

Actions that Promote Seven Types of Thinking

Curious

- ◆ Wonder
- ◆ Ask questions
- ◆ Observe closely
- ◆ Find problems
- ◆ Be playful

Intellectually Careful

- ◆ Evaluate Evidence
- ◆ Alert for errors
- ◆ Check for accuracy
- ◆ Corroborate information
- ◆ Justify opinions with evidence

Reflective

- ◆ Compare a product to criteria
- ◆ Evaluate a process
- ◆ Seek understanding
- ◆ Gather other opinions
- ◆ Consider relationship between parts and a whole
- ◆ Question results
- ◆ Identify patterns

Strategic

- ◆ Set goals
- ◆ Take action
- ◆ Evaluate and revise plans
- ◆ Use knowledge to make decisions
- ◆ Reason through problems

Creative

- ◆ Create novel solutions
- ◆ Make unusual connections
- ◆ Combine ideas
- ◆ Rearrange elements into new patterns

Adventurous

- ◆ Explore alternative views
- ◆ Open minded
- ◆ Think with a wide scope
- ◆ Seek understanding

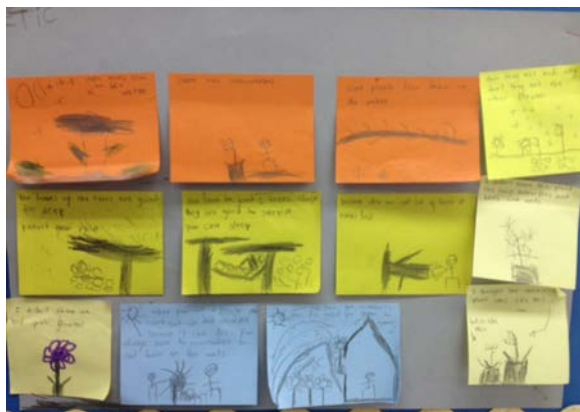
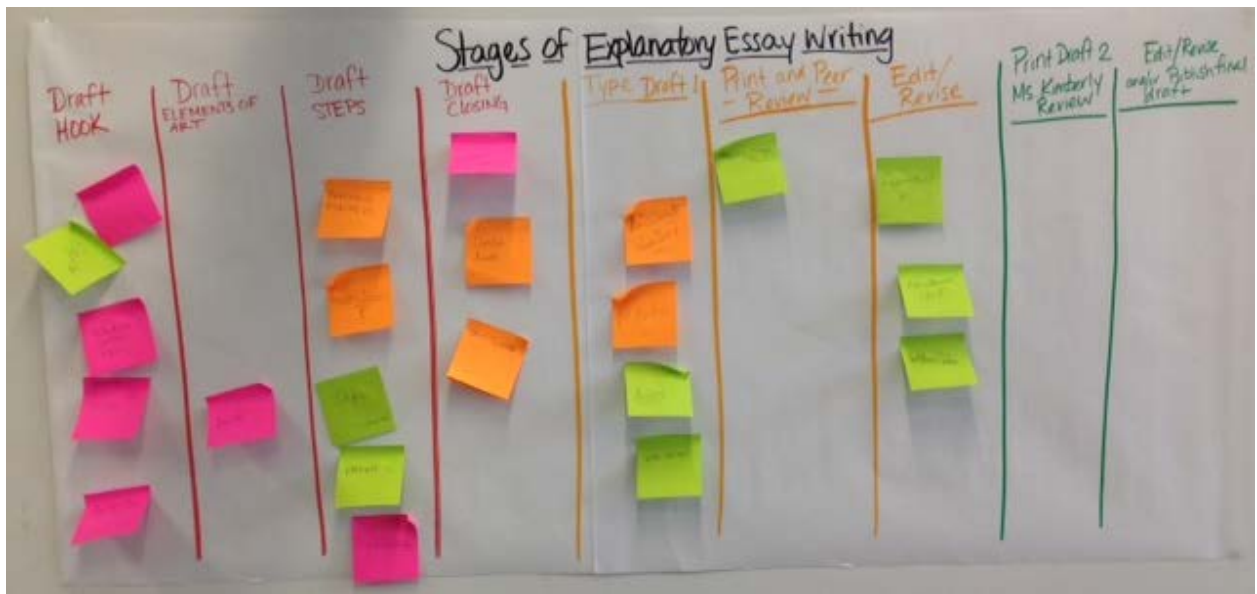
Collaborative

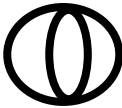


- ◆ Share ideas with others
- ◆ Ask clarifying questions
- ◆ Value the opinions of others
- ◆ Build learning through interaction

Richhart, R., M. Church, P. Palmer, & S. Tishman. (April, 2006). American Educational Research Association Conference. Thinking Routines: Establishing Patterns of Thinking in the Classroom.

<http://www.pz.harvard.edu/research/AERA06ThinkingRoutines.pdf>

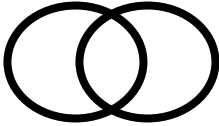
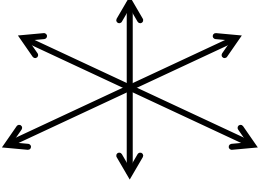
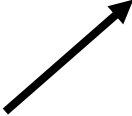
Additional Charts & Routines for Capturing Thinking and Making Thinking Visible



<p>See</p>  <p>Describe what you see</p>	<p>Think</p>  <p>What does that make you think about?</p>	<p>Wonder</p>  <p>What questions come up?</p>

Project Zero Visible Thinking Core Routines

http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03c_Core_routines/SeeThinkWonder/SeeThinkWonder_Routine.html

Connect 	Extend 	Challenge 

Project Zero Visible Thinking Core Routines

http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03d_UnderstandingRoutines/ConnectExtendChallenge/ConnectExtend_Routine.html

Boxing

What else do I know?

Questions I
have about
this . . .

Draw a Picture, Diagram, or
Graphic Organizer demonstrating
your experience with pre-assessment.

This has to do with. . .

In words, summarize the above.

T-Chart

Topic: _____

I think that I know

Questions that I have

 Confirmed

~~Cross Out~~

 Question

Add

Revisit this chart as you learn more.

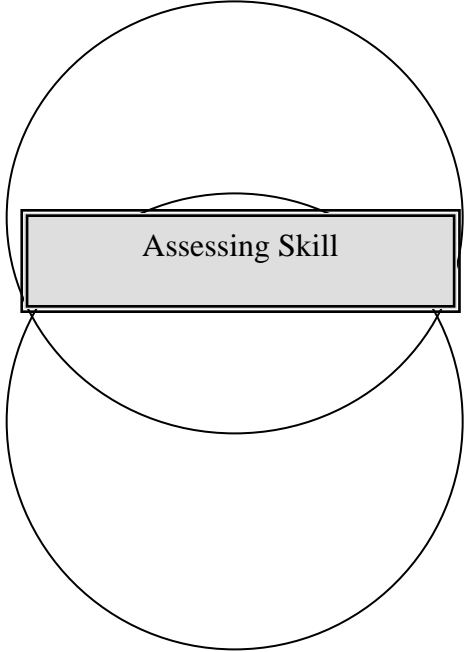
Place a check next to things that are confirmed.

Cross out things that you no longer think or question.

Place a question mark next to things that you would like to find out more about.

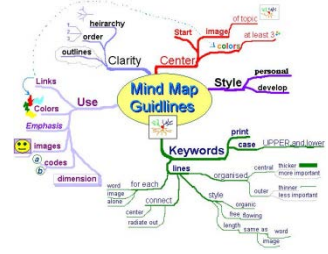
Add new ideas.

Four Square Assessment

<p>Name at least 5 different habitats</p> <p>Assessing Academic Vocabulary</p>	<p>Choose two habitats to compare and contrast</p>  <p>Assessing Skill</p>
<p>How did these images help you to understand habitats better?</p> <p>Assessing Visual Literacy Metacognition</p>	<p>Which habitat type would you like to learn more about?</p> <p>Assessing Interest</p>

Quick and Effective – Practical Pre-Assessment Strategies

Mind Maps – a diagram used to represent words, ideas, images, and facts centered around and connected to a specific topic. Process created by Tony Buzan.



Think I know – Questions Chart

KQR (K= think I know, Q = questions and wonderings, R=what I will read or research) to signal about students' interests and awareness of resources

Ponder-Pass – tell students the upcoming topic. Then pass a notepad around the class and challenge students to write notes about what they know, skills they need, facts they want to know and questions related to the topic.

Response Cards – to inform teacher and practice student metacognition regarding knowledge base, feelings, attitudes, likes/dislikes, facts learned, and identify misconceptions

Yes/No Cards - Yes, Got It!; No, No Clue! students respond to teacher question with yes or no. If yes, they are required to elaborate; teacher takes notes about what was known, misinformation, and what needs to be emphasized or skipped in instruction.

Show and Tell - tell it, draw it, write it, create a sample to display

One Minute Paper – (described in Angelo and Cross, *Classroom Assessment Techniques*) asks students to write down short answers to two questions:

- What was the most important point made in class today?
- What unanswered question do you still have?

Respond back to students in writing with a one sentence comment.

Entrance/Exit Card - on one side of the sheet pose three questions. The first two questions are review - addressing information previously taught and the third question addresses the topic of the day's lesson. These questions were to be answered prior to beginning of the lesson. On the reverse side are a series of open-ended questions including:

- * What did I learn today?
- * Where did I excel?
- * Where can I improve?

Temperature Check or Likert Scale or Take a Stand, Agree-Disagree

on issues or statements related to content

Concept and Vocabulary Tasks – WordSplash (brainstorm words associated with a topic), comparing words, and connecting concepts to similar/different

Process Letter – students write a letter explaining a process or solving a problem

PMI – students indicate the pluses, minuses, and interesting ideas / concepts related to a topic

Picture Interpretation – Connections/Relationships - ask students to depict or describe the relationships between concepts (this requires them to organize and relate their background knowledge)

Make Curiosity Visible in the Classroom

Gallimaufrey Gatherings – several weeks prior to a new unit, pose a problem, question, topic, person or event on a container. Ask students to fill container with materials and resources related to the topic. Individuals must complete an entry form for each contribution explaining what it is and why it relates.

This will build curiosity, help identify knowledge base, and bring to light misconceptions.

Related ideas – Content Knowledge Boxes, Mystery Masters, Content Surveys, Visual KWL or Graffiti Wall

Add more ideas below

Then What

Differentiated Instruction: Adding Supports and Extensions

Short formative assessments make visible to both teachers and learner that supports and/or extensions to the established curriculum are needed to meet the learning needs of all learners. Supports and/or extensions usually have one of four main goals to make learning accessible, accelerate the pace of learning, review/practice previous learning, or provide missing information or develop missing skills.

Accessible - making learning opportunities more accessible

Accelerate – design tasks to accomplish learning goals efficiently

Review/Practice – offer an opportunity to repeat previous instruction and skill practice

Provide missing information – close gaps by providing missing information/skills

Web sites to learn more about *Thinking*

[Artful Thinking](#)

<http://pzweb.harvard.edu/tc/index.cfm>

Artful Thinking is a program by Harvard Project Zero in collaboration with the Traverse City, Michigan Area Public Schools (TCAPS). The purpose of the Artful Thinking Program is to help teachers regularly use works of visual art and music in their curriculum in ways that strengthen student thinking and learning. Go to this site to access the [Thinking Routines](#).

[Visible Thinking](#)

http://pzweb.harvard.edu/vt/VisibleThinking_html_files/VisibleThinking1.html

Visible Thinking is a flexible and systematic research-based approach to integrating the development of students' thinking with content learning across subject matters. Go to this site to learn more about [Thinking Routines](#).