Learning is not attained by chance, it must be sought for with ardor and attended to with diligence.

--Abigail Adams

Presentation developed by Janet Hale, CM Consultant and Trainer
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Essential Question
How does inquiry affect knowledge?

Supporting Questions
How may designing learning based on conceptual questions affect student learning over time?

How may essential and support questions influence instruction practices including instructional delivery and assessment methods?
Refine is defined as: to use precise distinctions in thought, speech, or text.

Refine Maps Equals
Refine Current Curriculum Design and Practice

There are a variety of ways curriculum may become more precise or distinctive.

In today’s session the refinement focus pertains to the distinctive features regarding essential and supporting conceptual-based questions.
Dr. Heidi Hayes Jacobs has a chapter dedicated to Essential Questions in...


Chapter 4: Refining Maps Through Essential Questions

The key word here is refining! Beginning mapping does not ask for or often include EQs unless teachers have been extensively trained in this type of unit design and are already using EQs in curriculum design and instruction.
Just because essential questions appear on maps, it does not necessarily mean the questions are truly essential!

Essential Questions

What is an even number? What is an odd number?

What is the position of the hour hand and the minute hand at "half-past" an hour? Can you show "half-past" on an analog clock?

ART 8

ORIENTATION - CLASSROOM EXPECTATIONS

ESSENTIAL QUESTIONS:
What will we "DO" in art 8?
How is the art room organized for locating materials/supplies and what are proper clean-up procedures?
What are guidelines for classroom safety with use of tools?

What is the length of the field of view (in mm's) when looking through the lowest power on the microscope?
Recommended Reading

Concept-Based Curriculum and Instruction for the Thinking Classroom
--H. Lynn Erickson Corwin Press

Concept-Based Curriculum and Instruction: Teaching Beyond the Facts
--H. Lynn Erickson Corwin Press

Understanding by Design
--Grant Wiggins & Jay McTighe ASCD

The Understanding by Design Handbook
--Jay McTighe & Grant Wiggins ASCD

Note: These books focus on unit design that embraces conceptual learning. You do not have to embrace the authors’ entire unit-design process. I am recommending these books to aid in gaining a deeper insight into the reasoning behind incorporating essential questions when refining your curriculum (maps and student learning).
The term *enduring* refers to the big ideas, or the important understandings, that we want students to "get inside of" and retain after they've forgotten many of the details.

Put differently, the enduring understandings provide a larger purpose for learning the targeted content .... Why is this topic worth studying?

*I remember when I studied...*
Essential Questions are broader, timeless concept-based questions that are not answered easily. A student must synthesize multiple facets of understanding to adequately answer Essential and Supporting Questions.
Well-written Essential Questions/Supporting Questions cause students to experience / explore / evaluate learning via Six Facets of Understanding …a multi-faceted view of what makes up understanding (p. 44)

Can Explain …
Can Interpret …
Can Apply …
Have Perspective …
Can Empathize …
Have Self-Knowledge …
Essential/Supporting questions are conceptual-based questions based on **transferable generalizations**.

**Examples**

Authors choose certain words to express emotions.

The population of a species will grow to fill any available habitat to which it can adapt.
Essential questions are meant to serve as *Mental Velcro* for the learner…

- EQs **define** concept-based big ideas or enduring understandings
- EQs **set** direction for a unit of study’s content-skill sets and intra-aligned assessments
- EQs **create** depth rather than breadth given time constraints
- EQs **increase** interaction and retention of what students must know, be able to do, and how the various cognition levels (Bloom) and perspectives (Wiggins/McTighe; Erickson) of learning are accurately measured

*Mental Velcro Analogy, Jacobs, H. H., Curriculum Mapping Institute, Santa Fe, New Mexico, 2006.*
EQs serve as a *framework* for a unit of study’s learning…

- EQs and SQs are similar to a *Table of Contents* in that they inform learners of what is yet to come. (Jacobs, CMI 2003)

- EQs and SQs inform learners of what the *conceptual focus or focuses* will be in the unit learning.

- Conceptual focuses are visited and revisited over time—both horizontally and vertically—to allow learners to *transfer knowledge* and expand their ability to *generalize* the conceptual focuses.
EQs serve as a framework for a unit of study’s learning...

The wording of EQs greatly impacts the conceptual focus(es) and the topic-based focuses (SQs) in a given unit of study. For example, think of the variety of learning that could take place given the slight wording changes below by (a) using how versus why, and (b) by switching the two nouns within the EQs:

<table>
<thead>
<tr>
<th>How does movement influence motion?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why does movement influence motion?</td>
</tr>
<tr>
<td>_________________________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How does motion influence movement?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why does motion influence movement?</td>
</tr>
</tbody>
</table>
So, I want to make certain I am getting this right...

A well-written Essential Question is not simply “a question.” It is a question based on broad concepts and can be answered quite differently based on personal viewpoints and perspectives.

Get ready for a “light bulb” moment!

1. Grab a blank piece of paper and writing utensil.
2. Listen for the verbal directions.
Consider yourselves divided!

**LEFT**

Simple tools are found in the kitchen.

**RIGHT**

Draw illustrations...
Consider yourselves divided!

LEFT

RIGHT

Simple tools solve problems.

Draw illustrations...
Simple tools solve problems.

Simple tools are found in the kitchen.

Fact/Topic-Based

Concept-Based

Do both statements have nouns or noun phrases and connecting verb or verb phrases?
Conceptual-Based Big Ideas Cause Your Brain To "GENERALIZE!"
Technically, there is great variety to the types of questions asked in the classroom...

Essential Questions

Concept-Based Big Ideas/Enduring Understandings

Supporting Questions
   Unit-Specific Factual & Concept-based Related Learning

Direct-Answer Questions
   Foundational Yes/No/Factual

Isolated Questions

Essential Questions
   Concept-Based Big Ideas/Enduring Understandings
What Type of Question? EQ, SQ, or D-AQ?

1. Why do businesses think critically about customer service?
2. What will happen when we put the seed in the pot with soil and water it daily?
3. Why do choices alter results?
4. Why do rains affect ecosystem interactions?
5. How did the first people arrive in North America?
6. How does algebra prove number tricks work?
7. How do revolutions repeat in structures?

**Questions 3 and 7 are Essential Questions.**  
**Questions 1, 4, and 6 are Supporting Questions.**  
**Questions 2 and 5 are Direct-Answer Questions.**
A concept is an organizing idea; a mental construct that is...

- Universal
- Timeless
- Broad / Abstract
GENERALIZATION

= Enduring Understanding

Two or more concepts combined to make a relationship...

“CONCEPTUAL BIG IDEAS” CAN TRANSFER TO DEVELOP OR EXPAND GENERALIZATIONS

H. Lynn Erickson  ●  lynnerickson.net  ●  www.corwinpress.com
Concept-based generalization statements can be transformed into essential questions.

**Generalization Statements**

- Culture *exhibits* both change and continuity through time.
- Line *defines* shape and adds meaning.

H. Lynn Erickson  ●  lynnerickson.net  ●  www.corwinpress.com
Government establishes rules that people are expected to live by.

The capacity of available tools affects the quality and specificity of information that scientists can collect.

Prior knowledge, reading experience, and life experience shape how readers read and respond to text.
Whether an enduring understanding, an essential question, or a supporting question, two concepts form a relational statement.

Example: Grade 9
Generalized Concept/Enduring Understanding = A country’s geography has a direct impact on its economy.

Essential Question = How does geography impact an economy?

Supporting Questions (Foreign Trade) = How does Japan’s land and sea trade routes impact global economies? How may changes in United States trade routes impact global economies?
Example: **Grade 2**

**Generalized Concept/Enduring Understanding =**

A country’s climate has a direct impact on its agriculture.

**Essential Question =** How does weather help or hurt growth?

**Supporting Question (Arizona Geography/Science) =**

How does Tucson’s weather help or hurt our city’s food crops?
Essential questions and supporting questions must be written with consideration for the unit of study and student population.*

* Age group or groups and interests
Language acquisition
School and local community connections

*Important: Stage of maturational and cognitive development (grade level) affects wording/word choice.

Grade 3 EQ
How does direction affect movement?

Grade 5 EQ
How does movement affect lifestyle?

Grade 7 EQ
How does lifestyle affect movement?
How does learning affect growth?

How does eating healthy foods affect your growth?

How do farming practices affect crop production?

How does AIDS research affect rates of infection?
What can we do to improve students’ retention and desire to learn?

Essential question-driven units of study are most often designed based on a combination of standard statements, content-skills sets, and assessments.
Students investigate (observe, record, describe) characteristics in daily weather and seasonal cycles.

Why do people dress in different ways?

Why do families dress in different ways in different seasons?

What can we do to improve students’ retention and desire to learn?

Students investigate (observe, record, describe) characteristics in daily weather and seasonal cycles.

Why do people dress in different ways?

SQ

Why do families dress in different ways in different seasons?
What can we do to improve students’ retention and desire to learn?

**Standard Statements**

1. Represent quantitative relationships graphically and use the graphs to solve real-world and mathematical problems.
2. Generate a table of values from a formula and graph the resulting ordered pairs on a grid.

**Essential Question**

How do trends influence production?

SQ

How can mathematical statistics influence Arizona’s economy?

**Grade 8**

Patterns, Functions, and Algebra
What can we do to improve students’ retention and desire to learn?

Standard Statement
Analyze and explain the impact on American society and culture of the new immigration policies after 1965 that led to a new wave of immigration. (Individuals, Society, and Culture)

Essential Question
How does equality generate policy?
SQ
How do formal and informal leaders generate immigration policies?

High School US History Unit
United States in Troubled Times: 1960 to 1980
How Many EQs Per Unit? One (or Two)

• In order to make a unit of study manageable given the need for depth rather than breadth, it is recommended there be one (no more than two) essential question per unit.

• Beyond the unit’s essential question, it is recommended that two to four unit-specific supporting questions are designed to aid students’ conceptual and topic-specific learning.

• The wording of both essential questions and supporting questions should written with respect to the language acquisition of the students. (Note: There may be one word in a question that will be a part of the unit’s learning.)
Jacobs (Mapping the Big Picture, 1997) outlines eight criteria when generating student-friendly essential questions:

1. Each child should be able to understand the question.
2. The language of the questions should be written in broad, organizational terms.
3. The question should reflect your conceptual priorities.
4. Each question should be distinct and substantial.
5. Questions should not be repetitious. (SQs)
6. The questions should be realistic given the amount of time allocated for the unit or course.
7. There should be a logical sequence to a set of essential questions.
8. The questions should be posted in the classroom. (pp. 30-32)
A Visual Reminder!

- Post EQs and SQs where all students can see them easily
- Refer to them often during every day / period’s learning experiences
- Include them textually on handouts and assessments
- Connect previous learning to new learning in relationship to EQs and SQs

Essential Questions and Supporting Questions should be clearly posted at the beginning and throughout a unit of study!
Essential Question

How does text influence readers?

Unit Focus:
Leisure Reading

Some teachers prefer
to design essential or
topic-based SQs that
*do not use a*
noun-verb-noun
*pattern,*
*but still cause students*
to think broad and
*from multiple*
perspectives.

SQ: What makes a book a book?

SQ: What makes a good book “good?”

SQ: If you owned a children's bookstore and could only carry five genres of books, which would you carry and why?
Physical Science Standard Proficiencies:
Recognize basic Earth materials. / Observe and describe rocks, soils, water and air.

EQ

How can attributes define cycles?

SQs

How can rock cycles be interrelated?

Do rock cycles have to have sequential changes or steps?

What causes attributes in rocks?

How are rocks officially classified?

What does the term attribute mean?

How does a geologist study?
Physical Science Standard Proficiencies:
Recognize basic Earth materials.
Observe and describe rocks, soils, water and air.

How can attributes define cycles?
How can rock cycles be interrelated?
What causes attributes in rocks?
What does the term attribute mean?

Culminating assessment(s) and periodic formative assessments incorporate the EQ and SQs relational knowledge based on foundational learning and prior knowledge.

Lesson Plans:

Activity #1
Activity #2
Activity #3
Activity #4
Activity #5
Activity #6

Activities Include Direct-Answer Foundational Questions (Yes/No/Factual)
In learning environments wherein *Interdisciplinary Units* are the norm for instructional practice, teachers from *different disciplines* may choose to not only plan a unit of study’s based on the *same* EQ(s), each discipline’s teachers’ SQs based on the disciplines’ course-specific content-skill learning. Oftentimes, the teacher team designs a final or culminating unit assessment that measures learning involving all the disciplines!

**Shakespeare**

- Language Arts
- Social Studies
- Math
- Science
- Art
- Music
4 Ps For Writing EQs/SQs

1. Plan
   Based on standard statement(s), design learning based on desired depth of knowledge & 6 Facets of Understanding appropriate for student population.

2. Practice
   Write/rewrite questions so that they accurately reflect the desired conceptual focus (EQs) and topic-focus (SQs) given the planned content-skills-assessments.

3. Prepare
   A unit’s Essential Question needs Supporting Questions and Foundational Questions. Plan lessons and resources accordingly.

4. Perform
   Activities (Lesson Plans) must be realistic given the time allotted for the unit of study and EQ/SQs.
A Unit of Study

Remember a unit of study’s EQs and SQs must connect directly to the specific learning within the unit.

Students must be able to cognitively experience a direct correlation between a unit’s content, skills, and assessments and the unit’s EQ(s) and SQs.
The following slides provide an overview of a manner in which teachers can design essential questions based on concepts that are based on a current unit’s planned learning (content, skills, assessments) and aligned standard statements.
prepare to use the formula framework:

conceptual + verb + conceptual
noun/noun + noun/nounphrase + noun/nounphrase

analyze a unit’s intra-aligned content, skills, assessments, and standard statements to look for potential “conceptual lens” connections.

• brainstorm possible conceptual noun or noun phrases related to the unit’s theme, topic, and/or facts learning.

• brainstorm possible relational verbs.

this process is best done using sticky notes that can be move around—one noun or verb word/phrase per sticky.
Earth Science Weather Unit of Study

Some Sample

NOUNS
- Concepts
- Condition
- Behavior
- Outcome
- Observation

VERBS
- Action
- Change
- Result
- Inform
- Cause
Try different combinations (by manipulating the sticky notes) in the formula framework:

_____________ + _____________ + ______________
conceptual        verb          conceptual
noun/noun                  noun/noun
phrase                              phrase

Decide which conceptual-based combinations you/your team believe “fits best” given the theme, topic, and facts in the unit of study. (Note: You may need to add –s to your nouns or verbs and/or may need additional words.)

Quality Control: If a combination is truly conceptual, you can generalize and easily think of learning beyond the key facts and topics of the given unit!
**Earth Science Weather Unit of Study**
*(teachers wanted to add in ELA connections)*

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Change</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>Creates</td>
<td>Outcomes</td>
</tr>
<tr>
<td><strong>Media</strong></td>
<td>Informs</td>
<td>Behavior</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Create</td>
<td>Behaviors</td>
</tr>
<tr>
<td><strong>Media</strong></td>
<td>Informs</td>
<td>Occupations</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Influence</td>
<td>Information</td>
</tr>
</tbody>
</table>

**Important Note:**
With any of the combinations, learning can extend outside of the Science discipline.
The bridge to “cross over” from a conceptual-based statement (big idea) Noun + Verb + Noun to a conceptual-based EQ is the *introduction terms*...
Try your conceptual-based big idea(s) with both introduction terms How ___ and Why ____ in front of the big ideas.

How _____ _____ + _______ + _______?

Why _____ _____ + _______ + _______?

Important: Notice the use of how versus why will often times change the direction of learning!

How do conditions change outcomes?
Why do conditions change outcomes?
Once the desired EQ has been selected…

How do conditions change outcomes?  
Why do conditions change outcomes?  

How does media inform behavior?  
Why does media inform behavior?  

How do outcomes influence information?  
Why do outcomes influence information?  

Next steps include designing topic-specific Supporting Questions, fact-based Foundational Questions, Summative/Formative Assessments, Activities, and Resources; discuss Instructional Methods.
If it seems overwhelming ... Start slow!

Begin by revising one current unit’s content-skills-assessments-resources-standards to reflect the larger purpose within the learning by designing one EQ and one or two SQs.

Based on the conceptual demands, revise the unit’s current elements:

- New Content needed?
- Revise measurable verb(s) in skill statements?
- Add new skill statement(s)?
- Analyze current assessments? Do they truly measure student’s ability to independently answer the to be added EQ and SQs?
Let's Give It A Try!

Essential Questions?

Supporting Questions?

Do I Have Any Volunteers?
Essential Question

How does inquiry affect knowledge?

Supporting Questions

How may designing learning based on conceptual questions affect student learning over time?

How may essential and support questions influence instruction practices including instructional delivery and assessment methods?
How do you perceive your learning organization’s desire to refine current or future learning expectations and instructional practices to reflect a commitment to student learning based on conceptual essential and supporting questions?
We have not succeeded in answering all of your problems. The answers we have found only serve to raise a whole set of new questions. In some ways we feel we are as confused as ever, but we believe we are confused on a higher level and about more important things.

--OMNI Magazine