Inquiry, Category 3 Workshop

Missoula, MT, United States

20 - 22 August 2018

Language of delivery: English
Facilitator/s: Julie Lennox

www.ibo.org/programmes/pd
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Mission statement

The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.

To this end the organization works with schools, governments and international organizations to develop challenging programmes of international education and rigorous assessment.

These programmes encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right.
Workbook Contents

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Types of Student Inquiry

By: @trev_mackenzie

Structured Inquiry
Students follow the lead of the teacher as the entire class engages in one inquiry together.

Controlled Inquiry
Teacher chooses topics and identifies the resources students will use to answer questions.

Guided Inquiry
Teacher chooses topics/questions and students design product or solution.

Free Inquiry
Students choose their topics without reference to any prescribed outcome.
Open Inquiry
No predetermined question: Students propose and pursue their own questions.

Guided Inquiry
No predetermined method: students must determine how to investigate the problem.

Structured Inquiry
No predetermined answer: conclusions based solely on student investigation.

Limited Inquiry
"Traditional" labs: students follow the directions and make sure their results match those given in the text.
Levels of inquiry-based learning

1. confirmation inquiry
   - re-inforces prior knowledge
   - student follows set process
   - research question only provided
   - student does everything

2. structured inquiry

3. guided inquiry

4. open/true inquiry

High teacher involvement

Low teacher involvement
Ways to Help Your Children Become Better Inquirers

- Model good questioning
- Ask open-ended rather than "yes-no" questions
- Ask higher-level Key Concept questions
- Encourage and value your child's questions
- Don't always be quick to give solutions to your child. Encourage thinking and reflecting about how your child can find out the answers.
- Assist your child's research during units of inquiry. Take them to the Media Center or public library or on "field trips" to secure necessary resources.
- As your child reads books at night, ask your child questions using the Key Concepts. also, ask them questions about how characters demonstrate the Learner Profile attributes such as caring and risk-taker.
- Encourage inquiry through "I wonder...." statements.
- Let your child catch you reading or engaging in inquiry.
- Become involve in your child's learning. Ask your child to tell you about the current unit of inquiry being studied. Other questions to ask include: What new things did you learn this week? What was hard about the work you did this week? What units of inquiry have you been the most excited about this year?

ENCOURAGE YOUR CHILDREN TO QUESTION AND REFLECT!
### Rubric for Becoming an Inquiry Based Teacher

#### Curriculum

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#### Lesson Presentation

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<td>Teacher frequently lectures and uses demonstrations and activities to verify information.</td>
<td>Teacher usually lectures and does demonstrations and activities to explain information.</td>
<td>Teacher occasionally lectures and uses demonstrations and activities to reinforce concepts.</td>
<td>Teacher occasionally lectures and uses investigations so students can demonstrate understanding.</td>
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<td>Teachers use only demonstrations and structured activities.</td>
<td>Teacher uses demonstration and attempts open-ended activities.</td>
<td>Teacher uses demonstrations and open-ended activities and occasionally attempts teacher-initiated and student initiated inquiries.</td>
<td>Teacher uses an inquiry process approach and consistently provides teacher-initiated and student-initiated inquiries.</td>
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<td>Teacher plans only whole-class instruction.</td>
<td>Teacher plans whole-class instruction but occasionally uses small group instruction.</td>
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Adapted from *Inquire Within*, D. Llewellyn Ellen Alquist
### Communication

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<td>Teacher effectively moves about the room, speaking from different areas to monitor and enhance learning.</td>
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<td>Teacher communicates by standing above or over students.</td>
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### Engagement of Students

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<td>Students are mostly passive but teacher uses some hands-on activities.</td>
<td>Students are occasionally active; teacher uses hands-on activities but attempts some open-ended investigations.</td>
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<td>Teacher and students share decisions around room and seating arrangements to maximize student interactions, work, and discussions.</td>
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<td>Supplies and materials are sequestered; teacher permission is needed for students to access and use items.</td>
<td>Some supplies and materials are readily available for students to access own; teacher permission is needed for students to access and use certain items.</td>
<td>Many supplies and materials are readily available for students to access and use own; teacher permission is needed for students to access certain items.</td>
<td>Most supplies and materials are readily available for student to access and use on their own; teacher permissions is needed for certain students to access and use certain items.</td>
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<td>Classroom does not contain centers or areas for students to work independently; room arrangement remains the same for the entire school year.</td>
<td>Classroom occasionally contains centers; room arrangement changes occasionally.</td>
<td>Classroom regularly contains centers and areas for independent work; room arrangement changes occasionally.</td>
<td>Classroom contains centers and areas for student to work or read independently; room arrangement change regularly.</td>
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<td>Walls are mostly bare with a few commercially made posters displayed.</td>
<td>Posters and some student work displayed on walls.</td>
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<td>Walls are filled with work representing all students in the class.</td>
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### Questioning Skills

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<tr>
<td>Teacher asks mostly low-level, recall, and knowledge questions.</td>
<td>Teacher asks recall and comprehension level questions, attempts application and evaluation level questions.</td>
<td>Teacher poses higher-level and open-ended questions.</td>
<td>Teacher uses all levels of questioning and adjusts level to individual students.</td>
</tr>
<tr>
<td>Teacher uses questions to impart knowledge and solicit a desired response from students.</td>
<td>Teacher uses questioning skills to initiate discussion.</td>
<td>Teacher uses questioning skills to assess prior knowledge and initiate interactions between teacher and students and students and students.</td>
<td>Teacher uses questioning skills to assess prior knowledge, facilitate discussions and construct knowledge.</td>
</tr>
<tr>
<td>Teacher leads students to answer questions correctly and provides correct answer.</td>
<td>Teacher leads student to answer questions correctly, attempts prompting strategies.</td>
<td>Teacher frequently uses probing, prompting and redirectioning techniques.</td>
<td>Teacher consistently uses probing, prompting and redirectioning techniques.</td>
</tr>
<tr>
<td>Teacher rarely asks open-ended questions.</td>
<td>Teacher sometimes attempts to pose open-ended questions.</td>
<td>Teacher frequently poses open-ended questions.</td>
<td>Teacher consistently poses open-ended questions.</td>
</tr>
</tbody>
</table>

Adapted from *Inquire Within*, D. Llewellyn Ellen Alquist
| Teacher does not use wait time strategies. | Teacher occasionally uses wait time strategies. | Teacher frequently uses wait time strategies. | Teacher consistently and effectively uses wait time strategies. |
| Teacher provides answers when students cannot answer questions. | Teacher attempts rephrasing techniques when students cannot answer questions. | Teacher frequently uses prompts and rephrasing techniques when students cannot answer questions. | Teacher consistently and effectively uses prompts and rephrasing techniques when students cannot answer questions. |

### Assessment Procedures

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<td>Teacher frequently uses worksheets to assess learning; students record learning on teacher designed sheets.</td>
<td>Teacher reduces the use of worksheets to assess learning; teacher attempts having students record on student designed sheets.</td>
<td>Teacher seldom uses worksheets to assess learning; students record on student designed sheets and/or journal with some success.</td>
<td>Teacher seldom uses worksheets to assess learning; students record on student designed sheets and/or journal with complete success.</td>
</tr>
<tr>
<td>Teacher mostly uses objective-type testing.</td>
<td>Teacher uses objective testing and attempts to implement authentic assessment.</td>
<td>Teacher varies assessments to include objective testing, portfolios, rubrics, and other authentic assessments.</td>
<td>Teacher consistently and effectively varies assessments to include objective testing, portfolios, rubrics, and other authentic assessments.</td>
</tr>
<tr>
<td>Teacher assesses students based on content information only.</td>
<td>Teacher assesses students based on content and skills.</td>
<td>Teacher assesses students based on content, skills and problem-solving skills.</td>
<td>Teacher assesses students based on concepts, knowledge, attitudes, transdisciplinary skills and action taken because of new learning.</td>
</tr>
<tr>
<td>Teacher works as an individual.</td>
<td>Teacher works with another teacher to share inquiry strategies and activities.</td>
<td>Teacher works in collaboration with others to develop and share inquiry strategies.</td>
<td>Teacher works in collaboration with others in study group sessions to share units, articles and success stories.</td>
</tr>
</tbody>
</table>
### What does inquiry sound and look like?

<table>
<thead>
<tr>
<th>Looks and Sounds Like</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups of students talking about their learning experiences</td>
<td>The constructivist learning model builds on connecting new information to old knowledge and experiences</td>
</tr>
<tr>
<td>Tables or clusters of desks</td>
<td>Room geography that is conducive to collaborative learning</td>
</tr>
<tr>
<td>Students eager to be at school and sad to leave</td>
<td>Inquiry provides a safe, comfortable, challenging and interesting environment</td>
</tr>
<tr>
<td>Kids using reference books, online searches, phone interviews, face to face interviews, email or letters to people resources</td>
<td>Research skills need to be developed and kids need the time and freedom to explore all kinds of resources</td>
</tr>
<tr>
<td>Questions posed around the room, from students, teachers and parents</td>
<td>Inquiries authored by students and others need to be noticed and valued</td>
</tr>
<tr>
<td>Questions abound among teachers, students and parents</td>
<td>Without questions there can be no in depth inquiry</td>
</tr>
<tr>
<td>Students chatting in halls, conversations about past, on-going and future planners</td>
<td>Planning, reflecting, sharing, inquiring in all settings is natural in an inquiry-based school</td>
</tr>
<tr>
<td>Teachers thinking out loud-modeling how learning occurs – decisions made – monitoring and adjusting</td>
<td>Personal perceptions that students can hear help them internalize</td>
</tr>
<tr>
<td>Conferences where everyone reflects, discusses and then chooses new, meaningful action</td>
<td>Action is for all stakeholders</td>
</tr>
<tr>
<td>Laughter, chatter, intensity</td>
<td>Learning is hard work and fun</td>
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<tr>
<td>Visual reminders of the Student Profile, IB Attitudes, Action Cycle and planners are prominently displayed</td>
<td>Visual reminders for all the learning community are needed for inspiration, reflection, goal setting and recognition in both self and others.</td>
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Inquiry

Successful inquiry is the finding of new understandings.

Understanding
☐ Understanding is temporary and can be changed over time

Answers
☐ Answers are final and will not change with new experiences

Inquiry Language
☐ Help me understand...
☐ Tell me more...
☐ I wonder if...
☐ That surprises you...
☐ So you think maybe...
☐ What do you think...
☐ In what ways do you know...
☐ There's a part I want to ask...
☐ I'm trying to figure out...
☐ I wonder why..
☐ Well maybe...
☐ I think that..
☐ I noticed...
☐ This is what I don't get
☐ It makes sense that...
☐ I thought it was..
#### Rubric for Becoming an Inquiry Based Teacher

| Curriculum                                                                 |  |  |  |
|---------------------------------------------------------------------------|  |  |  |
| **Student knowledge is solely based on mastery of facts and trial information.** | **Student knowledge is based on mastery of facts and process skills.** | **Student knowledge is based on mastery of facts, process skills, and problem-solving skills.** | **Student knowledge is based on ability to apply facts and process skills to solve problems and make connections to new situations.** |
| **Curriculum is teacher centered and based on prescribed activities with anticipated results.** | **Curriculum allows for some flexibility for investigations according to the interests of students.** | **Curriculum allows for flexibility of investigations and units of study according to the interests of students.** | **Curriculum is student centered and provides flexibility for students to design and carry out their own investigations.** |
| **Curriculum is bases on subject specific textbooks.**                    | **Curriculum uses multiple textbooks and resources.** | **Curriculum uses multiple textbooks, internet and other software resources.** | **Curriculum uses texts (written, visual, spoken), the internet, software, people, places, events, and the world.** |

| Lesson Presentation                                                             |  |  |  |
|-----------------------------------------------------------------------------|  |  |  |
| **Teacher is center of lesson.**                                            | **Teacher is center of lesson and sometimes acts as a facilitator.** | **Teacher is center of lesson and frequently acts as facilitator.** | **Teacher consistently acts as effective facilitator and coach.** |
| **Teacher frequently lectures and uses demonstrations and activities to verify information.** | **Teacher usually lectures and does demonstrations and activities to explain information.** | **Teacher occasionally lectures and uses demonstrations and activities to reinforce concepts.** | **Teacher occasionally lectures and uses investigations so students can demonstrate understanding.** |
| **Teachers use only demonstrations and structured activities.**              | **Teacher uses demonstration and attempts open-ended activities.** | **Teacher uses demonstrations and open-ended activities and occasionally attempts teacher-initiated and student initiated inquiries.** | **Teacher uses an inquiry process approach and consistently provides teacher-initiated and student-initiated inquiries.** |
| **Teacher plans only whole-class instruction.**                             | **Teacher plans whole-class instruction but occasionally uses small group instruction.** | **Teacher plans whole-class instruction and regularly uses cooperative learning groups.** | **Teacher effectively plans for whole group instruction as needed and frequently uses cooperative learning groups.** |
| **Teacher has difficulty with unexpected results.**                        | **Teacher begins to accept unexpected results.** | **Teacher easily accepts unexpected results.** | **Teacher accepts and anticipates unexpected results.** |
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### Assessment Procedures

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<th>Teacher reduces the use of worksheets to assess learning; teacher attempts having students record on student designed sheets.</th>
<th>Teacher seldom uses worksheets to assess learning; students record on student designed sheets and/or journal with some success.</th>
<th>Teacher seldom uses worksheets to assess learning; students record on student designed sheets and/or journal with complete success.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher mostly uses objective-type testing.</td>
<td>Teacher uses objective testing and attempts to implement authentic assessment.</td>
<td>Teacher varies assessments to include objective testing, portfolios, rubrics, and other authentic assessments.</td>
<td>Teacher consistently and effectively varies assessments to include objective testing, portfolios, rubrics, and other authentic assessments.</td>
</tr>
<tr>
<td>Teacher assesses students based on content information only.</td>
<td>Teacher assesses students based on content and skills.</td>
<td>Teacher assesses students based on content, skills and problem-solving skills.</td>
<td>Teacher assesses students based on concepts, knowledge, attitudes, transdisciplinary skills and action taken because of new learning.</td>
</tr>
<tr>
<td>Teacher works as an individual.</td>
<td>Teacher works with another teacher to share inquiry strategies and activities.</td>
<td>Teacher works in collaboration with others to develop and share inquiry strategies.</td>
<td>Teacher works in collaboration with others in study group sessions to share units, articles and success stories.</td>
</tr>
</tbody>
</table>
Naturally Differentiated Teaching Strategies
That Encourage Inquiry, Constructivism
and Active Student Engagement:

** This is a non-exhaustive list of examples. You will think of other ways to use these strategies and improve upon them, as well.

KWHIAQ
From John Barell’s work on inquiry (Developing More Curious Minds, Problem-Based Learning: An Inquiry Approach). Use at the beginning of a topic/new learning and continue to add new ideas, new questions, new learning. **K**: What do we think we KNOW already? **W**: What do we WANT and need to find out? **H**: HOW will we proceed to investigate our questions? Organize our time? Self-assess our progress? **L**: What are we LEARNING (ongoing, daily, and at the end)? **A**: How and where can we APPLY our results (now that we know this – so what?)? **Q**: What QUESTIONS do we have now?

Human Graph
Instead of making a graph with paper or on the computer, students literally become the bar graph. They choose their place on the graph (usually done against a wall for ease of “reading” the graph) based on their appropriate placement. For example, the teacher could ask a question and students stand at “Yes” “No” “Maybe” “Unsure” for a 4-bar graph. Any number of responses can be elicited depending on the information you seek. A continuum of answers can work well, too. For modeling to students, first try birthday month, hair color, number of siblings, etc.

4 Corners
Similar to the human graph, this is a great diagnostic, formative and even summative assessment tool. To get quick information from students, ask them to place themselves in one of 4 corners. Each corner represents a different stance, answer, etc. For example, the teacher could ask “How comfortable are you with Chemistry?” on the first day of class. The 4 corners could represent “Very comfortable” “Comfortable” “Not very comfortable” “Terrified.” Another option: “No experience” “Beginner with some experience” “Experienced” “Expert.” Or, you can use a metaphor that can apply to any topic: “On the shore” “Wading” “Swimming” “Surfing.” 4-corners gives teachers quick, visual feedback. Using the same prompt early in a unit and returning to it several times can make for interesting comparisons. Data collection is immediate according to the numbers of students in each corner.

Compiled by Jodi Baker
jodihillbaker@gmail.com
**Two Stars and a Wish**
Students get used to this response when it’s integrated often into class for self-assessment, peer-assessment, or just comments. Upon listening to another student’s presentation, reading, etc., a student tells him/her two stars (2 compliments) and a wish (something to improve or something they suggest).

**Wonder Wall**
A designated place in the classroom for students to post their questions/wonderings. The class may regularly go to the Wonder Wall to discuss and see if any questions have been answered. Similarly a “Community Wall” can be a place to write concerns about how the class is functioning or a place for celebrating. The Wonder Wall is a great way for the teacher to remember to continue to gather student questions throughout a unit of study, not just at the beginning.

**Clock Partner**
A simple way to plan ahead so students can easily find a partner for a learning experience. Students use a clock face to get up to 12 different partners. Students write their partners’ names on their own clock so they will each have a 12 o’clock, 1 o’clock, 2 o’clock, etc. partner. When the teacher wants to have students meet with a partner, they simply say “Meet with your 3 o’clock partner.” Students need to keep their hard copy clock on hand and they will want to occasionally start over with a blank clock so students get new partners.

**Stand and Deliver/Quaker Share**
Modeled after the Quaker tradition of standing to make a statement without interruption or response. “Stand and Deliver” can be a powerful way to summarize learning. For example, after students read an article/book/assignment, have them choose one line that resonates for them. Then, one at a time, randomly as students are ready to share, students stand and speak their line. No one responds – the room is silent except for the student who is speaking. The students who have shared all stay standing until everyone has had his/her turn. This strategy can be used in a number of ways. For instance, as a wonderful way to reflect on new learning, students are asked to “stand and deliver something you learned today” or “stand and deliver a question you now have.” Stand and Deliver is a very quick activity and can be a great way for a teacher to assess students formatively.

Compiled by Jodi Baker
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Observe/Think/Question
O: Observe only. Facts based on observation. Slow down your thinking and don’t jump to inferences or questions - yet. T: Think - inferences and connections based on observation and prior knowledge. Q: resulting curiosities, researchable queries, wonderings.

Write in the Margins
As students read, they write in the margins: 7 = confusion/questions they have; I = something they are surprised by/impressed with; A = agree with; D = disagree with; N = new to me; I = important

Fishbowl
To model a specific learning experience (partner reading, peer conferencing, etc.) students and/or teacher are in the middle while the class watches from all around them as if they are watching fish in a fishbowl. This is a great way to compliment students who are great examples. They can be the models for others. It also works well when you want to demonstrate something they all need to know: from a science experiment to an art technique.

Minute to Spin It
In partners. 1st minute - person A talks while person B actively listens (no comments, no body language or nodding or feedback. JUST LISTEN.) 2nd minute - person B talks while person A actively listens. 3rd minute - respond/react/question each other.

Concentric Circles
Make an inside and an outside circle of equal numbers of people. The outside circle faces in and the inside circle faces out so students in the inside circle are looking at students in the outside circle. Students now have a partner (or if an odd number, 3 students can share) to share, discuss a question, solve a problem, etc. For additional responses or to give students more sharing time with additional partners, the outside or inside circle moves one person over and they now have new partners. Even a 1-minute sharing time per partner group can evoke positive results. This strategy has multiple applications.

Speed Dating/Cocktail Party (this is the adult name for this strategy - you'll want to think of a more appropriate name depending on the age of your students)
This can be very organized with students rotating through places at specific intervals like "speed dating" or more like a cocktail party where students get up and mingle. This strategy gives students multiple opportunities to share/think/debate with more than one partner.

Compiled by Jodi Baker
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Listening Trio
Groups of 3: Protagonist, Antagonist, Mirror. The Protagonist is on the offense and argues for a stance/statement/idea. The Antagonist argues against the same stance/statement/idea. Students don’t necessarily have to agree with their position. The ability to state their perspective allows them to consider both sides of an argument (of course there may be several sides, so more people can be involved). The Mirror listens to the other two, and then reflects back the heart of the matter. Each person has 30 seconds to state his/her perspective. Like debate, this process can be repeated so rebuttals can occur.

Conveyor Belt
Just like the conveyor belt at the grocery store, students add to a large chart paper that moves from table group to table group. It helps to have each group use a different colored marker so each group’s additions can be seen. It can be a timed response, or not. Timed can result in more spontaneity. One interesting way to use a timed conveyor belt for reflection is to have students finish a sentence stem using metaphor: “Writing is like an onion because...” “Writing is like water because...” You could also use this for students to respond to a provocative statement (“The Godfather” was the best movie ever made) or to have them write all they know about a topic (Write all you know about the writing process). Groups stay put while the paper moves on to the next group when the teacher calls time. The new groups read what is there already and adds on. In a typical class you may have 5-7 sheets moving around the room, all with different statements/questions/provocations on them. The resulting information can be compiled and/or posted in the room.

Carousel
Opposite of the ‘Conveyor Belt’ the papers are stationary and groups move about the room adding to what is already on the sheets. For example, to brainstorm ways your school could focus on reducing bullying you could have 6 pieces of chart paper up with these headings: In the Cafeteria. In the Hallways. In Classrooms. Between Students. During Assemblies. In the Larger School Community. Like with the ‘Conveyor Belt’ it helps to have each group use a uniquely colored marker so additions can be seen.

Word Sort
Students are provided with cards each with one word on them – vocabulary words, concepts, etc. for a unit. Students sort the words (individually, in groups or with partners) in whatever way they choose. They should be able to explain what their “rule” for the sorting was. This can be an excellent diagnostic at the beginning of a unit that can be repeated at the end for comparison. Because the words get moved around, taking a digital photo of the groupings for later comparison is a good idea. The teacher can gain a lot of diagnostic and formative information by listening to students’ discussions as they sort.

Compiled by Jodi Baker
jodilallbaker@gmail.com
**LJgscaw**
Students are divided to accomplish a task and become an "expert" in one part of the task (e.g. one section of a text, one element of the periodic table, etc.). Then they can either work together in “homogeneous” groups to prepare for a class presentation, or “heterogeneous” groups that meet with one person from each expert group sharing his/her expertise. This is an efficient way to divide work, tasks or reading so students learn deeply about one aspect and then learn from peers about theirs.

**Gallery Walk**
To highlight student work (summatives, projects, word sorts, etc.) students set up an area with their display, computer, information, etc. This can have the feel of a museum or gallery, especially if students create some interactive part of their presentation and/or have labels for the visitors. Other students walk through to view/experience the work. It can be especially positive if students have a place at their display for visitors to write compliments and questions.

**Visual Representation**
Students sketch/draw/create a visual that expresses their understanding of a concept/topic. These can be displayed as a collage, shown in a “Gallery Walk” or shared with partners/groups/whole group. It is interesting to do these early in a unit and then have students revisit them to revise.

**Stop and Jot** (or Stop and Act, Stop and Sketch)
Students use a small notebook or scratch paper for jotting down answers to questions/reflections/questions/thoughts from a teacher prompt. Teachers can use this strategy to allow students time to process their thinking during a lecture/video/presentation/read aloud or any number of learning experiences. This is effective across all disciplines and can give the teacher a quick insight into students’ thinking. Students may be asked to hold up their paper for the teacher to view or turn it in later, or not at all, depending on the teacher’s expectation.

**Turn and Talk** (or Turn and Define, Turn and Teach, Turn and Rank, Turn and Compare)
Like “Stop and Jot” this strategy gives students time to process. Students can become very good at this technique, especially with practice. Using “fishbowl” to model this strategy works very well. The teacher simply says “Turn and talk” and students turn to someone near them (not getting up and moving all over the room). The teacher may prompt with a specific idea or question to ponder, or may simply allow students to process about whatever they are thinking. After a short time (even 1 minute can be extremely effective) the teacher resumes. For read alouds, it works well to read a section, say “turn and talk” or “stop and jot” then, when you want their attention, repeat the last line read aloud just before they shared/wrote. This requires some practice, but even the youngest students can become very good at this. Listening in on their discussions is a great formative assessment.

Compiled by Jodi Baker
jodihirobaker@gmail.com
Think-Pair-Square-Share
This is simply starting from individuals and working out to the whole group. Any number of versions of this work well: Think-Pair-Share, etc. Students think to themselves, maybe jot down some notes, then share with a partner, then share with another partner group to make a “square” of 4 people, then share with the whole group.

Choral Poem/Voice Collage
Students each write one line of what ends up being a choral poem. The poem can be visually created with each student’s strip of paper lined up to create a poem on the floor, wall, etc. or orally shared one line at a time. The topic of the poem can relate to what you are learning, a reflection, a question, etc. You may even ask a specific question and have students’ lines be the answer. For example, everyone’s line starts with “I will never forget ______ because __________.”

Share Your “I Queue”
Non-verbal way to share. One example: In five minutes quickly make a visual representation of ______ (current understanding of a concept, idea, etc.). Make one line shoulder to shoulder. The line curls back on itself as the end person moves to face the line and walks silently along, holding up his/her visual representation. The next person in line follows until the entire line has been recreated again by folding back on itself (think “snake”). With this strategy, participants will see each other’s visuals twice – once when they are stationary in the line and once when they are the moving facing the line.

“Bottoms Up” / “Head to the Ground” / “Placemat” (you may want to rename this)
For this collaborative experience, groups of 4-5 work on one sheet of large paper in the center of the group – hence the title. It’s easiest to stand up and work on each section, which usually makes everyone put his or her heads down and bottoms up. Each student has his/her own section. There is a central area for the collaborative work. For example, each student may write his/her definition in each section and in the middle, the group writes a collaborative definition. This strategy has many applications – any time you want individual thoughts first that then come together for a collaborative purpose.

I Made a Connection!
For those times students made a connection with what is being said, read, shared, rather than interrupt the flow of what's happening, they can loop their thumb and forefingers together on each hand and hook them together like a chain. This simple symbol lets the teacher and other students know that a connection has happened for that student. The student can jot down the idea for later sharing.
**Double Entry Journals**
These are wonderful tools for all kinds of applications. Basically, a T-chart. students write one entry on the left and another on the right. Some Ideas: LEFT - Key event, idea, word, quote, concept RIGHT - Connections: LEFT - Reflection RIGHT - Questions: LEFT - What I notice RIGHT - What I think. LEFT - Observation RIGHT - sketch.

**Exit Slips**
On their way "out the door" or when transitioning to a new learning engagement, lunch, recess, etc., students write down a question, response, nugget of learning that serves as their pass at the end of a learning engagement or even at the end of the day. These can be a great formative assessment tool for teachers. The "exit slip" could also be verbal or a sketch/action/drawing. Typically, the teacher is asking for students to show some level of understanding or confusion/question.
CHAPTER 10

Identifying Inquiry in the K–5 Classroom
by Doris Ash and Barry Kluger-Bell

What does an inquiry classroom look like? How does it work? How can you tell if genuine inquiry is happening in the classroom? This chapter offers three practical guides to help educators who are trying to identify and support the specialized characteristics of the inquiry environment.

The elementary classroom is a complex social environment in which people talk, write, laugh, learn, and interact with one another. Teachers are asked to implement a variety of policies and standards in multiple content areas. They are expected to meet a variety of goals and needs and to respond to administrators, parents, policymakers, and the community. But first and foremost, teachers are expected to meet the needs of children.

As Karen Worth suggested in Chapter 4, inquiry is an excellent way to help foster children’s learning. School districts around the country have begun requiring their administrators, teachers, and professional developers to better understand the nature of inquiry and how to implement it in the classroom. They also have a pressing need to help their teachers create inquiry in the elementary classroom.

Teachers, administrators, and others who experience inquiry as adult learners still wonder about the nature of inquiry in the classroom: What does it look like? What would the children be doing? What would the teacher be doing? How would the classroom environment feel? Over the past few years, professional developers have been developing “markers” designed to help teachers recognize when inquiry is occurring in the classroom. These indicators are shown below, in three guides that look at the special characteristics of the inquiry classroom.
Imagine yourself in an inquiry classroom. What would you expect to see? These guidelines from the Vermont Elementary School/Continuous Assessment Project were created by observing students as they did “hands-on, minds-on” exploration in the classroom. “The intent is not to use the guide as a checklist,” they said, “but to use it as a statement of what we value in the areas of science process, science dispositions, and science content development.”

When students are doing inquiry-based science, an observer will see that:

**Students View Themselves as Active Participants in the Process of Learning**
1. They look forward to doing science.
2. They demonstrate a desire to learn more.
3. They seek to collaborate and work cooperatively with their peers.
4. They are confident in doing science; they demonstrate a willingness to modify ideas, take risks, and display healthy skepticism.
5. They respect individuals and differing points of view.

**Students Accept an “Invitation to Learn” and Readily Engage in the Exploration Process**
1. They exhibit curiosity and ponder observations.
2. They take the opportunity and time to try out and persevere with their own ideas.

**Students Plan and Carry Out Investigations**
1. They design a fair test as a way to try out their ideas, not expecting to be told what to do.
2. They plan ways to verify, extend, or discard ideas.
3. They carry out investigations by handling materials with care, observing, measuring, and recording data.

**Students Communicate Using a Variety of Methods**
1. They express ideas in a variety of ways: journals, reporting out, drawing, graphing, charting, etc.
2. They listen, speak, and write about science with parents, teachers, and peers.
3. They use the language of the processes of science.
4. They communicate their level of understanding of concepts that they have developed to date.

**Students Propose Explanations and Solutions and Build a Store of Concepts**
1. They offer explanations both from a “store” of previous experience and from knowledge gained as a result of ongoing investigation.
2. They use investigations to satisfy their own questions.
3. They sort out information and decide what is important (what does and doesn’t work).
4. They are willing to revise explanations and consider new ideas as they gain knowledge (build understanding).

**Students Raise Questions**
1. They ask questions—verbally or through actions.
2. They use questions that lead them to investigations that generate or redefine further questions and ideas.
3. They value and enjoy asking questions as an important part of science.

**Students Use Observations**
1. They observe carefully, as opposed to just looking.
2. They see details, seek patterns, detect sequences and events; they notice changes, similarities, and differences.
3. They make connections to previously held ideas.

**Students Critique Their Science Practices**
1. They create and use quality indicators to assess their own work.
2. They report and celebrate their strengths and identify what they’d like to improve upon.
3. They reflect with adults and their peers.

Adapted from materials created by the Vermont Elementary Science Project and the Continuous Assessment in Science Project, ©1995. Courtesy of Gregg Humphrey.
In the inquiry classroom, the teacher's role becomes less involved with direct teaching and more involved with modeling, guiding, facilitating, and continually assessing student work. Teachers in inquiry classrooms must constantly adjust levels of instruction to the information gathered by that assessment.

The teacher's role is more complex, including greater responsibility for creating and maintaining conditions in which children can build understanding. In this capacity, the teacher is responsible for developing student ideas and maintaining the learning environment.

Besides the process skills that the student must hone in the inquiry classroom, there are also skills a teacher must develop in order to support student learning of scientific ideas. When you enter an inquiry classroom, you may see that the:

**Teachers Model Behaviors and Skills**
1. They show children how to use new tools or materials.
2. They guide students in taking more and more responsibility in investigations.
3. They help students design and carry out skills of recording, documenting, and drawing conclusions.

**Teachers Support Content Learning**
1. They help students form tentative explanations while moving toward content understanding.
2. They introduce tools and materials and scientific ideas appropriate to content learning.
3. They use appropriate content terminology, as well as scientific and mathematical language.

**Teachers Use Multiple Means of Assessment**
1. They are sensitive to what children are thinking and learning, and identify areas in which children are struggling.
2. They talk to children, ask questions, make suggestions, share, and interact.
3. They move around and make themselves available to all students.
4. They help children go to the next stage of learning with appropriate clues and prompts.

**Teachers Act as Facilitators**
1. They use open-ended questions that encourage investigation, observation, and thinking.
2. They carefully listen to students' ideas, comments, and questions, in order to help them develop their skills and thought processes.
3. They suggest new things to look at and try, and encourage further experimentation and thinking.
4. They orchestrate and encourage student dialogue.

*Adapted from materials created by the Exploratorium Institute for Inquiry.*

**Inquiry Indicators: How Does the Environment Support Inquiry?**

The Social and Emotional Environment of the Inquiry Classroom

Creating the proper environment is a necessary condition for maintaining an inquiry classroom, but it is not sufficient in itself. The environment of an inquiry classroom can look quite different from our “standard” picture of a typical classroom. An inquiry classroom may be very active and filled with materials. It may be filled with children having conversations about scientific phenomena, or it may be filled with evidence of independent investigations.

There are three major areas of development in any inquiry endeavor. These are:

- Content and conceptual understanding and development
- The skills and the activities of doing science
- Attitudes and habits of mind

It takes a very special classroom environment to support all these elements for children engaged in the inquiry experience. In addition to the guidelines expressed in the “On-the-Run Reference Guide to the Nature of Elementary Science” above, an inquiry classroom must
make it possible, on a social and practical level, for students to pursue their investigations.

Walking into an inquiry classroom, an observer may see that:

**Students Work in an Appropriate and Supportive Physical Environment**
1. The room is set up to support small-group interaction and investigation.
2. Lists of student questions are prominent and available for all to see.
3. A variety of general supplies are available, both at desks and in easily accessed cabinets.
4. A variety of materials specific to the area being explored are easily accessible.
5. Student work is displayed in a variety of ways in order to reflect their investigations.

**Students Work in an Appropriate and Supportive Emotional Environment**
1. Their thinking is solicited and honored.
2. They are comfortable expressing ideas and opinions and speaking up.
3. They are comfortable interacting with one another, and with the teacher.
4. They are encouraged to share information and ideas with each other—as individuals or in groups.
5. They know what they are doing and why.

**Students Work in a Variety of Configurations to Encourage Communication**
1. Work may be done in student pairs, small or large groups, or in whole-class situations.
2. Students have many opportunities to respond to feedback and learn from one another.
3. Students become part of a “community of learning,” supporting and affecting each other's thinking.

*Adapted from materials created by the Exploratorium Institute for Inquiry.*

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Not every inquiry classroom will look and feel the same, but the major elements identified in these three guides will be manifested in some form.

It’s not the form that makes an inquiry environment successful, however, but the underlying substance. There are many different ways to encourage communication, just as there are many different ways to support continued learning. Inquiry classrooms always involve engaging children’s intellect in exploring and investigating interesting phenomena. The emphasis is on allowing and assisting children to find their own best pathway to learning. The indicators listed here are meant to be one way to begin to determine if genuinely exciting inquiry learning is occurring.
Chapter 1

Inquiry as a stance on curriculum

Kathy G Short, University of Arizona, USA

Inquiry is one of those frequently-used terms that educators rarely define because they assume a shared understanding. Most often, inquiry is used to signal that learners ask questions and engage in research, and so educators focus on getting students to ask better questions and to develop effective research strategies. Ironically, this view of inquiry often leads to teacher-directed projects and activities that are fun and engaging, but that actually violate the deep structures of inquiry.

Inquiry is not a particular teaching method but a stance that underlies our approach to living as learners, both within and outside of school. Within schools, inquiry highlights learning as a process that underlies curriculum across disciplines, subject areas, and age levels. We have always known that how we teach influences students as much or more than what we teach. Inquiry immerses us in exploring the learning process and using those understandings to shape how we teach our content so that an inquiry stance on learning permeates our teaching.

Since curriculum involves putting a set of beliefs into practice, we need to examine and articulate our beliefs in order to explore ways of enacting those beliefs in classrooms with students. Curriculum as inquiry thus involves exploring inquiry as a stance on learning and envisioning ways of bringing that stance to life in classrooms.

Inquiry as stance

My first response to inquiry was skepticism because experts often use new terms to label old concepts so their approaches seem fresh and new. I had explored theme units for some time and the talk about inquiry seemed, on the surface, like adding a stronger focus on research investigations to theme units, rather than something fundamentally different. The tensions I was experiencing about theme units, however, gave me pause and led me to explore the possibilities of inquiry within curriculum, although initially I saw inquiry as a method, not a stance.

As a student, I experienced curriculum as fact through a textbook curriculum that emphasized skills and facts with right answers and correct procedures for getting those answers. Teachers covered the content through textbooks, worksheets, tests, and research papers. We covered lots of topics and memorized many facts, to be forgotten as soon as the test was taken or the research paper handed in. We ended up with superficial knowledge and no desire to keep learning about a topic—an indication that these experiences were not educative.

As a teacher, I wanted to make curriculum meaningful for students and so explored ways to actively engage students, such as writing workshops, literature circles, and
theme units. This approach of *curriculum as activity* immersed students in a range of reading, writing, and research activities around particular topics. My tensions about these activities grew out of observations that the activities still involved covering the curriculum and facts, just in a more engaging way, so that, while I did not ask students to memorize facts, they still collected facts.

I often felt as though we were doing activities at the expense of critical, in-depth knowing. I was uneasy that the units remained teacher-driven since I was the one setting up the projects and activities within which students asked and pursued questions. The learning in these units was limited by my knowledge of the topic and students often viewed this learning as school-based, with little connection to their lives. The focus on topics like family, nutrition, or water made true curricular integration difficult – the activities were correlated across subject areas, but not integrated across the curriculum and students’ lives in significant ways.

These tensions led to discussions with colleagues and to theorists such as Dewey, Freire, and Vygotsky to search for other ways of thinking about the construction of understanding. Several of us formed a study group where we worked together to enact *curriculum as inquiry* in our classrooms, meeting over several years to make sense of our experiences. We struggled with the difficulty of enacting our beliefs, challenged by students’ responses to our attempts at inquiry. Our experiences convinced us that inquiry was not a refinement of project approaches or theme units, but a stance on learning that challenged our perspectives as teachers.

The problem with defining inquiry is a stance that is describing a stance or philosophy is much more difficult than describing teaching methods or processes. I often find myself describing the different ways that inquiry might play out in classrooms, and avoiding defining the stance itself. Understanding and articulating inquiry as a stance, however, are essential to moving beyond projects and units to curriculum as inquiry. Changing a few engagements in our classrooms is much easier than changing our thinking about learning and that is what a stance of inquiry invites us to do as educators.

For me, *inquiry is a collaborative process of connecting to and reaching beyond current understandings to explore tensions significant to learners*. Inquiry is a stance that combines uncertainty and invitation. A feeling of uncertainty encourages us to wonder and question, to move beyond current understandings to pursue new possibilities. Without invitation, however, we may not feel the courage to pursue those uncertainties or tensions; invitation beckons us to feel some safety in taking the risk to pursue those possibilities by thinking with others.

Inquiry is thus a reaching stance of going beyond information and experience to seek an explanation, to ask *why* and to consider *what if*. Lindfors argues that inquiry involves going beyond in intellectual, social, and personal ways – we go beyond our current understandings, our sense of identity, and our engagements with others. This process of going beyond is dependent on remaining connected to current understandings as the point from which to reach out and requires the support of a collaborative community. We need to know that we are still connected to the known and are not totally separated from the ideas and beliefs that ground our lives. At the same time, if we do not reach beyond, we get stuck in a rut. Thinking with others provides the impetus and zone of safety from which to reach out.

Inquiry is also a stance of being off-balance. Although the self-help literature trumpets the need to lead a balanced life, a state of perfect balance involves staying perfectly still in the same place – in that comfortable rut. Reaching out occurs because learners experience a sense of being off balance or in tension, the driving force that compels learners to move forward (Dewey, 1938). Tension disrupts a learner’s sense of unity and understandings about life, and this disruption compels learners to pursue a tension to reach toward new insights and unities.

**Inquiry is natural to learning**

A particular set of beliefs about learning underlies inquiry as a collaborative process of connecting to, and reaching beyond, current understandings to explore tensions significant to the learner. The first is that inquiry is natural to how children and adults learn outside of school contexts. In fact, I would argue that three-year-olds epitomize inquiry: they engage with life, immersed in what is occurring around them until something catches their attention and raises curiosity or doubt.

This curiosity creates a need to know that they explore through play and observation and through pestering adults with questions. They move from curiosity to knowledge that leads to more in-depth investigations (unless something more compelling catches their attention). These explorations and investigations, in turn, support them in constructing their understandings of the world and in asking new, more complex, questions.

Inquiry invites us as educators to base instruction on the processes that are natural to learning – to investigate how people learn and build curriculum from these processes. The typical approach is to create instruction based on how we think people should learn, to ask “How do I teach inquiry?” instead of first asking, “How do I and others inquire?” Once we explore inquiry as natural to learning, then we can engage in the difficult task of creating learning environments that immerse learners in these processes, rather than in how we think they should learn.

Barnes argues that many students operate as if there are two boxes of knowledge in their heads – an action knowledge box that contains the knowledge used to function in their daily lives and a school knowledge box that contains what is learned in school. They close the action box as they enter the classroom, assuming that knowledge is irrelevant in school, and open the school box, reversing the process at the end of the day. A stance on inquiry invites students to function with action knowledge both inside and outside of school.

**Inquiry is based in connection**

Inquiry has no other place to begin than in learners’ own experiences and current understandings. Bateson states that learning is the search for and finding of
patterns that connect. Without significant points of connection, learning remains difficult and easily forgotten because that learning is experienced as isolated ideas and information. This search for connection distinguishes tension that drives learning from stress that shuts down the learner.

We typically begin a unit by teaching new information and covering key points about the topic to provide students with a knowledge base. Inquiry starts with immersing students in engagements so they can find and connect to their life experiences and so we as teachers can observe and listen to students’ current understandings. Connecting in significant ways to students’ lives means we often have to move beyond the topic so that, for example, a unit on immigration might begin with students exploring their experiences of moving from place to place, rather than with information on immigration patterns within a particular part of the world.

Inquiry is conceptual

If our goal is only for students to gain information on particular topics, then a curriculum based in inquiry is not essential. Inquiry includes but goes beyond information to search for an explanation, to understand the why behind that information. Inquiry is a conceptually-based, rather than a topic-based, approach to curriculum. Conceptually-based curriculum puts the major emphasis on the big ideas that lie behind topics, leading to deep essential understandings that transfer across contexts. Information and knowledge are still significant, but the goal is no longer to cover a particular set of information, but instead to build the knowledge necessary for providing the base from which to explore conceptual understandings that underlie that knowledge. Knowledge becomes a tool to explore conceptual understanding rather than an end in and of itself.

Preparing students for the 21st century has become a frequent topic in education, based on the assumption that we have moved from an Information Age that depends on knowledge workers and analytical thinkers, to a Conceptual Age depending on the ability to combine creativity and analysis. Children and adults need to be able to think conceptually in order to identify the critical issues of our society — to not be distracted by the massive flow of information around them — and to be able to apply their understandings and knowledge in future contexts that have not even begun to unfold in the present.

The focus on topics and content, however, is so deep-rooted in how we think about instruction that the conceptual frame for units of inquiry is easily lost. A unit on water may begin conceptually around the central idea of the consequences of the limited availability of natural resources, but get lost in information about water shortages and water conservation.

Or a unit on nutrition may be framed conceptually around making choices that affect our health and lives but get lost in information on body systems, bones, and food groups. A conceptual frame focuses on the biggest idea behind the central idea – to the very essence of the unit, such as choice or limited availability – so that our attention remains on the ‘why’ of that unit.

These experiences have forced me to realize that units of inquiry need to begin with connection to the conceptual frame, not to the topic, as the essence of that central idea plays out in children’s lives. Water is the topic and limited availability is the concept, so the connection is the consequences of limited availability in students’ lives, not to water but to whatever they might currently experience as a limited resource. Nutrition is the topic and choice is the conceptual frame, so the connection is to the choices children make in their lives in comparison to the decisions that adults make for them.

A group of first grade teachers planning a unit of inquiry on endangered animals realized they needed to start by exploring a conceptual understanding of loss, not with information about animals. They invited children to tell stories about losing things (a very common experience for six-year-olds) to understand the feeling of losing something forever in contrast to the joy of finding something they thought was lost. This conceptual frame provided a different perspective for children from which to consider the possibility of losing animals that are endangered in our world.

Many units of inquiry are designed to build initial knowledge separate from the conceptual frame with the goal of gradually working toward conceptual understanding; the result is that students focus on information in isolation from that frame. If inquiry is conceptual, then that frame must be the first focus of attention and be woven throughout the unit, not a conclusion we hope students might reach. The topic is a case study, a way to get at the broader conceptual understandings, not the actual focus or rationale for that unit of inquiry. As teachers, we are so used to covering content that we lose sight of the conceptual frame and immerse ourselves in designing activities to cover the content, to teach water or nutrition or endangered animals.

Inquiry is problem-posing and problem-solving

One of the most common understandings of inquiry is problem-solving with the vision of students engaged in research on particular topics of interest related to the class focus. The teacher sets up a situation to pose an engaging problem as a means of encouraging students to ask questions about that problem and to research those questions. A common approach to science, for example, is to provide students with batteries, wires and bulbs, and ask them to determine what causes an electric current to light the bulbs. Students are encouraged to ask lots of questions but the problem itself is already determined. Teachers often plan a unit to result in research projects around a focus already determined before the unit even begins, such as deciding that children will research the systems of government, family and education for particular ancient civilizations, or break into groups to research a specific explorer.
These experiences of guided inquiry provide students with strategies for how to go about research, but they do not learn how to find a problem that matters and is worth investigating in the first place. Scientists undertake investigations because they have a problem to solve. Inquiry begins with exploring a phenomenon of interest and attending to problems or tensions that emerge and that are worth taking the time to investigate. Scientists also have to be able to develop experiments that will further that investigation. We short-circuit the process by handling students the experiment and asking them to engage in the procedures of science labs, but not the processes of scientific reasoning. They do not actually experience science.

Freire\textsuperscript{10} argues that the person who poses the problem is the one who remains in control of learning. Inquiry makes us nervous as teachers because we may feel as though we are turning over control to our students. By retaining our role as problem-positers, we keep control, while at the same time seeming to actively engage students as inquirers. The problem is that they are asking questions about the problems we have posed, not the issues significant in their lives. They never fully experience inquiry.

Students need to know how, out of everything that is possible to know or experience, to determine what is significant and worth pursuing. It is essential that learners know how to reason through a question or problem to investigate it, but problem-solving is not sufficient. We do not want students to become problem-solvers who only pursue the questions that others pose for them and do not question the questions.

Many curricular models of inquiry start with students asking questions as the first step and then delineate in detail the steps to investigating those questions. My experiences as a researcher show that finding the question is often the most difficult part of the inquiry process and that often the question does not emerge until the study is almost over.

As a researcher, I start with a particular interest or tension, and then spend time immersed in the context, gaining knowledge through observation, conversation, and professional reading. The question or problem that is worth investigating grows out of knowledge and experience with the research focus. Even when I start with a particular question, that question usually changes once I know more. Problem-posing is not a simple starting point for a researcher; it is a process that goes across the research, intertwined with and informing the problem-solving.

Asking students what they know and what they want to know (KWL) at the beginning of a unit of inquiry may provide insights into current understandings, but not for posing problems. Frank Smith\textsuperscript{11} argues that you can't think critically about something you don't know anything about. Posing thoughtful questions grows out of knowledge about a topic or issue and that takes time and immersion in explorations to see what tensions develop and become compelling for learners.

Although we may be able to predict those tensions, we cannot determine what will cause a specific learner to feel tension. Dewey\textsuperscript{12} argues that the role of the teacher is to create a learning environment that has the most potential for creating anxiety or tension for learners. Learners need voice and knowledge to determine what is compelling for them to pose as a problem worth investigating.

This distinction between problem-posing and problem-solving distinguishes between guided inquiry, personal inquiry, and collaborative inquiry. Personal inquiry involves the learner as both the problem-poser and problem-solver in pursuing personal interests and tensions that may never be the focus of the school curriculum. Independent reading, writing workshops, and expert projects are examples of engagements that can provide the space for students to pursue inquiries growing out of personal interests or life issues.

Collaborative inquiries, where teachers and students collaborate on problem-posing and problem-solving through a process of negotiation within the curriculum, are at the heart of units of inquiry. Teachers influence the problems that are posed through engaging students with specific materials and experiences as well as by determining the understandings at the center of a particular unit of inquiry. Teachers, however, negotiate the curriculum with students, not just build curriculum from students, so that investigations grow out of process.

Guided inquiry, where the teacher is the problem-poser and students are problem-solvers, is often found in skill instruction. For example, teachers may use assessment to determine students' needs as readers and form a guided reading group to work on a specific reading strategy. Within the group, the teacher poses the problem that is the focus of the group and engages students in a meaningful reading of a text, within which they actively engage in reasoning to develop their own understandings of that strategy.

The tension for teachers is providing the space within classrooms for students to move in and across personal, guided, and collaborative inquiries. The project-based approaches that many schools have taken to inquiry are problematic only because all of their engagements and units are guided inquiries and students never experience posing problems. The units are filled with interesting projects and activities and end with summary projects that involve students in problem-solving to demonstrate their understandings. What gets left out is time for students to pose and investigate problems they find compelling within that unit.

\textit{Inquiry is collaborative}

Since inquiry involves reaching beyond ourselves and our current understandings, we need collaborators with whom we can think to challenge us to outgrow ourselves. Those collaborators may be real (members of our immediate community with whom we talk and interact) as well as virtual (authors with whom we think in books or on internet sites). Schools often focus on cooperation, dividing up a task into different roles for students to complete. Inquiry goes beyond cooperation to collaboration where students think together, not just work together, through dialogue about ideas. Freire\textsuperscript{13} argues that this dialogue is how we transform ourselves as human beings.
Vygotsky’s Zone of Proximal Development provides another rationale for the necessity of learning with others. Vygotsky argues that the most conducive space for learning is defined by what can be learned with the support of collaborative others. This space is located between the point of what learners can already do independently and the point at which they can only function if someone takes over the task for them.

Lave and Wenger argue that the most effective learning occurs within communities of practice where members work together toward understanding. These communities of practice involve participating in activity, not just from experience, but also in the social world, not just coming to know about the world.

Everyone actively participates as a member of that community; while some may be less proficient or are newcomers with limited participation, they are still members of the community. For example, all children are viewed as English language learners with some more proficient in their use of the language, but no one is a non-speaker positioned outside of the community.

We construct understanding by working collaboratively with others, who are more or less expert, on problems that arise out of practice and are focused on understanding and improving practice within that community. Teachers may thus be at the center of the community in terms of their expertise and knowledge, but students are members of the community and have the responsibility of thinking collaboratively with their teachers and peers. Students are collaborators, not just informants, and so actively engage with teachers in negotiating curriculum.

Enacting inquiry in the classroom

Moving from these beliefs about inquiry to practice in classrooms is facilitated by the use of a curriculum framework. A framework provides a guide for planning curriculum based in theory as well as a structure for connecting theory and practice that reflects the complexity of the process. Curriculum frameworks provide a bridge between theory and practice that supports teachers in more consistently enacting theories. We are able to teach in a theoretically consistent manner because the framework allows us to articulate what is most significant. A framework provides the bigger picture, particularly highlighting the relationships between the parts, so that we can more effectively work at those parts within the whole.

Inquiry as a stance involves a set of beliefs about the learning process that can be depicted in a range of curricular frameworks. Although there is no one ‘correct’ framework, the framework I use to plan and implement curriculum based on my beliefs about inquiry as a process of learning, is the Inquiry Cycle. The inquiry cycle is an authoring process in the sense that learners engage in authoring or constructing meaning about themselves and the world. A unit of inquiry on human rights with ten- to 12-year-old students in Tucson, Arizona, provides one example of how this framework might play out in a classroom.

Figure 1. Inquiry Cycle

Kathy G. Short & Jerome C. Harste, 2002

Connection

The inquiry cycle does have a specific starting point within any unit of study and that is with connections to the life experiences and understandings of learners. Connection gets at the why rather than the what of a unit. This connection to the broader conceptual frame involves getting at the essence of the central idea that frames a unit, for example the big idea of making choices as the why behind a
nutrition unit. The role of the teacher is to immerse students in engagements, so they can explore their current understandings of the conceptual frame for the inquiry, by considering how that idea is already present and significant in children's lives.

In the human rights inquiry, our conceptual focus was on 'rights' as the needs we have as human beings in order to live in a society. We knew that children would struggle with the difference between 'needs' and 'wants' as well as the balance of 'individual voice' with 'group responsibility'. In reflecting on rights, we realized that this idea plays out in students' lives in their complaints about what is unfair, especially at lunch or recess. We read aloud A Fine, Fine School[7] to begin our conversations about unfair decisions in school and put out many picture books about school for students to browse. Students created unfair maps of their school on which they labeled places where unfair events had occurred.

Once the maps were completed, we talked about what determines when something is unfair, and that the feeling of unfairness is often based on a sense of rights being violated in some way. Students worked in small groups to create lists of their rights within the school, based on the entries on their unfair maps. These discussions were intense and engaged, providing them with a conceptual understanding of rights as well as strong connections to their own experiences.

**Invitation**

Students are invited to expand their knowledge, experiences, and perspectives in order to go beyond their current understandings. Teachers immerse students in a range of engagements, that encourage their active exploration of the inquiry focus and increase their knowledge through providing access to resources and experiences. Invitations often take the form of guided inquiry, in that the teacher has determined particular lines of inquiry related to the unit focus, that are significant for students to gain a strong depth and range of knowledge about that focus.

In offering invitations, we found that it’s important to be selective and to remember that the emphasis is not on covering the inquiry focus, but on expanding knowledge to build understanding and raise tension. There are always many interesting and worthwhile activities and projects to consider; engaging students in all of these takes over the entire unit, leaving no time for in-depth investigation. The key is to select the most significant lines of inquiry as connected to the conceptual frame, instead of covering the content; for example, choosing engagements that highlight making choices that affect our health, not covering nutrition.

Another consideration is to choose engagements that actively involve students, such as text sets or exploration centers, where they have time to explore and observe as well as have the opportunity to make choices and engage in conversation. These engagements should start closest to the students rather than at the farthest historical point. A unit in which students compare systems of government, family, and school in ancient civilizations to their own lives, for example, may be more effective if the engagements start with their lives and then move back in time.

Also, while informational books and websites are important resources, powerful pieces of fiction, including both novels and picture books, are significant in moving students from information to conceptual issues. The careful choice of a chapter book to read aloud as students engage in these explorations, can keep the focus on the conceptual frame, helping to prevent students becoming lost in gathering information.

In the Human Rights inquiry, we immersed students in read alouds and text sets to expand their knowledge of human rights to the global context. We put out text sets containing fiction and non-fiction picture books, and newspaper articles around issues such as child labor, discrimination, freedom/government, violence, basic needs, education, and the environment.

Students had time to read from these books as well as to talk with each other and web the issues that were emerging. We also read aloud and discussed picture books such as The Carpet Boy’s Gift[8] a story based on child labor in carpet mills in Pakistan. Student interest in the boy who led a movement against this practice led to choosing Iqbal[9] as a chapter book read aloud. Students struggled with judging parents who sell their children to work in these mills and in understanding the tremendous poverty that led to such a difficult decision.

**Tension**

As students expand their understanding about the inquiry focus, tensions emerge that are significant and compelling and that they want to pursue in greater depth. These tensions may be expressed as wonderings or issues, not questions. They signal a shift from information, fact-based questions to issues that students find compelling and from teacher-guided inquiry to student-driven inquiry. In order to know when this shift has occurred, some system of keeping track of students’ wonderings and issues needs to be in place in the classroom throughout invitations, such as individual ‘I Wonder’ journals or class charts that are added to on a daily basis through reflection on particular invitations.

In the human rights inquiry, we regularly gathered for reflection after read alouds or text set browsing for students to share their observations and add to a chart of issues about human rights. In addition, after reading for several weeks in the text sets, students worked in small groups to web their understandings and tensions about human rights.

Our initial plan had been to see what area of human rights emerged as a strong interest and move into investigations around that area, looking both locally and globally. We were surprised to find, however, that the most compelling issue for students was how kids can be involved in taking action. They had not believed that they could make a difference as kids and much of their discussion focused on the strategies that Iqbal and other children, in books, were using to take action for social change.

At that point our focus shifted to taking action on violations of rights and we realized that taking action in their own school context was most compelling to
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them. They cared about the ways human rights were playing out in global contexts but they needed to experience taking action in their own context. Also, they did not have enough in-depth knowledge about particular global issues to take action in thoughtful ways. They were clearly still at an exploration stage with these issues, but ready to investigate how to take action in the school.

To highlight strategies for taking action, we engaged in several dramas around books in which children took action on social issues, in particular homeless people and undocumented immigrants from Mexico. In these dramas, they took on the roles of characters from within these stories and interviewed each other in pairs, with a reporter asking a character questions about the action that child took within the story.

Investigation

Investigation is a shift to problem-solving and in-depth investigation on a particular issue or question, with students often working as partners or in small groups to support each other through dialogue and research. Their focus is unpacking complexity, not developing simple solutions to complex problems. The teacher's role involves a major shift because the nature of these investigations cannot be determined ahead of time if they truly reflect the tensions that are significant for students.

If several classes are engaged in the same unit of inquiry, this is also the point where those classes should look different from each other since the focus is on what is compelling for students. If the classrooms look the same during investigations, that is a strong signal of teacher-guided projects rather than collaborative inquiry. These differences will also be evident within a classroom across students with different tensions that they want to pursue. Teachers play a key role in planning structures for supporting students in organizing their investigations but not in determining their focus. One of those roles is helping students create plans for their investigations by reflecting on questions: Why are we interested in this issue? What are our related questions? What do we really want to know? What will we do to investigate our question? What is our plan for investigation? What materials and resources do we need to gather to implement our plan?

Students in the human rights inquiry returned to their unfair school maps and webbed the problems they still saw as significant within their school context. Their original webs of problems were somewhat self-serving, without consideration of how their desires would affect other students. We hoped that when students returned to their maps after the global exploration of human rights and taking action, they might have a different understanding of the balance between individual needs and responsibility to the group.

This shift was evident in that issues the students had raised earlier that would benefit a few at the expense of others, such as specific playground rules or when to do classroom work, were no longer raised. Each small group chose the top one or two problems from their list to share with the class and each class engaged in a discussion to determine, through consensus, the problem they wanted to take on as a class. They talked about their experiences with that problem and brainstormed a list of people who had perspectives on the issue. They then invited several to come to the classroom for an interview with the whole class. They also individually conducted other interviews. Based on these interviews, they came to a consensus on a strategy for taking action.

Both classrooms involved in this study focused on taking action about a school issue because the same tension was evident; however, their webs of problems and the problem they decided to focus on differed. They decided to come to a consensus on one problem as a class, instead of breaking into small groups on different problems, because they recognized the difficulty of taking action with adults in school contexts. One group was concerned about the quality and options for school lunches, particularly the lack of fresh vegetables and fruit. After interviews with school personnel, they found out that their lunches were made in a central district location and then trucked to schools. They realized that the problem was district-based and worked on a petition (that they asked parents, children and teachers to sign) for delivery to the district head of food services and the superintendent.

The other class was concerned with their lack of voice in decisions about the many rules that governed their play on the playground. Upon interviewing their parents, they realized that there was a tremendous difference of opinion and reasons for and against why children should have a voice in school rules. Their interviews with playground monitors gave them insights into why adults made rules, who was making the rules, the haphazard nature of how rules were created. These insights, along with feedback from a second- and a third-grade teacher, helped students set up a petition to be delivered to the school board. Their petition was delivered, and changes were made to the playground rules.

Demonstration

During investigation, the role of the teacher shifts from offering invitations based on the lines of inquiry to supporting student investigations through demonstrations that respond to students' needs. Demonstrations offer students possibilities for what they might do, rather than modeling what they must do. These demonstrations are often research strategies or tools, such as note taking, internet searches, or skimming to locate information. In the human rights inquiry, demonstrations included developing questions and taking notes in interviews.

Re-vision

As students engage in inquiry, they need opportunities throughout the process to pull back and reflect on their learning. Our minds seek unity and investigation upsets that unity as we attend to difference, to what is new or unlike from what we already know. Students need to continuously reflect and make sense of what they are learning, not the information, but on connections between these ideas and their thinking – they create a new unity or vision of the understandings that guide their inquiry.
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This re-vision can be encouraged by an ongoing learning log or other device for reflecting on learning. In our case, we used small group and whole group webs as well as class reflections at the end of research sessions to engage in this re-visioning of understanding.

Representation

Inquiry is never-ending; there are always new questions and issues to pursue. At some point, however, learners pull together their learning and go public with what they have learned. While not final, these public representations support them in recognizing how much they have learned as well as what they still need to know.

These representations take a variety of forms as appropriate to particular investigations, such as reports, skits, murals, and posters. Often that form varies from group to group within a classroom. In one classroom in the human rights inquiry, the representation took the form of signed petitions and a formal letter that were sent to the district food services director and superintendent.

In the other classroom, students developed a proposal for a committee with several students from each grade level, who would meet with the principal and playground monitors once a month to review new rules and issues on the playground. The students spent a great deal of time developing structures for who would be on this committee, and when the committee could meet, as well as how students could become advisors to the adults on rules affecting children in the school.

Valuation

Representing what has been learned to an audience opens an opportunity for learners to pull back even further to reflect on what is of value from their learning for themselves and the world. They consider their learning of content, process, and intentions/goals to determine the value of this learning for future inquiries and to reposition themselves in the world. In our case, students brainstormed a class web of what taking action meant to them conceptually, as well as created individual sketches in which they symbolically depicted the meaning of taking action. This summative assessment connected to the central idea and conceptual frame for the unit.

One common misconception is that the summative assessment should be a major project that addresses the lines of inquiry and so the time needed for investigation is taken over by summative assessment. Instead of student-driven inquiry, students engage in another guided inquiry. The summative assessment focuses on the broad conceptual frame of the unit, the central idea, and can be a reflective engagement that does not require large amounts of time.

Action

Any research needs to address the ‘So what?’ question of the kind of action that is now possible, given the investigation. What difference does this study make in the broader context of the inquirer and the world? The learner has gained new understandings from this inquiry, but what action will now be taken because of those understandings? What are the new questions or tensions to pursue based on these understandings? If action is not addressed, then the artificial separation of action knowledge from school knowledge is continued. 20

In our case, the action was built into the investigation in that the representations involved taking action in the school setting. The issue of thoughtful ways of including students’ voices in adult considerations of school decisions was one that continued to be raised across a range of contexts within the school across the year and was the source of continued action.

Conclusion

Inquiry is not merely a ‘new’ set of instructional practices, but a theoretical shift in how we view curriculum, students, learning and teaching. Inquiry as a stance influences how we teach and create learning environments for students. More importantly, however, a stance of inquiry influences who learners become as human beings.

Indigenous educators argue that the difference between western and indigenous perspectives is that western societies emphasize schooling students to become good citizens while indigenous societies emphasize educating students to become good human beings. 21 Inquiry as a stance brings together these perspectives to argue that we have a responsibility to help students to become good citizens and good human beings – to develop wisdom as well as knowledge. Inquiry transforms education from learning about to learning to be – to the process of becoming.

References

Chapter 2

Communities of inquiry

Simon Davidson

The International Baccalaureate's Primary Years Programme (PYP) is an inquiry-based programme. However there are many definitions and facets to inquiry, and many layers to the PYP. It can be hard to see their connections and relate them to the actual processes of learning. Therefore I investigated some of these aspects, and how they combine in PYP classrooms.

I looked at inquiry as a creative process; a community pursuit of new understanding by applying, adapting and recombining different concepts and skills. As such, the process requires and develops a set of powerful ways of thinking, the tools of inquiry. These tools are given meaning and purpose by the social and intellectual life of the class.

I first considered these tools of inquiry. As a cultural species, we have many tool systems to master. In didactic teaching, they form the core of traditional subject-based learning. In inquiry they are building blocks that will be integrated and used creatively to understand complex ideas. Some of these are physical tools, like pencils and computers. Others are psychological tools, a broad range of mental constructs and processes as diverse as addition, note taking, and the scientific process.

Children also learn to use a variety of languages and sign systems, such as the many different forms of English or Chinese; or the languages of various domains such as music, visual representation or mathematics. As they learn these tools, students acquire a range of component skills, overcome misconceptions, and learn the ways of thinking of different disciplines. As in didactic learning, much of this happens through processes of internalisation, in which social activities become part of students' individual mental functioning.

The greatest differences between inquiry learning and didactic teaching are not in the tools themselves, but in how the class functions as a community to develop and use these tools in the pursuit of new insights. Several social aspects are involved: the classroom community is underpinned by shared purposes and values; there are shared classroom routines and approaches; there are shared ways of talking that support the main purposes; the students have varied and changing roles and relationships. It is useful to think of these community aspects of learning as processes of transformation.

These elements together give a multi-dimensional model of inquiry that spans the life of the class, which develops into a Community of Inquiry at the beginning of the year, and develop as a community over the year. As a community, students and teachers explore complex areas, by applying tools from 'stand alone' units and