

3

How Do We Design Essential Questions?

Now that you have a better understanding of the characteristics of and purposes for essential questions, we turn our attention to design. In this chapter we address the following questions: How might we come up with effective EQs for framing our units? What design strategies and tips should we keep in mind when we are generating EQs? How should we revise existing questions to make them more “essential?”

If Content Is an “Answer” . . .

One approach to developing essential questions, discussed in Chapter 1, can be seen through the following thought experiment. If the content listed in standards documents (or found in a textbook) specifies the “answers” to be learned, then what were the questions that led to those answers? For example, if learning about “three branches of government” is an outcome, what questions could help students come to understand the underlying idea and its value? How about these: *Why do we need a balance of power in government? How might we avoid abuse of power? How should leaders be “checked and balanced?”* From such general EQs, we could pose a more specific question for this topic: *Why did the Federalists advocate for a balance of power, and what were the arguments on the other side? How effective is the U.S. government’s structure of three branches and what are viable alternatives?* We could also raise more general questions: *When is it wise to share power? When do we gain (and when might we lose) power by sharing it? Does balance of power inevitably lead to gridlock in government?*

The point here is straightforward—by interrogating the content in this manner, we are engaging learners in making meaning and coming to understand the content’s meaning and importance. Alternately, we could have students memorize the fact that there are three branches of government and the roles of each, but how engaging and effective is that likely to be? Would such rote learning enable students to understand current and future issues related to our government? Clearly not.

Unpacking Standards to Develop Essential Questions

Essential questions can be generated from national, state, and provincial standards. Here's an efficient and effective process for "unpacking" standards. Review a set of standards and identify the key *verbs* and *nouns* that are listed (especially those nouns that recur). Often the nouns related to key verbs in declarative statements identify important concepts, and these can form the basis of an important question for students to explore. Figure 3.1 shows several examples from the Common Core State Standards in English/language arts and mathematics, and the Next Generation Standards (draft) in science, with key verbs in boldface italics and key nouns in boldface.

Figure 3.1 Unpacking Standards to Generate Essential Questions

English/LA Anchor Standards, Reading— Key Ideas and Details	Related Essential Questions
1. <i>Read closely</i> to <i>determine</i> what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.	• What logical inferences can I draw, based on what is in the text? • What specific evidence in the text supports my ideas?
2. <i>Determine</i> central ideas or themes of a text and <i>analyze</i> their development ; summarize the key supporting details and ideas .	• What is the central idea running through the text? • How is that idea developed? • What textual details support my argument about the central idea?
Mathematics Content Standards	Related Essential Questions
1. Understand addition as putting together and adding to , and understand subtraction as taking apart and taking from .	• What whole can be made from these parts? • What's left? • What should be taken away?
2. <i>Define, evaluate, and compare</i> functions. Use functions to <i>model</i> relationships between quantities .	• Is there a functional relationship (in response to ambiguous data)?
Mathematics Practice Standards	Related Essential Questions
1. <i>Make sense of problems</i> and <i>persevere</i> in solving them.	• What do effective problem solvers do? • What should I do when I'm stuck?
2. Use appropriate tools strategically.	• What is the most appropriate method and/or tool to use here, if efficiency and effectiveness are the goals? • What tool(s) will help make the work more efficient and precise?
Next Generation Science Standards	Related Essential Questions
1. <i>Plan and carry out investigations</i> to <i>identify</i> the effect forces have on an object's shape and orientation .	• Why did this move that way? • Why is this shaped that way? • What distinct forces caused that effect?

Source for CCSS: © Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.

This same process can be used to analyze standards and outcomes from any source. Here are other examples of standards in the arts and physical education, respectively, with overarching and topical questions:

Standard: Understanding **dance** as a way to create and communicate **meaning**. (National Art Education Association, 1994)

Overarching Essential Questions: *How do artists best express what they think and feel? How does the medium influence the message?*

Topical Essential Questions: *What ideas and feelings can we express through dance? How can motion convey emotion?*

Standard: Applies movement **concepts** and **principles** to the learning and **development** of **motor skills**. (National Association for Sport and Physical Education, 2004)

Overarching Essential Questions: *What feedback will enhance or improve performance most? What kind of practice “makes perfect”?*

Topical Essential Questions: *How can we hit with greatest power without losing control? What will maximize distance, speed, and accuracy?*

Try your hand at unpacking standards in this way. (For more on unpacking standards, see Module I [Wiggins & McTighe, 2012] and *Understanding by Design: An Introduction* [An ASCD PD Online course].)

Deriving Essential Questions from Desired Understandings

As noted in Chapter 1, essential questions are linked to the important big ideas that we want students to come to understand. These ideas reside at the heart of all disciplines. They are timeless, cut across topics, and are embodied in *concepts* (e.g., the modern “flat” world), *themes* (e.g., love conquers all), *issues and debates* (e.g., nature versus nurture), *paradox* (e.g., poverty amidst plenty), *complex processes* (e.g., scientific isolation and control of variables), persistent *problems and challenges* (e.g., global warming), influential *theories* (e.g., manifest destiny), established *policies* (e.g., mandatory retirement age), key *assumptions* (e.g., the markets are rational), or differing *perspectives* (e.g., terrorist versus freedom fighter). These categories can be very helpful in generating possible essential questions. Figure 3.2 presents an example for the topic of nutrition.

Understandings are the specific insights, inferences, or conclusions about the big ideas that you hope your students will attain as a result of inquiry. In *Understanding by Design* (Wiggins & McTighe, 2005), we recommend that curriculum planners frame desired understandings as *full-sentence* statements—the particu-

Figure 3.2 From Concept Categories to Essential Questions for the Topic of Nutrition

Conceptual Category	Example	Essential Question
Concept	Obesity	What is an ideal weight?
Theme	A “balanced” diet	What should we eat?
Theory	Diet affects life span	How does my diet affect my life?
Policy	Government taxes or bans on sugary drinks and alcoholic beverages	Should the government have a say in what people eat and drink?
Issue/Debate	Value of synthetic vitamins and genetically altered crops	Is “natural” better?
Assumption	Three meals a day is best	How much and how often should we eat?
Perspectives	American Egg Board: “The incredible edible egg” American Heart Association: “Control cholesterol”	Whom can we believe about dietary matters?

lars of what you want learners to understand about an idea. For example, “I want my students to understand that a written constitution and encoded rule of law are essential to safeguard citizens’ rights in a democracy.”

Because understandings are abstractions, not facts, they are not “teachable” in the conventional sense. An understanding can be gained only through guided inference whereby the learner is helped to make, recognize, or verify a conclusion. This point suggests the critical role that essential questions play in teaching for understanding. As this book’s title suggests, EQs serve to open doors to student understanding; that is, by repeatedly exploring an essential question, learners are more likely to “come to” an understanding. In other words, the EQ helps learners construct meaning out of otherwise abstract notions and disconnected facts.

Thus a straightforward way of generating essential questions is to derive them from desired understandings. Figure 3.3 shows examples from different subject areas. Of course, the reverse is true—understandings can be derived from essential questions.

Working from Overarching Questions

In the first chapter we noted that essential questions vary in size and scope and referred to the broader EQs as “overarching,” in that they transcend any given unit topic and sometimes even subject areas. Although typically broader than the questions we might use to explore a specific topic, overarching questions can be very helpful for generating topical unit EQs. Look at the examples in

Figure 3.3 Essential Questions Derived from Desired Understandings

Desired Understandings	Possible Essential Questions
Great literature from various cultures explores enduring themes and reveals recurrent aspects of the human condition.	• How (much) can stories from other places and times be about us?
Statistical analysis and display often reveal patterns in data, enabling us to make predictions with degrees of confidence.	• Can you predict the future? • What will happen next? How sure are you?
Humans process both verbal and nonverbal messages simultaneously. Your communication becomes more effective when verbal and nonverbal messages are aligned.	• What makes a great speaker great? • How do great speakers use nonverbal messages?
True friendship is revealed during hard times, not happy times.	• Who is a “true friend,” and how will you know?
Effective persuaders employ techniques matched to the needs, interests, and experiences of their audience. They also anticipate and rebut opposing positions.	• How can I be more persuasive?

Figure 3.4 to see how you can derive topical (unit) EQs from more general (over-arching) questions.

Here is a set of overarching essential questions in mathematics developed in Pomperaug Regional 15 School District in Middlebury, Connecticut:

- How is mathematics used to quantify and compare situations, events, and phenomena?
- What are the mathematical attributes of objects or processes, and how are they measured or calculated?
 - How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?
 - How is mathematics used to measure, model, and calculate change?
 - What are the patterns in the information we collect, and how are they useful?
 - How can mathematics be used to provide models that help us interpret data and make predictions?
- In what ways can data be expressed so that their accurate meaning is concisely presented to a specific audience?
 - How do the graphs of mathematical models and data help us better understand the world in which we live?
 - What do effective problem solvers do, and what do they do when they get stuck?

Once these overarching questions were identified, the math teachers found that they could fruitfully pull questions from this set to address nearly every grade-level

Figure 3.4 Deriving Topical Essential Questions from Overarching Ones

Subject	Overarching Essential Questions	Topical Essential Questions
Literature	• What makes a great story? • How do effective writers hook and hold their readers?	Unit on mysteries • What is unique about the mystery genre? • How do great mystery writers hook and hold their readers?
Civics/Government	• How and why do we provide checks and balances on government power?	Unit on the U.S. Constitution • In what ways does the Constitution attempt to limit abuse of government powers?
Visual Art	• In what ways does art shape culture as well as reflect it? • How do artists most wisely choose tools, techniques, and materials to express their ideas?	Unit on masks • What do masks and their use reveal about the culture? • What tools, techniques, and materials are used in creating masks from different cultures?
Science	• How does an organism's structure enable it to survive in its environment?	Unit on insects • How do the structure and behavior of insects enable them to survive?
Social Studies	• Why do people move?	Unit on migration • What factors cause today's global migrations?
Mathematics	• If axioms are like the rules of the game, which ones should we use to make the game work best, and when should we change the rules? • What differentiates a necessary and important "given" from an arbitrary "given"?	Unit on the parallel postulate • Should an axiom be this complex? • How important is this axiom? What makes it so important?

concept and skill. Thus they didn't have to come up with new questions for every single unit topic! Such overarching EQs can fruitfully be asked over and over again *across* the grades as they are linked to more sophisticated content. Indeed, "spiraling" the curriculum around a set of recurring questions provides the intellectual coherence needed to develop and deepen understanding of essential ideas within and across disciplines.

Overarching EQs may be developed for all subject areas. Once in place, they assist teachers in creating versions that are more topic-specific. The added benefit is for learners: by exploring these recurring questions applied to different topics across the grades, they come to "see" the larger, transferable ideas at the heart of subject matter.

Considering Possible or Predictable Misconceptions

Another fruitful source for essential questions may be found in the misconceptions that learners often harbor about subtle and abstract ideas. Experienced teachers have noticed the pattern: it is not uncommon for learners to display fundamental misunderstandings about certain concepts and skills. Moreover, there is an established body of research on students' misconceptions, particularly in science and mathematics, that can be used to generate fruitful questions. Figure 3.5 presents examples of possible misconceptions with related EQs.

Because new learning is built upon a base of prior knowledge, it is imperative that teachers use pre-assessments to ferret out potential misconceptions at the beginning of their teaching of new content. In this regard, essential questions can serve as fertile checks when employed as pre-assessments.

Considering the Facets of Understanding

In our books on Understanding by Design (Wiggins & McTighe 2005, 2011, 2012) we propose that understanding can be assessed via various facets, or indicators. We have identified six—the capacity to *explain*, *interpret*, *apply*, *shift perspective*, *empathize*, and *self-assess*. Although originally intended to serve as indicators of understanding, the facets have proven useful in generating classroom questions, including EQs. Figure 3.6 presents a set of question starters and prompting verbs based on the six facets of understanding.

Figure 3.5 Misconceptions and Related Essential Questions

Misconceptions	Possible Essential Questions
If it's written (in a textbook, in a newspaper, or in Wikipedia), it must be true.	How do we know what to believe in what we read?
An equals sign (=) means that you have to find the answer.	- Are these values equivalent? - Is there an equivalency that can simplify this problem and help us solve it?
The scientific method is simply trial and error.	- What are the key variables that need control? - What is an efficient and effective investigation? - How can we check the validity of scientific claims?
Either you're born with ability (such as drawing, singing, good eye-hand coordination) or you're not. If you don't have natural talent, you might as well just give up.	- What makes a good artist great? - How true is it that genius is 90 percent perspiration and 10 percent inspiration (in the words of Thomas Edison)? - How can we enhance any artistic performance? - How can I improve my performance?

Figure 3.6 Question Starters, Verbs, and EQs Based on the Six Facets of Understanding

Facets of Understanding and Question Starters	Prompting Verbs	Sample EQ
Facet: Explanation		
How did _____ come about? Why is this so? What caused _____? What are the effects of _____? How might we prove/confirm/justify _____? How is _____ connected to _____? How might we help others understand _____?	• connect • demonstrate • derive • describe • design • exhibit • express • induce • instruct • justify • model • prove • show • synthesize • teach	What are causes and effects of the 9/11 attack?
Facet: Interpretation		
What is the meaning/implication of _____? What does _____ reveal about _____? How does _____ relate to me/us? So what? Why does it matter?	• create analogies • critique • illustrate • make meaning of • make sense of • provide metaphors • read between the lines • represent • tell a story of • translate	Why do they hate us? (Or is "hate" the right term?)
Facet: Application		
How and when can we use _____? How is _____ applied in the larger world? How might _____ help us to _____? What will happen next?	• adapt • build/construct • create/invent • debug • decide • design • perform • produce • propose • solve • test • use	What might prevent another 9/11? (Or can we?)

Continued on next page

Figure 3.6 (continued)

Facets of Understanding and Question Starters	Prompting Verbs	Sample EQ
Facet: Perspective		
What are different points of view about _____? How might this look from _____'s perspective? How is _____ similar to/different than _____? Whose story is this?	• analyze • argue • compare • contrast • critique • evaluate • infer	What is the jihadists' story of 9/11?
Facet: Empathy		
What would it be like to walk in _____'s shoes? How would you feel if you were _____? How might _____ feel about _____? What was _____ trying to make us feel/see?	• be like • be open to • believe • consider • imagine • relate • role-play • simulate	What motivates a suicide bomber?
Facet: Self-Knowledge		
What do I truly know? How do I know it? What are the limits of my knowledge about _____? Where are my "blind spots"? What are my strengths and weaknesses in _____? How are my views about _____ shaped by my (experiences, habits, prejudices, culture, etc.)?	• be aware of • realize • recognize • reflect • self-assess	In what ways did 9/11 change me or my life?

Essential Questions and Skills

Teachers with whom we have worked often find it more natural to develop essential questions for conceptual topics (e.g., themes in literature, principles of science, patterns of history) than for skill-based work (e.g., instrumental music, sports, beginning levels of world language). Indeed, we have met teachers who claim that EQs do not apply to them because "I only teach skills." Although we empathize with their concern, we do not agree with their conclusion, as we have suggested in earlier chapters.

Important ideas of purpose and strategy underlie all skill mastery, and these form the basis of fruitful essential questions, as we noted in Chapter 2 with Polya's essential questions in mathematics problem solving. In fact, considering such questions is *essential* to the ultimate goal of skill teaching—fluent and flexible performance. We have found that essential questions can be fruitfully framed around four categories of ideas relevant to effective skill learning: (1) *key concepts*, (2) *purpose* and *value*, (3) *strategy* and *tactics*, and (4) *context of use*.

Let's consider an example from physical education and athletics. For sports that involve the skill of swinging with long-handled objects, such as baseball, golf, lacrosse, hockey, and tennis, *key concepts* include power, torque, and control. Thus, as we have suggested, we might frame a question for exploring these ideas, such as "How does torque affect power?" Or more generally, we could pose the question "How can you hit with greatest power without losing control?" to help learners develop effective *strategies* for their swings (e.g., keeping eyes on the ball or puck and follow-through). A third question relates to *context*: "When should we swing softly?"

The same categories are useful in academic skill areas, such as reading: *How do you know that you comprehend what you are reading?* (key concept); *How important is it for readers to regularly monitor their comprehension?* (purpose and value); *What do good readers do when they don't understand the text?* (strategy); and *When should we use "fix-up" strategies?* (context of use). Figure 3.7 presents additional examples of possible essential questions to use when teaching skills.

As noted in the previous chapters, intent is everything when judging the essentialness of questions. Thus, to engender genuine inquiry as opposed to only posing leading questions in skills-focused work, questions related to strategy and value have to arise from the kinds of problems or challenges in which such strategic decisions must be made.

Accordingly, questions in skill areas are essential only when asked in a context of genuine performance challenges, where ongoing judgments and adjustments are required. In real-world skills applications, rote learning will rarely suffice. Skills are means, not ends, and their aim is *transfer*—fluent, flexible, and effective performance in varying contexts. That outcome requires the ability to make wise choices from a repertoire—that is, understanding *which* skill to use *when*, *how*, and *why*, when confronted with complex performance challenges.

Revising Essential Questions

Developing good essential questions is not easy. Even experienced teachers who possess a deep knowledge of their subjects have exclaimed that crafting EQs is tough. As Jerome Bruner (1960) famously put it: "Given particular subject matter or a particular concept, it is easy to ask trivial questions. . . . It is also easy to ask impossibly difficult questions. The trick is to find the medium questions that can be answered and that take you somewhere" (p. 40).

Indeed, the ability to generate good essential questions is a learned skill, and very few people create a perfect EQ on the first try. We have found it helpful to think of designing essential questions as a genre of writing, and like the writing process itself, it typically requires drafts, feedback, and revisions.

A basic tip for reviewing and revising EQs is to evaluate them against the seven defining characteristics presented in Chapter 1. Also, show your draft questions to

Figure 3.7 Skills, Strategies, and Related Essential Questions

Subject	Skills	Strategies	Related EQs
Reading	“Sound out” unfamiliar words.	Use context clues to figure out the word’s meaning.	- What is the author trying to say? - How can I infer or find out what these words might mean?
Writing	Follow the five-paragraph essay structure.	Match your word choices with your purpose and audience.	How can I best achieve my purpose with this audience?
Mathematics	Dividing fractions: Invert and multiply.	Problem solving: - Simplify equivalent expressions. - Work backward from end result.	- How can I turn unknowns into knowns? - What is the most revealing final form?
Visual Arts/Graphic Design	Use the color wheel to select complementary colors.	Use colors to reinforce the mood you want to evoke in the viewer.	- What am I trying to make the viewer feel? - How can I best express it?
Carpentry	Apply proper techniques when using a band saw.	Measure twice, cut once.	How can I best save time, money, and energy?
Instrumental Music and Keyboarding	Practice to achieve automaticity in skill performance.	To make practice time most effective, one must have clear goals, constantly monitor performance, seek and heed feedback, and make needed adjustments.	If practice makes perfect, what makes perfect practice?

other teachers (especially those who understand EQs) for feedback. In curriculum planning, it's easy to become too close to your work or to get writer's block, and sometimes all it takes is another set of eyes to spark a breakthrough.

The bad news: as noted, writing essential questions that meet our criteria is not easy. The good news: this is a skill that improves with practice. To help you build this skill set, study the sets of “before and after” essential questions in Figure 3.8 to see examples of revisions and associated comments.

Did you notice what is common to the revisions? They move away from the convergent toward more open and nuanced questions. The revised versions imply that there is a range of plausible answers or that a thoughtful judgment has to be made. They call for inquiry and extended thinking, and answers are likely to be refined or even rethought as understanding deepens. Note that although the original questions could certainly be used as part of a study of a given topic, they are not the best for framing the whole inquiry.

You also may have noticed that there are some simple techniques for opening up the question: *To what extent? How well? How much?* These small but helpful edits now make more clear that there is a *range* of possible answers, not just a single right answer.

Of course, the best test of an essential question comes in its use. Does it in fact engage the learners in productive inquiry? Does it stimulate thinking, discussion, and even debate? Does it spark rethinking and further questions? Does it lead to deeper insights about important matters? If not, revisions are needed. If so, your question has realized its promise.

FAQs

How many essential questions and companion understandings should a unit have?

The answer depends in large part on the scope and time frame of the unit. A 2-week unit on a specific topic within one subject area would likely have fewer EQs and understandings than a 12-week interdisciplinary unit. That said, we typically see between two and four essential questions in a unit of 3 to 4 weeks' duration. The important thing to remember is that quality, not quantity, counts. It does not follow that a unit with more targeted essential questions (and related understandings) is better than a unit with fewer. In this regard, it is useful to invoke a variation of the Marine Corps recruiting motto: We seek “only a few good” inquiries. If they are truly essential, they can (and should) establish priorities and help uncover the key ideas. Do not state questions that you do not intend to actively pursue through discussion, research, problem solving, and other constructivist means. Finally, keep in mind that a truly essential question is one that we will continually revisit throughout the unit, so we don't want too many. The same is