



Higher Level Questioning: how to raise the rigor for our students

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- MY BOOKS
- BLOGS
- SPEAKING
- TODD TALKS
- ENRICHMENT
- RESOURCES
- PROF. DEVELOPMENT
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+ HOW DOES YOUR QUESTIONING BEHAVIOR RATE?

1. How often do you challenge students by asking questions that arouse their curiosity or makes them want to know more?
2. Do your questions encourage students to listen to each other's responses, opinions?
3. Do your questions promote self-evaluation by your students?
4. Do you preplan key questions you want to ask during the lesson?
5. Do your questions call for students to think for themselves?
6. Do you ask a variety of questions— recall vs. thoughtful questions?
7. Do all students get involved in class discussions?
8. Do students speak to each other when responding or only to you?
9. Do you wait a reasonable time for students to think about their responses before calling on them or permitting them to speak?
10. Do you encourage your students to ask questions?

+ Now add up your score and use the following scale to rate your questioning behavior:

- 45 - 50 – Your questioning behavior is off the charts, literally. Students are being pushed to reach their potential through your questions and theirs.
- 39 - 44 – Your questioning behavior is above average and just needs a little refining.
- 33 - 38 – Your questioning behavior is pretty good but could use some consistency.
- 27 - 32 – Your questioning behavior shows you need to put a little more work into the types of questions you ask and the culture you create with your students.
- 21 - 26 – You might want to take a good look at the questions you ask in class and what they are designed to do.
- 0 - 20 – Your questioning behavior needs a major overhaul but good news, this book is designed to provide you with the skills to do so.



+ Reflection Question #1

- Were you surprised at your questioning behavior rating or do you think it gives a clear picture of the type of questioner you are? Are you happy with your questioning rating or do you see room for improvement?

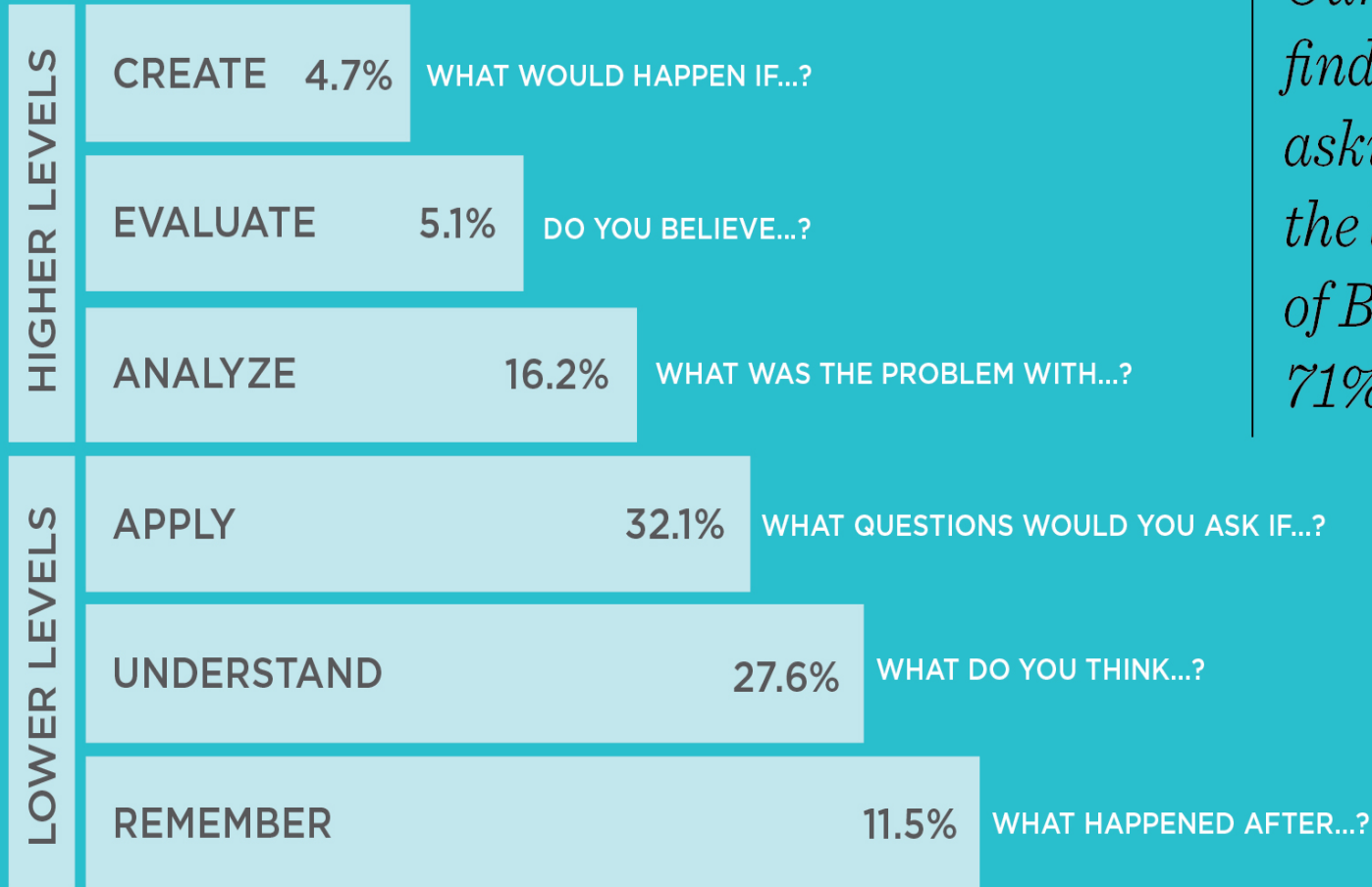


+ Orchard Cove Protocol – 10 minutes

- Pair up with another person
- Each person shares two to three insights they got from rating their questioning behavior activity.
- These insights should be in the form of a question.
- Will report out some of these to the group.



Are you asking Higher-Order-Thinking Questions?



Our walkthroughs find that teachers are asking questions at the lower three levels of Bloom's Taxonomy 71% of the time.

Data based on 334,329 walkthroughs using **Power Walkthrough**[®] software

+ Benefits of Higher Level Questioning

- Improves student achievement
- Better chance of understanding and thus retention of learning
- Increased student engagement
- Asks students to think for themselves
- Teaches valuable 21st century skills





Why use higher level questioning in your classroom



- Questioning is the most powerful tool in a teaching repertoire.
- High-level, open-ended questions lead to better student understanding.
- Quality, thoughtful questions set high expectations and promote critical and creative thinking as well problem solving.
- Teachers can challenge every student by differentiating with effective questioning.



Difference Between Hard and Rigorous



- **Hard:** the answer is not common knowledge and would require a certain amount of study or exposure in order to know it. Relies on lower level thinking such as memorization and recall.
 - **Example:** Who is the 17th Vice-President of the United States?
- **Rigor:** commonly applied to questions that encourage students to question their assumptions and think at a higher level.
 - **Example:** Who do you think has been a successful Vice-President?

+ Hard or Rigorous

- | | | | |
|-----|--|---|---|
| 1. | What is the circumference of the Earth? | H | R |
| 2. | When should you use the Pythagorean theorem? | H | R |
| 3. | What is the best form of government? | H | R |
| 4. | Why is the sky blue? | H | R |
| 5. | What is the theme of the book Frankenstein? | H | R |
| 6. | Why do you suppose the Germans decided to fight a two front war during World War II? | H | R |
| 7. | Did you like the movie Bohemian Rhapsody? | H | R |
| 8. | How do you change a tire? | H | R |
| 9. | What is a good reason for picking a certain computer? | H | R |
| 10. | Why do you suppose tennis is scored the way it is? | H | R |



1. What is the circumference of the Earth? *Hard*

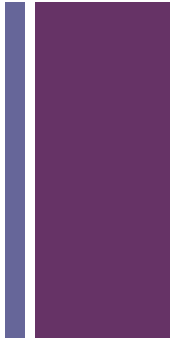
- This might be difficult to figure out because this is not something students are encountering on a daily basis. However it is not a rigorous question because scientists have figured out the precise circumference of the Earth, meaning students could look it up and find the answer.

2. When should you use the Pythagorean theorem? *Hard*

- The Pythagorean theory can be quite complex and hard to figure out how to apply it. However, there are situations when doing so is right, and others that are wrong.

3. What is the best form of government? *Rigorous*

- There is no authority that has determined which government is the best one. Different countries choose different governments for different reasons that make sense to them. The student would have to justify why he/she chose which one he/she did.



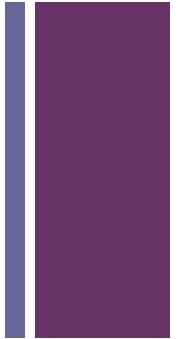
+ 4. Why is the sky blue?

Hard or Rigorous

- This one could be either depending upon the intent of the question. If you are in science class and you ask students this question, there is a definitive answer as to what makes the sky blue. However, if you are asking a group of younger students why they think the sky is blue, they could come up with all sorts of creative and imaginative responses ranging from that it has to be blue because the yellow from the sun and the blue in the sky make the grass green, to that's the crayon that was pulled from the box when creating the sky.

5. What is the theme of the book Frankenstein? *Hard*

- Even though this is probably not going to be explicitly stated in the book, there will be numerous concrete clues that point a student in the direction of what the theme is. It might have to be inferred but it is still based off of content knowledge.

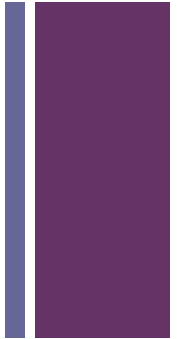


+ 6. Why do you suppose the Germans decided to fight a two front war during World War II? *Rigorous*

- Although there is lots of speculation as to why Germany did this with many experts weighing in, there is no document showing us the sole reason Germany decided to fight against the Allies to the west and Russia to the east and divide their army. Students could use reasoning to develop their own theory as to why the Germans did this.

7. Did you like the movie Bohemian Rhapsody? *Rigorous*

- Although a pretty popular movie, not everyone liked it. There might be some that argue that it was historically inaccurate and so did not care for it while others might not have liked the fact that the lead actor did not sing his own material.



+ 8. How do you change a tire? *Hard*

- True, not everyone knows how to change a tire and it can be a challenge to do so, but there is a proper way.

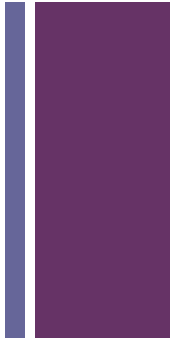
9. What is a good reason for picking a certain computer? *Rigorous*

- Different people are going to have different reasons for choosing a particular computer. Some might need fast internet, others good storage space, while another just might like the color of it. The rigor comes in the justification of the choice.

10. Why do you suppose tennis is scored the way it is?

Rigorous

- This one does not have a definitive answer. Followers of the sport are not quite sure how they came up with the system of love, 15, 30, 40, and deuce. There are all sorts of theories but nothing is known for sure. It would be fun for people to try to speculate why it is score the way it is.



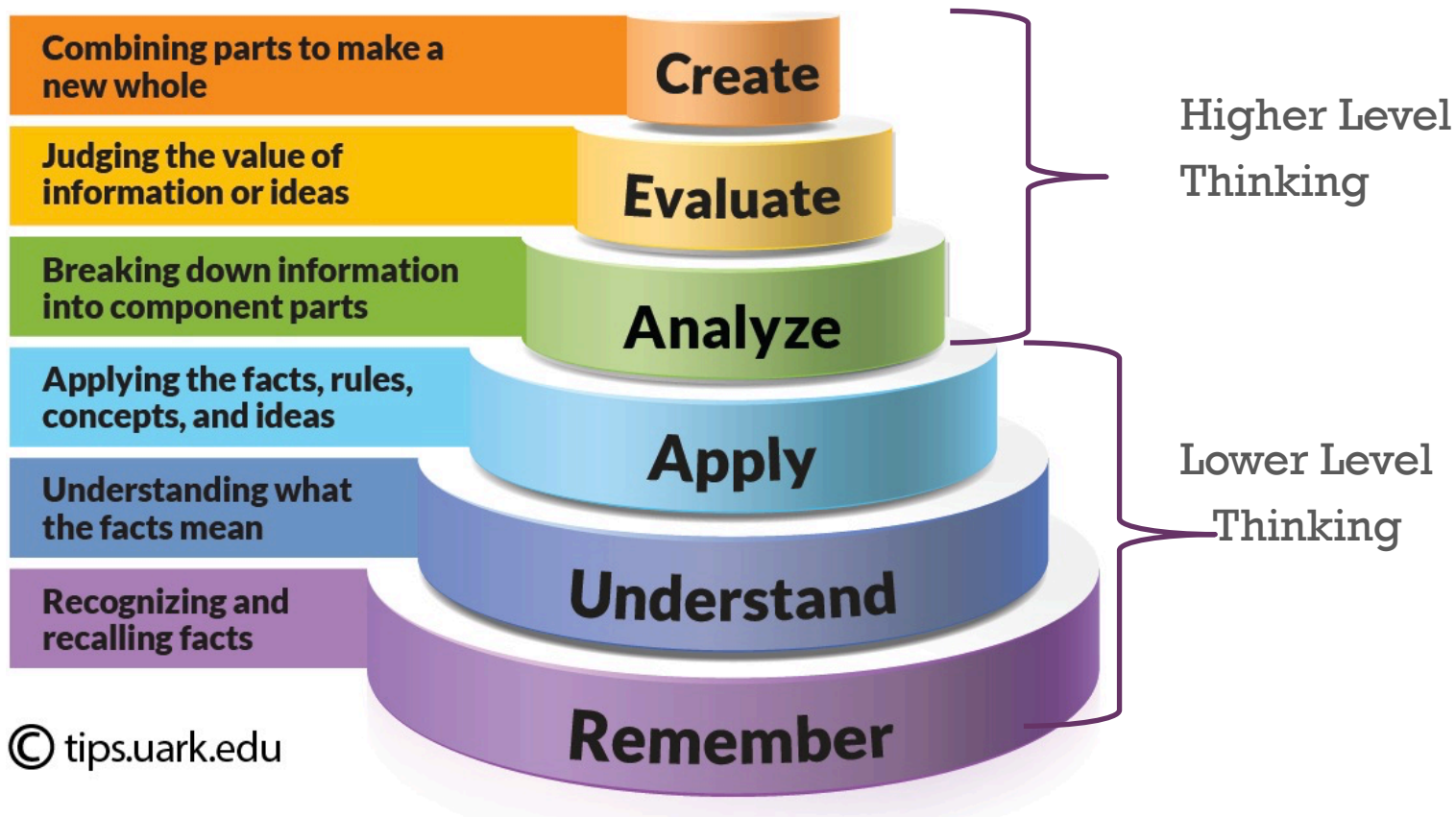
+ Using a framework to identify what sorts of questions you are asking

- The Five Ws
- Convergent versus Divergent Questions
- Costa's Three Levels of Questions
- Webb's Depth of Knowledge
- Fusco's Questioning Strategies



+ Blooms - The core of asking questions

- Use the levels of Bloom's to guide you



+ Lower Level Questioning



- Remember
 - Understand
 - Apply
-
- What percentage of your questions fall into one of these three?
 - These act as the building blocks for students but ask yourself how often you are stopping there instead of using this foundation of knowledge and understanding to challenge students with higher level thinking skills.
 - Lower level questions should just be the beginning, the starting point before jumping into deeper levels of questioning.

+ Higher Level Questioning



- Analyzing
 - Evaluating
 - Creating
-
- This is where the depth of learning takes place for students.
 - Because these questions tend to be more open-ended there is no ceiling on them.
 - These levels of questions are not necessarily more complex, they just require students to access a different level of thinking.
 - These also help students to see the context of content, looking at the big picture rather than just a specific fact.

+ The difference...?



- Usually questions at the lower levels are appropriate for:
 - Evaluating students' preparation and comprehension.
 - Diagnosing students' strengths and weaknesses.
 - Reviewing and/or summarizing content.
- Questions at higher levels are usually more appropriate for:
 - Encouraging students to think deeply and critically.
 - Problem-solving.
 - Encouraging discussions.
 - Stimulating students to seek information on their own.

Remembering	choose, define, find, how, identify, label, list, locate, name, omit, recall, recognize, select, show, spell, tell, what, when, where, which, who, why
Understanding	add, compare, describe, distinguish, explain, express, extend, illustrate, outline, paraphrase, relate, rephrase, summarize, translate, understand
Applying	answer, apply, build, choose, conduct, construct, demonstrate, develop, experiment with, illustrate, interview, make use of, model, organize, plan, present, produce, respond, solve
Analyzing	analyze, assumption, categorize, classify, compare and contrast, conclusion, deduce, discover, dissect, distinguish, edit, examine, explain, function, infer, inspect, motive, reason, test for, validate
Creating	build, change, combine, compile, compose, construct, create, design, develop, discuss, estimate, formulate, hypothesize, imagine, integrate, invent, make up, modify, originate, organize, plan, predict, propose, rearrange, revise, suppose, theorize
Evaluating	appraise, assess, award, conclude, criticize, debate, defend, determine, disprove, evaluate, give opinion, interpret, justify, judge, influence, prioritize, prove, recommend, support, verify



What remember might “look like” in a question:



- Social Studies: *recalling* the names of the seven continents.
- Math: *memorizing* math facts such as all of the multiples of 9 up to 108.
- Language Arts: *knowing* the common conjunctions of and, but, or.
- Science: *recognizing* the elements on the periodic table.

+ “When” to ask at the remembering level:

- Reviewing material already learned
- Introducing a concept by starting with definitions
- Learning basic math facts that will be used later to develop math skills
- When something has to be memorized
- Determining whether something is true or false



What understanding might “look like” in a question:



- Social Studies: *concluding* the result of what certain events caused.
- Math: *comparing* shapes to one another.
- Language Arts: *restating* the general plot of a story.
- Science: *organizing* the data that is collected from conducting an experiment.



“When” to ask an understanding level question:



- Trying to determine whether students have comprehended something they have read.
- Having students to explain what they have learned to somebody else in their own words.
- Checking whether a student’s “lightbulb” goes off or not.
- When you want students to draw a conclusion from the information they have been given.
- Requiring a student to show his work in a math problem.



What applying might “look like” in a question:



- Social Studies: *showing* students how to conduct research, then they use that skill to find new information about a country they are studying.
- Math: *classifying* numbers as fractions, improper fractions, or mixed numbers.
- Language Arts: *developing* an essay using introduction, body, and conclusion structure.
- Science: *using* the scientific method to run your own experiment.



“When” to ask an applying level question:



- Seeing whether students understand a math concept by giving them problems to solve.
- Having them follow rules of writing or grammar when composing something.
- When you want to see students take something they have learned and apply it to a new situation.
- Taking already established formulas and using them to convert a problem.
- Using logic to predict the outcome of a situation.



What analyzing might “look like” in a question:



- Social Studies: *breaking down* the stock market and trying to predict what a stock will do based on its past performance and future market.
- Math: *investigating* the various steps in an incorrect problem and determining where it went wrong and how to fix it.
- Language Arts: *connecting* a character’s motives to something that occurred to them in the past.
- Science: *analyzing* the relationships between different animals in an ecosystem.



“When” to ask an analyzing level question:



- When some large concept needs broken down into smaller parts.
- For understanding the big picture or essential question of a concept.
- To compare and contrast something.
- Making connections between ideas or organizing them.
- Getting students to begin to ask questions for themselves.



What evaluating might “look like” in a question:



- Social Studies: *ranking* the top ten Presidents of the United States.
- Math: *judging* whether a student chose the best method of solving a problem.
- Language Arts: *defending* the actions of the character Severus Snape from Harry Potter.
- Science: *deciding* whether a scientist acted ethically or not in his experiments.

+ “When” to ask an evaluating level question:

- When talking about a controversial topic.
- Debating two or more sides of an argument.
- Justifying an opinion or recommendation about something.
- Asking students to self-evaluate themselves or reflect.
- Backing up an answer students gave by using evidence.



What creating might “look like” in a question:



- Social Studies: *devising* a solution to the housing shortage in third world countries.
- Math: *constructing* a strategy for counting the number of jelly beans in a jar.
- Language Arts: *rewriting* the ending of the story so that it is more realistic.
- Science: *formulating* an alternative hypothesis based on evidence.

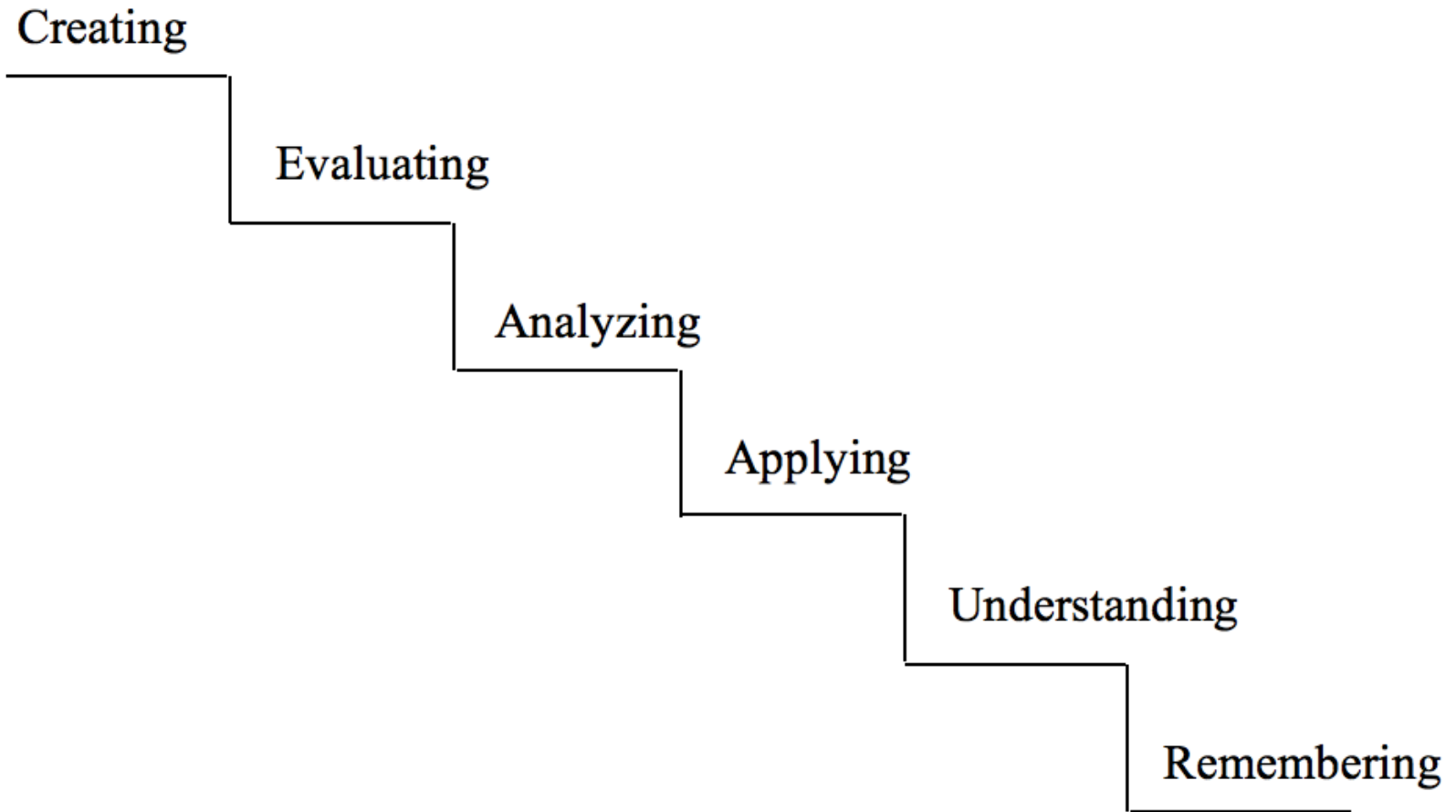


“When” to ask a creating level question:



- Generating new ideas.
- For solving a problem by proposing a solution.
- Improving a plan that has flaws or could be even better.
- When you want students to use their creativity.
- Thinking of multiple possibilities.

+ Scaffolding the question





Can scaffold by just changing the verb



■ Language Arts

- LL – *Describe* the setting of the book.
- HL – *Change* the setting of the book.

■ Math

- LL – *Solve* the equation.
- HL – *Modify* the equation.

■ Science

- LL – *Explain* how chemical change works.
- HL – *Validate* how chemical change works.

■ Social Studies

- LL – *Name* three reasons the Colonists won the American Revolution.
- HL – *Rank* three reasons the Colonists won the American Revolution.

+ Scaffolding Bloom's

Using the story *Goldilocks and the Three Bears*

- Remember – What are items used by Goldilocks while she was in the Bears' house?
- Understand – Explain why Goldilocks liked Baby Bear's chair the best.
- Apply – What would Goldilocks use if she came to your house.
- Analyze – Compare this story to reality. What events could not really happen?
- Evaluate – Judge whether Goldilocks was right for entering the Bears' house. Defend your opinion.
- Create – Imagine how the story would change if the bears had simply locked their door.

†
Are you teaching to the level of the standard?

- Using the Content Standard to Determine What Level of Questioning Should Be Used



Nouns

- Are the “what” of what should be taught.
 - Each content area with standards is set up to encourage a specific set of content specific information to be assessed. They give us this information within the text of the indicator.

Verbs

- These are the **levels of thinking** of what the student should be able to do.
 - The verb will determine the **minimum point** of the cognitive range at which the instruction should **start**.
 - We can use Bloom's Taxonomy to help figure out the range according to the indicator.

Common Core ELA

Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

Verbs: write, examine, analysis

Levels of thinking: creating, analyzing, and analyzing

Common Core Math

Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

Verbs: use, inference, generate

Levels of thinking: analyzing, creating

Next Generation Science

Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

Verbs: measure and graph

Levels of thinking: application, understanding



Sometimes might take more than one question to address the standard



Math Common Core

Write, interpret, and explain statements of order for rational numbers in real-world contexts.

- Write a statement of order to express the fact that $-3\text{ }^{\circ}\text{C}$ is warmer than $-7\text{ }^{\circ}\text{C}$.
- Explain your answer in a sentence or two.
- What can you infer about the weather from this statement?

+ Don't have to write to the level of the standard. You can raise the rigor

Work with Time and Money

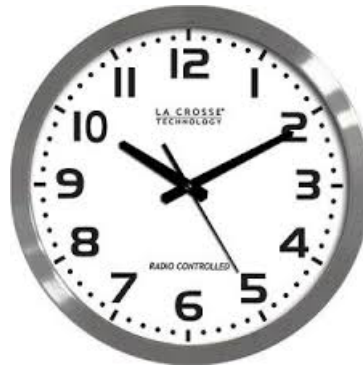
- Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.



Examples of assessment of mastery



- Write the time from the following clock



- If it is dark outside would this time be AM or PM?

- How would you indicate 5:45 on the clock?





Analyze – breaking down information into component parts



- Categorize these times with the appropriate action.

Bedtime

Lunch

Dinner

Wake up



Evaluate – judging the value of information or ideas



- Your parents have asked you to pick one of these times as your bedtime. Make an argument for which one is best as well as why the others are not as good a choice.

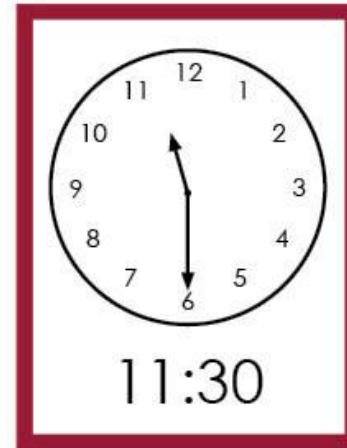
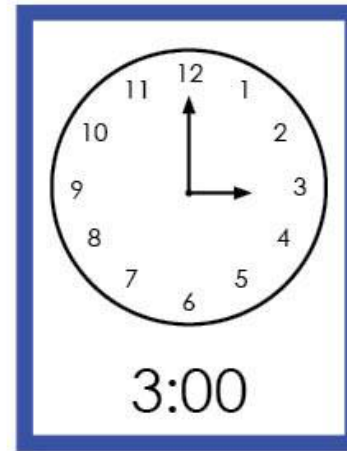




Create – combining parts to make a new whole



- You are going to invent a game in which those participating must use the correct time in order to succeed.
- Example: Similar to the card game War, two people will turn over a card from their pile. Then a third card will be turned over from the neutral pile. Whichever time is closest to the neutral pile time wins that round and the other person must add all cards to their pile.
- At the end of 15 minutes, whomever has the pile with the fewest amount of cards wins the game.





How do we move it to the higher levels of thinking?



- By having the question be something in which students either analyze, evaluate, or create.
- A question requiring students to think at this level would be challenging them to go deeper.
- A question can be anything from answering a one sentence question to explaining yourself at length.
- It is not the difficulty of the question that causes students to grow, it is the level of thinking you are asking them to do.



Changing the Question from Lower to Higher



- **Lower lever:** What is the setting of the book?
This question checks a student's ability to recognize through comprehension where the book is set. There is definitely a right and wrong answer.
- **Higher level question:** How does the setting influence the story? If the setting were different would that change the effectiveness of the story in any way?
This question allows the student to recognize and identify the setting but also to evaluate whether this was an effective setting and create a setting of their own.



Changing the Question from Lower to Higher



- **Lower lever:** What are three factors that allowed the Colonists to win the American Revolution?

This question checks a student's ability to recall facts. These facts may be very complex and involving, but they are still something that they were told or read and they are repeating them back.

- **Higher level question:** How might the United States be different if the British had won the American Revolution?

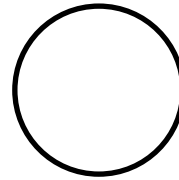
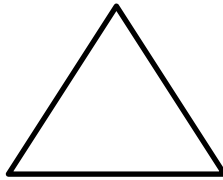
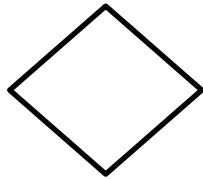
This question requires them to take knowledge and understanding they have accumulated and make a likely prediction based on these (ex. British people drink a lot of tea, Colonists stopped drinking tea in protest to the Boston Tea Party. Thus Americans would not drink as much coffee and would drink more tea.)



Changing the Question from Lower to Higher



Lower level: Identify the following shapes?



Higher level: Draw the following four shapes and then decide which one does not belong and explain why this is.

- square
- rhombus
- triangle
- circle

+ Analysis Openers



What motive does _____ have.....?

What conclusions can you draw about.....?

What is the relationship between.....?

How is _____ related to?

What ideas support the fact that.....?

What evidence can you find.....?

What inferences can you make about.....?

What generalizations can be made about?

What assumptions do you make about?

What is the theme of.....?

+ Evaluation Openers

Compare two characters in the selection....which was a better person...why?

Which character would you most like to spend the day with?

Do you agree with the actions of.....?

How could you determine.....?

Why was it better that.....?

What choice would you have made about.....?

How would you explain.....?

What data was used to make the conclusion.....?

Would it be better if.....?

+ Creating Openers



What would happen if.....?

What advice would you give.....?

What changes would you make to.....?

Can you give an explanation for.....?

How could you change the plot.....?

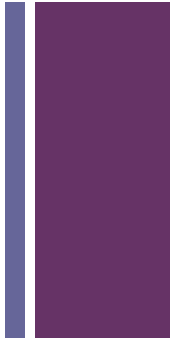
Suppose you could _____, what would you do.....?

How would you rewrite the section from
_____ 's point of view.....?

How would you rewrite the ending of the story?

+ Reflection Question #2

- **How aware are you of how you construct any written questions you use not only on assessments but in day-to-day activities?**



+ Written Questions



- Have to be aware of the level of questions you are asking of students in written assessments.
- Should be a ratio of 50/50, 50 percent lower level and 50 percent higher.

+ Audit of Questions



- You need to have a system in place where you can collect data on the sorts of questions you are asking?
- Can simply be a graphic organizer

Blooming Questions

Adapted from Bloom et. al., 1956, by Deborah Bambino, 2005.

Since we all profess a commitment to critical thinking examining the questions we ask seems like a natural winner. This is an easy way to get everyone to bring an example of their work, or current work from their school, to the table. If you repeated this process periodically and documented your findings, you could track changes over time.

Part I

- Invite all members of your group to bring a written copy of a current question(s) they have posed to their students. *Administrators or external coaches might collect questions as they visit classrooms.*
- Chart, or pass the questions around and examine them with the following prompts in mind:
 - What do you see? (Describe w/o evaluation.)
 - What questions does your review of this sampling raise for you?
 - What are the implications for your focus on higher order questioning?

Part II

- Select a question and “tune” it with a partner. Offer at least two ways the question could be phrased to take students to a higher level of thinking.
- Debrief the process and content of this experience.
 - *Will this help you with your questioning strategies?*
 - *How will you share this experience with your colleagues, students...?*
 - *What else can we do to develop “rich” questions?*

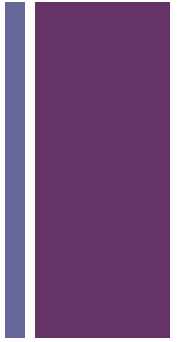
Extension: Have students keep track of the questions they have been asked and then go through the process with them. Have students examine the kinds of questions they are asking in class and then have them practice tuning their own questions.

+ When you can use written higher level questions?



- Bell ringer
- Exit ticket
- Homework
- Worksheets
- Essential question
- Activities
- Reflection/Journal
- Assessments

+ Oral Questions



- Have to ask yourself “what are the questions I am asking my students not just in my assessments, but in the day-to-day questions I pose to them?”

+ Scripting questions



- Things to consider:
 - Am I asking an open or closed question?
 - What type of response do I expect from students? Is the question phrased in a way to allow this to happen?
 - Do I have a good mix of questions on the full range of Bloom's taxonomy?
 - What will I do if students answer differently than I expect? What is plan B?
 - Do I have dead-end questions? These are questions that stop the progress of the discussion because there is nowhere to go with them.
 - Do I have enough questions to sustain the discussion? You should always have more questions than you are going to actually use.

+ Techniques for Successful Questioning

- Phrasing; teacher communicates the question so that the students understand the response expectation (ie: no one word answers).
- Adaptation; teacher adapts the question being asked to fit the language and ability level of the students.
- Sequencing; teacher asks the questions in a patterned order indicating a purposeful questioning strategy.
- Balance; teacher asks both lower and higher level questions and balances the time between the two types. The teacher uses questions at an appropriate level or levels to achieve the objectives of the lesson.
- Participation; teacher uses questions to stimulate a wide range of student participation, encouraging responses from volunteering and non-volunteering students, redirects initially asked questions to other students.
- Probing; teacher probes initial student answers, and encourages students to complete, clarify, expand or support their answers.
- Wait Time ('Think Time'); teacher pauses three to five seconds after asking a question to allow students time to think. The teacher also pauses after students' initial responses to questions in class.
- Student Questions; teacher requires students to generate questions of their own.

+ Importance of probing questions

- If what, now why?
- If when, then how?
- Challenge students to ask you questions that cannot be turned into a question.
- Written feedback on assessments can ask for follow up.





Examples of probing questions:



- Remembering: What is government?
 - How is it more than just politicians?
- Understanding: How does the government work?
 - Where have you seen instances of government in your day-to-day life?
- Applying: How does the government work for you?
 - Do you feel there are instances where it doesn't work for you but should?
- Analyzing: How does our government compare with some other types of government?
 - Have you looked at the basic idea of communism, not how it is currently being used? Do you think that could work for people?
- Evaluating: Do you think the government in its current state is working?
 - What would you do to improve our current government?
- Creating: If you could make your own government, what would it look like?
 - What would the world look like without a government?

Level of Bloom's	How many times it is being asked
Remembering	
Understanding	
Applying	
Analyzing	
Evaluating	
Creating	



Tips for Integrating HLQ in Your Classroom



- Ask the student/class a thought-provoking question, asking students to reflect before responding.
- Reverse the order. Offer student(s) the answer, and ask, “What is the question?”
- Employ the use of “What if...” to encourage student(s) to expand and extend answers.
- Get students in on the act of writing questions. If you assign a reading assignment for homework, have students prepare questions for next day’s review using Bloom’s Taxonomy.

+ Creating a flip chart



- Take 6 index cards
- Use the resources to make cards that would personally be helpful to you when trying to ask higher level questions.
- Choose verbs, stems, and prompts that will help you
- Bind them together and use as a flip chart or simply move through the index cards
- You can use this for both written and verbal questions