



Developing Critical Thinking Skills for Authentic Learning

Sufia Azmat

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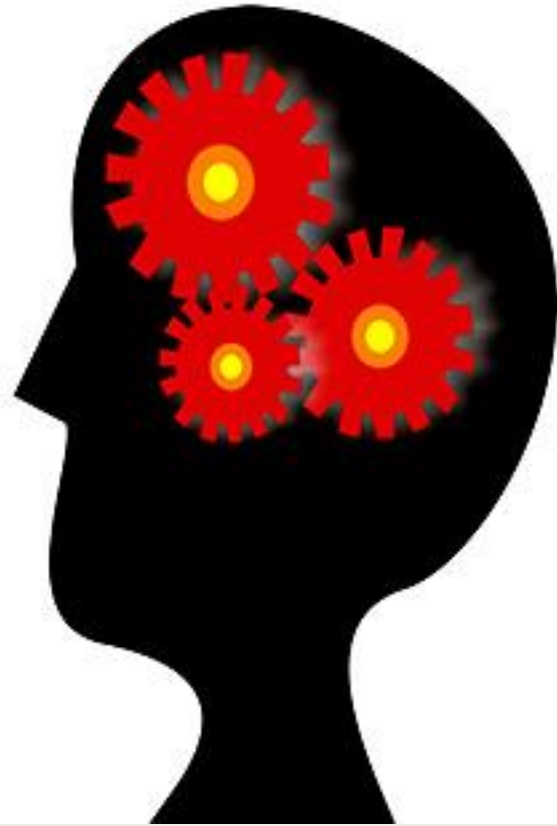
Email sufiaazmat@gmail.com for copy of presentation

Components of Presentation (Theoretical & Practical)

- ❖ Definition of Critical Thinking
- ❖ Characteristics of a Critical Thinker
- ❖ Using Critical Thinking Skills
- ❖ Role of the Teacher
- ❖ Lesson Components
- ❖ Questioning Techniques
- ❖ Discussion Strategy
- ❖ Application to Various Subjects

What does
it mean?





Critical thinking is thinking
about your thinking, while
you're thinking in order
to make your thinking better.

— Richard Paul

...not just thinking, but thinking which entails
self-improvement

Critical Thinking Defined...

- Involves analyzing, evaluating, interpreting, or synthesizing information and applying creative thought to form an argument, solve a problem, or reach a conclusion.
- Implies a form of learning that goes beyond memorization and recall of information.

Critical Thinking Defined...

- Critical thinking skills include the ability to interpret, verify, and reason, all of which involve applying the principles of **logic**

Critical Thinking Includes...

- Developing well-reasoned, persuasive arguments and evaluating and **responding to counterarguments**
- Examining concepts or situations from **multiple perspectives**, including different cultural perspectives
- **Questioning** evidence and assumptions to reach novel conclusions

Critical Thinking Includes...

- Devising **imaginative** ways to solve problems, especially unfamiliar or complex problems
- Formulating and articulating thoughtful, **penetrating questions**
- Identifying themes or patterns and **making abstract connections** across subjects

Critical Thinking Leads to...

Authentic Learning

Beyond the surface comprehension

Real life applications

The Critical Thinker

"The ideal critical thinker is habitually **inquisitive**, trustful of reason, **open-minded**, **flexible**, honest in facing personal biases, **willing to reconsider**, orderly in complex matters, **diligent in seeking relevant information**, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit."

- (American Philosophical Association, "Consensus Statement Regarding Critical Thinking," 1990)

Critical thinkers...

Raise vital questions and problems

Gather and assesses relevant information, using abstract ideas to interpret it effectively

Come to well-reasoned conclusions and solutions, testing them against relevant criteria and standards

Think open-mindedly

Critical versus non-critical thinking

Critical Thinking	Uncritical Thinking
<u>Seek complete information to arrive at a decision</u>	<u>Make decisions based on partial or wrong information</u>
<u>Have a clear focus</u>	<u>Drift and easily get distracted</u>
<u>Base judgement on evidence and facts</u>	<u>Base judgment on hearsay, preferences or self-interests</u>
Control feelings and emotions	Get emotional
Make decisions with the head	Make decisions with the heart
Open-minded	Close-minded
Interested in hearing alternative views and opinions	Unwilling to entertain views and opinions of others
Realistic about their ability	Overestimate their ability
Validate assumptions	Make assumptions which may not necessarily be true
Sensitive to bias and distortions in decision-making	Fall prey to bias and other distortions
Persevere	Easily give up



When do we need critical thinking skills?

Conflict Resolution

Apply critical thinking abilities when working through personal or professional conflicts with others.

With critical thinking skills, you can step back from the personal emotion of such conflicts and logically determine the pros and cons of expressing your feelings.

You may rationalize that walking away or staying detached emotionally is your best move.

Other times, you may want to share feelings and critical thinking allows you do so calmly, rationally and more effectively.



Team Problem-Solving

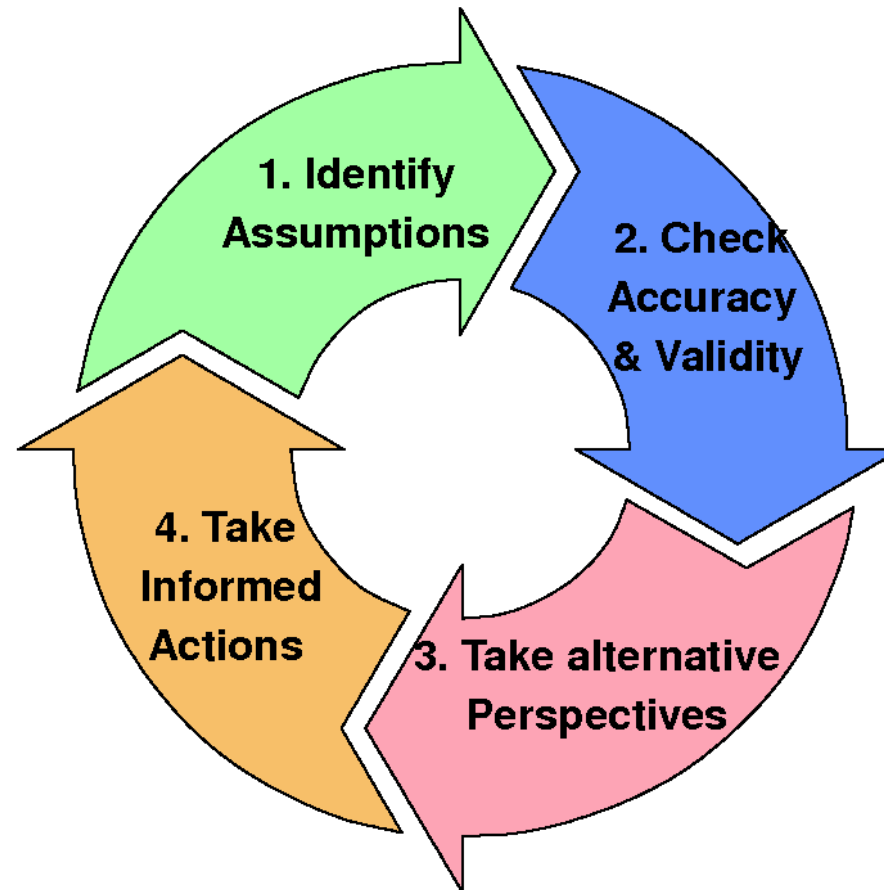
The ability to think critically is especially useful in work groups or teams. A key reason a company uses a work team structure is to incorporate the element of critical thinking in decision-making. Individuals can often act on emotion and impulse. In a team, a critical thinker may encourage everyone to step back, analyze the facts of a situation, remove emotion and recognize the long-term implications of a decision.

Teaching Critical Thinking

- Learning to **distinguish inferences from assumptions** is an important distinction in critical thinking.
- To foster quality thinking, we don't want students simply to assert things; we want them to try to **reason things out on the basis of evidence** and good reasons.

Critical Thinking Process

Stages are not linear, and may overlap



Be careful not to jump to stage four too quickly

Critical Thinking Cartoon

The Teacher's Role



Cartoon by www.CartoonStock.com

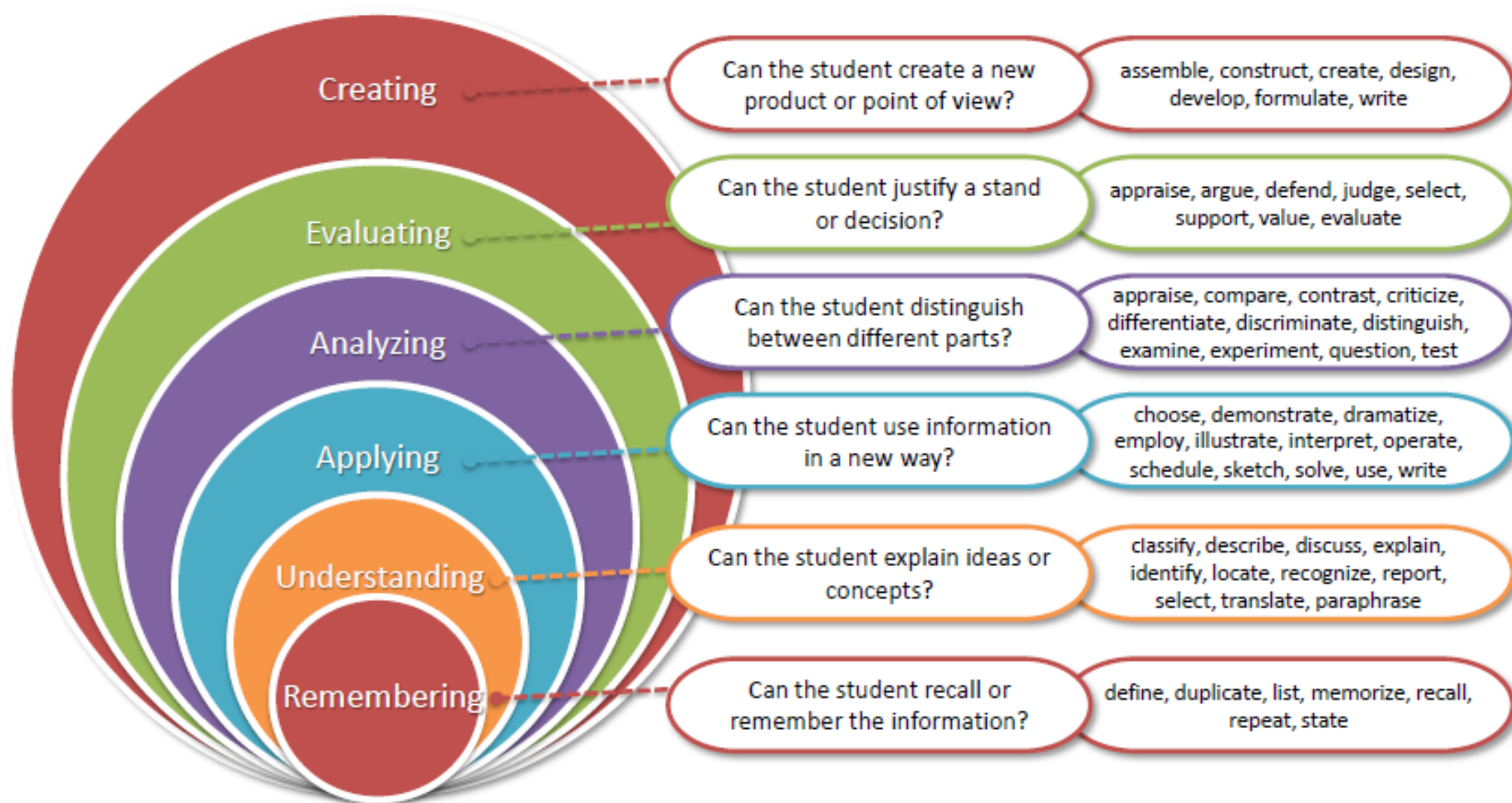
As Teachers...

We must **internalize the basic concepts** and principles of critical thinking so deeply that we **habitually use them** in all of the various dimensions of our own lives: as parents, teachers, and citizens, so that when we teach we teach in a way that helps our students translate all fundamental and root concepts and principles into the circumstances of their own day-to-day life.

Students must see our minds at work. Our minds must stimulate theirs with questions; questions that call for reasons and evidence; questions that lead students to examine interpretations and conclusions, questions that help students to discover their assumptions, questions that stimulate students to test their ideas, to take their ideas apart, to challenge their ideas.

Bloom's Taxonomy refers to a hierarchy of question stems that teachers use to guide their students through the learning process.

Bloom's Taxonomy (Revised)



Using DOK (Depth of Knowledge)

Depth of Knowledge Wheel

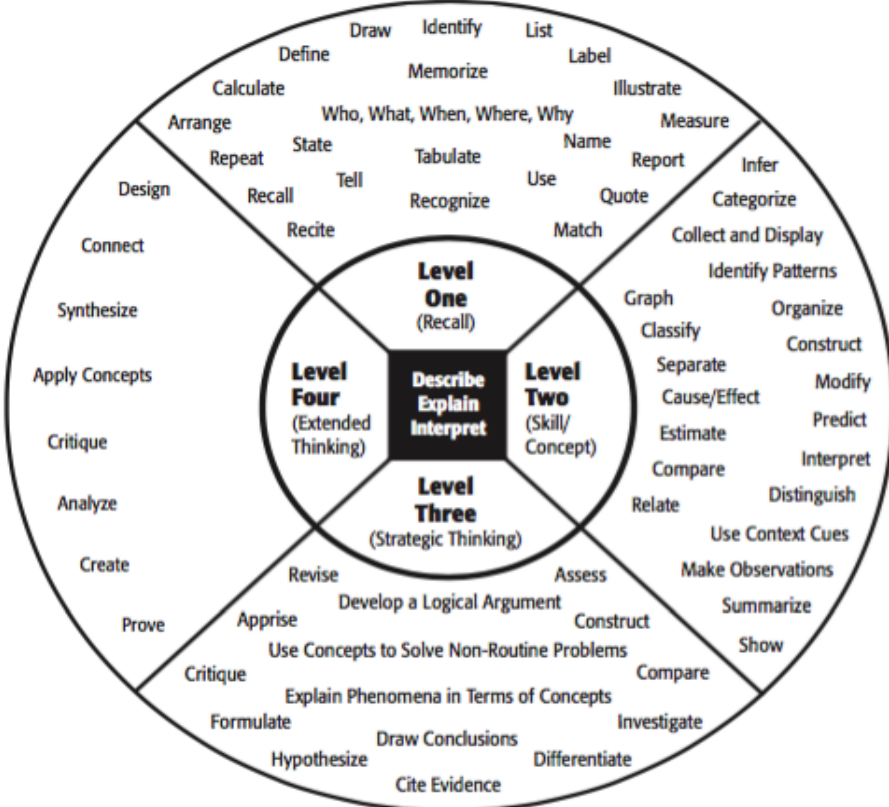
Consists of 4 Levels

Each level goes into greater depth

DOK categories create rich environments where all students learn at a high level.

DOK tasks are categorized according to the complexity of thinking required to successfully complete them.

Depth of Knowledge (DOK) Levels



Level One Activities	Level Two Activities	Level Three Activities	Level Four Activities
Recall elements and details of story structure, such as sequence of events, character, plot and setting.	Identify and summarize the major events in a narrative.	Support ideas with details and examples.	Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/ solutions.
Conduct basic mathematical calculations.	Use context cues to identify the meaning of unfamiliar words.	Use voice appropriate to the purpose and audience.	
Label locations on a map.	Solve routine multiple-step problems.	Identify research questions and design investigations for a scientific problem.	Apply mathematical model to illuminate a problem or situation.
Represent in words or diagrams a scientific concept or relationship.	Describe the cause/effect of a particular event.	Develop a scientific model for a complex situation.	Analyze and synthesize information from multiple sources.
Perform routine procedures like measuring length or using punctuation marks correctly.	Identify patterns in events or behavior.	Determine the author's purpose and describe how it affects the interpretation of a reading selection.	Describe and illustrate how common themes are found across texts from different cultures.
Describe the features of a place or people.	Formulate a routine problem given data and conditions.	Apply a concept in other contexts.	Design a mathematical model to inform and solve a practical or abstract situation.
	Organize, represent and interpret data.		

DOK Question Stems

<p>DOK 1</p> <ul style="list-style-type: none"> • Can you recall ____? • When did ____ happen? • Who was ____? • How can you recognize ____? • What is ____? • How can you find the meaning of ____? • Can you recall ____? • Can you select ____? • How would you write ____? • What might you include on a list about ____? • Who discovered ____? • What is the formula for ____? • Can you identify ____? • How would you describe ____? 	<p>DOK 2</p> <ul style="list-style-type: none"> • Can you explain how ____ affected ____? • How would you apply what you learned to develop ____? • How would you compare ____? • Contrast ____? • How would you classify ____? • How are ____ alike? Different? • How would you classify the type of ____? • What can you say about ____? • How would you summarize ____? • How would you summarize ____? • What steps are needed to edit ____? • When would you use an outline to ____? • How would you estimate ____? • How could you organize ____? • What would you use to classify ____? • What do you notice about ____?
<p>DOK 3</p> <ul style="list-style-type: none"> • How is ____ related to ____? • What conclusions can you draw ____? • How would you adapt ____ to create a different ____? • How would you test ____? • Can you predict the outcome if ____? • What is the best answer? Why? • What conclusion can be drawn from these three texts? • What is your interpretation of this text? Support your rationale. • How would you describe the sequence of ____? • What facts would you select to support ____? • Can you elaborate on the reason ____? • What would happen if ____? • Can you formulate a theory for ____? • How would you test ____? • Can you elaborate on the reason ____? 	<p>DOK 4</p> <ul style="list-style-type: none"> • Write a thesis, drawing conclusions from multiple sources. • Design and conduct an experiment. Gather information to develop alternative explanations for the results of an experiment. • Write a research paper on a topic. • Apply information from one text to another text to develop a persuasive argument. • What information can you gather to support your idea about ____? • DOK 4 would most likely be the writing of a research paper or applying information from one text to another text to develop a persuasive argument. • DOK 4 requires time for extended thinking.

Level 1: Recall and Reproduction

Tasks at this level require recall of facts or rote application of simple procedures. The task does not require any cognitive effort beyond remembering the right response or formula. Copying, computing, defining, and recognizing are typical Level 1 tasks.

Level 2: Skills and Concepts

At this level, a student must make some decisions about his or her approach. Tasks with more than one mental step such as comparing, organizing, summarizing, predicting, and estimating are usually Level 2.

Level 3: Strategic Thinking

At this level of complexity, students must use planning and evidence, and thinking is more abstract. A task with multiple valid responses where students must justify their choices would be Level 3. Examples include solving non-routine problems, designing an experiment, or analyzing characteristics of a genre.

Level 4: Extended Thinking

Level 4 tasks require the most complex cognitive effort. Students synthesize information from multiple sources, often over an extended period of time, or transfer knowledge from one domain to solve problems in another. Designing a survey and interpreting the results, or analyzing multiple texts by to extract themes, would all be examples of Level 4.

Depth-of-Knowledge Levels for Four Content Areas

1. Language Arts

Reading

Writing

2. Math

3. Science

4. Social Studies

Reading Level 1:

Requires students to recite facts. Includes oral reading that does not involve analysis of the text.

Items require only a shallow understanding of text and often consist of verbatim recall.

Allows use of a dictionary to find the meaning of words.

Reading Level 2:

Requires comprehension and inference.

Some important concepts are covered but not in a complex way.

Literal main ideas are stressed.

Using context cues to identify the meaning of unfamiliar words.

Assessment may include words such as summarize, interpret, infer, classify, organize, collect, display, compare, and determine whether fact or opinion.

Reading Level 3:

Students are encouraged to go beyond the text.

Students may be encouraged to explain, generalize, or connect ideas.

Assessments involve reasoning and planning. Students must be able to support their thinking.

May involve abstract theme identification, inference across an entire passage, or students' application of prior knowledge.

May also involve superficial connections between texts. Some examples are:

Determine the author's purpose and describe how it affects the interpretation of a reading selection.

Analyze and describe the characteristics of various types of literature.

Reading Level 4

Higher order thinking is central and knowledge is deep.

Assessment at this level will probably be an extended activity, with extended time provided.

Students take information from at least one passage and are asked to apply this information to a new task.

They may also be asked to develop hypotheses and perform complex analyses of the connections among texts.

Some examples are:

Analyze and synthesize information from multiple sources.

Examine and explain alternative perspectives across a variety of sources.

Describe and illustrate how common themes are found across texts from different cultures.

Writing Level 1

Requires the student to write simple facts that do not include complex synthesis or analysis but basic ideas.

Students list ideas or words as in a brainstorming activity; or in a simple spelling or vocabulary assessment; or are asked to write simple sentences.

Some examples are:

Use punctuation marks correctly.

Identify Standard English grammatical structures and refer to resources for correction.

Writing Level 2

Students are engaged in first draft writing or brief extemporaneous speaking.

Students are beginning to connect ideas using a simple organizational structure. Students may be engaged in note-taking, outlining or simple summaries.

Students demonstrate a basic understanding and appropriate use of a dictionary, thesaurus, or web site.

Students may write summaries that contain the main idea of the reading selection and pertinent details.

Writing Level 3

- Students are engaged in developing compositions that include multiple paragraphs and may include complex sentence structure and demonstrate some synthesis and analysis.
- Students show awareness of their audience and purpose.
- Students address chronological order in a narrative or include supporting facts and details in an informational report.
- Students are engaged in editing and revising to improve the quality of the composition.
- Students may support ideas with details and examples.

Writing Level 4

Students may write a multi- paragraph composition that demonstrates synthesis and analysis of complex ideas or themes.

There is evidence of a deep awareness of purpose and audience.

Informational papers include hypotheses and supporting evidence.

Students are expected to create compositions that demonstrate a distinct voice and that stimulate the reader or listener to consider new perspectives on the addressed ideas and themes.

Students may write an analysis of two selections, identifying the common theme and generating a purpose that is appropriate for both.

Skills learned from reaching higher
levels of understanding
taught by using questioning
techniques
develop critical thinking
so that it becomes a habit!



S. GROSS

"It sort of makes you stop and think, doesn't it."

Resources...

- *Facione, P. & Gittens C. *Think Critically*, Pearson Education
- criticalthinking.org
- *Questioning for Classroom Discussion*, J. Walsh & B. Sattes
- Google Images