The Guide to Questioning, Synthesis and Assessment

MINING FOR MEANING
Questions are at the heart of inquiry. The natural curiosity that generates them drives wonder, engagement, and deep, authentic learning.

Questions uncover meaning, connections, evidence and purpose. Questions are the catalyst for synthesis and understanding.

Depth  Rigor  Relevance
Inquiry Meets the Common Core
Questioning and the Common Core

Rationale: Inquiry ignites the Common Core. At the heart of all inquiry is questioning. Deep questions, authentic questions, student generated questions, critical analysis, and essential questions initiate and sustain inquiry.

- Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

- Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

- Develop factual, interpretive, and evaluative questions for further exploration of the topic(s).

- Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

- Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

- To be ready for college, workforce training, and life in a technological society, students need the ability to gather, comprehend, evaluate, synthesize, and report on information and ideas, to conduct original research in order to answer questions or solve problems, and to analyze and create a high volume and extensive range of print and non-print texts in media forms old and new.

- Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

- Pose questions that connect the ideas of several speakers and respond to others’ questions and comments with relevant evidence, observations, and ideas.

- Probe and reflect on ideas under discussion. Delineate a speaker’s argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.

- Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.
Questions are:
- prerequisites to learning
- a window into creativity and insight,
- a catalyst for fresh thinking and a challenge to outdated assumptions.

<table>
<thead>
<tr>
<th>Cognition</th>
<th>Products</th>
<th>Affect</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facts</td>
<td>Short term recall</td>
<td>Disengaged</td>
<td>Who, What, Where, When</td>
</tr>
<tr>
<td></td>
<td>Inert ideas</td>
<td>Bureaucratic tasking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inflexible knowledge</td>
<td>Compliant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>One right answer</td>
<td>No meaning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NO TRANSFER</td>
<td>No connections</td>
<td></td>
</tr>
<tr>
<td>Explanation</td>
<td>Restating Information,</td>
<td>Task oriented</td>
<td>Which, What’s different,</td>
</tr>
<tr>
<td></td>
<td>Related facts</td>
<td>With sense of relationships</td>
<td>What’s the same, Can you</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or organization</td>
<td>define, What is the main</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Retelling</td>
<td>idea</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Original conclusions</td>
<td>Engaged Active learner</td>
<td>Why, How, So what, Should,</td>
</tr>
<tr>
<td></td>
<td>Analysis of complex texts</td>
<td>Negotiating questions,</td>
<td>What if</td>
</tr>
<tr>
<td></td>
<td>Integrate information</td>
<td>Process products,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Draw evidence</td>
<td>Meaning constructed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstrate understanding</td>
<td>Authentic intellectual work</td>
<td></td>
</tr>
</tbody>
</table>

Moving from Rote to Inquiry
Teacher Questions

- **FACT Questions** - one right answer
- **Closed questions** - correct or incorrect, yes or no
- **Open questions** - defend, explain position
- **Follow up questions** - clarification, limitless ideas, stir debate
- **Feedback questions** - focused, critical, redirect, stimulates reflection
- **Elaborate, hypothetical questions** - extend, WHAT IF, could, should
- **Essential questions** - probing, challenging, broad, enduring, encompassing the moral of the story, core of a content discipline, arguable, overarching, challenging, draw learners into the discipline

- **Powerful questions**: motivate fresh thinking, generate curiosity, stimulate thinking and conversation, surface and challenge assumptions, focus inquiry, invite creativity, generate energy for exploration

### Sample Questions

- What food groups did you eat today?
- What food groups are most important to health?
- Does this animal breathe air?
- Where does light come from?
- Why did Ahab chase Moby Dick?
- Should you modify your breakfast for more nutritional value?
- How does this animal breathe air?
- Why do we need light?
- How does the journey impact the destination?
- How did the sacrifices and convictions of individuals in the Civil War preserve the union?
- Why was Columbus a villain or hero?
- Should medical technology progress without ethical and moral considerations?
- How is man the measure of all things in the Renaissance?
# Socratic Questions

The Socratic Questioning technique is an effective way to explore ideas in depth. By *questioning*, teachers promote independent thinking and student ownership. Higher-level thinking skills are present while students think, discuss, debate, evaluate, and analyze.

**Intel – “Socratic Questioning Technique”**

<table>
<thead>
<tr>
<th>Conceptual Clarification</th>
<th>Questions about questions</th>
<th>Probing assumptions</th>
<th>Implication or Consequence questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>· What do you mean by...?</td>
<td>· Why is this question important?</td>
<td>· Why would someone make this assumption?</td>
<td>· What affect would that have?</td>
</tr>
<tr>
<td>· Could you put that another way?</td>
<td>· Is this question easy or difficult to answer</td>
<td>· What is assuming here?</td>
<td>· Could that really happen or probably happen?</td>
</tr>
<tr>
<td>· What do you think is the main issue?</td>
<td>· Why do you think that?</td>
<td>· What could we issue instead?</td>
<td>· What is an alternative?</td>
</tr>
<tr>
<td>· Could you give us an example?</td>
<td>· What assumptions can we make based on this question?</td>
<td>· You seem to be assuming ________.</td>
<td>· What are you implying by that?</td>
</tr>
<tr>
<td>· Could you expand upon that point further?</td>
<td>· Does this question lead to other important issues and questions?</td>
<td>· Do I understand you correctly?</td>
<td>· If that happened, what else would happen as a result? Why?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Probing evidence, rationale, reasons</th>
<th>Viewpoint or Perspective Questions</th>
<th>Origin/Souse Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>· What would be an example?</td>
<td>· How would other groups of people respond to this question? Why?</td>
<td>· Is this your idea or did you hear it from some place else?</td>
</tr>
<tr>
<td>· Why do you think this is true?</td>
<td>· How could you answer the objections ______ would make?</td>
<td>· Have you always felt this way?</td>
</tr>
<tr>
<td>· What other information do we need?</td>
<td>· What might someone should believed ______ think?</td>
<td>· Has your opinion been influenced by something or someone?</td>
</tr>
<tr>
<td>· Could you explain your reason to us?</td>
<td>· What is an alternative?</td>
<td>· Where did you get that idea?</td>
</tr>
<tr>
<td>· By what reasoning did you come to that conclusion?</td>
<td>· How are ______ and ______’s ideas alike? Different?</td>
<td></td>
</tr>
</tbody>
</table>
**Student Generated Questions**

“Without questions the inquiry cycle stops and learning regresses into read and recite, without testing for relevance and meaning.” - Daniel Callison

<table>
<thead>
<tr>
<th>RED Light Questions</th>
<th>GREEN Light Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question leads to one answer</td>
<td>Question leads to more information</td>
</tr>
<tr>
<td>Question leads to yes or no</td>
<td>You ask WHY, HOW, WHICH, WHAT IF</td>
</tr>
<tr>
<td>Questions keeps you from thinking about more ideas</td>
<td>Question makes you investigate further, think, decide, validate the thinking about more ideas</td>
</tr>
<tr>
<td>You already know the answer, or answer is rote</td>
<td>Question inspires ideas, new questions, new directions for researcher answer is rote</td>
</tr>
<tr>
<td>Question is too broad or narrow</td>
<td>Question draws a personal response</td>
</tr>
<tr>
<td>Question is not interesting</td>
<td>Question leads to connections</td>
</tr>
<tr>
<td>Question requires lists or collections of facts</td>
<td>Question requires analysis, application of information, conclusions</td>
</tr>
<tr>
<td>Question STOPS with answer</td>
<td>Question makes you curious, engaged</td>
</tr>
</tbody>
</table>

**Golden Research Questions Need to be:**
NARROW and SPECIFIC, DEEP enough for multiple sources, COMPLEX enough for multiple points of view, BALANCED between fact and interpretation, STRUCTURED around different levels of questions including HOW, WHY, WHAT IF, SHOULD, and VARIED enough to address the richness of points of view, solutions, causes.

- New York City Information Skills Benchmarks
Thinking and the Common-Core Sampler

- Respond thoughtfully to diverse perspectives; **synthesize comments**, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to **deepen the investigation** or complete the task.

- Develop personal, cultural, textual, and thematic **connections** within and across genres as they respond to texts through written, digital, and oral presentations, employing a variety of media and genres.

- Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).

- Analyze a case in which two or more texts provide **conflicting information** on the same topic and identify where the texts disagree on matters of fact or interpretation. Use experience and knowledge of language and logic, as well as culture, to **think analytically**, **address problems creatively**, and advocate persuasively.

http://www.corestandards.org

---

### Thinking on a Continuum

<table>
<thead>
<tr>
<th>OBVIOUS, scratches the surface, just uses what is given</th>
<th>Probes beyond the given, stretches for new connections, question, applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuzzy, rambling, unfocused, loses main ideas or purpose</td>
<td>Clear and focused, structured, clear purpose, tied to main ideas, organized</td>
</tr>
<tr>
<td>Simplistic, no detail or nuance, broad, general, simplified</td>
<td>Elaborated, richly detailed, imaginative, descriptive</td>
</tr>
<tr>
<td>One-dimensional, sees no complexity, layers, or viewpoints</td>
<td>Multi-dimensional, recognizes complexity, levels, perspectives or viewpoints</td>
</tr>
<tr>
<td>Restricted, avoids big ideas or hard questions, biased, resistant</td>
<td>Generative, expands, extends, broadens, opens up new lines of inquiry, curious, openbiased, resistant</td>
</tr>
<tr>
<td>Tangential, strays from important, central ideas for trivia</td>
<td>Essence-capturing, insightful, sees deep structure</td>
</tr>
</tbody>
</table>

---

http://www.pzharvard.edu/at
Questions are the product of natural curiosity

Teachers need to yield the monopoly on the right to

Learners need to be encouraged to ask questions, to wonder, and to generate new questions as inquiry proceeds.

Student centered teaching depends on questions, as does the authentic construction of meaning from text.

-Daniel Callison

Questions and INQUIRY

Inquiry is not so much seeking the right answer—because often there is none. Rather it is students seeking appropriate resolutions to the questions and issues.

-www.thirteen.org

Inquiry should be motivated by questions which have real world purpose and meaning to the child.

Excellent Questions...

- Are open-ended
- Have more than one word answer
- Have more than one answer
- Show effort and deep research
- Lead to multiple perspectives
- Lead to debate
- Are interesting, not obvious
- Lead to more questions and thinking

-CTAP Region IV

Essential Questions

- Probe a matter of considerable importance
- Move a learner from understanding to action
- Are global and abstract
- Go to the heart of what is important to learn and understand
- Lead to enduring truths after the facts have been forgotten
- Endure, shift, lead to larger questions
- Can not be answered completely or in few words
- Maintain interest despite mystery
- Lead to other questions
- Are asked over and over in the course of inquiry

-Harada and McKenzie
The Guide to Synthesis
An Information Knowledge Journey

Common Core

“Synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.”

“Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.”

“Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.”

INQUIRY Meets the Common Core

- Use facts to build meaning
- Connect ideas and information
- Think analytically, advocate persuasively
- Draw original conclusions
- Use vocabulary of the content knowingly
- Create products that convey new understanding

ISTE/AASL

Critical Thinking, Problem Solving, and Decision Making
Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions. Students...
- identify and define authentic problems and significant questions for investigation.
- plan and manage activities to develop a solution or complete a project.
- collect and analyze data to identify solutions and/or make informed decisions.
- use multiple processes and diverse perspectives to explore alternative solutions.

Research and Information Fluency
Students apply digital tools to gather, evaluate, and use information. Students...
- plan strategies to guide inquiry.
- locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
- process data and report results.
Synthesis Boot Camp

Understanding is being able to “teach it, use it, prove it, connect it, explain it, defend it, [and] read between the lines.” - Wiggins and McTighe

What is synthesis?

- Students culminate their comprehension, application and analysis
- Student creates a knowledge product that exceeds and transforms the materials used
- Students fuse separate elements to form a coherent whole
- Students combine opposing and reinforcing ideas to make a new higher level of meaning
- Students combine elements or parts to constitute a pattern not seen before
- Student uses text to construct meaning
- Students exhibit creativity
- Students product is not just summary, paraphrase, or abstract
- Students extract inferences that links what is found in logical, meaningful pattern
- Students generate unique communication
- Student product is an analysis of information, facts, opinions, emotions, perceptions
- Students answer the questions - What is most important? What is my conclusion?
- Thesis is a strong statement that can be proven with evidence
- Thesis or research question is a product of critical thinking after some research
- Angle or point of view needed to present conclusions

Daniel Callison, Leslie Preddy
- The Blue Book on Information Age Inquiry, Instruction and Literacy

Barbara Stripling et al-
- New York City Information Fluency Continuum
Getting to gold: Student guide to synthesis

DIG
- Find, read, and think about multiple, related informational texts
- Uncover the BIG PICTURE, gaps, conflicts, pros, cons

THINK
- Make sense of new, special, complex vocabulary
- Evaluate the quality of information and select the best
- Sort out different perspectives
- Determine fact and opinion
- Think critically to see relationships, logic, strongest arguments
- Begin to cluster related ideas, arguments, solutions
- Find and use details and pieces of evidence
- Sort out the best evidence and details
- Analyze information, facts, emotions, and perceptions
- Pull out BIG IDEAS, central argument, important issue

CONNECT
- Find relationships and connections among ideas, details
- Find logical, meaningful pattern in texts
- Cluster evidence and important arguments into categories
- Cluster ideas with similarities and differences and categorize
- Combine ideas in a new, original way
- Tie key solutions, arguments, and main ideas to a thesis
- Analyze related assumptions, points of view
- Combine ideas to make a new, original whole

CONCLUDE
- Decide on the central, essential issue, argument, idea
- State what is most important
- Present conclusions with a point of view
- Use complex vocabulary with understanding
- Decide on most relevant, useful evidence, detail
- Organize/sequence relevant BIG IDEAS with related detail
- Considering facts, data, evidence, draw a conclusion
- Cogently state conclusions with depth and meaning
- Go beyond paraphrasing, summarizing, and restating
- Unify elements in a new pattern proposing alternatives
From: Bloom's Taxonomy Synthesis Level - [http://www1.centerk12.mo.us](http://www1.centerk12.mo.us)

**Start with**
- ambiguities
- challenges
- confusions
- dilemmas
- discrepancies
- doubt
- obstacles
- paradoxes
- problems
- puzzles
- questions
- uncertainties

**Required thinking**
- complex analysis
- creative thinking
- critical thinking
- decision making
- evaluation
- logical thinking
- metacognitive thinking
- problem solving
- reflective thinking
- scientific experimentation
- scientific inquiry
- synthesis
- systems analysis

**Products Generated**
- arguments
- compositions
- conclusions
- confirmations
- decisions
- discoveries
- estimates
- explanations
- hypotheses
- insights
- inventions
- judgments
- performances
- plans
- predictions
- priorities
- probabilities
- problems
- products
- solutions
- representations
- resolutions
- results
- solutions

---

**Common Core:** Production and sharing of knowledge products
**Common Core:** Types of Text: Narratives, Expository, Arguments
**Common Core:** Integration of knowledge and ideas
**Common Core:** Respond to varying demands of audience, task, purpose, and discipline
**Common Core:** Collaboration and Communication

From: Higher Order Thinking Skills Definition, Teaching Strategies, Assessment by King, Goodson, Rohani Center for the Advancement of Learning and Assessment
Students

The Information to Knowledge Journey - How Do You Know When You Have Arrived?

- Move beyond gathered facts, stockpiles, disconnected surface grasp of details
- Students move beyond a superficial sense of relationships between facts
- Reach meaningful, original conclusions
- Organize coherently reflecting a sense of how ideas relate to each other
- Use their mind to transform text, not simply transfer text
- Use content vocabulary in knowledge products and writing demonstrating understanding
- Address discrepancies, reconcile conflicts, explore oppositional ideas
- Synthesize multiple perspectives and texts to build evidence
- Reach meaningful, original conclusions
- Treat a subject area creatively
- Organize coherently reflecting a sense of how ideas relate to each other
- Establish personal conclusions using found information
- Have a strong awareness of information quality
- Condense sets of facts into fewer but more abstract statements
- Exhibit interest, motivation, empathy, self-knowledge
- Engage in critical analysis and communication
- Develop arguments, viewpoints, positions
- Use evidence, data, arguments that are appropriate
- Provide evidence of deep questions
- Use technology tools effectively to communicate new knowledge
- Students own the process
- Move from description to detailed explanation
- Increase specificity of topic focus
- Can give personal estimate of how much is known
- Integrate and unify ideas
- Develop ideas with structural centrality and unity

- Mary Ratzer based on the research and writing of Ross Todd

Learner makes sense of information by clarifying main and supporting ideas.
- At first ideas are discrete, unrelated
- Then some limited structure, meaning, some grouping of ideas, some not

Learner looks for patterns and connects ideas across resources.
- Contiguous ideas are associated, somewhat continuous
- Overall ideas are interrelated

Learner organizes information by using a variety of tools and strategies.
- Ideas are integrated and unified, with structural centrality, and overall unity.
- Depth and breadth of understanding in evidence

Learner compares new ideas to prior knowledge and reflects on new understandings, draws conclusions by integrating new ideas with prior knowledge.
- Able to engage in intellectual exploration
- Can think deeply about ideas
- Engage in higher order, flexible thinking, analysis, synthesis, creative thinking
- Able to reason with evidence, relevant, connected knowledge
- Able to use complex language of a discipline, discuss substantively

Learner discusses, collaborates, and negotiates meaning with others.
Synthesis Strategies in Action, Constructing New Knowledge

- Drawing conclusions or generalizing from facts, making inferences
- Supporting conclusions with evidence
- Drawing conclusions from looking at multiple perspectives
- Examples, quotes, data, textual references to support claims
- Explanation or analysis of evidence
- Extending thinking to create new ideas from old ones

Use these verbs to prompt SYNTHESIS!

<table>
<thead>
<tr>
<th>Create</th>
<th>Invent</th>
<th>Compose</th>
<th>Predict</th>
<th>Organize</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>Construct</td>
<td>Design</td>
<td>Modify</td>
<td>Imagine</td>
</tr>
<tr>
<td>Elaborate</td>
<td>Combine</td>
<td>Original</td>
<td>Change</td>
<td>Adopt</td>
</tr>
<tr>
<td>Suppose</td>
<td>Improve</td>
<td>Produce</td>
<td>Set up</td>
<td>What if...</td>
</tr>
</tbody>
</table>
**Questions for Synthesis:**
Digging Deep into Information and Mining for Meaning

<table>
<thead>
<tr>
<th>Analyze information for:</th>
<th>Ask questions as you read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Cause and effect</td>
<td>· How is this organized?</td>
</tr>
<tr>
<td>· Conclusions</td>
<td>· Can I map or outline this?</td>
</tr>
<tr>
<td>· Categories</td>
<td>· Do I agree or disagree?</td>
</tr>
<tr>
<td>· Relationships</td>
<td>· What supports this point?</td>
</tr>
<tr>
<td>· Patterns</td>
<td>· What evidence is needed to prove this?</td>
</tr>
<tr>
<td>· Hierarchies</td>
<td>· Who would disagree with this?</td>
</tr>
<tr>
<td>· Relevance</td>
<td>· What information is needed to proceed?</td>
</tr>
<tr>
<td>· Irrelevance</td>
<td>· What is the point of view?</td>
</tr>
<tr>
<td>· Value</td>
<td>· How does this relate to other facts, data, or evidence I have?</td>
</tr>
<tr>
<td>· Comparisons</td>
<td>· How important is this?</td>
</tr>
<tr>
<td>· Contrasts</td>
<td></td>
</tr>
<tr>
<td>· Key concept</td>
<td></td>
</tr>
<tr>
<td>· Bias</td>
<td></td>
</tr>
</tbody>
</table>
The Guide to Assessment

<table>
<thead>
<tr>
<th>Diagnostic</th>
<th>Formative</th>
<th>Summative</th>
</tr>
</thead>
<tbody>
<tr>
<td>To inform instruction</td>
<td>To inform learning</td>
<td>To measure knowledge</td>
</tr>
<tr>
<td>Measures pre-existing knowledge and skills</td>
<td>Guides teacher decision making and improves instruction</td>
<td>Gauges progress, mastery of content and skills</td>
</tr>
<tr>
<td>Occurs early in the teaching cycle, and during it</td>
<td>Tools to generate ongoing evidence of understanding</td>
<td>Evaluates effectiveness of instruction, innovates</td>
</tr>
<tr>
<td>Determines specific learning needs in relation to expectations</td>
<td>Can help learner self-assess</td>
<td>Learners demonstrate knowledge in many ways</td>
</tr>
</tbody>
</table>

Teaching to the Test focuses on the recall of surface information vs. deep, flexible content mastery.

“The act of teaching to the test limits the teacher’s ability to use multiple creative teaching methods based on their students’ needs (Riffert, 2005) and creates an atmosphere of learning facts and material without any real emphasis on student understanding beyond the ability to answer test questions correctly (Posner, 2004).
**Authentic Assessment Defined**

A form of assessment in which students are asked to perform real-world tasks that demonstrate meaningful application of essential knowledge and skills - **Jon Mueller**

"...Engaging and worthy problems or questions of importance, in which students must use knowledge to fashion performances effectively and creatively. The tasks are either replicas of or analogous to the kinds of problems faced by adult citizens and consumers or professionals in the field." - **Grant Wiggins** (Wiggins, 1993, p. 229).

Based on performance and reality, authentic assessment allows for learner specific evaluation, self-assessment, measures meaningful and valid tasks, is criterion referenced, and is implemented with a wide variety of tools. - **University of Alberta**

**How do I design AUTHENTIC ASSESSMENT? Do I have the tools?**
Survey the learning landscape - Assess before teaching to plan instruction and the learning process.
- Captures prior knowledge and skills with evidence
- Brainstorming, discussing, mind mapping, concept mapping
- KWL Chart
- Think Pair Share, Peer questioning
- Charting or lists for categorizing
- Shared observations, student questions, ideas
- Words walls with subject focus
- Anticipation guide, graphic organizers
- Misconception, assumption analysis

Uncover - How are students progressing? How should I adjust my teaching? Are target skills evident?
- Student answers the questions - “Am I getting it? How am I doing?” Self-management!
- Student plans research, makes strategic decisions based on criteria and feedback
- Infused throughout the learning continuum
- Foster reviews from peers, teacher conferencing

Discover - Student demonstrates understanding and skill to capture and report achievement.
- Student constructs a tangible, substantial product by analyzing, evaluating and synthesizing
- New knowledge emerges as student engages with quality texts in multiple formats
- Evidence from texts supports strong arguments, original conclusions
- Student demonstrates meaningful answers to important questions
<table>
<thead>
<tr>
<th>TEACHER-Led Formative Assessment</th>
<th>LEARNER-Led Formative Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback on drafts, observation</td>
<td>Questioning - Generating questions, inquiry framework questions, Question stems, Question Webs</td>
</tr>
<tr>
<td>Exit cards, approval stages</td>
<td>Organizing - Visualization, concept map, simplified outline, goal setting, project plans, donuts, notes TARGET</td>
</tr>
<tr>
<td>Observation checklist/rubrics</td>
<td>Sharing - Reciprocal teaching, think aloud, THINK PAIR SHARE, learning communities, group assessment</td>
</tr>
<tr>
<td>Consultation, informal interview, conference agenda</td>
<td>Challenging - Peer review and feedback, Why, What else, Who says questions, HERE'S What, So What, Now What?</td>
</tr>
<tr>
<td>Benchmarks check</td>
<td>Evaluating - Rubric, checklist, Rating Scale</td>
</tr>
<tr>
<td>Interactive research journal, wiki</td>
<td>Internalizing - Assimilating process skills, thinking skills, transparent thinking, summaries, topic sentences</td>
</tr>
</tbody>
</table>

Based on the work of Barbara Stripling
AASL Assessment Mini-Conference 2009
**Summative**

Assessing Knowledge Products and Performance in the 21st Century

<table>
<thead>
<tr>
<th>Conduct an original experiment</th>
<th>Video, Multimedia and Photo Journals</th>
<th>Reenactment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Student-led conferences</td>
<td>Public Service Announcement</td>
</tr>
<tr>
<td></td>
<td>Models, exhibits, prototypes, blueprints</td>
<td>Newscasts</td>
</tr>
<tr>
<td>Perform an original skit, dance, role play</td>
<td>Letters, diaries, community publication</td>
<td>Musical composition</td>
</tr>
<tr>
<td>Presentation, iMovie, Voice Thread, Debate, Talk Show, Speech, Interview</td>
<td>Narratives, scripts, poetry, digital story telling</td>
<td>Media sharing</td>
</tr>
<tr>
<td></td>
<td>Cartoons, comics, murals, infographic</td>
<td>E-portfolio</td>
</tr>
<tr>
<td></td>
<td>Debate, mock trial, speeches</td>
<td>Podcast</td>
</tr>
<tr>
<td></td>
<td>Argument, persuasive proposal with evidence</td>
<td>Forum, Desk Top Sharing</td>
</tr>
<tr>
<td></td>
<td>Teaching or mentoring</td>
<td>Voice Thread, Crazy Talk</td>
</tr>
<tr>
<td></td>
<td>Vlog, Blog, Website, Prezi</td>
<td>Photostory, Animoto</td>
</tr>
</tbody>
</table>

ISTE-Educational technology standards are the roadmap to teaching effectively and growing professionally in an increasingly digital world. Technology literacy is a crucial component of modern society. In fact, the globalizing economy and technological advances continue to place a premium on a highly skilled labor force.
Graphic Organizers for Formative Assessment

New York City Information Fluency Continuum Benchmarks and Assessments

- Prior Knowledge, Learning Goals
- Selecting, Creating Research Questions, Focus Questions
- Note taking, Reflective Note taking
- Organizing thinking, concept mapping
- Making Inferences from Facts
- Sorting, analyzing facts, arguments, ideas, details
- Using Facts, Evidence, and Perspectives to Draw Conclusions
- Constructing Arguments with Evidence
- Self-Assessment

In 1998, Black and Wiliam reviewed 21 research studies and about 580 articles or chapters on the impact of formative assessment on student achievement. They found that “innovations that include strengthening the practice of formative assessment produce significant and often substantial learning gains,” which exceed the impact of most educational interventions. Stiggins (2004) confirmed this conclusion by concluding that effective classroom assessment comparable to the results of one-on-one tutoring.

There are many useful, web based formative assessments...
http://www.nhcs.k12.nc.us/instruction/ssflpe/honors/graphic_organizers.htm
http://www.eduplace.com/graphicorganizer/index.jsp
http://school.discoveryeducation.com/schrockguide/assess.html
http://www97.intel.com/my/AssessingProjects/AssessmentStrategies/
Assessing Teaching Practice, Inquiry Planning, Unit Plans

- Determined and communicated learning goals for higher-order thinking skills?
- Addressed learning standards? Rigor?
- Tapped prior knowledge and built background?
- Emphasized connections, explicit or inferred?
- Promoted student thinking?
  - Interpreting facts
  - Synthesizing information
  - Reasoning logically
  - Framing arguments with evidence
- Promoted student questioning? Deep levels of questioning?
- Used organization tools, mapping, charts, timelines?
- Developed criteria for evaluating information, relative importance and relevance of ideas,
- Engendered debate and discussion?
- Focused on essential question and focus questions?
- Provided paths to investigation? Choices?
- Mentored and guided self-directed students?
- Promoted active, authentic quest for new ideas authentic questions, resources, products?
- Integrated original conclusions
  - Test against evidence
  - Divergent/convergent thinking
  - Relative strength of arguments, positions, perspectives
  - Critical stance
- Planned and implemented multiple, ongoing assessments?
- Incorporated technology?
- Framed a final knowledge product that is publicly presented?
- Utilized models and criteria in advance?