INQUIRING MINDS LEARN TO READ AND WRITE: PLANNING TO TEACH THROUGH AN INQUIRY APPROACH

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6Ms Teaching Heuristic

Process For Teaching Inquiry

1. Set up
    - MOTIVATE – with essential question and frontloading, personally connect students to content

2. Standards or goals
    - Meeting them through MULTIPLE MODALITIES and MEASURES

        - Articulate major learning goals, both conceptual (what) and strategic (how).
        - Provide multiple ways for learning and demonstrating learning of the standards/end goals/ enduring understandings through independent culminating projects

3. Sequence or scaffold for gradual release of responsibility by
    - MODEL – *for* – Teacher does/students watch
    - MENTOR – *with* – Teacher does/students help and students do together/teacher helps
    - MONITOR – *by* – Student does/Teacher assesses and helps as needed

Inquiry Sequence for Unit Planning

<table>
<tr><td colspan="2">Essential Question:
When designing essential questions, think about…
- Have I related the topic to students' past and present experiences?
- Does the topic relate to human issues and human well-being?
- How might I teach so that my students and I work together to build a community of practice?
- Have I made good use of disciplinary concepts used by practitioners?
How Might I explore the emotional, ethical, and human dimensions that relate to the topic?</td><td></td></tr>
<tr><td rowspan="2">Naming Conceptual and Procedural Knowledge
When identifying these skills, think about…
- Do these skills mirror what experts do in their discipline?</td><td>Procedural Knowledge</td><td>Conceptual Knowledge</td></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="2">Culminating activity
When designing a culminating project, think about…
- Where do I want the students to be at the end of the unit?
- Does the project allow students to demonstrate their conceptual and procedural understandings?
- Is it authentic by mirroring what "real experts" would do?
- Does it require intellectual quality?
- Does it consider differentiation? Are there different ways to complete the project?
- How does your culminating performance allow students to reach the mentioned standards?</td><td>Project Description</td></tr>
<tr><td colspan="2">Frontloading
When designing frontloading activities, think about…
- How does your activity activate and build the students' prior knowledge or background information regarding your unit inquiry?
- How does the activity work to motivate students</td><td></td></tr>
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for reading and inquiry regarding the theme? - How will the frontloading activity work to organize inquiry, set purposes, and consolidate learning about the theme throughout the unit, i.e., how will it help students set purposes for their reading, focus their learning, clarify what they are coming to know, and help them to monitor their learning progress?	

Sequencing Scaffolding Activities

When designing a scaffolding activity, think about …

- Does it allow students to explore the big ideas connected or relevant to the essential topic?

- Does it allow students to practice techniques required for disciplinary expertise in a variety of ways?
- Does it assist students to expand their conceptual and strategic repertoire?
- Does it provide for multiple entrance levels?
- Does it provide for multimodal learning?
- Does it provide for differentiation?
- Does it provide for student discovery and meaning making in a social setting?

Principles of Scaffolding

○ Close to home→ Far From Home ○ Current Knowledge→ Need to Know ○ Visual→ Written ○ Short→ Long	○ Easy→ Hard ○ Concrete→ Abstract ○ Directly Stated→ Implied ○ Supported→ Independent	○ Whole→ Part→ Whole ○ Learning→ Doing→ Reflecting ○ Model→ Mentor→ Monitor

Formative Assessments

When planning formative assessments within a unit, think about…

- What is the intent of the unit? What is the purpose of this activity?
- How will the students be showing me what they know?
- What will I be monitoring or looking for in the students' thinking?
- How will I track the assessment of my students?
- How will the students leave this activity thinking about something in a new way or changed in some way?
- How is this activity layered for all students' learning?
- How does this activity allow students to practice more than one thing at a time?
- How will students be demonstrating true understanding – the capacity to flexibly use, extend, transfer, and think about what has been learned?

Week 1:				
Activity/Strategy	**Texts & Resources**	**Procedural Knowledge**	**Conceptual Knowledge**	**Formative Assessment And CCSS**
Monday:				
Tuesday:				
Wednesday:				
Thursday:				
Friday:				
Week 2:				
Activity/Strategy	**Texts & Resources**	**Procedural Knowledge**	**Conceptual Knowledge**	**Formative Assessment And CCSS**
Monday:				
Tuesday:				
Wednesday:				
Thursday:				
Friday:				
Week 3:				

Conceptual and Procedural Knowledge

The Enduring Understanding:
The major takeaway that can be applied and transferred across situations both inside and outside the discipline

Conceptual: Exploring the big ideas

- What you want the students to know in terms of "declarative" nameable concepts?
- These should be articulations of big and generative disciplinary ideas.
- Big understanding goals: can be phrased as sub-questions of the inquiry, or as statements

Procedural: What you want the students to be able to do and perform

- Skills, tools, strategies, procedures for problem-solving and meaning construction.
- Can be phrased as objectives: "students will be able to . . ."

Example: What are the costs and benefits of whaling in this modern age?
Enduring Understanding: All flora and fauna in any ecosystem exist in a delicate balance that can easily be upset.

Conceptual	**Procedural**
• What are the global ramifications of whaling? • What the various points of views of whaling and how are these justified culturally? • What are the major points in arguments for and against whaling?	• Students will learn how to develop an argument using a clear claim, evidence/data from research and warranting of the data • Students will be able to express both practical and ethical dimensions of the issue in a variety of modalities

Example: How can freedom and security be balanced? **Enduring Understanding: Freedom is always balanced by other concerns and issues and must therefore be scrupulously protected.**	
• How can freedom be defined? • What different perspectives are there on freedom? • What are some of the constraints that communities and cultures place on freedom and why do they do so? • How do historical and cultural situations affect security policies?	• Students will evaluate the comprehensiveness and validity of evidence in an author's argument (DRTA) • Students will explain the author's point of view and interpret how this influences the text (and to do so, will use critical theory, questioning the author, questioning hierarchy)

Match your articulated goals to your curriculum outcomes.

How will meeting your unit goals prepare students:

- to do the discipline?
- to be active and engaged democratic citizens?
- to be problem-framers and solvers?

Frontloading Criteria Sheet

Please check your frontloading activity's quality by responding to the following questions, and having one of your group members also respond.

1. How does your activity activate or build the students' prior knowledge or background information regarding your unit theme?

2. How does the activity work to motivate students for reading and inquiry regarding the theme?

3. How will the frontloading activity work to organize inquiry, set purposes and consolidate learning about the theme throughout the unit, i.e. how will it help students set purposes for their reading, focus their learning, clarify what they are coming to know, and help them to monitor their learning progress?

Make sure you have justified your answers based on motivation and schema theory. If not, do so on the back of this sheet. Good luck!

Examples: Frontloading Activities

1. **Ranking Scenarios:**

What makes a good relationship and what screws them up?

Each of the following scenes describes a relationship. Read each scene and rank them from the scene that describes the best love relationship (1) to the scene that describes the worst love relationship (3). Make sure you can support your opinions. You'll be sharing them in groups and then with the whole class.

_____ 1. Joseph always felt uneasy at parties, especially parties that included people from Forest View. Forest View was Elk Grove's chief rival in every sport, and Joseph and his friends have been competing against kids from Forest View for as long as he could remember. And sometimes those competitions got pretty heated. So who could blame Joseph for saying his good-byes early. As he was headed out the door, however, Joseph caught a glimpse of Sara. Even all decked out in Forest View's colors, she was, Joseph thought, the most beautifully girl he had ever seen. Screwing up his courage, Joseph went over to say hello. And it wasn't long before he was involved in a friendly conversation with Sara and several of her friends. An hour flew by and Joseph really did have to go home. But he felt changed. Monday at school he confided to his best friend that he was in love, and with someone from Forest View on top of it. The kidding he got was intense; he and his best friend even got into a fight about it. But Joseph was sure. He couldn't wait to see her again. He spent all week searching to find a party that she might attend.

_____ 2. Mary and Martin have been next-door neighbors since the fifth grade and for seven years they've walked to school together. Since high school started, thought, once they got to school, they went their separate ways – Mary was an athlete and Martin a musician. But on that mile walk they shared a lot of talk about everyday events, hopes, dreams and heartbreaks. The senior prom was approaching and neither Mary nor Martin had a date. They decided to go together. It was funny, they broached the subject on the same day, and in fact, they couldn't figure out who asked whom. The prom was great; they laughed and danced and kidded with their friends. They didn't go on an after-prom trip though. They had decided that would make them seem too much like a couple, and they didn't want any uncomfortableness to interfere with their friendship. That night both of them thought that the prom was one of the best dates they had ever had. It was too bad that their "real" dates never went so well.

_____3. What a whirlwind of a romance, thought Amy. Ever since she had met Tom, things had been, well, fantastic. Nightly phone calls. Dinners at expensive restaurants. Gifts. She didn't mind that Tom insisted she spend all of her time with him. After all, her friends should understand, and if her grades slipped a bit, who cares? She'd always be able to get into some college. She had a bit of a twinge when he asked her not to go

out for the musical, but the dozen long-stem roses made that twinge fade. What a romance.

2. Autobiographical Writing Prompt

Most young people want to have dating relationships that are fun, exciting, and long lasting. First, describe a healthy, lasting dating relationship that you've been part of or that you've observed. What does a relationship need to be like in order to grow and last? Why do some relationships seem to work well? Be specific, and remember to write about real relationships that you yourself have experienced or watched. (from Brian White, 1995)

3.Opinionaire/Survey

Identify whether you agree (A) or disagree (D) with each statement. Then choose one statement that you feel particularly strongly about and write a brief comment about what in your experience of the world leads you to feel this way.

1. Love at first sight is possible.
2. Love means never having to say you are sorry.
3. It is better to have loved and lost than never to have loved at all.
4. You are never too young to fall in love.
5. You can't expect a person to change his or her habits after you enter into a relationship with them.
6. Love takes a lot of hard work.
7. Opposites attract.
8. If you are really in love, physical appearance doesn't matter.
9. Teenagers are capable of true love.
10. The hottest fires burn out fastest.
11. If you are really in love with someone, then you won't be attracted to someone else.
12. Love is blind.
13. If someone does not return your affection, the best thing to do is to keep trying to change his or her mind.
14. You have to work very hard at love.
15. Love is a decision that you make, not something that happens to you.

(original idea from Kahn, et al. *Writing About Literature*, 1984)

Procedural Frontloading Criteria

1. Frame the frontloading work as fun, interesting, relevant and usable – immediately, in terms of the unit work, and in the future. Make sure the connection to usability is made! **Combine with conceptual frontloading for a two-fer!**

2. Design an activity (or short series of activities) that will show the procedure in action and give students some introductory practice using the procedure.

   a. Make sure that this activity (or sequence of activities) provides you with preassessment feedback about what the students can and cannot yet do with the procedure.

3. Use the activity (or activities) to articulate and highlight the textual tip-offs that one must activate this procedure and the steps to use the procedure.

4. Plan to continue following up on this introductory frontloading until all students have mastered the basics of the procedure.

5. Make sure students know how the procedures will be used in their culminating project/final student composition.

Examples of Reading Processes:

General processes:

Asking general questions

Visualizing

Summarizing: Bringing Meaning Forward

Monitoring Understanding/self-correcting

Making Predictions

Making Simple Inferences

Reflecting on Meaning;
Consolidating knowledge to build Schema

Task-specific processes:

Seeing Complex Implied Relationships: Making inferences across a text or texts

Asking task specific questions

Processes of reading Symbolism

Processes of reading Irony

Text-Specific Processes

Reading /Writing:
Extended Definition
Argument
Classification
Satire
Fables
Dramatic Scripts

Cognitive Apprenticeship and Sequencing

Key pieces to instruction according to Collins, Brown and Newman

Note : Problem solving is the process students are engaged in while learning new strategies or concepts

1. **Content**
    a. Content = conceptual/factual knowledge in use during problem solving
    b. Heuristic strategies - rules of thumb that guide problem solving, gives students the intellectual tools needed
    c. control strategies - monitoring, evaluating, helping with decision making
    d. Learning strategies - strategies used in acquiring new information
    e. Genre/Text Based strategies - strategies required by particular kinds of text

2**. Method**
    a. Model - expert carries out task so students can observe the process
    b. Coach - feedback, hints, reminders, scaffolding
    c. Scaffold - supports --teacher carries out pieces of task that students cannot yet manage
    d. Articulation - name what students need to do and make it visible to them
    e. Reflection - compare own problem solving process to expert or other student
    f. Exploration - teacher fades, encourage student autonomy in problem solving and problem setting. Allow students to set questions and frame process.

3. **Sequence**
    a. Increasing complexity - control both task complexity and the amount of scaffolding/support for learning
    b. Increasing diversity - wider variety of strategies/skills integrated in different contexts
    c. Global <u>before</u> local (very different than traditional education, which says local before global)- see the whole, the value, the purpose **before** refining/honing each sub skill
    d. Teacher Involvement - models, scaffolds, coaches, then fades as students approach independence

4. **Sociology** - designed to motivate and "ground" learning
    a. Situated learning: give students opportunity to observe, engage in, invent or discover expert strategies in context:
        - see how strategies fit together with their conceptual knowledge
        - clear expectations and learning goals: skills seen in context of application to problem solving
        - skills used in an integrated way that shows their value and meaning within the culture

- application conditions: knowing when to use or not to use a skill

b. Culture of expert practice: See models of expertise-in-use.
    - benchmarks of progress helps students to identify their own strengths and weaknesses for improvements and see different ways of doing things
c. Intrinsic motivation: there is an integration of skill improvement and social reward in traditional apprenticeship:
    - students see advancing skill as increasing role/participation/social reward within a community
    - skills are seen as authentic and purposeful
d. Exploiting cooperation: use small groups to help see others doing a process
    - apprentices/students at different levels of expertise
e. Exploiting competition: get students to see the different <u>processes</u> students use to accomplish problem solving, not the <u>products</u>

Principles of Sequence through Activity with Materials

Provide extended practice in miniature to help students gain practical expert knowledge, especially through meaningful social activity.

- Easy to hard
- Immediate to Imagined
- Close to home- far from home
- Familiar to Unfamiliar
- Oral to Written
- Concrete to Abstract
- Visual, visually supported to Textual
- Short to Long, Directly stated to implied
- Scaffolded and Assisted Activity to More Independent
- Collaborative and Socially Supported to Individual

Move students to independence

Principles of Sequence across Types/Genres

1. •By complexity
2. •By type
3. •Within type

1. Sequence by complexity: Autobiographical writing
   Autobiographical account of discrete experience
   Themed autobiography
   Memoir

Or

Narratives of education/pedagogical narratives/Bildungsromanen
   Fable
   Hero-quest
   Coming of age story

2. Sequence by type
   What kids will write is determined by how you frame the inquiry, e.g. for Romeo and Juliet
   - Arguments of judgment: What makes and breaks relationships?
   - Arguments of extended definition: What is a good relationship?
   - Arguments of policy: What can families/communities/society do to promote good relationships?
   - Arguments of analysis: How did Shakespeare construct Romeo and Juliet to compare and contrast various threats to relationships?

3. Sequence by complexity within type
    Students likely to know evidence already
    Students draw on single text
    Students draw on range of secondary sources
    Students draw on range of primary sources
    Students generate new data through inquiry

Make sure students develop heuristics

What is a “heuristic”? A simple transportable thinking tool

Examples:

- the 5 W’s + H in journalistic writing
- the four kinds of knowledge
- five themes of flow that foster engagement
- what makes you say so- so what? (Toulmin’s notion of argument)
- If anything is odd, it’s probably important (in a literary text)

Sequencing and Layering

In sequencing and layering aunit, teachers are:

- ✓ Moving students from where they are to where they need to be
- ✓ Moving students from their current state of being and understanding to a new level of understanding
- ✓ Moving students from Essential Question to Culminating Project
- ✓ Moving from teacher gradual release of responsibility to student independence: demonstrating their understanding in multiple ways
- ✓ Tracking ways to document student development throughout the unit

Students need time to practice, reflect and inquire into the conceptual and procedural knowledge of the unit through a variety of activities and reflections with formative assessment.

When introducing new procedural knowledge, move from

- Teacher Models
- Class and Teacher work together
- Small group activity
- Individual activity

Activities should be layered and differentiated to meet all students' needs.

- Provide opportunities to meet student needs through teacher guided choices and student choices
  - R.A.F.T.
  - Choice centers
  - Think tac toe
  - Flexible student groupings
  - Differentiated cube responses for literacy and/or group discussions
- Activity centers
- Workshop opportunities
- Flexible groupings
- Activities should allow for students to grow in their intellectual thinking by covering all multiple intelligences as well as DaBono's thinking "hats"
  - Cube (color coded for levels)
  - Literacy cards with different levels of thinking questions
  - Cue card responses
  - 3 level questioning

- Opportunities for reflection through
    - Boxing
    - Dialogue journals
    - Dialogue threads
    - Metacognition stems

Planning Documentation/Formative Assessments/Teacher Research within the Unit

- Use of documents to track students thinking and make their learning visible
- How will students track their own project naming?
- Ways to name the conceptual and procedural learning
- Align skills and concepts with standards
- Use of formative documentation throughout

Main Idea Heuristic

(achieved through an assignment sequence)

1. **Identify The Topic (or General Subject) of the Piece:**

   To find clues to topic:

   a) Look at the title
   b) Look at the first and last paragraph: the topic is often named and always implied
   c) Ask yourself: What is discussed through the whole selection? What general subject spreads across the whole text?
   d) Look at captions, pictures, words in bold, headings, and so forth for clues to topic. What do all of these have in common? What do they all have something to do with?
   e) Remind yourself: The topic must connect to all the major details and events from the selection. Caution: not every detail has something to do with the topic. The topic is the common element or connection amongst the major details.
   f) What do all the major details have in common?

   Check Yourself: **It's not a true topic if . . .**

   a) it's too general or too big (The topic statement suggests or could include many ideas not stated in the text).
   b) It's off the mark, totally missing the point
   c) It only captures one detail, rather than all of the key details
   d) It captures only some of the details, for example, maybe you didn't think about the ending, or the climax, or a shift or major change of some kind.

   Questions to ask yourself:

   a) Does the topic I've identified give an accurate picture of what the whole selection is about?
   b) Was I as specific as possible in accommodating all of the key details?
   c) After naming the topic, can I now fairly specifically picture in my mind what happened or was communicated in the text? Or might I picture something radically different that also fits my topic statement? If so, how can I revise my topic statement to correct this problem?

2. **Identify The Key Details or Events and the Pattern and Trajectory These Create by Working Together.**

   Authors often plant important ideas in rules of notice, for example:

   a) Details that reflect or refer to the title
   b) Details at the beginning of the text/ or front and center of the picture
   c) Details at the end
   d) Surprises, revelations, whenever your expectations are not met
   e) Repetition

f) Lots of attention given to a detail, for instance, long explanation or description
g) Subheads, bold, italics
h) Single sentence paragraphs
i) Changes in character, tone, mood, setting, plot twists
j) A question near the beginning or the end

Check Yourself: **It's not a key detail if . . .**

a) It's interesting, but it doesn't develop the topic/lead to the central focus
b) It reminds use of something is even personally important, but if you were to remove it from the piece, the work would not lose any significant meaning or impact

Questions to ask yourself:

a) Are all the details related to the topic?
b) How do the key details relate to each other?
c) What pattern do the details make when they are added together?
d) What point does this pattern add up to and imply?
e) What can we extrapolate or interpolate from the pattern?

3. **Identify the Main Idea** (the theme of point the author makes about the topic)

a) the statement of main idea you name must make a point about the topic and cover the whole selection
b) Ask yourself: Is the main idea directly stated? If not, it must be inferred from the pattern and relationship of the key details
c) Which details help me decide on the main idea? Why are these details important?
d) The central focus considers how the details relate to one another or lead to one another (what caused or correlated or led to what?)
e) The main ideas must consider the ending and how the details, character, setting, perspectives, interactions of these and events led to this conclusion.

Check Yourself: **It's not a main idea if . . .**

a) It is so literal and specific it doesn't allow the reader to apply the main idea to his own life
b) It is too general – more like a topic statement than a main idea or point
c) It is true but misses the point of this text. It wasn't what the author was saying through this combination of these details
d) It misses the point
e) It only fits one detail, event, or part of the story, not the coherent whole
f) It does not incorporate all the details, but only a few
g) It doesn't fit the ending or final situation

Questions to ask yourself:

a) What point do the key details repeat and add up to when taken all together?
b) Is the main idea or point a statement about the topic?
c) Is it something useful that can help you to think or act in the world?
d) Also consider: Do you agree with the statement as applied to life? Will you use this idea to undertake action in the world or to think about the world? Why or why not?

Picture Mapping Directions

•Identify the topic of your reading - symbolize the topic with a visual (no words allowed!)
•As you read, mark or list each key idea about the topic
•Symbolize each key idea with a picture or a symbol - do this as simply as you can!
•Show the relationships and the patterns of the key details
•Show the central focus and/or implied actions that follow from this trajectory of these details

"Republic of Cockroaches" by David Quammen, "Who Will Survive?" unit
When the Ultimate Exterminator meets the Ultimate Pest *Natural Acts*

In the fifth chapter of Mathew's gospel, Christ is quoted as saying that the meek shall inherit the earth, but lately, other opinions suggest that it will more likely go to the COCKROACHES.

A decidedly ugly prospect: That our dear planet – after the final close of all human beings – ravaged and overrun by great multitudes of cockroaches, plagues of them, scuttering herds shoulder to shoulder like the old herds of bison. Legions of cockroaches will sweep over the prairies like driver ants. This, unfortunately, is not the fantasy of a pessimist. It is the touch of hard, cold science.

The cockroach is a popular test subject for laboratory research. It adapts well to captivity, lives a long life, reproduces quickly, and will survive in full vigor on Purina Dog Chow. The largest American species is about two inches long. Here is an animal of frugal habits, tenacious of life, eager to live in laboratories and requires very modest space. Tenacious of life, indeed! Not only in kitchen cupboards, in dark corners of the basement, the average cockroach is a hard beast to kill.

Survival. The cockroach is roughly 250 million years old, which makes it the oldest of living insects, possibly even the oldest known air-breathing animal. Think of it this way: Long before the first primitive mammal appeared on earth, before the first bird, before

the first pine tree, before the first reptile, the cockroaches were running wild. They can live almost anywhere and eat almost anything.

Unlike most insects, they have mouthparts that enable them to take hard foods, soft, and liquids. They tend to eat anything; however, cucumbers disagree with them.

They are flattened enough to squeeze into the narrowest hiding place. They are quick on their feet, and can fly if they need to. But the real reason for their long continued success and their excellent prospects for the future is this: They have never specialized.

If there was ever to be a nuclear war, probably the cockroaches would prevail. The lethal dose for animals in a pasture is 180 rads (gamma radiation). For horses it is 350 rads. Water is a shield for radiation, so the lethal dose for fish is from 1100 rads to 5600. The dose for humans is not known (no one has been tested to date), but around 600 is the guess.

Cockroaches who were exposed to 830 rads lived to be a ripe old age. A large test group was blasted with about 10,000 rads and HALF the group was alive two weeks later. They don't know exactly how long the second half lasted, but long enough for egg capsules to be delivered, hatch and the life cycle to continue on. With luck maybe this won't happen.

What do you suppose the common cockroach thinks of a can of RAID?

Resources

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