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Guidelines and Resources for Learning Through Inquiry

Questioning that yields critical thinking can sometimes be an elusive skill, but effective teachers recognize the need to have a classroom where inquiry is a central part of the daily exchange. The following are strategies meant to help teachers ask better questions of their students and to help students ask better questions of of themselves and one another.

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools
Constructing better questions is critical to productive classroom discussions.	● **Model precision and diplomacy in language**. If students are expected to ask thoughtful, diplomatic and precise questions, then teachers need to model doing so. ● **Engage in deeper inquiry.** There are many ways to classify questions, but the predominant goal is to ask more thought-provoking questions that spark deeper inquiry: ○ More thought-provoking questions ask students to *elaborate, justify, defend, extend,* and *develop* their ideas. ○ More thought-provoking questions challenge students to *imagine, suppose, predict, create.* ○ More thought-provoking questions ask ○ "What if…?" ○ "If...then…?" ○ "What might the consequences be if…?" ○ "How might we…?" ● **Have a balance of question types.** Sometimes teachers get so enthralled in a labyrinth of questions that the objective and purpose of the inquiry is buried and students lose interest. Having a balance of objective and subjective, convergent and divergent, and/or closed and open-ended questions is important. Above all, monitoring student engagement and adjusting the inquiry and lesson accordingly is a hallmark of good teaching.	Types of Questions Teachers Ask Let's Switch Questioning Around--student inquiry Engaging Students Through Effective Questions Levels of Questioning-- Arthur Cost Revised Bloom's Taxonomy

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools
	● **Ask questions that are at an appropriate level**. Students will become quickly discouraged by class discussions if they never have the right answers. Make certain to ask struggling students questions that they can answer confidently and without embarrassment. Use vocabulary students can understand and keep questions short and dynamic. ● **Consider Bloom's Taxonomy** when writing questions: 　○ **Remembering** asks students to recall information. ("What are the three branches of government?") 　○ **Understanding** asks students to put information in another form as they clarify, translate, illustrate, and categorize. ("Which characters in the novel *To Kill a Mockingbird* are protagonists?) 　○ **Applying** asks students carry out or use a procedure in a given situation or solve problems in new situations by applying acquired knowledge, facts, techniques and rules in a different way. ("Apply the facts in the article on climate change to specific plants and animals living in a forest biome.") 　○ **Analyzing** asks students to examine and break information into parts; to differentiate between relevant-irrelevant concepts; and to distinguish, focus, select, organize, outline, construct, and deconstruct information ("How does a capitalist economic system compare with a socialist economic system?") 　o **Evaluating** asks students to make judgments and present and defend their opinions about the quality of work or the validity of ideas based on a set of criteria. ("After examining U.S. immigration system policies and proposals for change, which proposed change do you think would be the best solution for Arizona? Defend your choice.") 　o **Creating** asks students to develop, design, produce information or to reorganize information in a different way into new patterns or alternative solutions. ("Write a script for a legal services television commercial highlighting the	[Developing Questioning Skills](#) [Asking the Right Questions](#)

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools

	dangers of specific commonly used pesticides on human health.")
	● Consider questioning strategies based on **Arthur Costas'** structure for dividing intellectual functioning into three levels:
	   ○ **Level One** questions are the lowest level of question, requiring student to gather information. Level one questions ask students to remember and show understanding.
	     ■ What is the definition of photosynthesis?
	     ■ What is the setting for Bradbury's story, "There Will Come Soft Rains"?
	     ■ How did President Kennedy respond to the Soviet Union during the Cuban Missile Crises?
	   ○ **Level Two** questions require students to process the information. Level two questions ask students to use their understanding, to examine, and to create.
	     ■ How do the visions for the future of robotics presented in the following articles differ: "Robots to Replace White Collar Workers," "Robots Without a Conscience," "Robots and the Brave New World"? Which is the most plausible and why?
	     ■ Where do you see evidence of efforts to address drought conditions in California? What do you see as the immediate next steps to address the drought in your community?
	   ○ **Level Three** questions require students to apply the information they have received or gathered. Level three questions ask students to make a decision or judgment and to use supportive evidence to validate their responses.
	     ■ How would a specific episode in a story differ if told from another character's' point of view? What evidence from the story supports your portrayal of the selected character's perspective on the chosen event?
	     ■ If your state's Senate Education Committee invited you to provide direction on future policies to govern education what advice would you give them? Support your suggestions with valid reasons and evidence from credible sources.	

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools
Sequence questions that build on each other. There are several ways to organize questions in a sequence.	- Note how the following questions build on each other: - What were the popular beliefs or tenets that characterized the Enlightenment period in American history? - How did those same tenets lead to the American colonists' desire for freedom from British rule? - What would a country absent of the tenets of the Enlightenment look like? - All are good questions that serve a purpose. In fact, they build upon one another in a sequence. Yet, the first two will eventually dead-end with clear-cut responses. They are more typical of what teachers might ask and then end the discussion. The last allows for deeper critical and creative thinking to determine possible answers. The goal is to get students to this level of thinking through questioning **Extending and Lifting** (Taba, 1971) occurs when teachers ask a series of questions at the same cognitive level where the students "extend" what they know to provide answers. Those questions act as preparatory thinking for the "lift" that follows where the teacher moves the questioning to the next cognitive level. An example from a Geometry class shows how Extending and Lifting works with the last question functioning as the lift: - What is a square? - What is a cube? - How are a cube and square similar and different? - What is a circle? - What is a sphere? - How are a circle and sphere similar and different? - Which objects in this classroom could be represented by each of these two-dimensional and three-dimensional shapes? - How do the shapes and dimensions of these objects relate to their purpose? - The **Circular Path** is a type of questioning where the answer eventually comes	Question Stems for Revised Bloom's Taxonomy High Level Thinking and Questioning Strategies Tips for Teachers: Questioning Strategies Differentiator (Goal setting based on Bloom's taxonomy- can be used to understand how to sequence questions based on the taxonomy)

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools
	back to the initial position or idea: ○ "Were Hitler's actions against the Jews a manipulation of—or a reaction to—people's prejudice? Explain." (Vogler, 2008) ○ Is the role of the artist to guide a culture's perceptions or to respond to occurrences and perceptions within a culture? ● The **Narrow to Broad** pattern is characterized by asking several specific cognitively lower-level questions followed by broader higher-level questions. Consider this example of narrow to broad sequencing from a history class where the topic is events that lead up to the American Civil War: ○ What is ethnocentrism? ○ In what ways do Americans behave ethnocentrically? ○ How is ethnocentrism embedded in our patriotism? ○ How would people from a country without cultural ethnocentrism behave toward people from other cultures? ● Conversely, **Funneling** or the **Broad to Narrow** questioning technique begins with broader lower-level questions and narrows down to specific higher-level questions. Consider this example: ○ What is prejudice? ○ What motivates people to be prejudice? ○ How do people overcome prejudice? ○ How was prejudice evident in the aftermath of the attack on Pearl Harbor in the United States? ○ How does Julie Otsuka's *When the Emperor Was Divine* inform a deeper understanding about the effects of widespread prejudice on the individual?	
Ask text-dependent	● Text dependent questions require that students have actually read the text. They are not just recall questions, although they may require that students remember	Guide to Creating Text Dependent

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools

questions to help students practice substantiating their claims with evidence**.**	facts from the text to answer them. Instead they are questions that ask students to think beyond the basic facts:
	
	    ○ Would you tell the police the truth about why Jay Gatsby was murdered at the end of *The Great Gatsby*? Would it have mattered? Explain your reasoning using evidence from the text.
	    ○ Toward the end of the novel The Great Gatsby, Nick Carraway, the narrator, called several of the principle characters careless people. What evidence from the novel supports Nick's perceptions?
	
	● Text-dependent questions demand that the reader understand what the author is conveying through the text, rather than imposing their own ideas upon it. Students need to understand thoroughly what the author is saying so that they can challenge the text with their own evidence, or extend the ideas in the text further in an exploration of its implications. Therefore, in order for students to answer text-dependent questions well, they must be taught the skills for close-reading (See table on Anchor Texts and Text Sets).
	
	● Text-dependent questions are derived from a variety of explorations about a text including, but not limited to the following:
	    ○ General information about a section of the text or the whole text (What is this about? Why does the author say this is an important idea?)
	    ○ The author's purpose (Why did the author write this piece? What in the article tells you the author's purpose?)
	    ○ The audience for which the text was intended (For whom was this written? What in the text tells you who is the intended audience?)
	    ○ Key details related to the purpose or the argument (How does the author support her claim? What evidence does she include?)
	    ○ Diction (Why did the author use this word? What is its connotation? How is it related to the purpose of the text? How would the meaning of the
		Questions
		
		Text-dependent Questions from Achieve the Core
		
		Asking Questions That Prompt Discussion

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools
	sentence change if the word were different?) ○ Syntax (Why is the sentence written in this way? Why not reorder the words?) ○ Inferences (Considering its title, what can the reader infer about the article? How does the concluding idea relate to an earlier argument?) ○ Opinions, intertextual connections (How are the ideas in this text similar to one we studied earlier? How do the authors' points of view differ?)	
Avoid ineffective questions as they will frustrate the discussion and disenchant the students.	● Questions that are too vague or unclear serve to confuse students rather than invite them to answer. ● Questions that are loaded leave students guessing at what you want them to say rather than encouraging them to share what they really think. ● Questions such as "Does that make sense?" or "Do you all understand?" generally won't elicit a negative response from students who do not want to admit their confusion in front of an audience. ● "What questions do you have?" likewise does not encourage much of a response from students who often do not understand the topic of focus clearly enough to generate thoughtful, specific questions.	Using Effective Questions Developing Questioning Skills Variables in Evidence Based Questioning
Establish ground rules and a discussion-friendly classroom.	● **Establish a climate of respect and civility.** Effective and productive classroom inquiry and discussions will only occur in classrooms where there is a culture of respect and acceptance. Posting and reminding students of discussion rules will yield more peaceable and constructive inquiries. Students need to be allowed to struggle with an answer or even have the wrong idea about something without ridicule. ● **Arrange the classroom so that everyone can hear one another and participate in the discussion**. Desks or tables facing each other, U shapes, or	Asking Questions that Encourage Inquiry-Based Learning Developing Questioning Skills

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools

	circles all work to include everyone.
	● **Ask questions in such a way that everyone in the classroom is included**.
	  ○ Use a "no hands up rule"-as soon as a few students raise their hands, the rest of the class tends to check out because they figure the other students will answer the questions. If no hands are raised and students are called on randomly, more students will be engaged.
	  ○ Ask open-ended questions that may have a variety of responses so that many students can contribute answers. This approach lends value to all of their contributions and gets students thinking critically.
	    ■ "What do you notice here?"
	    ■ "Why do you suppose…?"
	    ■ "How would you define or explain this in your own words?"
	    ■ "What does this remind you of?"
	    ■ "What problems can you identify here?"
	    ■ "What similarities (or differences) can you see here?"	

Prepare thoughtful questions ahead of time in order to ensure a more focused and productive class discussion.	● **Write it down** - Preparing and writing out a sequence of specific questions prior to the class meeting helps teachers plan for deeper and more direct questions that engage students and allow for a sequence of more exploratory and interpretive questions.
	● Use the following **criteria when creating questions**:
	  ○ Consider first what you want students to learn. What are the standards or objectives of the lesson? What concepts should students glean? What skills should students demonstrate?
	  ○ What background knowledge might the students need to understand in order to answer this question?
	  ○ Does this question draw the focus to the key concepts of the lesson?
		Using Effective Questions
		
		Asking Questions to Improve Learning
		
		Research-based Questioning Techniques

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools
	○ Is this question clearly stated? ● **Prepare follow-up questions**. Consider what answers students might offer as responses and prepare follow up questions to deepen the inquiry, rather than allow the discussion to dead-end. ● **Be flexible with follow-up questions** and allow time for a full exploration of the inquiry. It is impossible to predict all that might emerge in a discussion so be prepared to respond with extemporaneous questions as well. Always keep the objective in mind as you facilitate this exploration. ● **Make it visual** - To further engage students both visually and auditorily in the discussion, project the prepared questions on a screen for all students to see. Consider showing one question at a time or a series of questions depending on the aim of the discussion. Having visually prepared questions helps to refocus a wayward discussion, keeps the teacher and students on task, and provides a reference for clarification.	
Using specific and direct strategies to facilitate discussion will keep students engaged in a line of inquiry.	● **Call on a variety of students**. It is easy to call on the same students for responses because they are always engaged. If, however, from the beginning of class, all students are accustomed to the possibility of being asked to respond to a question, they stay more engaged. ● **Vary the way students respond**. Variety keeps students engaged. Ask them to **raise their hands** if they know the answer to a question, i.e. "Raise your hands if you remember the definition of ethnocentrism." This provides a quick assessment of what they know or have retained. It gets them thinking and keeps them on their toes, especially if they think you might ask them to actually answer the question. ● Ask the students to **think of an answer** before you call on them, ie. "I am going to ask you a question and I want you all to think of an answer before I call on someone."	The Art of Questioning includes transcripts of effective inquiries as they played out in the classroom. Inquiry: Leading Your Students to Ask Questions Video

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools
	- Likewise, use **Think-Pair-Share** and ask students to discuss their answers with a peer. Give them 10 seconds to think of an answer and then another 30 to discuss it with a classmate. Students who process verbally will benefit from having a chance to work out their ideas with one person rather than the entire class. - Instead of a direct verbal response, ask students to **write down their answer** before responding. The simple act of writing ignites thinking and can clarify ideas for print-oriented learners. - Avoid always answering the students' questions, but rather encourage **students** to **answer each other's questions** in class discussion. "Who has an answer to that question?" "Do you agree with Josie's idea?" "Is there another way to look at this?" "What would an opposing idea be to Dylan's response?" - Require students to **ask the teacher or each other** follow up questions. This creates an inquiry-friendly climate.	Using Effective Questions Questioning Strategies for Teaching Cognitively Rigorous Curricula A Good Question is Worth a Thousand Thoughts
Thoughtful teacher responses and sufficient wait time (think time) are critical for successful inquiry practice in the classroom.	**Respond thoughtfully and encouragingly to all student inquiries and responses**, even if they don't know exactly how to answer a question. Consider using statements such as, "You're on the right track. Let's see what others can contribute here." "You're nearly there. Let's think about this some more." "I see why you might think that. There may be another way of looking at it." - Rather than just saying, "Good job" or "Well done", **a more specific statement** avoids judgment. When students hear a teacher say "Good job" to a peer's response, they may determine that their answer may not have been good because it wasn't the same as the answer that was just praised. Saying something such	Asking Questions to Improve Learning A Good Question is Worth a Thousand Thoughts Questioning

Effective Practices for Learning Through Inquiry	Additional Guidelines & Strategies	Internet Resources & Digital Tools

	as, "Thank you for that response. That was insightful. What ideas do the rest of you have?" allows space for other good responses.
	● **Ask students follow-up questions that prompt deeper thinking.**
	  ○ "What do you mean by that?"
	  ○ "Can you explain that further?"
	  ○ "So what would that look like in practice?"
	  ○ "What if you looked at it from another perspective?"
	  ○ "Is that the only answer? What could another solution be?"
	  ○ "Do you agree (or disagree) with this idea? Why?"
	  ○ "What happens if…?"
	● **Use an appropriate wait time (think time)**. Students need some time to formulate answers. Recognize that students must not only make sure they hear and understand the question being asked, but also search their memory for the information and then evaluate it for acceptability before they even respond. Research supports the fact that increased wait time generates more thoughtful and accurate responses. Consider even talking to students about the value of wait time (think time) and encourage them to think a bit before responding.
		Strategies for Teaching Cognitively Rigorous Curricula

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