

Higher Order WebQuests

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What are Critical Questions?

Critical Questions are large, overarching questions that guide the activity. These questions should help frame student learning and activity.

Questioning is integral to developing reflective and meta-cognitive thinking. It requires students and teachers to reflect on their understandings and can lead to changes and improvements in learning, thinking and teaching.

The questioning process is the cornerstone of inquiry.

It helps to:

- extend thinking skills
- clarify understandings
- gain feedback on teaching/learning
- provide revision strategies
- create links between ideas
- enhance curiosity
- provide challenges

Student As Researcher

- Allows the researcher to make personal connections
- Support curriculum through skills and content instruction
- Require critical thought rather than the simple retrieval of information
- Allow the researcher to draw conclusions or make judgments that can be supported by the researched information
- Provide opportunities for original thinking
- Allow the researcher to examine alternatives and make justifiable choices
- Allow the researcher to apply knowledge and skill beyond school application
- Provide opportunities for collaborative learning
- Be narrow enough in scope to research appropriately
- Be worded so that the meaning is clear and precise

Considerations

- What is amazing about the topic? What important consequences does it have in our lives?
- How have children experienced the topic in their own lives?
- What connection does this topic have to others? Is there a principle or concept at the root that leads to something universal?
- How can students be led to discover the topic for themselves rather than tell them what they are going to study?
- Is there a great question, issue or challenge that could introduce the topic?

Sample Critical Questions

What do you think will happen next in the story?

How does the main character in this story compare to another you have read? How are they the same and different?

Compare the way a butterfly eats with the way a caterpillar eats.

How does the weather effect our desert landforms, animals and plants?

Explain and compare our landform (rainforest) and weather conditions to the weather conditions and landforms of the Arctic region.

Is a robot like a living human being? Why or why not?

How are the microscopes that are used today better than those that were used two hundred years ago?

What is a hero? What does a hero think and do? How do you know if someone is a hero?

Predict which is more destructive an earthquake or a volcano and explain why.

Compare the lifestyle of the Ancient Romans to ours today.

In view of freedom of speech, do recording companies have a responsibility to customers for the content of the music they produce and sell? Should there be any changes in the recording industry and, if so, what are those changes?

Do you think any system of government - including democracy, communism, socialism - can solve the problems of poverty, injustice, crime or discrimination? Explain.

Describe a dance that utilized a dance form (theme and variation, round, canon, etc.). Give a detailed explanation of the form and how it was used in the dance. What effect did it have?

Bloom's Taxonomy of Six Cognitive Levels

Level 1: Knowledge

A starting point that includes both the acquisition of information and the ability to recall information when needed.

- A. Classifying
- B. Distinguishing opinion from fact
- C. Giving definitions and examples
- D. Outlining and summarizing

Level 2: Comprehension

The basic level of understanding. It involves the ability to know what is being communicated in order to make use of the information.

- A. Making comparisons
- B. Identifying structure
- C. Ordering steps in a process
- D. Reading charts and graphs
- E. Recognizing meaning
- F. Identifying main ideas
- G. Identifying relationships

Level 3: Application

The ability to use a learned skill in a new situation.

- A. Estimating
- B. Anticipating probabilities
- C. Making inferences
- D. Applying math

Level 4: Analysis

The ability to break down information into its integral parts and to identify the relationship of each part of the total organization.

- A. Judging completeness
- B. Recognizing relevance & irrelevance
- C. Identifying story elements
- D. Judging sentence sequence
- E. Recognizing fallacies

Level 5: Synthesis

The ability to combine existing elements in order to create something original.

- A. Communicating ideas
- B. Planning projects
- C. Forming hypotheses
- D. Drawing conclusions

Level 6: Evaluation

The ability to make a judgement about the value of something by using a standard.

- A. Making generalizations
- B. Developing criteria
- C. Judging accuracy
- D. Making decisions
- E. Identifying values
- F. Identifying the mood of a story

Bloom's Taxonomy Verb Chart

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
list name identify show define recognize recall state	summarize explain put into your own words interpret describe compare paraphrase differentiate demonstrate visualize find more information about restate	solve illustrate calculate use interpret relate manipulate apply classify modify put into practice	analyze organize deduce choose contrast compare distinguish	design hypothesize support schematize write report discuss plan devise compare create construct	evaluate choose estimate judge defend criticize justify

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Knowledge

Recalling memorized information. May involve remembering a wide range of material from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Represents the lowest level of learning outcomes in the cognitive domain.

Learning objectives at this level: know common terms, know specific facts, know methods and procedures, know basic concepts, know principles.

Question verbs: Define, list, state, identify, label, name, who? when? where? what?

Comprehension

The ability to grasp the meaning of material. Translating material from one form to another (words to numbers), interpreting material (explaining or summarizing), estimating future trends (predicting consequences or effects). Goes one step beyond the simple remembering of material, and represent the lowest level of understanding.

Learning objectives at this level: understand facts and principles, interpret verbal material, interpret charts and graphs, translate verbal material to mathematical formulae, estimate the future consequences implied in data, justify methods and procedures.

Question verbs: Explain, predict, interpret, infer, summarize, convert, translate, give example, account for, paraphrase x?

Application

The ability to use learned material in new and concrete situations. Applying rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.

Learning objectives at this level: apply concepts and principles to new situations, apply laws and theories to practical situations, solve mathematical problems, construct graphs and charts, demonstrate the correct usage of a method or procedure.

Question verbs: How could x be used to y? How would you show, make use of, modify, demonstrate, solve, or apply x to conditions y?

Analysis

The ability to break down material into its component parts. Identifying parts, analysis of relationships between parts, recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.

Learning objectives at this level: recognize unstated assumptions, recognizes logical fallacies in reasoning, distinguish between facts and inferences, evaluate the relevancy of data, analyze the organizational structure of a work (art, music, writing).

Question verbs: Differentiate, compare / contrast, distinguish x from y, how does x affect or relate to y? why? How? What piece of x is missing / needed?

Synthesis

The ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns or structure.

Learning objectives at this level: write a well organized paper, give a well organized speech, write a creative short story (or poem or music), propose a plan for an experiment, integrate learning from different areas into a plan for solving a problem, formulate a new scheme for classifying objects (or events, or ideas).

Question verbs: Design, construct, develop, formulate, imagine, create, change, write a short story and label the following elements

Evaluation

The ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria, which may be internal (organization) or external (relevance to the purpose). The student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all the other categories, plus conscious value judgments based on clearly defined criteria.

Learning objectives at this level: judge the logical consistency of written material, judge the adequacy with which conclusions are supported by data, judge the value of a work (art, music, writing) by the use of internal criteria, judge the value of a work (art, music, writing) by use of external standards of excellence.

Question verbs: Justify, appraise, evaluate, judge x according to given criteria. Which option would be better/preferable to party y?

Sample Bloom's Activity

Purpose:

To apply Bloom's theory of developing higher levels of thought processes to everyday classroom activities.

Knowledge: the recall of specific information

Who was Goldilocks?

Where did she live? With whom?

What did her mother tell her not to do?

Comprehension: an understanding of what was read

This story was about _____. (Topic)

The story tells us _____. (Main Idea)

Why didn't her mother want her to go to the forest?

What did Goldilocks look like?

What kind of girl was she?

Application: the converting of abstract content to concrete situations

How were the bears like real people?

Why did Goldilocks go into the little house?

Write a sign that should be placed near the edge of the forest.

Draw a picture of what the bear's house looked like.

Draw a map showing Goldilock's house, the path in the forest, the bear's house, etc.

Show through action how Goldilocks sat in the chairs, ate the porridge, etc.

Analysis: the comparison and contrast of the content to personal experiences

How did each bear react to what Goldilocks did?

How would you react?

Compare Goldilocks to any friend.

Do you know any animals (pets) that act human?

When did Goldilocks leave her real world for fantasy? How do you know?

Synthesis: the organization of thoughts, ideas, and information from the content

List the events of the story in sequence.

Point out the importance of time sequence words by asking: What happened after Goldilocks ate the Baby Bear's porridge? What happened before Goldilocks went into the forest? What is the first thing she did when she went into the house?

Draw a cartoon or stories about bears. Do they all act like humans?

Do you know any other stories about little girls or boys who escaped from danger?

Make a puppet out of one of the characters. Using the puppet, act out his/her part in the story.

Make a diorama of the bear's house and the forest.

Evaluation: the judgment and evaluation of characters, actions, outcome, etc., for personal reflection and understanding

Why were the bear's angry with Goldilocks?

Why was Goldilocks happy to get home?

What do you think she learned by going into that house?

Do you think she will listen to her mothers's warnings in the future? Why?

Do parents have more experience and background than their children?

Would you have gone in the bear's house? Why or why not?

Do you think this really happened to Goldilocks? Why?

Why would a grown-up write this story for children to read?

Why has the story of Goldilocks been told to children for many, many years?

Assessment

The **Holistic Critical Thinking Scoring Rubric (HCTSR)**

The use of the rubric by students and faculty facilitates understanding of critical thinking, the use of the language of thinking. It focuses on the skills and habits of mind that characterize a person who uses reasoned judgement to problem-solve and to make decisions about what to do or what to believe.

The HCTSR supports multi-modal assessment, for it provides evaluators with descriptors of four levels -- two positive and two negative -- where in they can categorize the critical thinking evident to them in projects, portfolios, presentations, essays, etc. and the like.

http://www.insightassessment.com/pdf_files/rubric.pdf

RubiStar is a tool to help the teacher who wants to use rubrics but does not have the time to develop them from scratch

<http://rubistar.4teachers.org/index.shtml>

Useful Links

An Educator's Guide to Critical Thinking Terms and Concept

<http://www.criticalthinking.org/University/gloss/intro.html>