Question Exploration Routine

TRAINER'S GUIDE

By Janis A. Bulgren, B. Keith Lenz, Jean B. Schumaker, & Donald D. Deshler,

January, 2002

University of Kansas Center for Research on Learning Lawrence, Kansas

OVERHEAD TRANSPARENCIES

	· · · · · · · · · · · · · · · · · · ·		
Overhead 1:	Content Enhancement	Overhead 42:	7. Enter a Challenge Question About
Overhead 2:	Guidebooks in the Content		the Real World
	Enhancement Series	Overhead 43:	Decide When to Use the Routine
Overhead 3:	Purpose of the QER	Overhead 44:	Plan Integration
Overhead 4:	Understanding the Challenge of	Overhead 45:	Plan for the Presentation
	Diversity	Overhead 46:	Plan Assessment Devices
Overhead 5:	Responding to the Challenge	Overhead 47:	Plan Assessment Devices (cont)
Overhead 6:	Supporting Research	Overhead 48:	Plan Assessment Devices (cont)
Overhead 7:	Components of the Question	Overhead 49:	Get Set!
	Exploration Routine	Overhead 50:	Go!
Overhead 8:	The Question Exploration Guide	Overhead 51:	Use the Routine Explicitly
Overhead 9:	Blank QEG (one-page vertical form)	Overhead 52:	Evaluate Your Use of the Routine
Overhead 10:	Completed QEG (use of conflict in	Overhead 53:	Build Thinking Skills
	narrative writing)	Overhead 54:	Emphasize Patterns
Overhead 11:	Section 1: The Critical Question	Overhead 55:	Example of a "Comparison" QEG
Overhead 12:	Section 2: Key Terms & Explanations	Overhead 56:	Example of a "Cause & Effect" QEG
Overhead 13:	Section 3: Supporting Questions	Overhead 57:	Example of an "Alternative
Overhead 14:	Section 4: The Main Idea Answer		Explanation" QEG
Overhead 15:	Section 5: Use in a Related Area	Overhead 58:	Example of an "Problem-Solution-
Overhead 16:	Section 6: Overall Idea and		Effect" QEG
· · · · · · · · · · · · · · · · · · ·	Real-World Use	Overhead 59:	Example of a QEG Using "Steps in a
Overhead 17:	The Linking Steps		Procedure"
Overhead 18:	The ANSWER Linking Steps	Overhead 60:	Build in Continuity
Overhead 19:	Using the Linking Steps with the	Overhead 61:	Emphasize "Unpacking" Difficult
	Guide		Questions
Overhead 20:	The Cue-Do-Review Sequence	Overhead 62:	Streamline Where Possible
Overhead 21:	Get Ready!	Overhead 63:	Ensure Student Understanding
Overhead 22/23:	QEG (2-page vertical form)	Overhead 64:	Use Alternative Formats
Overhead 24:	QEG (1-page horizontal form)	Overhead 65:	Example of a QEG With a Semantic
Overhead 25/26:	QEG (2-page horizontal form)		Map
Overhead 27:	Identifying the Critical Question	Overhead 66:	Example of a QEG Using a Sketch
Overhead 28:	Identifying the Critical Question (cont)	Overhead 67:	Example of a QEG With Symbolic
Overhead 29:	Identifying the Critical Question (cont)		Representations
Overhead 30:	Identifying the Critical Question (cont)	Overhead 68:	Example of a QEG With
Overhead 31:	Identifying the Critical Question (cont)		Computations
Overhead 32:	Construct a Draft	Overhead 69:	Build Ties
Overhead 33:	Enter a Critical Question	Overhead 70:	Tie to Other Content Enhancement
Overhead 34:	2. Work Out the Main Idea Answer		Routines
Overhead 35:	3. Create the Overall Idea	Overhead 71:	Use the QEG to Guide Writing
Overhead 36:	4. Identify & Explain Key Terms	Overhead 72:	Use the QEG to Guide Writing
Overhead 37:	4. Identify & Explain Key Terms (cont)	Overhead 73:	Students Win!
Overhead 38:	5. Identify Supporting Questions &	Overhead 74:	You Win!
	Answers	Overhead 75:	Activity: Sorting Critical Questions
Overhead 39:	Identify Supporting Questions &	Overhead 76: ·	Training Activities
	Answers (cont)	Overhead 77:	Dred Scott QEG/lesson-level question
Overhead 40:	5. Identify Supporting Questions &	Overhead 78:	Dred Scott QEG/unit-level question
	Answers (cont)	Overhead 79:	Dred Scott QEG/course-level question
Overhead 41:	6. Enter a Challenge Question About a	Overhead 80:	Example of a Content-Free QEG
	Related Area	1	

Content Enhancement

A way of teaching an academically diverse group of students in which:

- Both group and individual needs are valued and met;
- The integrity of the content is maintained;
- Critical features of the content are selected and transformed in a manner that promotes student learning; and
- Instruction is carried out in a partnership with students.

Guidebooks in the Content Enhancement Series

The Course Organizer Routine
The Unit Organizer Routine
The Lesson Organizer Routine
The Survey Routine

The Concept Mastery Routine
The Concept Anchoring Routine
The Concept Comparison Routine

The Question Exploration Routine

The Clarifying Routine
The Framing Routine

The Recall Enhancement Routine
The Quality Assignment Routine
The LINCing Routine

Purpose of the QER

The Question Exploration Guide is designed to enhance student:

- Ability to explore difficult questions;
- Performance on tests and in other assessment activities; and
- Belief in the value of content.

Understanding the Challenge of Diversity

- Increased student diversity results in varying levels and types of background knowledge.
- Many students don't understand what they need to know to answer Critical Questions.
- Students often do not have good questioning strategies and do not know what other questions they need to ask.
- Students often do not relate questions and answers to their lives.

Responding to the Challenge

The Question Exploration Routine helps students to:

- Explore existing background knowledge.
- Build knowledge from simple definitions to complex explanations and explorations.
- Acquire a repertoire of different strategies to unpack a Critical Question through the use of questioning patterns.
- Find ways to generalize an answer to a Critical Question so that it is relevant to their own lives.

Supporting Research

- The Question Exploration Routine was fieldtested in secondary content-area classes characterized by diversity.
- Participating teachers learned to use the Question Exploration Routine easily, and student learning gains were observed by both teachers and researchers.
- Students who took part in the routine earned a mean test score of around 70%. Those who had traditional instruction earned a mean test score of around 45%.

Components of the Question Exploration Routine

- The Question Exploration Guide
- The Linking Steps
- The CUE-DO-REVIEW Sequence

The Question Exploration Guide

Is a visual device that:

- Is created with teacher guidance;
- Poses a critical Course, Unit, or Lesson question;
- Prompts exploration of Key Terms & Supporting Questions that help answer the larger Critical Question;
- Focuses attention on the Main Idea
 Answer to the Critical Question;
- Prompts use of the Main Idea in related areas or the real world; and
- Prompts creation of an Overall Idea (where appropriate) and its application to today's world.

Question Exploration Guide

Title/standard:Student name:		Date:	
Course Question #:	Unit Question #:		uestion #:
(1) What is the <u>Critical Question</u> ?			
What are the <u>Key Terms</u> and explan	ations?		·
What are the Supporting Questions	and answers?		
	•		
			•
			A STANLING MARKET THE THE THE THE THE THE THE THE THE T
4 What is the Main Idea Answer?			
5 How can we <u>use</u> the Main Idea?			
6 is there an Overall idea? Is there	e a real-world use?		
:			

Question Exploration Guide

1 What is the Critical Question?

Why is conflict important in a narrative?

2) What are the Key Terms and explanations?

Conflict

A struggle between two people or within a person.

Narrative

A story with an introduction, high point, and resolution.

High Point

The part where a character faces and makes a big decision.

Resolution

The part where the reader sees the results of the decision.

(3) What are the Supporting Questions and answers?

Who has a conflict?

A main character has a conflict.

When is conflict used?

It is used throughout the story, such as in the introduction, at the high point, and at the resolution.

Why is it important in the introduction?

It grabs the reader's interest.

Why is it important at the high point?

It makes the reader want to see and understand the decision.

Why is it important at the resolution?

The reader sees the results of the decision and learns the author's message.

4 What is the Main Idea Answer?

The conflict grabs the readers' interest and keeps them interested until they see the results of the main character's decision and learn the author's message.

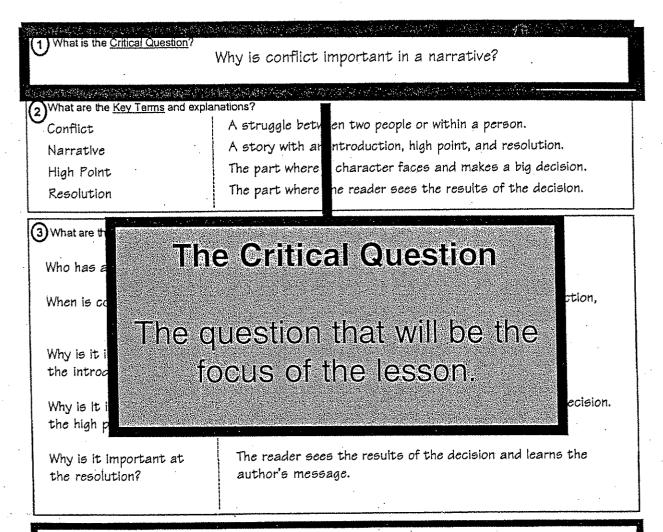
(5) How can we use the Main Idea?

Select a narrative we've read, describe the conflict, and explain how the author uses conflict as described in the Main Idea Answer.

6 Is there an Overall idea? Is there a real-world use?
O.L.: Conflict is the method authors use to deliver their message to readers.

• Select a real-life conflict shown on TV or described in newspapers or magazines. Explain how the storytellers used the conflict in each part of the story to deliver a message to you.

Section 1 of the Guide



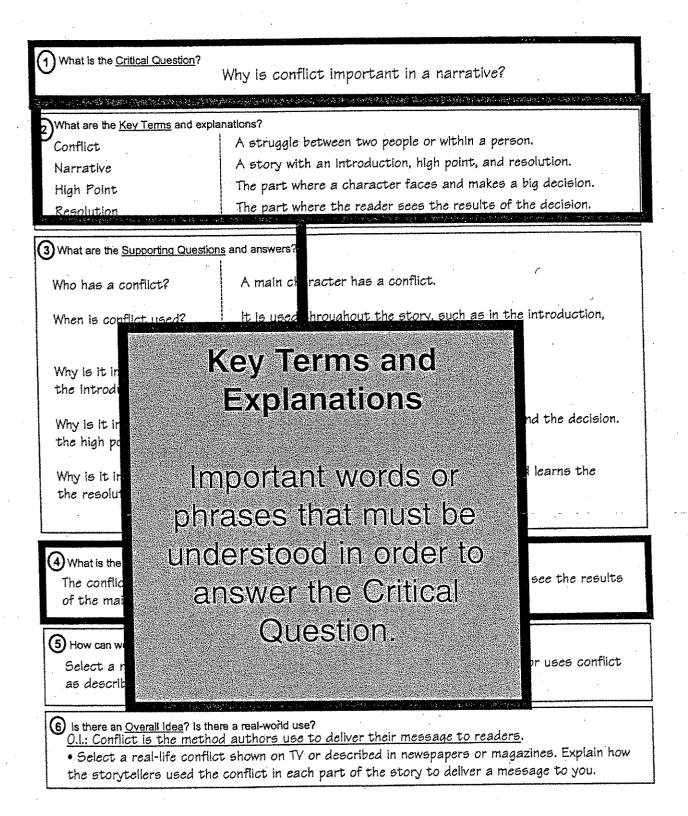
What is the Main Idea Answer?

The conflict grabs the readers' interest and keeps them interested until they see the results of the main character's decision and learn the author's message.

- (5) How can we <u>use</u> the Main Idea?

 Select a narrative we've read, describe the conflict, and explain how the author uses conflict as described in the Main Idea Answer.
- 6 is there an <u>Overall Idea</u>? is there a real-world use?
 O.l.: Conflict is the method authors use to deliver their message to readers.
 - Select a real-life conflict shown on TV or described in newspapers or magazines. Explain how the storytellers used the conflict in each part of the story to deliver a message to you.

Section 2 of the Guide



Section 3 of the Guide

Supporting Questions

The smaller questions that need to be answered in order to answer the Critical Question.

Cor

High Point

Resolution

The part where

The part where

character taces and makes a big decision.

ne reader sees the results of the decision.

3) What are the Supporting Questions and answers?

Who has a conflict?

A main character has a conflict.

When is conflict used?

It is used throughout the story, such as in the introduction, at the high point, and at the resolution.

Why is it important in the introduction?

It grabs the reader's interest.

Why is it important at the high point?

It makes the reader want to see and understand the decision.

Why is it important at the resolution?

The reader sees the results of the decision and learns the author's message.

4 What is the Main Idea Answer?

The conflict grabs the readers' interest and keeps them interested until they see the results of the main character's decision and learn the author's message.

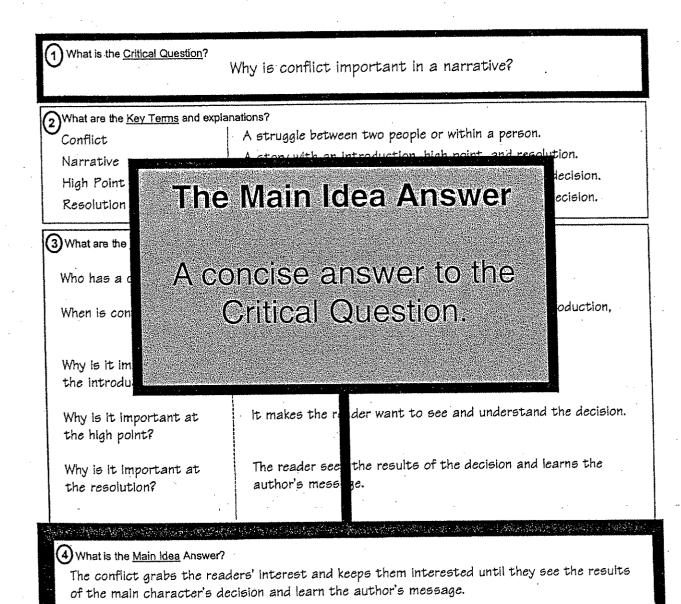
5 How can we <u>use</u> the Main Idea?

Select a narrative we've read, describe the conflict, and explain how the author uses conflict as described in the Main Idea Answer.

6 is there an <u>Overall Idea</u>? Is there a real-world use? <u>O.l.: Conflict is the method authors use to deliver their message to readers.</u>

• Select a real-life conflict shown on TV or described in newspapers or magazines. Explain how the storytellers used the conflict in each part of the story to deliver a message to you.

Section 4 of the Guide

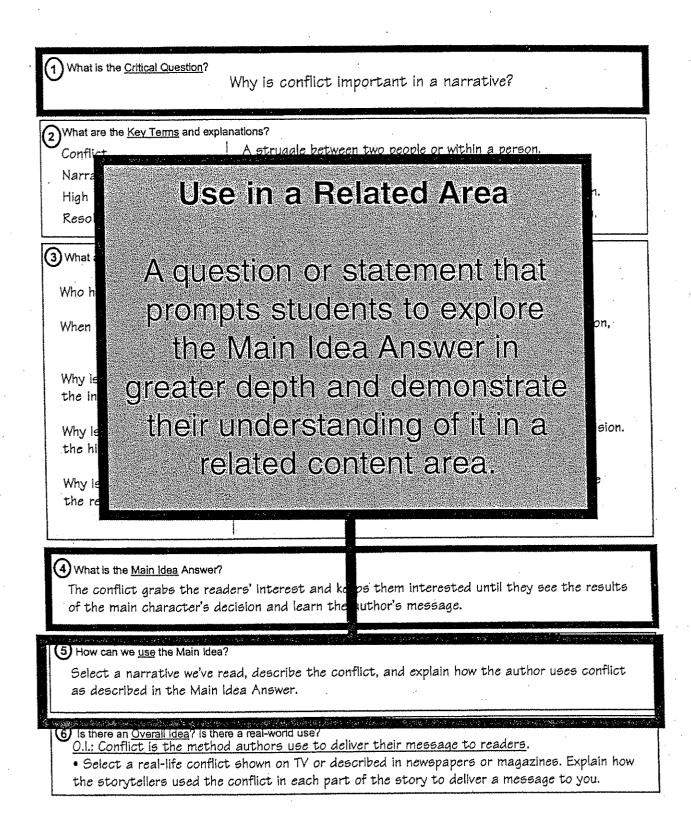


(5) How can we use the Main Idea?

Select a narrative we've read, describe the conflict, and explain how the author uses conflict as described in the Main Idea Answer.

- 6 Is there an <u>Overall Idea</u>? Is there a real-world use?
 O.l.: Conflict is the method authors use to deliver their message to readers.
 - Select a real-life conflict shown on TV or described in newspapers or magazines. Explain how the storytellers used the conflict in each part of the story to deliver a message to you.

Section 5 of the Guide



Section 6 of the Guide

ween

n inti

the

eader

eade

Overall Idea

A generalization derived from the Main Idea
Answer which can be applied to the world at large.

Why s It important at the esolution?

The reader sees th author's message.

important in a narrative?

Real-World Use

A question or statement that challenges students to show how the Main Idea Answer applies to the real world.

4 Wat is the Main Idea Answer?

The conflict grabs the readers' interest and keeps them interested until they ee the results of me main character's decision and learn the author's message.

5 Hor can we use the Main Idea?

Se at a narrative we've read, describe the conflict, and explain how the author uses conflict

6 Is there an Overall Idea? Is there a real-world use?
O.l.: Conflict is the method authors use to deliver their message to readers.

• Select a real-life conflict shown on TV or described in newspapers or magazines. Explain how the storytellers used the conflict in each part of the story to deliver a message to you.

The Linking Steps

Guide the teacher to:

- Focus student attention on learning;
- Elicit and make connections to the prior knowledge of students; and
- Involve students in constructing and using the Question Exploration Guide.

The ANSWER Linking Steps

A sk a Critical Question

ote and explain Key Terms

S earch for Supporting Questions and answers

Work out the Main Idea Answer

Explore the Main Idea within a related area

R elate the idea to today's world

Using the Linking Steps with the Guide

Ask a Critical Question

Complete Section 1 of the guide

Note and explain Key Terms

Complete Section 2 of the guide

Search for Supporting Questions & answers

Complete Section 3 of the guide

Work out the Main Idea Answer

Complete Section 4 of the guide

Explore the Main Idea within a related area

Complete Section 5 of the guide

Relate the idea to today's world

Complete Section 6 of the guide

The CUE-DO-REVIEW Instructional Sequence

CUE

The teacher introduces the Question Exploration Guide and explains expectations for student participation.

DO

The teacher and class collaboratively construct the device using the ANSWER Linking Steps.

REVIEW

Information presented in the Question Exploration Guide is reviewed and confirmed, and the process of exploring and answering a question is reviewed.

Get Ready!

- Collect materials & ideas.
- Identify the Critical Question.
- Construct a draft.
- Decide when to use the routine.
- Plan integration.
- Plan for the presentation.
- Plan your assessment devices.

Question Exploration Guide

Title/standard: Student name:		Date:
Course Question #:	Unit Question #:	
1 What is the <u>Critical Question</u>		
What are the Key Terms and	explanations?	
3 What are the Supporting Qu	restions and answers?	

· . · · · · · · · · · · · · · · · · · ·	
What is the Main Idea Answer?	
(5) How can we <u>use</u> the Main Idea?	
5) How can we use the Main idea?	
6 is there an Overall Idea? is there a real-world use?	

Guide
oration
Exp
Question
Q

Student name: (1) What is the Critic (2) What are the Key (3) What is the Mail (4) What is the Mail	andard: Course Question #; Lesson Question #: Lesson Question #: Lesson Question #: Date:	What are the <u>Key Terms</u> and explanations?	ancimore?	What are the <u>Supporting Questions</u> and answers t		What is the <u>Main Idea</u> Answer?	How can we <u>use</u> the Main Idea?	
---	---	---	-----------	--	--	--------------------------------------	--------------------------------------	--

O
<u> </u>
_
C
\subseteq
\sim
atic
ra
<u></u>
9
Щ
on
.0
St
Ü
Q

	100 m	Course Question #:	Unit Question #:L	Lesson Question #:
Inte/standalu.		Library State Company	Date:	ANNA CARLO C
Student name:				
What is the Critical Question?				
1				
			•	
What are the Key Terms and explanations?	nations?			
(2)				
·				•
(3) What are the <u>Supporting Questions</u> and answers?	s and answers?			
				·
e e e e e e e e e e e e e e e e e e e		:		
·				
· ·				
note dominate.				
			•	

Identifying the Critical Question

- 1. Review materials developed by others.
- 2. Review materials you have developed.
- 3. Ask yourself questions about your content area.
- 4. Ask yourself questions about your students.

1. Review materials developed by others:

- Standards and guidelines (state and district)
- Recommendations found in teacher textbooks
- National professional association recommendations
- Publisher-prepared tests
- Departmentally adopted tests/syllabi
- Samples from statewide assessment tools

2. Review materials you have developed:

- Questions from study guides and tests
- Questions from other Content Enhancement devices
- Questions prompted by primary sources
- Questions based on student interest

3. Ask yourself the following questions about your <u>content area</u>:

- What is "core knowledge" that students will use over and over again?
- What will students need to know as foundational knowledge in future advanced courses?
- What Overall Ideas tie together important ideas in your course?
- What current events or new discoveries have added to your field and lead to interesting Critical Questions?
- What are important questions related to field trips, exhibits, museums, or important sites in your geographical area that you have visited?
- What are important questions related to websites that you have visited or assigned in your instruction?

4. Ask yourself the following questions about your <u>students</u>:

- What questions need to be explored to provide the background knowledge that students lack yet need?
- What have I learned from IEP meetings about student needs?
- What student interests can be connected to the course?
- What do students need to know for their future well-being as individuals, learners, or citizens?
- What have students indicated they want to know?

Construct a Draft of the QEG

- 1. Enter the Critical Question.
- 2. Work out the Main Idea Answer.
- Create the Overall Idea.
- 4. Identify and explain Key Terms.
- Identify Supporting Questions and answers.
- 6. Enter a Challenge Question about a related area.
- 7. Enter a Challenge Question about the real world.

Construct a Draft of the QEG

1. Enter a Critical Question

A Good Question:

- Focuses on a critical, core, or essential course question.
- Helps students do well on assessments.
- Requires an answer which shows depth and breadth of understanding versus statement of a fact.
- Includes words that start the thinking process by prompting the identification of Key Terms and Supporting Questions.
- Prompts students to use thinking patterns for exploring difficult questions.
- Can be used by students to check their progress in the course.

Construct a Draft of the QEG

2. Work out the Main Idea Answer

A Good Main Idea Answer:

- Is a direct and accurate answer to the Critical Question.
- Is a statement that can answer related questions.
- Can be generalized to other content in the course.

3. Create the Overall Idea

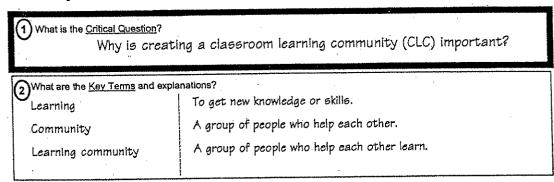
A Good Overall Idea:

- Is a broad statement that can be applied to the world at large.
- Is a broader statement than the Main Idea Answer.
- Is optional (some Main Ideas cannot be expanded upon).

4. Identify and Explain Key Terms

Key Terms can be explicitly stated within the Critical Question.

For example...



Key Terms can be implied in the Critical Question.

For example...

1 What is the Critical Question? How did sectionalism lead to the Civil War?

2 What are the Key Terms and explanations? Sectionalism? A feeling of loyalty to one part of the nation.

Three sections? North, South, and West.

4. Identify and Explain Key Terms (continued)

- Key Terms can be part of a definition of another Key Term.
- Key Terms can be part of a Supporting Question or its answer.
- Key Terms can be words students must know to answer the Critical Question.

5. Identify Supporting Questions & Answers

Begin with the Key Terms & their definitions and ask questions about them.

) What is the <u>Critical Question?</u> Why is conflict important in a narrative?			
What are the <u>Key Terms</u> and exp	lanations?		
Conflict	A struggle between two people or within a person.		
Narrative	A story with an introduction, high point, and resolution.		
High Point	The part where a character faces and makes a big decision.		
Resolution	The part where the reader sees the results of the decision.		
When is conflict used?	It is used throughout the story, such as in the introduction, at the high point, and at the resolution.		
Why is it important in the introduction?	It grabs the reader's interest.		
Why is it important at the high point?	It makes the reader want to see and understand the decision		
•	The reader sees the results of the decision and learns the		

5. Identify Supporting Questions & Answers (cont.)

Ask a series of "Who," "What," "When," "Where," "Why," and "How" questions about the Key Terms.

1) What is the Critical Question?

Why is creating a classroom learning community (CLC) important?

2) What are the Key Terms and explanations?

Learnina

To get new knowledge or skills.

Community

A group of people who help each other.

Learning community

A group of people who help each other learn.

3) What are the Supporting Questions and answers?

In a CLC ...

Who takes part?

The students and teacher take part.

What do they learn?

They learn new information, new skills, and how to help each other learn.

How do they help each

other learn?

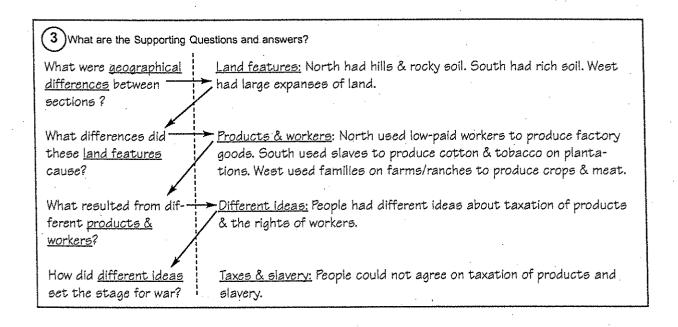
They encourage, show how to do things, and compliment each

What is the result?

People learn more, are happy, feel as if they belong, become connected, and feel good about themselves.

5. Identify Supporting Questions & Answers (cont.)

Use the "Question-Answer-Question" process; that is, after you have developed the first Supporting Question and have come up with the answer to that question, see if you can construct a second question that the answer to the first may suggest, etc.



6. Enter a Challenge Question About a Related Area

Good Challenge Questions About a Related Area prompt student thinking about content:

- In a new way or from a new angle.
- In the current course.
- In a previous course.
- In a related course.
- From primary sources.

Good Challenge Questions About a Related Area challenge students to manipulate information by:

Judging.

Prioritizing.

Comparing.

Verifying.

Predicting.

Tracing cause & effect.

Formulating.

Interpreting.

Defending.

7. Enter a Challenge Question About the Real World

Good Challenge Questions About the Real World prompt student thinking about:

- A current event.
- A sequence of current events.
- The school, town, state, nation, or the world.

Good Challenge Questions About the Real World prompt student use of thinking skills:

- Analysis.
- Synthesis.
- Application.
- Evaluation.
- Generalization.

Decide When to Use the Routine

Ensure students have enough knowledge to participate in the routine through:

- A previous course
- Personal experience
- A previous lesson
- A previous assignment

Plan Integration

- Include the Critical Question on a Course, Unit, or Lesson Organizer.
- Introduce a foundational concept with a Concept Diagram.
- Use patterns of higher-order thinking (e.g., comparison)
- Use the Clarifying Table to expand on a Key Term.
- Construct Recall Enhancement Devices to help students remember information on the Question Exploration Guide.

Plan for the Presentation

- Make notes of prompting questions to be used.
- Obtain supplies.
- Consider presentation options:
 - Use cooperative learning structures
 - Use assignments
 - Use student discussion leaders

Plan Assessment Devices

Content:

- Align with state and local standards
- Measure student knowledge of:
 - Key Terms and definitions
 - Answers to Supporting Questions
 - Main Idea & Overall Idea
 - Ability to apply the Main Idea and Overall Idea

Plan Assessment Devices

When creating alternative assessment devices:

- Think about accommodations recommended in IEPs
- Think about providing students with a choice in how they express mastery of information
- Think about the needs of highachieving, average-achieving, and lowachieving students, plus students with special needs.
- Consider how all students can best demonstrate what they have learned.

Plan Assessment Devices

To ensure success:

- Plan practice in responding
- Conduct reviews before assessments
- Provide feedback after the assessments
- Allow revisions of answers for extra credit.

Get Set!

- Prepare to teach students about the Question Exploration Guide.
- Introduce the Question Exploration Guide.
- Describe how you will CUE the Question Exploration Guide.
- Describe and model how you will DO the routine.
- Explain how you will REVIEW the information in the Question Exploration Guide.

Go!

- Use the routine explicitly.
- Evaluate your use of the routine.
- Build thinking skills.
- Emphasize patterns.
- Build in continuity.
- Emphasize "unpacking" difficult questions.
- Streamline where possible.
- Explore alternative sequences and formats.
- Build ties.
- Beware of pitfalls.

Use the Routine Explicitly

Make sure your students:

- Know that a Question Exploration Guide is being use.
- Pay attention to the Question Exploration Guide.
- Can explain how a Question Exploration Guide facilitates learning.
- Become actively involved in constructing the guide.
- Actively use the Question Exploration Guide for study.
- Become aware of the steps for constructing the guide.

Evaluate Your Use of the Routine

Make sure:

- The Question Exploration Guide is large enough to see from the back of the room.
- All the words are legible.
- If symbols or abbreviations are used, there are linkages and labels so students can reconstruct the meaning on their own.
- Students understand each part of the Question Exploration Guide.
- You cue students to take notes on their guides.
- Students understand the process used to develop the guide.
- Students know how to demonstrate their understanding of the Main Idea.

Build Thinking Skills

- Application
- Analysis
- Synthesis
- Generalization
- Evaluation

Emphasize Patterns

- Comparisons
- Cause-and-effect relationships
- Alternative explanations
- Problems, solutions, and effects
- Steps in a procedure
- Other patterns:

Example of a "Comparison" QEG

1) What is the Critical Question?

How do the larval and adult stages of amphibians differ?

2)What are the Key Terms and explanations?

Amphibians?

Larval stage of amphibians?
Metamorphosis?

Yertebrates that are usually aquatic as larvae & terrestrial as adults.

Fishlike feeding stage that develops from an egg through metamorphosis.

Marked transformation in form & mode of life during development.

- 3) What are the Supporting Questions and answers?
 - A. What are the characteristics of the larval stage?
 - B. What are the characteristics of the adult stage?
 - C. What are the categories of differences?
- A. Characteristics of larval stage
- 1. Breathe with gills.
- 2. Single-loop circulation.
- 3. 2-chambered heart

- C. Differences
- ►1. Respiratory system.
- ►2. Vessels of cir-◀ culatory system.
- ►3. Heart in cir- ◀ culatory system
- B. Characteristics of adult stage
- 1. Breathe with lungs/skin.
- 2. Double-loop circulation.
- 3. 3-chambered heart
- What is the Main Idea Answer? The respiratory and circulatory systems of the adult stage of most amphibians are more complex than those of the larval stage.
- 5 How can we <u>use</u> the Main Idea?

What advantage does an amphibian have as an adult that it does not have as a larva?

- 6 is there an Overall idea? Is there a real-world use?
 - Find and discuss an environmental problem that inhibits the development of an amphibian from the larval stage to the adult stage.

Example of a "Cause & Effect" QEG

1) What is the <u>Critical Question?</u> How does the destruction of the rain forest in South America contribute to the greenhouse effect?

(2) What are the Key Terms and explanations?

Rain forest

A thick evergreen forest in a hot, wet area.

Greenhouse

A glass house that traps the sun's heat to grow plants.

Greenhouse effect

An event in which carbon dioxide (CO^2) in the atmosphere absorbs & holds the Earth's heat instead of allowing it to leave.

(3) What are the Supporting Questions and answers?

What's happening to the rain forests?

They are being burned, so farmers have more land to grow crops.

What does the burning cause?

1. The burning releases more ${\rm CO_2}$ into the atmosphere, and 2. The ${\rm CO_2}$ that the rain forests once removed now stays in the atmosphere.

What is the <u>effect</u> of the increased CO_2 ?

- 1. Increased CO_2 traps heat in the atmosphere creating a greenhouse effect, and
- 2. This greenhouse effect means that the entire earth is becoming warmer.

What is the Main Idea Answer?

When rain forests are burned, the resulting increase of ${\rm CO_2}$ contributes to the greenhouse effect.

5 How can we <u>use</u> the Main Idea?

How would cutting rather than burning rain forests affect the atmosphere?

6 Is there an Overall Idea? Is there a real-world use?
O.l.: What happens in one part of the world can affect us all.

• Describe an event that happened in one part of the world, and explain how it affected people in other parts of the world.

Example of an "Alternative Explanation" QEG

What is the <u>Critical Question?</u> Why does Shakespeare use events that can be explained either as chance or fate in Romeo and Juliet (R&J)?

2) What are the Key Terms and explanations?

Fate

Events planned in advance by an outside power.

OR

OR

OR

Chance

Events happening by accident.

Events in R&J

Lovers' meeting, lost messages, suicides.

(3) What are the Supporting Questions and answers?

A) How can events in R&J be explained as fate?

B) How can the same events in R&J be explained as chance?

A) FATE as explanation for events

Lovers' meeting: R&J were fated to meet and fall in love.

Lost message: Romeo didn't get the message because the lovers' escape plan was doomed by fate.

Suicide: R&J were fated to die young.

B) CHANCE as explanation for events

Lovers' meeting: R&J met because a servant couldn't read the guest list.

Lost message: Message wasn't delivered because the plague happened to stop travel.

Suicide: R&J died because Juliet didn't wake earlier.

What is the Main idea Answer?

Shakespeare wants to challenge the audience to think about a dilemma in which the same event can be explained in different ways.

5 How can we use the Main Idea?

How can the death of Paris be explained both as fate and as chance?

6 is there an Overall Idea? is there a real-world use?

O.I.: Authors use events in literature to help us look at things in different ways.

• Describe a news event, and tell how it can be explained either as fate or chance.

Example of a "Problem-Solution-Effect" QEG

1) What is the Critical Question? Why did Southerners want to fight in the Civil War? 2) What are the Key Terms and explanations? The war between the North and South of the United States of What was the Civil War? America from 1860 to 1864. (3) What are the Supporting Questions and answers? Effect Solution Problem How did the South see War followed The South The South the <u>problem</u>? because the decided to leave thought the North didn't the United Northern states want the South States (secede) What was their solution would try to to leave the and form their make decisions to the problem? United States. own country. for them (such as abolishing slavery & put-What was the effect of ting taxes on implementing their imported goods). solution?

- 4 What is the Main Idea Answer?

 Southerners eaw Northern dominance as a problem, thought leaving the U.S. was the solution, but the effect was war.
- (5) How can we use the Main Idea?

 Discuss what a Northerner's view of taxation and slavery might have been.
- 6 Is there an Overall Idea? Is there a real-world use?
 O.l.: We can understand events by considering the problem-solutions-effect pattern.
- Describe a current event that could be explained by looking at the problem, solution, & effect.

Example of Using "Steps in a Procedure"

1) What is the Critical Question?

What is the algorithm and an associated acronym for multiplying binomials?

2) What are the Key Terms and explanations?

Algorithm

A set of steps for performing a math operation.

Binomials

A mathematical expression composed of 2 terms joined by a plus

sign (+) or a minus sign (-).

Acronym

A word formed from the first letters of different words.

3) What are the Supporting Questions and answers?

Sample Problem: (2x-y) (3x+2y)

What is Step 1?

F= multiply the First terms in each binomial

(2x-y)(3x+2y) $2x \cdot 3x = 6x^2$

What is Step 2?

O= multiply the Outside terms in each binomial

(2x-y)(3x+2y) $2x \cdot 2y = 4xy$

What is Step 3?

I= multiply the Inside terms in each binomial

 $(2x-y)(3x+2y) -y \cdot 3x = -3xy$

What is Step 4?

L= multiply the \underline{L} ast terms in each binomial

(2x-y)(3x+2y) -y • 2y = -2y²

What is Step 5?

5= Set up and summarize the answer

 $6x^2 + 4xy - 3xy + 2y^2 = 6x^2 + xy - 2y^2$

(4) What is the Main Idea Answer? The algorithm contains 5 steps involving multiplying the terms in a sequence and summarizing the answer. The word "FOILS" is an acronym that can be used to remember the steps.

(5) How can we use the Main idea?

Solve this new problem using the FOILS algorithm: (3x + 4y)(2x + 2y)

(6) is there an Overall Idea? Is there a real-world use?

O.l.: Acronyms can be helpful in math.

• Explain how the "FOILS" acronym helps you as a learner. Create your own memory device for another math algorithm.

Build in Continuity

- Refocus student attention on an important question to assure yourself that students really understand it.
- Expand students' knowledge of the Critical Question and Main Idea by having them add to a QEG.
- Extend content learning by cuing students to watch for information related to Critical Questions as they learn about other topics in the same area.
 - Ascertain that students understand the process involved in using the QEG and have begun to generalize the process to other areas.

Emphasize "Unpacking" Difficult Questions

Focus on each of the following:

- Important words or phrases explicit or implicit in the question. (See OH 36)
- Generic questioning techniques using the words "Who," "What," "Where," When," and "Why." (See OH 38)
- Connections between Supporting Questions and answers. (See OH 40)

Streamline Where Possible

To help students streamline their notetaking on the guides:

- Eliminate articles such as "a" and "and."
- Use abbreviations such as "govn" for government.
- Use symbols such as arrows.
- Use question marks after a noun as a substitute for a complete question.

Ensure Student Understanding

- Specify the meaning of symbols often.
- Check student understanding of abbreviations and symbols.
- Label symbols on supporting handouts.
- Put word labels on connecting lines.

Use Alternative Formats

- Semantic maps
- Sketches
- Symbolic representations
- Computation patterns

Example of a Semantic Map

1) What is the Critical Question?

How did geography play a role in causing the U.S. Civil War?

What are the <u>Key Terms</u> and explanations?

Geography | The e

Civil War

U. S. Civil War

The study of the earth, its features, and life forms.

A war between people in different sections of the same country.

The war between the different sections of the U.S. in the 1860s.

What are the Supporting Questions and answers?

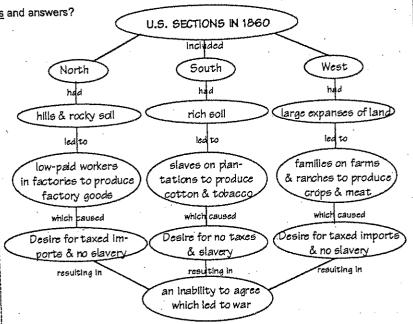
What were the sections in the U.S. in the 1860s?

What were the geographical differences between sections?

What differences did these land features cause?

What resulted from different products & workers?

How did different ideas set the stage for war?



4) What is the Main Idea Answer?

Different geography in the different sections of the U.S. led to different products and types of workers, resulting in different ideas and disagreement which led to war.

(5) How can we use the Main Idea?

Think of the U.S. today, and explain how different geography might be related to different ideas.

- (6) is there an Overall Idea? Is there a real-world use?
 - O.l.: Different geography can lead to such different ideas that conflict arises.
 - Describe a conflict in your community or state that is based on geography. Describe the geography and different Ideas associated with it.

Example of a Sketch

What is the <u>Critical Question</u>? Why is a four-chambered heart two pumps in one?

What are the Key Terms and Explanations?

Chamber

An enclosed space.

Heart

Pump

A muscle that pumps blood to the lungs through the body.

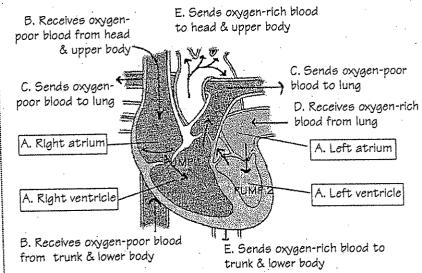
A device for moving liquid from one place to another.

3 What are the Supporting Questions and answers?

A. What are the four chambers?

What is the function of...

- B. The right atrium?
- C. The right ventricle?
- D. The left atrium?
- E. The left ventricle?



- What is the Main Idea Answer? The right side of the heart pumps oxygen-poor blood to the lungs, and the left side pumps oxygen-rich blood through the body. (The right side is one pump; the left is the second pump = 2 pumps.)
- (5) How can we use the Main Idea?

 Why do the walls of the left ventricle have to be thicker than the walls of the right ventricle?
- 6) Is there an Overall idea? Is there a real-world use?
 - If a person smokes, which pump is most affected and why?

Example of a Symbolic Representation

(1) What is the <u>Critical Question?</u> How did Huck's conflict deliver Twain's message in Huckleberry Finn?

(2) What are the Key Terms and explanations?

What is conflict?

Conflict is a struggle between two people or within a

What is Huck's conflict?

Huck must decide whether to help Jim escape slavery.

3) What are the Supporting Questions and answers?

A) How is Huck's conflict introduced?

- B) What is the high point where Huck must make a decision?
- C) How does Huck resolve the conflict?

B.

Huck must
decide if he
will give Jim
to the slave
hunters.

Huck struggles with
beliefs about
slavery on the trip
with Jim down the
Mississippi River.

Huck decides that human freedom is more important than his reputation.

What is the Main Idea Answer?

Huck resolves his conflict by deciding to save Jim from slavery and delivers Twain's message that a human being's freedom is all important.

5 How can we use the Main Idea?

How does Huck's decision to tell the slave hunters that Jim is his father contribute to Twain's message?

- 6 is there an Overall idea? is there a real-world use?
 - O.I.: The conflict holds our interest and delivers the author's message.
 - Choose a conflict in today's world that prompted someone to make a decision, and describe the message that was delivered.

Example of Computations

What is the <u>Critical Question?</u>
Why is knowing how to change a percentage to a decimal important when you are at a store sale? ("Pay only 80% of original price for this \$100 coat.")

What are the Key Terms and expla	nations?			
Percentage Percentage	Examples of percentages:	75%	100%	50%
Decimal	Examples of decimals:	.75	1.00	.50

What are the Supporting Questions	and answers?
How can you write 80% as a decimal?	→ .80
Why is the decimal useful in the calculation?	→ it allows us to multiply to get the price.
How is the calculation — set up?	\$100.00 x .80 00000
	<u>80000</u> \$80.0000
What is the answer? -	➤ The sale price is \$80.

- 4 What is the Main Idea Answer?

 Knowing how to change a percentage to a decimal allows us to accurately calculate the sale price.
- (5) How can we use the Main Idea?

 What other steps would be necessary if the sign said, "20% off the original price?"
- Is there an Overall Idea? Is there a real-world use?
 You are helping someone prepare a tax return. The directions tell you to calculate 6% of \$12,500. How would you compute that problem? Explain your work so that the person can do it himself next year.

Build Ties

- To other Content Enhancement Routines
- To standards & assessments
- To writing assessments
- To cooperative learning

Tie to Other Content Enhancement Routines

Indicate how information on the QEG is connected to the information from a Course, Unit, or Lesson Organizer (e.g., Lesson Question #3 is tied to Unit Question #2 and Course Question #1).

```
Title/standard: How do you write a great paragraph?

Student name: Sherie Martin Date: Sept. 10, 2005

Course Question #: _(1) Unit Question #: _(2) Lesson Question #: _3

RS #1.4.1
```

- Introduce how questions are tied to state standards and benchmarks (e.g., Reading Standard #1.4.1).
- Use elements from the organizers in Section 3 of the QEG.
- Develop one expanded QEG for each question on the Course Organizer or Unit Organizer.
- Use vocabulary words and symbols from past organizers on a QEG.

Use the QEG to Guide Writing

(1) What is the <u>Critical Question?</u> How did Huck's conflict deliver Twain's message in Huckleberry Finn?

(2) What are the Key Terms and explanations?

What is conflict?

Conflict is a struggle between two people or within a person.

What is Huck's conflict?

Huck must decide whether to help Jim escape slavery.

3) What are the Supporting Questions and answers?

A) How is Huck's conflict introduced?

- B) What is the high point where Huck must make a decision?
- C) How does Huck resolve the conflict?

B.

Huck must decide if he will give Jim to the slave hunters.

Huck struggles with
beliefs about
slavery on the trip
with Jim down the
Mississippi River.

Huck decides that human freedom is more important than his reputation.

(4) What is the Main Idea Answer?

Huck resolves his conflict by deciding to save Jim from slavery and delivers
Twain's message that a human being's freedom is all important.

(5) How can we use the Main Idea?

How does Huck's decision to tell the slave hunters that Jim is his father contribute to Twain's message?

6 is there an Overall Idea? is there a real-world use?

O.l.: The conflict holds our interest and delivers the author's message.

• Choose a conflict in today's world that prompted someone to make a decision, and describe the message that was delivered.

Use the QEG to Guide Writing

"How did Huck's conflict deliver Twain's message in Huckleberry Finn?"

Huck's conflict in Mark Twain's Huckleberry Finn helps deliver Twain's message to his readers. A conflict is a struggle between two people or within a person. In this story, Huck has a conflict within himself. He must decide whether or not to help Jim escape from slavery.

At the beginning of the story, Twain introduces the reader to Huck. He is a boy who struggles with his beliefs about slavery while on a raft trip down the Mississippi River with the slave, Jim. Huck has an important decision to make. He must decide whether to help Jim escape or turn him over to the slave hunters. Huck struggles with this decision. He resolves the conflict when he finally decides that Jim should be free and decides to help him escape.

Therefore, the author's message is delivered when we see how Huck resolves his conflict about Jim. Twain's message is that each human being should be valued and that each person's freedom is all-important. By protecting Jim, Huck delivers this message to the reader.

The way Huck chooses to protect Jim makes Twain's message very powerful. To save Jim, he tells the slave hunters that the man with him on the raft is his father. He tells them that his father is sick inside a tent on the raft with a disease they could catch. This makes Twain's message powerful because Huck is claiming Jim, a black man and a slave, as a member of his family. This shows how much Huck values Jim, like a son would value his father.

We see conflicts in today's world in many places. Movies and television shows often show a main character facing a decision. For example, a recent television program showed how a teenager made a decision to go on a trip with his family rather than hang out with his friends. It delivered the message that family is important, even to a teenager. Therefore, conflict can be used to deliver a message in an interesting way.

Students Win!

- Check that students are learning what they're supposed to be learning.
- Check that students are personally satisfied with what and how they are learning.
- Check that students' grades reflect how much they have learned.

You Win!

- Select the Question Exploration Guide as a personal growth target.
- Choose a way to learn.
- Choose a support system.
- Plan for confidence building.
- Debug.
- Maximize the challenge.
- Take ownership of the routine

Activity: Sorting Critical Questions

Sort the following Critical Questions by level (Course. Unit, or Lesson)

- 1. How are the House and Senate alike and different?
- 2. How have birds adapted for flight?
- 3. How are rising action and falling action related to climax?
- 4. How do you change percentages to decimals?
- 5. How are direct and indirect democracies different?
- 6. How can counseling help solve problems?
- 7. What makes a good short story?
- 8. How has the American Dream affected U.S. culture?
- 9. How are organisms organized into groups?
- 10. How do you research and write a term paper or lab report?

Training Activity

GOAL: To understand the links between content standards, course, unit, and lesson planning, and course, unit, and lesson questions.

BACKGROUND: This activity can be broken into a variety of smaller activities. Samples of background material on the Dred Scott decision and examples of completed Questions Exploration Guides related to the Dred Scott decision are provided as references.* Varying interpretations of the content and answers to the questions are expected. Use history teachers in your audience to refine the answers to the questions based on varying perspectives and interpretations.

PREPARATION: Prior to the workshop, select history text that contains information about the Dred Scott decision and make copies for participants. This information will be included in the history text in the section describing events leading to the start of the U.S. Civil War. Study the pages on this topic, and be prepared to interactively develop Question Exploration Guides on this topic with participants. Be sure to read pages that describe events leading up to the Dred Scott decision and the ramifications that followed. Prior to the workshop, study the three Question Exploration Guides that have been filled out for you on the Dred Scott decision.

PROCEDURES:

- 1. Once you have introduced and modeled the Question Exploration Guide, pass out three blank guides. Ask participants to analyze the pages of the history textbook and select three critical questions that might be associated with the Dred Scott decision. The first question should be a question that might be a major outcome for a lesson. The second question should be a question that that would be a major outcome for a unit and is supported by the lesson question. The third question should be a question that would be a major outcome of a course, is supported by the unit and lesson questions, and is tied to a content standard. Divide the participants into small groups and have them meet and share what they think would be a good question at each of the three levels—course, unit, and lesson. Then call on one person from each group to share their three questions. Make a consolidated list of the questions. Use this opportunity to point out the differences among the types of lessons at the three levels and model how to refine questions to fit each level.
- 2. Using the three completed Question Exploration Guides on the Dred Scott decision included in this guide as a packet, synthesize the participants' suggested questions into three questions that approximate samples provided for the course, unit, and lesson questions. Alternatively, be prepared to adapt the questions as directed by the group. However, be sure that you have the facts from the text clearly in mind to work with adaptations and additions to the sample guides.
- 3. Divide the participants into small groups again. Ask the groups to brainstorm ideas about the content of the guides that they might use to help their students understand one or more of the three Critical Questions at the course, unit, and lesson levels. Assign the content of the guides for each group according to size or expertise of the group. For example, all might work on a guide at the lesson level initially and then break into smaller groups to work on guides at the unit or course level. Ask each small group to share its best idea(s) with the whole group.
- 4. At some point, allow time to have participants think deeply about the match between the Critical Question and the Main Idea, refining both if necessary, about the process or processes suggested for "unpacking" the Critical Question into small questions, and about how they would develop questions that would prompt deep understanding of the Main Idea as well as applications to the real world. Ask each small group to share its best idea(s) with the whole group.

*Note: a content-free sample Question Exploration Guide is also included.

Title/standard: Student name:	Unit Question #:	Date:
		Decision affect slavery in
What are the <u>Key Terms</u> and explared slavery North's view of slavery South's view of slavery Dred Scott Case	Humans treated as the Against it. For it.	to own a slave when slave-
3 What are the Supporting Questions	and answers?	
What is the Dred Scott Decision?	The Supreme Court de property of owners, no of where they lived.	ecided that slaves were ot U.S. citizens, regardless
What was the effect on the North?	It allowed slaves in No Northerners, and incr	orthern territories, angered reased sectionalism.
What was the effect on the South?		ners' position; Southerners s' opposition to Supreme
	The Supreme Court's do of slaves to be U.S. cit	ecision on the Dred Scott izens.
(5) How can we <u>use</u> the Main Idea? may go against value		to settle civil disputes but
6 is there an Overall idea? Is the and civil rights are in		xample in which human rights

Title/standard: Student name: Course Question #:	Unit Question #:	Date:
1) What is the <u>Critical Question</u> ? Ho	ow did the decision in the ses made to prevent sect	Dred Scott Case affect
What are the <u>Key Terms</u> and expla Dred Scott Case Compromise Conflict	Case challenging slave owner owner moved to northern, no	nslave state. sides giving up something and
(3) What are the <u>Supporting Question</u> What was Dred Scott decision? What previous compro- mises did the Dred Scott	A person who had been purc citizen and could still be cor where he lived (even in a free	hased as a slave was not a U.S. nsidered property regardless of state).
decision affect? What did these compromises focus on?	union as free or slave state	e admission of states into the e union as a free or slave state
What did these compro- mises accomplish? What happened then?	based on voting of people o eignty) or by geographical b	f the state (called popular sover poundaries.
property of his owner	Since it confirmed the pos no matter where he lived, th mise and increased tension	ne Dred Scott decision erased
out the history of the	How was compromise use U.S. (e.g., think about the following the following of Representatives)?	d to prevent conflict through- ramers of Constitution in cre-
6 is there an Overall Idea? Is the How is compromise us undermine compromise	ed every day to prevent con	flict? How can other facts

Course Question revisited after unit on "Cause of the Civil War."

	Unit Question #:	_	
been a major theme of U.S. history?			
(2) What are the Key Terms and explanations?			
human rights	What is due every per	son as a citizen of the earth.	
civil rights	What is due every per	son under law.	
theme	Runs through from be	eginning to end.	
(3) What are the Supporting Questions and answers?			
What human rights were involved?	Freedom; people are n		
How is this part of our history?		n rights because of economic th in North and South).	
What civil rights were involved?	under law. When they	property, they were not equal were recognized as not being he door to being covered by	
How is this part of our history?		oth issues led to war, which aining more human and civil	

- What is the Main Idea Answer? During the civil war, our nation struggled over what were the human rights of people being treated as slaves. Protecting human rights opened the door for civil rights.
- (5) How can we <u>use</u> the Main 1000? The Declaration of Independence states that all people are equal—a major idea of human and civil rights. How does the Declaration of Independence address human and civil rights?
- 6 Is there an Overall Idea? Is there a real-world use? O.I.: Human rights must be guaranteed before you have civil rights. How do examples from different periods of our history illustrate the relationship between human rights and civil rights?

Example of a Content-Free Question Exploration Guide

Title/standard:		
Student name:	Date:	
Course Question #:	Unit Question #:	Lesson Question #:
1 What is the <u>Critical Question</u> ?	How can you get your understand you?	significant other to
(2)What are the <u>Key Terms</u> and exp	lanations?	
significant other	Spouse, mate, life partner, person you are committed to for a period of time.	
understand	To know at a deeper l	evel.
(3) What are the Supporting Question	ns and answers?	
What is this question about?		to make my significant other
How do I figure out what I have to do?	understand me, and	significant other did not then list steps on what l o promote understanding.
What kind of steps?	Steps should be beh	naviors & thoughts (self talk).
How do I use this?	I need to think of wa & identify when I fee	ays to remember to use steps I misunderstood.
	Although there is no sold what I have to identi	simple answer, understanding fy, remember, and do.
1	¹⁷ Many of my relations w I promote understand	hips beyond my significant ding.
6 is there an <u>Overall</u> Idea? Is th	the key to how others i	understand me.