

Differentiation Strategies for High-End Learners:
A Response to Instruction

**CRITICAL AND CREATIVE
THINKING**

Critical & Creative Thinking: Pre-assessment

- What is critical thinking?
- What is creative thinking?



Critical Thinking Skills

- What is critical thinking?
 - Applying known information to new situations
 - Categorizing
 - Identifying Patterns
 - Comparing and contrasting
 - Thinking from different perspectives
 - Recognizing cause and effect




Critical Thinking Skills

- Questioning assumptions
- Deductive & Inductive Reasoning
- Inferring
- Evaluating
- Showing insight
- Generalizing



Critical Thinking Skills

- Why is critical thinking important?

- To be able to make intelligent decisions
- To be able to reason  problems
- To be able to apply what one knows to new problems and situations
- To be able to communicate effectively
- To be able to function well in life and be a good citizen in a democratic society
- To be able to see connections and discern patterns in order to see the "bigger picture."






Critical and Creative Thinking Skills: Pre-Assessment

- What is creative thinking?

The ability to synthesize old or known information, concepts, or skills into original or unusual ideas, products, or perspectives in order to solve a problem or for artistic production.



Critical and Creative Thinking Skills

- Elements of Creativity
 - Fluency
 - Flexibility
 - Originality
 - Elaboration



Critical & Creative Thinking: Pre-assessment

- Why is creativity important?

“We are attempting to educate students today so that they will be ready to solve future problems that have not yet been identified using technologies not yet invented based on scientific knowledge not yet discovered.”

J. J. Lagowski



Critical & Creative Thinking

- *"In the Twenty-first century, creativity is [and will continue to be] at least as important as literacy."*



Sir Ken Robinson

Critical & Creative Thinking: Pre-assessment

- Which of the following levels of Bloom's Taxonomy involve critical and creative thinking?

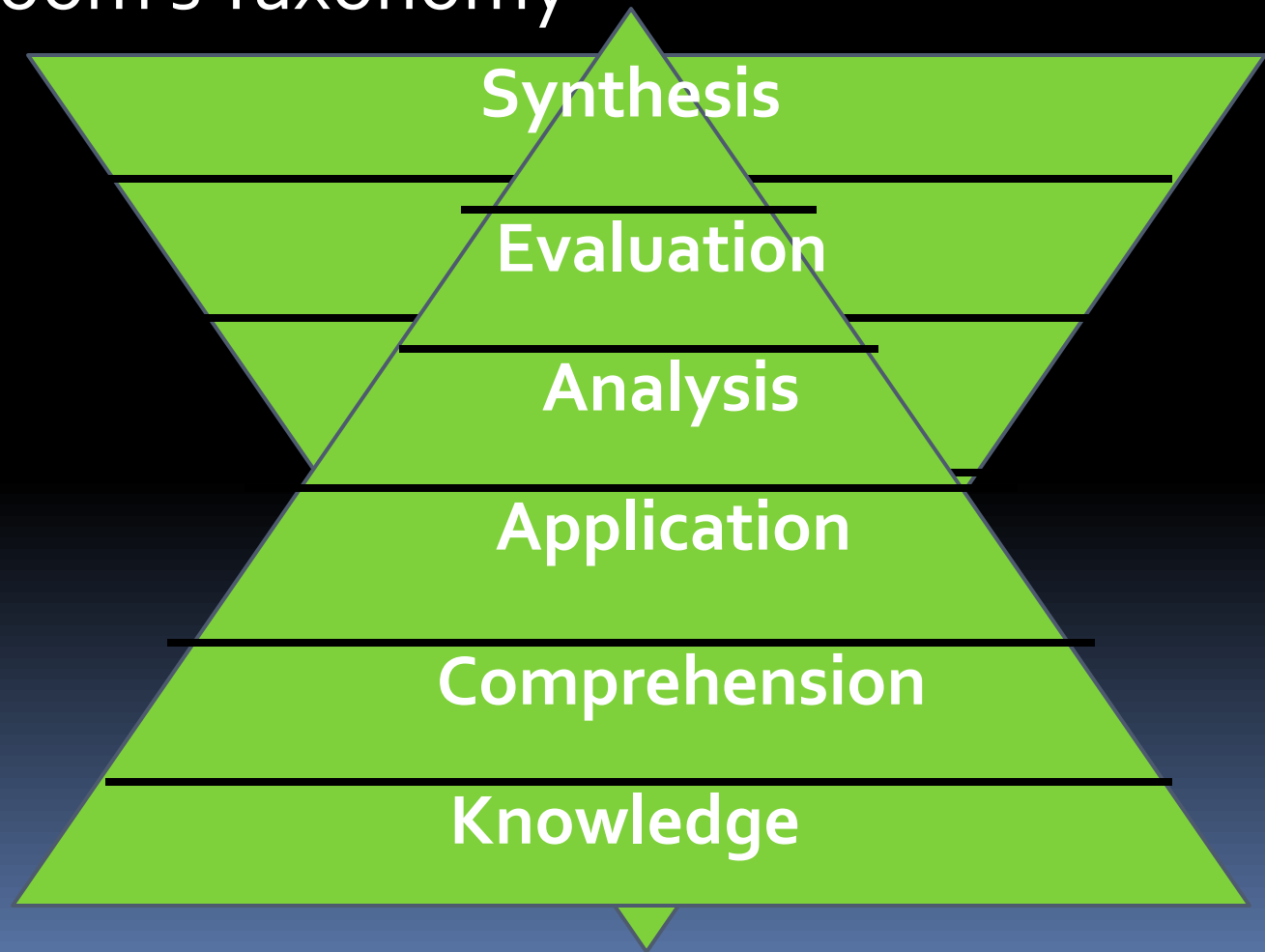
- A. Knowledge
- B. Comprehension
- C. Application
- D. Analysis
- E. Evaluation
- F. Synthesis

Answer: C, D, E, F



Critical & Creative Thinking

- Bloom's Taxonomy



Critical & Creative Thinking

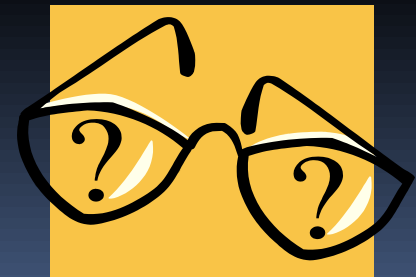
- Special Needs of gifted children and youth
 - Depth
 - Complexity
 - Acceleration
 - Opportunities for creative production



In their area/s of giftedness

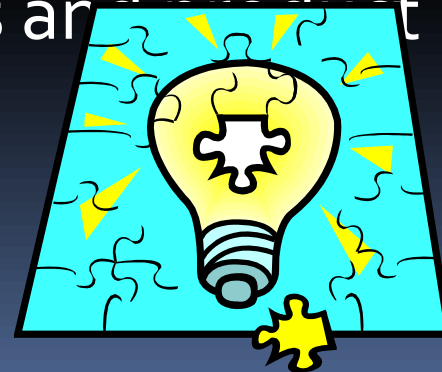
Critical & Creative Thinking

- When should we engage in critical and creative thinking?
 - **Every day**
- Who should engage in critical and creative thinking?
 - **All students**
 - **Gifted students often and with greater intensity**
- How can I make the time?
 - **Embed in everyday lessons**



Critical & Creative Thinking

- Embedding creative thinking into the classroom
 - Divergent thinking (Brainstorming, Productive Thinking)
 - Independent research and learning centers
 - Open-ended questioning
 - Student choice in process and product
 - Thinker Keys



Critical & Creative Thinking

- How can I embed critical and creative thinking into everyday lessons?
 - Debrief lessons and activities using the “What, So What, Now What?” Factor.
 - Allow time for metacognition.
 - Encourage students to solve problems through multiple strategies.
 - Encourage students to question the status quo and engage in discussions about controversial issues.



Critical & Creative Thinking

- More ways to embed critical and creative thinking into daily classroom activities
 - Choice of assignments
 - Open ended questioning & assignments
 - Anchor activities
 - Tiered learning centers
 - Mind Maps



<http://mywebspiration.com/user>

Critical & Creative Thinking

- Independent learning centers
 - Squiggle Station
 - Invention Center
 - Building Center
 - Creative Writing Center
 - Logic Center
- Web Quest <http://webquest.org>
- Metaphors in content area: Egs.
 - President:Democracy::_____:Monarchy
 - Moon:Earth::Earth: _____

Critical & Creative Thinking

Debriefing: “What, So What, Now What?”

□ **What?** (The facts)

□ **So What?** Now that we know the facts, how do they:

- Affect us? The community? The world? The environment? Society?
- What connections can be made between this topic and another topic now that we know these facts?
- How the same? How different?
- Is there a central theme or concept that emerges?

Critical & Creative Thinking

□ Now what?

- Now that we know about this, are there problems or controversies?
 - What can be done about it?
 - If something is done, what might be the effects, directly and indirectly?
 - What can I do? (Do I want to do anything about it?)
 - What careers, professions, or technologies might be involved in this action?
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- *Students do not have to answer all of the “So what, Now What?” questions. These are leading questions to get them thinking on a higher level in Bloom’s Taxonomy. But they should answer some. Teachers can differentiate the depth and complexity of the report, if necessary, by requiring students only to address questions 1 and 2. “Now what”? could be an additional tier for the high-end learners.*

Critical & Creative Thinking

- Let's look at some activities that engage students in critical and creative thinking.



Critical & Creative Thinking

- Critical and creative thinking in the content areas
- Language Arts:
 - Enhanced Venn diagram to compare character traits or character feelings among multiple characters, or themes among authors.
 - Chain link organizer to sequence connecting events.
 - “Cause and Effect” organizer to map an “event” in a story or a concept; then map the causes and effects. (This works well as an approach to class discipline, as well.)
 - Rewrite a story from the perspective of a different character

Critical & Creative Thinking

- Math:
 - Students list (as a group or individually) many, varied, unusual uses for numbers, Algebra, Calculus, etc.
 - Students are given a math problem. How many different ways can they demonstrate to solve it? (*Thinker Keys*)
 - What if the numeral "o" took a vacation? (*Thinker Keys*)
 - Make a transformation of $<$, $>$, $=$, or any other math sign.

Critical & Creative Thinking

- Social Studies
 - Enhanced Venn diagram to compare 4 different types of governments- democracy, communism, socialism, Fascism.
 - Cause/Effect Chain to explore either the causes or the effects of the current economic downturn, the stimulus package, or any current event; also effects of natural disasters, etc.
 - Triple Entry Journal as students read content from a primary document or text chapter.

Critical & Creative Thinking

- Science
 - Cause/Effect Map to describe a science experiment.
 - Rubrics to evaluate their science demonstrations for a science fair.
 - Outline on paper and then construct a new invention related to a scientific problem (The Inventions Key)
 - Think Fast using a crucial “concept” word.
 - Mind map to explain the interdependence of elements of an ecosystem.

How can YOU infuse critical and creative thinking strategies into your daily curriculum?



Critical & Creative Thinking:

- A final thought...

- “The creative is the place where no one else has ever been. To leave the city of your comfort to go to the wilderness of your intuition. What you discover will be wonderful. What you discover is yourself.”

— Alan Alda



Critical & Creative Thinking

- Upload your lesson plan to the Moodle Class website.
- Elementary : <http://atim.cc/course/view.php?id=377>
- Secondary : <http://atim.cc/course/view.php?id=378>
- Teach the lesson
- Follow-Up:
 - Webinar to discuss the effectiveness of the lesson and how to continue improvement **Date:**
 - WIKI to write a minimum of four paragraphs reflecting on the effectiveness of the lesson and how to continue improvement. In addition, post feedback to two other teacher postings.

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