# Leading Instructional Improvement

<table>
<thead>
<tr>
<th>My Reflection</th>
<th>My Goal</th>
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<tbody>
<tr>
<td>1. I focus every decision on what’s best for students.</td>
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<tr>
<td>2. I am a model instructional coach.</td>
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<td>3. I have built a sustainable professional learning network.</td>
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<td>4. I engage educators in self-reflection while providing specific, respectful feedback.</td>
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<td>5. I help our school focus on high-quality curriculum, instruction, and assessments.</td>
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<td>6. I help our school understand the importance of literacy.</td>
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<td>7. I embrace accountability measures.</td>
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<td>8. I have helped the school prioritize the needs for instructional improvement.</td>
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<tr>
<td>9. I regularly evaluate the instructional growth of my teachers and celebrate that growth.</td>
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<tr>
<td>10. I never stop learning.</td>
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The Rigor/Relevance Framework is a tool developed by staff of the International Center for Leadership in Education to examine curriculum, instruction, and assessment. The Rigor/Relevance Framework is based on two dimensions of higher standards and student achievement.

First, there is a continuum of knowledge that describes the increasingly complex ways in which we think. The Knowledge Taxonomy is based on the six levels of Bloom’s Taxonomy:

1. awareness
2. comprehension
3. application
4. analysis
5. synthesis
6. evaluation.

The low end of this continuum involves acquiring knowledge and being able to recall or locate that knowledge in a simple manner. Just as a computer completes a word search in a word processing program, a competent person at this level can scan through thousands of bits of information in the brain to locate that desired knowledge.

The high end of the Knowledge Taxonomy labels more complex ways in which individuals use knowledge. At this level, knowledge is fully integrated into one’s mind, and individuals can do much more than locate information. They can take several pieces of knowledge and combine them in both logical and creative ways. Assimilation of knowledge is a good way to describe this high level of the thinking continuum. Assimilation is often referred to as a higher-order thinking skill: at this level, the student can solve multistep problems and create unique work and solutions.

The second continuum, created by Dr. Willard R. Daggett, is known as the Application Model. The five levels of this action continuum are:

1. knowledge in one discipline
2. apply in discipline
3. apply across disciplines
4. apply to real-world predictable situations
5. apply to real-world unpredictable situations

The Application Model describes putting knowledge to use. While the low end is knowledge acquired for its own sake, the high end signifies action — use of that knowledge to solve complex real-world problems and to create projects, designs, and other works for use in real-world situations.
The Rigor/Relevance Framework has four quadrants.

Quadrant A represents simple recall and basic understanding of knowledge for its own sake. Quadrant C represents more complex thinking but still knowledge for its own sake. Examples of quadrant A knowledge are knowing that the world is round and that Shakespeare wrote *Hamlet*.

Quadrant C embraces higher levels of knowledge, such as knowing how the U.S. political system works and analyzing the benefits and challenges of the cultural diversity of this nation versus other nations.

Quadrants B and D represent action or high degrees of application. Quadrant B would include knowing how to use math skills to make purchases and count change. The ability to access information in wide-area network systems and the ability to gather knowledge from a variety of sources to solve a complex problem in the workplace are types of quadrant D knowledge.

Each of these four quadrants can also be labeled with a term that characterizes the learning or student performance.
A Fresh Approach

The Rigor/Relevance Framework is a fresh approach to looking at curriculum standards and assessment. It is based on traditional elements of education yet encourages movement to application of knowledge instead of maintaining an exclusive focus on acquisition of knowledge.

The Framework is easy to understand. With its simple, straightforward structure, it can serve as a bridge between school and the community. It offers a common language with which to express the notion of a more rigorous and relevant curriculum and encompasses much of what parents, business leaders, and community members want students to learn. The Framework is versatile; it can be used in the development of instruction and assessment. Likewise, teachers can use it to measure their progress in adding rigor and relevance to instruction and to select appropriate instructional strategies to meet learner needs and higher achievement goals.

Here is an example involving technical reading and writing.

<table>
<thead>
<tr>
<th>Quadrant A</th>
<th>Acquisition</th>
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<tbody>
<tr>
<td>Students gather and store bits of knowledge and information. Students are primarily expected to remember or understand this acquired knowledge.</td>
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</table>

<table>
<thead>
<tr>
<th>Quadrant B</th>
<th>Application</th>
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</thead>
<tbody>
<tr>
<td>Students use acquired knowledge to solve problems, design solutions, and complete work. The highest level of application is to apply appropriate knowledge to new and unpredictable situations.</td>
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</table>

<table>
<thead>
<tr>
<th>Quadrant C</th>
<th>Assimilation</th>
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</thead>
<tbody>
<tr>
<td>Students extend and refine their acquired knowledge to be able to use that knowledge automatically and routinely to analyze and solve problems and create unique solutions.</td>
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<thead>
<tr>
<th>Quadrant D</th>
<th>Adaptation</th>
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<tr>
<td>Students have the competence to think in complex ways and also apply knowledge and skills they have acquired. Even when confronted with perplexing unknowns, students are able to use extensive knowledge and skill to create solutions and take action that further develops their skills and knowledge.</td>
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Defining Rigor

Rigor refers to academic rigor — learning in which students demonstrate a thorough, in-depth mastery of challenging tasks to develop cognitive skills through reflective thought, analysis, problem-solving, evaluation, or creativity. Rigorous learning can occur at any school grade and in any subject. The Knowledge Taxonomy describes levels of rigor.

A versatile way to define the level of rigor of curriculum objectives, instructional activities, or assessments is the Knowledge Taxonomy Verb List (see page 6). The Verb List can be used either to create a desired level of expected student performance or to evaluate the level of existing curriculum, instruction or assessment.

An example of student performance at various levels follows. Notice each statement starts with a verb that comes from the appropriate section of the Knowledge Taxonomy Verb List. The expected achievement level for teaching about nutrition can vary depending on the purpose of the instruction. If a teacher only wants students to acquire basic nutritional knowledge, a student performance set at level one of two is adequate. If the instruction is intended to have a more significant impact on nutritional habits then some of the objectives need to be similar to levels four through six.

<table>
<thead>
<tr>
<th>Level</th>
<th>Basic Nutrition</th>
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<tbody>
<tr>
<td>Level 1 – Knowledge</td>
<td>Label foods by nutritional groups</td>
</tr>
<tr>
<td>Level 2 – Comprehension</td>
<td>Explain nutritional value of individual foods</td>
</tr>
<tr>
<td>Level 3 – Application</td>
<td>Make use of nutrition guidelines in planning meals</td>
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<tr>
<td>Level 4 – Analysis</td>
<td>Examine success in achieving nutrition goals</td>
</tr>
<tr>
<td>Level 5 – Synthesis</td>
<td>Develop personal nutrition goals</td>
</tr>
<tr>
<td>Level 6 – Evaluation</td>
<td>Appraise results of personal eating habits over time</td>
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</table>

Note that each of the levels requires students to think differently. Levels four through six require more complex thinking than levels one through three.

When creating lesson plans and student objectives, selecting the proper word from the Knowledge Taxonomy Verb List can help to describe the appropriate performance. Simply start with a verb from the desired level and finish the statement with a specific description of that skill or knowledge area.

The Verb List can also be used to evaluate existing lesson plans, assessments, and instructional experiences. Looking for verbs and identifying their level will give a good indication of the level of student performance in that instruction.
Defining Relevance

Relevance refers to learning in which students apply core knowledge, concepts, or skills to solve real-world problems. Relevant learning is interdisciplinary and contextual. Student work can range from routine to complex at any school grade and in any subject. Relevant learning is created, for example, through authentic problems or tasks, simulation, service learning, connecting concepts to current issues, and teaching others. The Application Model describes the levels of relevance.

Identifying the level of relevance of curriculum objectives and instructional activities is a little more difficult than determining the Knowledge Taxonomy level because there is no verb list. However, just as the Knowledge Taxonomy categorizes increasing levels of thinking, the Application Model describes increasingly complex applications of knowledge. Any student performance can be expressed as one of five levels of the Application Model. The Application Model Decision Tree can assist in setting the desired level of expected student performance in application (see pages 7-8) by asking the questions: Is it application? Is it real world? Is it unpredictable?

The Basic Nutrition example below is similar to the one in the Defining Rigor section in that it uses nutrition to describe student performance at various levels. Each level requires students to apply knowledge differently.

Similarly, the expected achievement level for teaching about nutrition can vary depending on the purpose of the instruction. If a teacher wants students only to acquire basic nutritional knowledge, a student performance set at level one is adequate. If the instruction is intended to have a significant impact on nutritional habits, then some of the objectives need to be at levels four and five.

Use of the Application Model Decision Tree can help to describe desired performance. Start by writing draft statements of student objectives and then use the Decision Tree to reflect on and revise these statements. The Decision Tree focuses on the three key characteristics that distinguish levels of the Application Model: application, real world, and unpredictability. The second page of the Decision Tree offers additional criteria to determine whether an objective meets the test of application, real world, and unpredictability.

The Application Model Decision Tree can also be used to evaluate existing lesson plans, assessments, and instructional experiences. Answer the questions to identify at which level of student performance that instruction or assessment is.

<table>
<thead>
<tr>
<th>Level</th>
<th>Performance</th>
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</thead>
<tbody>
<tr>
<td>Level 1 – Knowledge in One Discipline</td>
<td>Label foods by nutritional groups</td>
</tr>
<tr>
<td>Level 2 – Application in One Discipline</td>
<td>Rank foods by nutritional value</td>
</tr>
<tr>
<td>Level 3 – Interdisciplinary Application</td>
<td>Make cost comparisons of different foods considering nutritional value</td>
</tr>
<tr>
<td>Level 4 – Real-world Predictable Situations</td>
<td>Develop a nutritional plan for a person with a health problem affected by food intake</td>
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<tr>
<td>Level 5 – Real-world Unpredictable Situations</td>
<td>Devise a sound nutritional plan for a group of 3-year-olds who are picky eaters</td>
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<tr>
<td>KNOWLEDGE</td>
<td>COMPREHENSION</td>
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<td>-----------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>arrange</td>
<td>advance</td>
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<tr>
<td>check</td>
<td>calculate</td>
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<td>choose</td>
<td>change</td>
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<td>find</td>
<td>contemplate</td>
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<td>group</td>
<td>convert</td>
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<td>identify</td>
<td>define</td>
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<td>label</td>
<td>explain</td>
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<td>list</td>
<td>extrapolate</td>
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<td>locate</td>
<td>infer</td>
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<tr>
<td>match</td>
<td>interpret</td>
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<tr>
<td>name</td>
<td>outline</td>
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<td>point to</td>
<td>project</td>
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<td>recall</td>
<td>propose</td>
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<td>recite</td>
<td>reword</td>
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<td>repeat</td>
<td>submit</td>
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<td>say</td>
<td>transform</td>
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<tr>
<td>select</td>
<td>translate</td>
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<tr>
<td>write</td>
<td>vary</td>
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<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>ANALYSIS</th>
</tr>
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<tbody>
<tr>
<td>adopt</td>
<td>assay</td>
</tr>
<tr>
<td>capitalize on</td>
<td>audit</td>
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<tr>
<td>consume</td>
<td>break down</td>
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<td>devote</td>
<td>canvass</td>
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<td>employ</td>
<td>check out</td>
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<td>exercise</td>
<td>deduce</td>
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<td>handle</td>
<td>dissect</td>
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<td>maintain</td>
<td>divide</td>
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<td>make use of</td>
<td>examine</td>
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<td>manipulate</td>
<td>include</td>
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<td>mobilize</td>
<td>inspect</td>
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<td>operate</td>
<td>look at</td>
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<tr>
<td>put to use</td>
<td>scrutinize</td>
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<td>relate</td>
<td>sift</td>
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<td>solve</td>
<td>study</td>
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<td>start</td>
<td>survey</td>
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<td>take up</td>
<td>test for</td>
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<td>utilize</td>
<td>uncover</td>
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<table>
<thead>
<tr>
<th>SYNTHESIS</th>
<th>EVALUATION</th>
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<tbody>
<tr>
<td>blend</td>
<td>accept</td>
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<td>build</td>
<td>appraise</td>
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<td>cause</td>
<td>arbitrate</td>
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<td>combine</td>
<td>assess</td>
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<td>compile</td>
<td>award</td>
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<td>compile</td>
<td>classify</td>
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<td>compose</td>
<td>criticize</td>
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<td>conceive</td>
<td>decide</td>
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<td>construct</td>
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<td>create</td>
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<td>settle</td>
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<td>weigh</td>
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International Center for Leadership in Education
Directions: Select a task, application, or activity and then answer the following questions. See next page for clarification of the questions.

Level 1
Knowledge in one discipline

Level 2
Application in one discipline

Level 3
Interdisciplinary application

Level 4
Real-world predictable application

Level 5
Real-world unpredictable application

continued on page 8
Application Model Decision Tree

Directions: Use the following statements to clarify where a task, application, or assessment belongs on the Application Model.

Is it application?

YES
- Requires use of knowledge
- Requires students actually to practice steps in a procedure
- Uses previous knowledge to solve problems, create a design, or communicate information
- Assesses performance

NO
- Requires only recall or understanding
- Requires learning steps in a procedure
- Requires memorization of facts or formulas
- Assesses content knowledge

Is the application real world?

YES
- Application occurs in same way it is used by adults
- Standards for performance are same as for adult roles
- Students have access to real-world resources (tools, references, etc.)
- Task must be completed in same time frame as real-world

NO
- Application occurs only in school
- Lower standards of performance are acceptable
- Resources are limited
- Students have extended time to complete task

Is the outcome unpredictable?

YES
- Application has uncertain results
- Unknown factors involved (environment, people, time)
- Students have individual and unique solutions to problems

NO
- Application involves routine solution
- Parameters are controlled
- All students complete similar designs or solutions
# Teacher Questions by Quadrant

**Ask questions to summarize, analyze, organize, or evaluate:**

- How are these similar/different?
- How is this like _____?
- What's another way we could say/explain/express that?
- What do you think are some reasons/causes that _____?
- Why did _____ changes occur?
- How can you distinguish between _____?
- What is a better solution to _____?
- How would you defend your position about _____?
- What changes to _____ would you recommend?
- What evidence can you offer?
- How do you know?
- Which ones do you think belong together?
- What things/events lead up to _____?
- What is the author’s purpose?

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<th>D</th>
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**Ask questions to predict, design, or create:**

- How would you design a _____ to _____?
- How would you compose a song about _____?
- How would you rewrite the ending to the story?
- What would be different today, if that event occurred as _____?
- Can you see a possible solution to _____?
- How could you teach that to others?
- If you had access to all the resources, how would you deal with _____?
- How would you devise your own way to deal with _____?
- What new and unusual uses would you create for _____?
- Can you develop a proposal that would _____?
- How would you have handled _____?
- How would you do it differently?

**Ask questions to recall facts, make observations, or demonstrate understanding:**

- What is/are _____?
- How many _____?
- How do/does _____?
- What did you observe _____?
- What else can you tell me about _____?
- What does it mean _____?
- What can you recall _____?
- Where did you find that _____?
- Who is/was _____?
- In what ways _____?
- How would you define that in your own terms?
- What do/did you notice about this _____?
- What do/did you feel/see/hear/smell _____?
- What do/did you remember about _____?
- What did you find out about _____?

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<th>A</th>
<th>B</th>
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**Ask questions to apply or relate:**

- How would you do that?
- Where will you use that knowledge?
- How does that relate to your experience?
- How can you demonstrate that?
- What observations relate to _____?
- Where would you locate that information?
- Calculate that for _____?
- How would you illustrate that?
- How would you interpret that?
- Who could you interview?
- How would you collect that data?
- How do you know it works?
- Can you show me?
- Can you apply what you know to this real-world problem?
- How do you make sure it is done correctly?

Note: Quadrants B and D involve students “doing” as well as answering questions, but these questions help to move students toward increased relevance.
Revised Bloom’s Taxonomy – Question Starters

Remembering-Knowledge
Recall or recognize information, and ideas

The teacher should:
• Present information about the subject to the student
• Ask questions that require the student to recall the information presented
• Provide verbal or written texts about the subject that can be answered by recalling the information the student has learned

**Question prompts**
What do you remember about ____________?
How would you define ____________?
How would you identify ____________?
How would you recognize ____________?
What would you choose ____________?
Describe what happens when ____________?
How is (are) ____________?
Where is (are) ____________?
Which one ____________?
Who was ____________?
Why did ____________?
What is (are) ____________?
When did ____________?
How would you outline ____________?
List the ____________ in order.

Understanding-Comprehension
Understand the main idea of material heard, viewed, or read. Interpret or summarize the ideas in own words.
The teacher should:
• Ask questions that the student can answer in his/her own words by stating facts or by identifying the main idea.
• Give tests based on classroom instruction

**Question prompts:**
How would you compare ____________? Contrast ____________?
How would you clarify the meaning ____________?
How would you differentiate between ____________?
How would you generalize ____________?
How would you express ____________?
What can you infer from ____________?
What did you observe ____________?
How would you identify ____________?
How can you describe ____________?
Will you restate ____________?
Elaborate on ____________.
What would happen if ____________?
What is the main idea of ____________?
What can you say about ____________?

**Applying-Application**

*Apply an abstract idea in a concrete situation to solve a problem or relate it to prior experience.*

The teacher should:

- Provide opportunities for the student to use ideas, theories, or problem solving techniques and apply them to new situations.
- Review the student’s work to ensure that he/she is using problem solving techniques independently.
- Provide questions that require the student to define and solve problems.

**Questioning prompts:**

- What actions would you take to perform ________________?
- How would you develop ________________ to present ________________?
- What other way would you choose to ________________?
- What would the result be if ________________?
- How would you demonstrate ________________?
- How would you present ________________?
- How would you change ________________?
- How would you modify ________________?
- How could you develop ________________?
- Why does ________________ work?
- How would you alter ________________ to ________________?
- What examples can you find that ________________?
- How would you solve ________________?

**Analyzing - Analysis**

*Break down a concept or idea into parts and show relationships among the parts.*

The teacher should:

- Allow time for students to examine concepts and ideas and to break them down into basic parts.
- Require students to explain why they chose a certain problem solving technique and why the solution worked.

**Questioning prompts:**

- How can you classify ________________ according to ________________?
- How can you compare the different parts ________________?
- What explanation do you have for ________________?
- How is ________________ connected to ________________?
- Discuss the pros and cons of ________________.
- How can you sort the parts ________________?
- What is the analysis of ________________?
- What can you infer ________________?
- What ideas validate ________________?
- How would you explain ________________?
- What can you point out about ________________?
- What is the problem with ________________?
- Why do you think ________________?
Evaluating - Evaluation  
Make informed judgments about the value of ideas or materials. Use standards and criteria to support opinions and views.

The teacher should:
- Provide opportunities for students to make judgments based on appropriate criteria.
- Have students demonstrate that they can judge, critique, or interpret processes, materials, methods, etc. using standards and criteria.

**Questioning prompts:**
- What criteria would you use to assess ______________?
- What data was used to evaluate ______________?
- What choice would you have made ______________?
- How would you determine the facts ______________?
- What is the most important ______________?
- What would you suggest ______________?
- How would you grade ______________?
- What is your opinion of ______________?
- How could you verify ______________?
- What information would you use to prioritize ______________?
- Rate the ______________.
- Rank the importance of ______________.
- Determine the value of ______________.

Creating - Synthesis  
Bring together parts of knowledge to form a whole and build relationships for new situations.

The teacher should:
- Provide opportunities for students to assemble parts of knowledge into a whole using creative thinking and problem solving.
- Require students to demonstrate that they can combine concepts to build new ideas for new situations.

**Questioning prompts:**
- What alternative would you suggest for ______________?
- What changes would you make to revise ______________?
- How would you explain the reason ______________?
- How would you generate a plan to ______________?
- What could you invent ______________?
- What facts can you gather ______________?
- Predict the outcome if ______________.
- What would happen if ______________?
- How would you portray ______________?
- Devise a way to ______________.
- How would you compile the facts for ______________?
- How would you elaborate on the reason ______________?
- How would you improve ______________?