Teachers (pgs. 9-11) at <http://www.naturalcuriosity.ca/pdf/NaturalCuriosityManual.pdf>

STRATEGY 2

Get engaged! Provide meaningful, rigorous provocations that foster inquiry, problem solving and collaboration

Strategy two involves designing problems and provocations based on authentic problems and tasks that provoke thinking.



Simply put, provocations provoke! They provoke thoughts, discussions, questions, interests, creativity and ideas. They can also expand on a thought, project, idea and interest ~ Racheous

<http://www.racheous.com/reggio-inspired/what-provocation-reggio/>

Design real and authentic problems based on the BIG IDEAS of curriculum Using the big ideas from the curriculum (ex., ecology, conservation, culture, systems, forces, cycles), teachers intentionally design provocations that have children consider real and authentic problems in the world around them (ex., How do we conserve energy? How do we dispose of plastics? Why should we recognize differences in culture?)

Provocations are engaging experiences or activities that get children thinking about the big ideas and problems. They cause them to notice, think and wonder. Meaningful provocations are close at hand.

Provocations can come in many forms:

- An interesting photo, picture or book,
- Nature (e.g. specimens)
- Concepts (e.g. changing seasons, light)
- Old materials displayed in a new way
- An interest that a child or children have (e.g. something found on the yard)
- An object (e.g. magnets, maps)
- New creative mediums to work with (e.g. watercolour paints, clay)
- Questions (from any source – e.g. What is gravity?)
- An event (e.g. a presentation, a parade, a speaker, a trip to the Aquarium)

The outdoors is a natural provocation for younger children and for inquiry in the early childhood years. Children are easily engaged by what goes on outdoors. The outdoors also provides natural links to science and social studies curriculum. A walk outside, photographs taken, objects and artifacts collected can be provocations for thinking about certain topics more deeply – for example, What is their garbage on the beach? Why are the rocks black? What happens when it rains? Why is there a low and high tide? What happens to the plastic in the ocean?

Open-ended materials and open-ended questions provoke thinking

Open-ended materials (loose parts) can be powerful provocations. They can be moved, carried, combined, redesigned, lined up, and taken apart and put back together in multiple ways. They can be nature based or man-made. Because they have no specific set of directions they can be used alone or combined with other materials. (quote)

(Open ended) materials are the text of early childhood classrooms...Unlike books filled with facts and printed with words, materials are more like outlines. They offer openings and pathways by and through which children may enter the world of knowledge. Materials become the tools with which children give form to and express their understanding of the world and the meanings they have constructed. (Cuffaro, 1995, p. 33)

Provocations can be designed by teachers to also provoke problem solving. Given the task by sorting unusual materials, children have to really examine the qualities and characteristics of the materials and think deeper about similarities and differences. When the open ended materials have many attributes allowing children to sort in a variety of ways, teachers get to see what children already know by the way they sort, and the language they use to describe their work (their informal knowledge). Open-ended provocations also allow children to participate on many different levels. Teachers assessment of what children know gives them knowledge about where to start when scaffolding learning and designing lessons.

Open-ended questions combined with open-ended problems and provocations allows all children to engage at their own level of understanding.

For more information on loose parts

<http://www.letthechildrenplay.net/2010/01/how-children-use-outdoor-play-spaces.html>

STRATEGY 3

Ask Questions! Pose higher-level questions that challenge children to think at high levels

The third strategy focuses on developing the questions that support thinking at high levels. This includes engaging children in brainstorming and refining questions, as well as asking high-level questions that advance children's thinking.



Asking questions that matter, is one of the primary ways people have, starting in childhood, to engage their natural, self-organizing capacities for collaborative conversation, exploration, inquiry and learning ~ Brown, Issacs, and Margulies
Asking big questions: A catalyst for strategy evolution

<http://www.theworldcafe.com/wp-content/uploads/2015/07/asking-big.pdf>

Build inquiries around children's questions

The starting point for any inquiry is what children already know and the questions that children currently have. Taking notes of conversations and ideas that come from conversations assists teachers in thinking about how an inquiry can build on children's informal knowledge and prior experience.

A vital question, a creative question, rivets our attention...the creative power of our minds is focused on the question. Knowledge emerges in response to these compelling questions. They open as new worlds..." ~ Allee (1997). *The Knowledge Evolution: Expanding Organizational Intelligence.*

As it turns out, being curious motivates us to find answers. Curiosity is like a current that energizes learning. When curiosity is piqued, the parts of our brains that regulate pleasure and reward light up. This circuit in the brain energizes us to go and get things that are intrinsically rewarding. Curious minds also showed increased activity in the hippocampus, which is involved in the creation of memories. The brain releases a chemical called dopamine, which plays a role in enhancing the connections between cells that are involved in learning. Curious brains are better at learning not only about the subject at hand but also other stuff — even incidental, boring information (Singh, 2014).

<http://www.npr.org/sections/ed/2014/10/24/357811146/curiosity-it-may-have-killed-the-cat-but-it-helps-us-learn>

Making children's questions central to any inquiry or study automatically engages them.

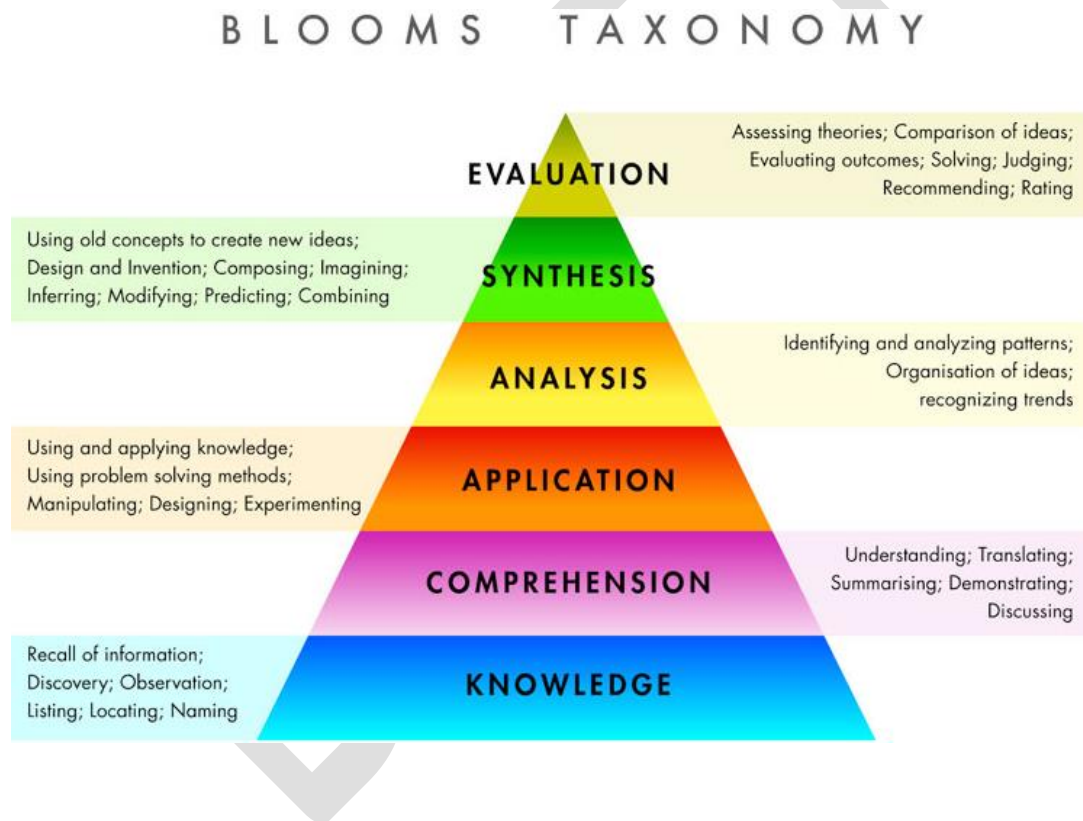
Brainstorm and refine questions

Children's questions can provide teachers with information about a student's understanding of content, as well as his or her level of critical thinking. By documenting and revisiting students' questions, teachers not only collect data that will inform the direction an inquiry may take and what resources to procure; they also gain insight into the learner's place along a developmental continuum or curriculum sequence.

Ask high level questions

Teachers develop their capacity to ask high-level questions with practice. Bloom's Taxonomy is a framework that can be used to think about the types of questions children and adults are posing the levels of thinking these questions provoke.

Traditionally teaching has focused on knowledge and comprehension; however, application, analysis, synthesis and evaluation are the focus in 21st century education.



STRATEGY 4

Find Out! Ensure children have opportunities to engage in small group, short and long term investigations that allow them to mess around with their ideas.

The fourth strategy refers to developing a plan for investigation, which includes direction observation, collecting data, designing experiments, building prototypes and talking to experts, as well as having children put their ideas and theories down on paper.



Problem-solve and collaborate about how to find out

Once questions have been posed and refined, teachers help children determine a path for researching, investigating and exploring their questions in greater depth and a way to keep a record of what they are finding out. Teachers turn the problem of what to do back to the group to discuss. A list of possible ways to go about gaining more information, creating models, testing theories or reaching out to others can be developed, and then with the guidance of the teacher, the group determines the way forward. The planning stage is important; teachers will get insights into what children's previous experiences have been, their comfort level with ideas that are presented and also some of what they think they will find out. The class might be divided into groups with tasks or children may self-select a component of the inquiry to work on.

Put theories to paper



Teachers ask children to draw their ideas (theories) of what they think. If the question posed was, how do trees grow branches? By making their ideas concrete children have an opportunity to think their ideas through, just as a designer conceptualizes an idea by drawing it and constructing a model or prototype. Children's ideas will be based on their informal knowledge and will often be quite inventive and may not correspond to more formal theories. The goal is to have children explore their own theories based on their experience and not to replicate more formal theories. Teachers encourage children to explore their theories with peers in small groups.

Investigate, research and explore – plan for direct experiences

Ultimately, the aim of any inquiry is to learn more about the topic rather than focusing on finding all the right answers.

Hands-on direct experiences are best! The learning path to 'finding out' can take many forms. Children's thinking about a topic is not confined to a particular subject area or a particular method. The interests and informal ideas of the children should inform the particular pathways taken as well as the outcomes.

The following are some examples of direct experience:

- Close observation of nature or a naturally occurring phenomena
- Design experiences
- Open-ended exploration
- Science in hand (working with materials)
- Documenting (camera, video)
- Designing and constructing a model or prototype (drawing, building, sculpting)
- Role playing
- Researching (interviews, data collection, reading)
- Field trips to museums, parks, aquarium



Strategy 5

Express Yourself! Provide opportunities for children to express their thinking through multiple means

The fifth strategy outlines methods for children talking through their ideas in mini-conferences and expressing their thinking in a various ways including dance, art, music and drama as well as through explanations, experiments and social service.



Each child is an interpreter of reality. The child's structure constructs a reality that does not objectively exist in the same way for everyone ~ Bruner, Vygotsky

One of the most extraordinary things about today's children is that they succeed in thinking, contemporaneously, in a plurality of ways. Unfortunately the avenues to express their understandings cannot always occur when we expect them to do it one way or all in the same way ~

It has been said that young children express their ideas in a hundred different ways. Given opportunities to express their ideas in different ways, and through different media, they will prompt them to think differently about the same topic.

Provide time to talk about ideas with others

Teachers assist children to think about individual and shared ideas by creating opportunities for children to talk in small groups about the ideas generated. When children listen to different perspectives, they will often expand their own thinking to include some of the ideas shared. Since not all children will be aware of all the ideas being discussed, sharing with the whole group, collective understandings are advanced.

Collaboratively build, sculpt, paint, dramatize, dance, sing one of the ideas that seem most appealing

Young children are very expressive, and, the modes they use to express their thinking are what we think of as arts based – dramatizing, imagining, creating, constructing. Providing opportunities for children to show their thinking in visual and art forms respects them as learners and gives them an opportunity to show what they have learned. Thinking about arts media as tools for thinking, opens this avenue for children to

represent their experiences using a variety of media and to share this expression with an audience. The open-ended nature of art materials creates opportunities for children to re-examine and re-think an idea or concept using another lens (sometimes called transmediation). The act of transmediation takes thinking to a meta-cognitive level.

Conduct mini-conferences

Teachers conduct conferences with children about their work individually and in small groups. Teachers listen and record the children's ideas. They prompt children to think more deeply by asking open-ended questions.

For more information on transmediation:


<https://teachingla.wikispaces.com/Child%27s+Creativity+in+Transmediation+-+Ideal+Language+Arts+Program>

- Tell me about your...
- What did you try?
- What did you learn?
- What are you wondering about?
- What might happen if you...
- What could you try instead?
- How do you think that could have happened?
- How do you know?
- What could you try differently?
- Show me what you can do with it?

STRATEGY 6

Share the Learning! Make children's thinking visible for self, peer and community reflection

The sixth strategy involves documenting the learning by means of photos and texts, and collecting artefacts in order to display the learning for feedback, reflection and assessment.



In the first few weeks of school, Callae took a piece of paper from the art centre and drew the budgie birds using markers. Based on her drawing, what has Callae noticed about the birds?

Value the process

A key element in assessment is valuing the learning process. For it is often in the process of learning that we gain true insights into the thinking of individual child and the learning that occurs in small groups. When we share what we notice with children individually or in small groups and we can see the advancements in their theorizing as they reflect on their learning together.

Observe and document using photos and text

A photo tells a story that cannot be captured with words alone. A series of photos can capture the steps or process of an investigation.

Documentation is a central feature of teachers' daily work and is linked with each aspect of the teacher's decision-making process: planning, interacting, observing, monitoring, analysing and assessing learning, and reflecting (Making Learning Visible, *Queensland Kindergarten Learning Guideline* https://www.qcaa.qld.edu.au/downloads/p_10/qklg_pd_mod3_ext1_learn_vis.pdf).

Teachers can observe and listen to children's interactions, and informally record notable children's remarks, questions, or observations. In this way, the teacher can assess the extent to which a student has internalized newly-acquired concepts. The manner in which a student naturally draws upon newly acquired concepts within the group makes

this evident, and is often the truest sign of a student's understanding (or misunderstanding).

Collect artefacts

Children's questions, comments, theories, observational sketches and drawings, or any visual mode of expression, research from books, internet sources and guest speakers, note and/or drawings from field experiences, new questions and theories provide teachers with valuable assessment opportunities, especially during, but not limited to, the preschool and primary years.

- Children's questions
- Inquiry books
- Portfolios
- Visual art
- Photographs, videos
- Anecdotal observations

Teachers might collect artefacts in a portfolio, dating and ensuring the children's names are noted in preschool through primary 3. Teachers may want to store children's work in an Inquiry book or portfolio of a learner's thinking and research processes over time. By reflecting on the qualitative nature of a learner's entries, the teacher gains a picture of his or her developmental growth.

Share the documentation and reflect on learning together and overtime

When looking through the artefacts, photos and notes collected, teachers engage in a mental sorting process as they attempt to determine what is important to document and communicate with others, how it should be presented and why.

During this process teachers explore how an idea developed, what the process involved, who participated and how new understandings were constructed by individual children and between children. This sorting process helps teachers to reflect on the learning that has occurred, to look for patterns in the learning, and consider new directions and possibilities for further collaborations. It also challenges teachers to dig deeper as they engage in interpretation and analysis of the learning experiences that have been recorded and gathered. When teachers engage with other teachers, reviewing the artefacts together new perspectives and new understandings are rendered, deepening teacher's understandings.

Progress is assessed by comparing what students knew at the beginning of the study when compared to later learning.

TERMS

Abductive or Practical Reasoning is a form of logical inference from observations to a theory which accounts for the observation, ideally seeking to find the simplest and most likely explanation. These theories are provisional, easily adaptable and allow for new ideas and new ways of thinking and sometimes surprising results.

Artifact

An object or item collected by the participants that is related to the inquiry or study.

Deductive Reasoning is a top-down logical process in which a conclusion is based on the concordance of multiple premises that are generally assumed to be true.

Constructivism

A theory of learning and a pedagogical process that people learn by construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences.

Documentation

Processes of keeping records and samples of children's work at different stages of completion that reveal or indicate children's experiences during the inquiry and their increasing competence and learning. Samples of children's work used to document their experiences during the project and their growth are also referred to as documentation and may include observations made by the participants, children's self-reflections, individual or group products, portfolio items, or narratives.

Display of Documentation

A shelf, table, or section of the room where objects, books, and other resources related to the project topic and significant events in their joint investigation are made accessible for children to study. Ideally, the displays reflect the story of the project.

Expert

A person knowledgeable about the topic of the project who can be interviewed by the children.

Field Trip

A journey to a specific field site related to the topic being investigated in the project.

Interview

Questions about the topic generated by the children to help them obtain answers to the questions that are the basis of their investigation. Interviews are conducted by the children, and interviewees might be visiting experts, parents, or others whose views are needed to answer the children's questions.

Inductive Reasoning is a logical process in which multiple premises, all believed true or found true most of the time, are combined to obtain a specific general conclusion. It is often used in prediction, forecasting, or behavior.

Inquiry

A method of teaching in which a lesson or an in-depth study of a particular topic is conducted by a child or a group of children based a question that drives the investigation.

Interview

Questions about the topic generated by the children to help them obtain answers to the questions that are the basis of their investigation. Interviews are conducted by the children, and interviewees might be visiting experts, parents, or others whose views are needed to answer the children's questions.

Inquiry

A method of teaching in which a lesson or an in-depth study of a particular topic is conducted by a child or a group of children based a question that drives the investigation.

Observational Drawing

Drawings and sketches based on firsthand observations of actual objects or locations under investigation that serve as representations or data related to the topic being studied.

Problem Solving

A process of discovering or deducing new relationships among things observed or sensed employed by all people at all levels of maturity. A method involving clearly defining the problem confronted, hypothesizing solutions, and testing of the hypotheses, until evidence warrants rejection or acceptance of the solution. For example, problem solving can include overcoming difficulties that children encounter when creating representations of what they have observed.

Project

An extended firsthand in-depth investigation of a topic undertaken by a class, a group of children, or an individual child in an early childhood classroom or at home. Projects involve young children in conducting child-initiated research on phenomena and events worth learning about in their own environments.

Provocation

Something that provokes, arouses, or stimulates curiosity

Field Trips

Planned visits to the field as sources of information to answer the questions guiding the investigation.

Recursive

A procedure that can repeat itself indefinitely

Teacher Research

Action research

Topic Web

A graphic representation of a topic and related subtopics. A web may be made by a teacher to anticipate what can be learned about the topic and used in planning the project (anticipatory web). A web may also be made in discussion with the children. This web can include what they already know or think about the topic as well as what they want to investigate.

Transmediation is the process of translating a work into a different medium. It may utilize more than one media form. All the components of a transmediated work are interlinked with each other to form the whole network.

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Blogs-

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