

How Do You Know What You Don't Know?:

Using Student Questions to Drive Primary Source Learning and Information Literacy

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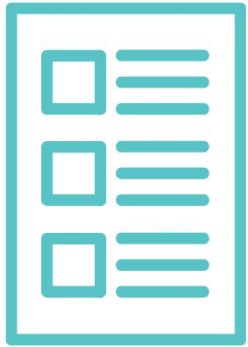
NBCTeacher Librarian (2004-2024)



<https://www.loc.gov/resource/ppmsca.40926/>

Access RQI's Free QFT Resources

<https://rightquestion.org/education/resources>



Classroom Examples



Instructional Videos



Planning Tools & Templates

Use and Share These Resources



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Link to Event Page for this session

bit.ly/rqi-at-aasl-25



Today's Agenda

- 1) Short introduction
- 2) Primary Source-QFT Experience
- 3) Unpacking the process
- 4) Examples in the library
- 5) Reflection, questions, and resources for further learning

Who is in the room?

- What grades do you work with?
- Do you give professional development to your teachers?

The Library of Congress: loc.gov

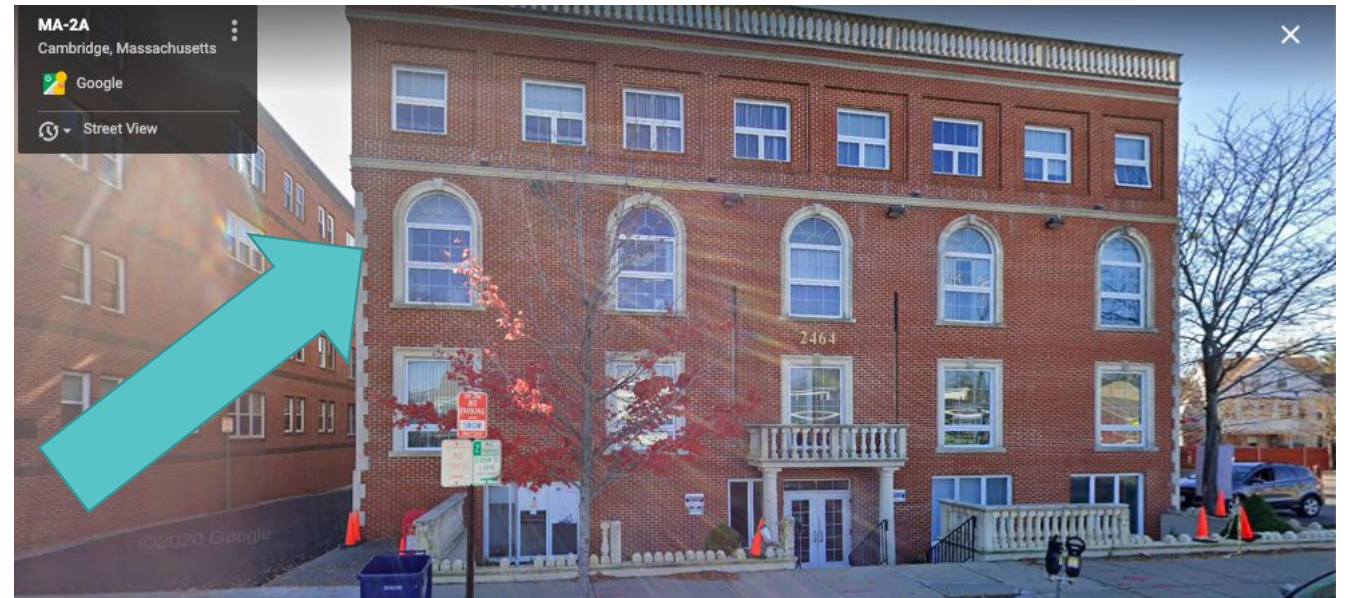
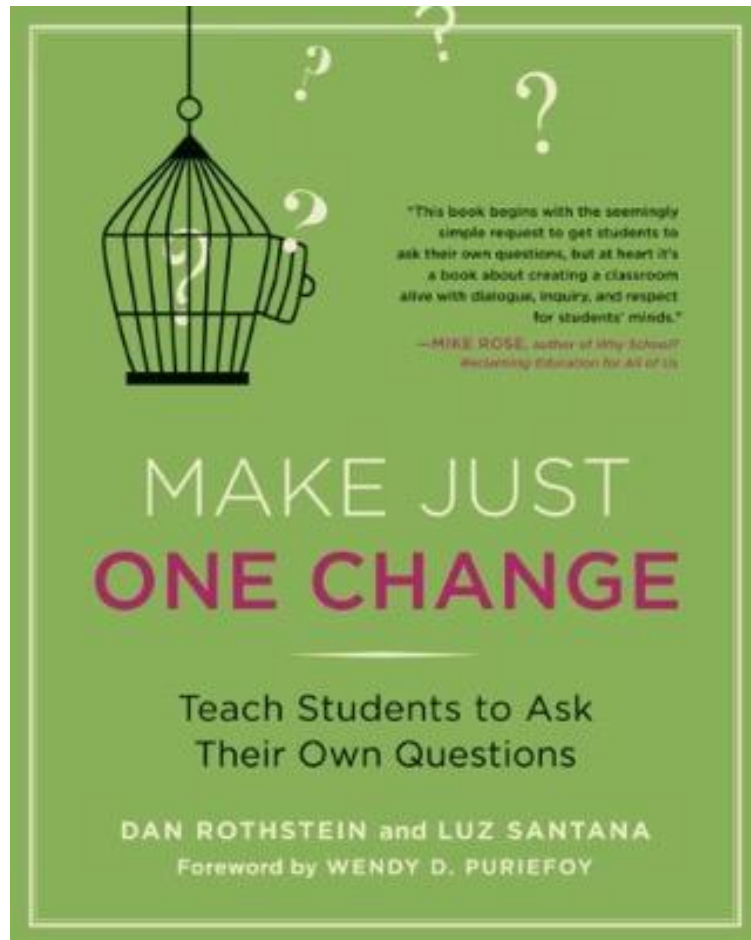


Highsmith, Carol M, photographer. Aerial view from the southwest of the. Library of Congress Thomas Jefferson Building, Washington, D.C. Photograph. Retrieved from the Library of Congress.



Highsmith, Carol M, photographer. Main Reading Room. View from above showing researcher desks. Library of Congress Thomas Jefferson Building, Washington, D.C. Photograph. Retrieved from the Library of Congress.

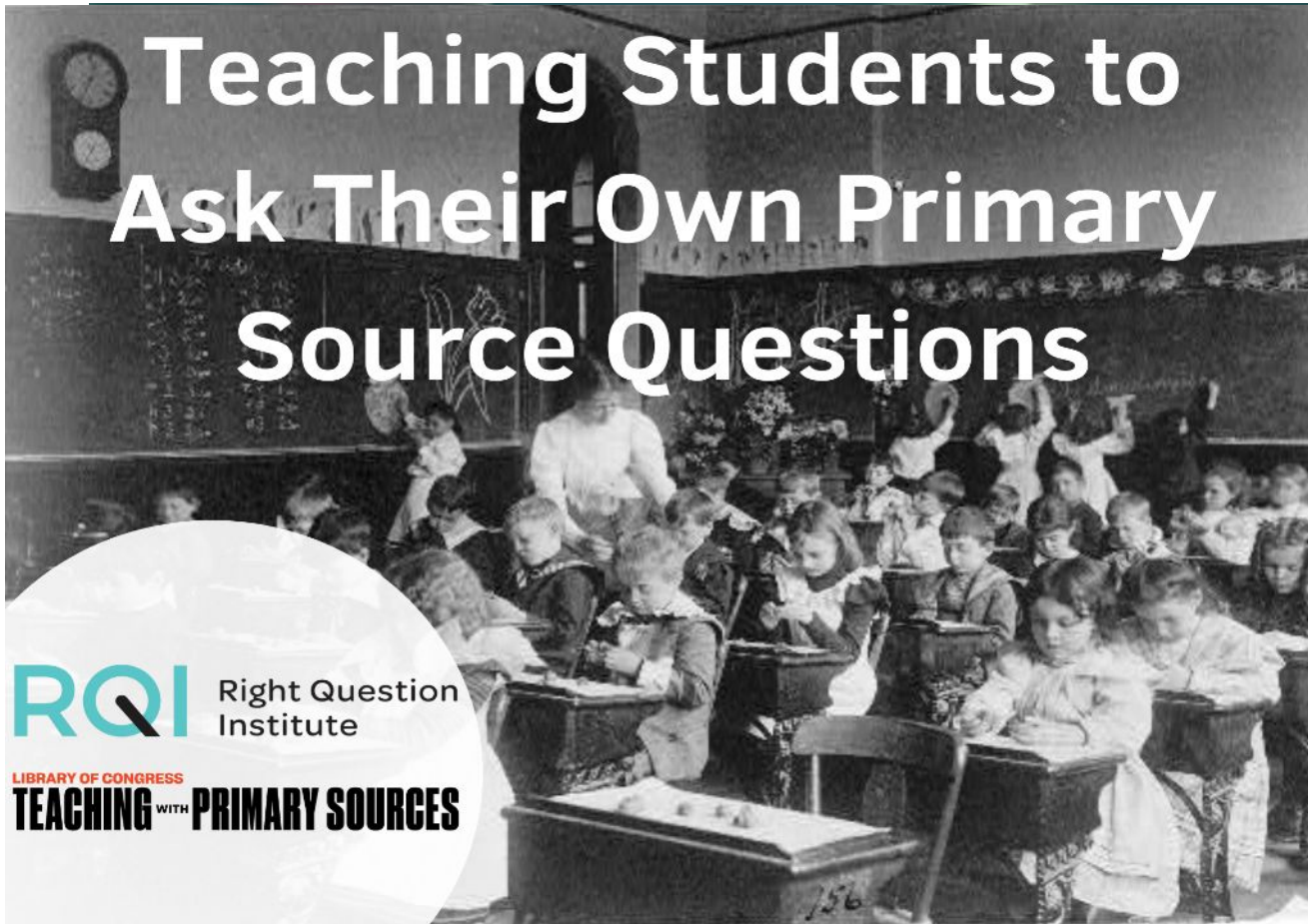
Right Question Institute: rightquestion.org



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Explore our free [Resource Hub](https://rightquestion.org/primary-sources) for Using the QFT with Primary Sources at rightquestion.org/primary-sources

A Question to Consider: Is This a Primary Source?



COLUMBUS TAKING POSSESSION OF THE NEW COUNTRY.

The voyage had lasted 70 days (35 of which being lost by delay at the Canary Islands), from August 3 to October 12, 1492, when Columbus landed on the island called Guanahani by the natives, and named by him San Salvador. This island was rediscovered by the English, and by them called Watling Island. Columbus took possession of the land in the name of Our Lord Jesus Christ, for the crown of Castile.

Published by THE PRANG EDUCATIONAL CO., Boston, U.S.A.

- Title:** Columbus taking possession of the new country
- Creator(s):** [L. Prang & Co.](#),
- Date**
- Created/Published:** Boston, U.S.A. : Published by the Prang Educational Co., 1893.
- Medium:** 1 print : chromolithograph ; 63.3 x 83 cm (sheet)

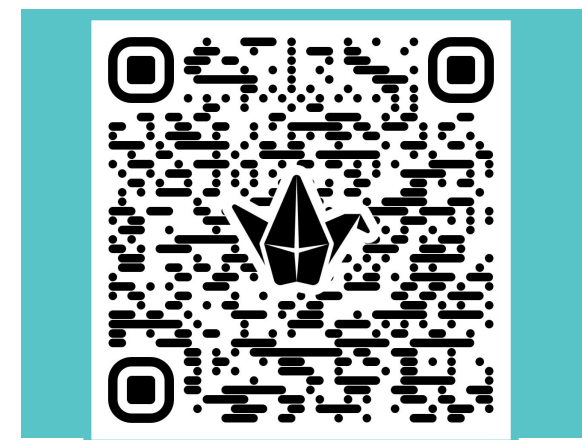
Here's what the Library of Congress would say

It depends...

What topic and time period are you studying?

If you're studying lithographs from the 1800s, then yes.

If you're studying Columbus' arrival to the Americas in the 1490s, then no.



+

Primary Source-QFT Experience

Rules for Producing Questions

1. Ask as many questions as you can
2. Do not stop to answer, judge, or discuss
3. Write down every question exactly as stated
4. Change any statements into questions

Produce Questions

1. Ask Questions
2. Follow the Rules
 - Ask as many questions as you can.
 - Do not stop to answer, judge, or discuss.
 - Write down every question exactly as it was stated.
 - Change any statements into questions.
3. Number the Questions

Question Focus

<https://www.loc.gov/resource/rbpe.1000660d/>

Adopted by Council of American Library Association at Atlantic City on June 18, 1948

Library BILL OF RIGHTS*

3

CENSORSHIP OF BOOKS, urged or practiced by volunteer arbiters of morals or political opinion or by organizations that would establish a coercive concept of Americanism, must be challenged by libraries in maintenance of their responsibility to provide public information and enlightenment through the printed word.

Categorize Questions: Closed/Open

Definitions:

- **Closed-ended** questions can be answered with a “yes” or “no” or with a **one-word** answer.
- **Open-ended** questions require more **explanation**.

Directions: Identify your questions as closed-ended or open-ended by **marking them** with a “**C**” or an “**O.**”

Discuss

Closed-ended Questions

Advantages	

Discuss

Open-ended Questions

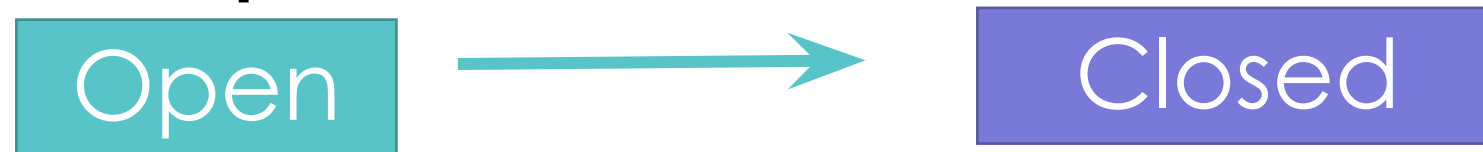
Advantages	

Improve Questions

- Take one **closed-ended question** and change it into an **open-ended question**.



- Take one **open-ended question** and change it into a **closed-ended question**.



- Add these as new questions at the bottom of your list.

Prioritize Questions

Review your list of questions

- Choose three questions that pique your interest the most.
- Draw a  next to those questions.
- Then, think about why you chose those questions.

Building Context

This is the full Library Bill of Rights from 1948 document.

What are you thinking or wondering about now?



Adopted by Council of American Library Association at Atlantic City on June 18, 1948

Library BILL OF RIGHTS*

The Council of the American Library Association reaffirms its belief in the following basic policies which should govern the services of all libraries:

1

AS A RESPONSIBILITY of library service, books and other reading matter selected should be chosen for values of interest, information and enlightenment of all the people of the community. In no case should any book be excluded because of the race or nationality, or the political or religious views of the writer.

2

THERE SHOULD BE the fullest practicable provision of material presenting all points of view concerning the problems and issues of our times, international, national, and local; and books or other reading matter of sound factual authority should not be proscribed or removed from library shelves because of partisan or doctrinal disapproval.

3

CENSORSHIP OF BOOKS, urged or practiced by volunteer arbiters of morals or political opinion or by organizations that would establish a coercive concept of Americanism, must be challenged by libraries in maintenance of their responsibility to provide public information and enlightenment through the printed word.

4

LIBRARIES SHOULD ENLIST the cooperation of allied groups in the fields of science, of education, and of book publishing in resisting all abridgment of the free access to ideas and full freedom of expression that are the tradition and heritage of Americans.

5

AS AN INSTITUTION of education for democratic living, the library should welcome the use of its meeting rooms for socially useful and cultural activities and discussion of current public questions. Such meeting places should be available on equal terms to all groups in the community regardless of the beliefs and affiliations of their members.

*By official action of Council on 3 February 1951, the Library Bill of Rights shall be interpreted as applying to all materials and media of communications used or collected by libraries.

More context building

Information from the ALA on the first Library Bill of Rights:

<https://www.ala.org/tools/first-library-bill-rights>



- Approved by the ALA Council in 1939 during the Annual Conference in San Francisco
- Modeled on a similar statement written by Forrest Spaulding, librarian at the Des Moines Public Library. Spaulding had been appointed by the Executive Board as chairman of a special committee on censorship, following the recent banning by a number of libraries of John Steinbeck's *Grapes of Wrath*.
- ALA had a "wavering" position on intellectual freedom during the 1920s and 1930s. "...concern voiced about censorship in 1924, 1929, and in 1934 ... but not against the Hitler regime, when it ordered books burned in 1933."
- Document reflected the climate of the times: the preamble started, "Today indications in many parts of the world point to growing intolerance, suppression of free speech, and censorship affecting the rights of minorities and individuals..."

More context building

The current Library Bill of Rights on the ALA website:
<https://www.ala.org/advocacy/intfreedom/librarybill>



Selection & Reconsideration Policy Toolkit for Public, School, & Academic Libraries (on the ALA website)
<https://www.ala.org/tools/challengesupport/selectionpolicytoolkit>



Support when Books and other Materials are Challenged (on the ALA website)
<https://www.ala.org/tools/challengesupport>



Prioritize & Next Steps

Reflect on the questions you prioritized already.

- **What would you prioritize now?**
- **What might you do next with your questions?**

Reflection

- What did you learn from the process of asking questions?
- How did the work on this 1948 document help you think about your work today?

A Look Inside the Process



The QFT, on one slide...

1) Question Focus

2) **Produce** Your Questions

- ✓ Follow the rules
- ✓ Number your questions

1. Ask as many questions as you can
2. Do not stop to discuss, judge or answer
3. Record *exactly* as stated
4. Change statements into questions

3) **Improve** Your Questions

- ✓ Categorize questions as Closed or Open-ended
- ✓ Change questions from one type to another

4) **Strategize**

- ✓ Prioritize your questions
- ✓ Action plan or discuss next steps
- ✓ Share

5) **Reflect**

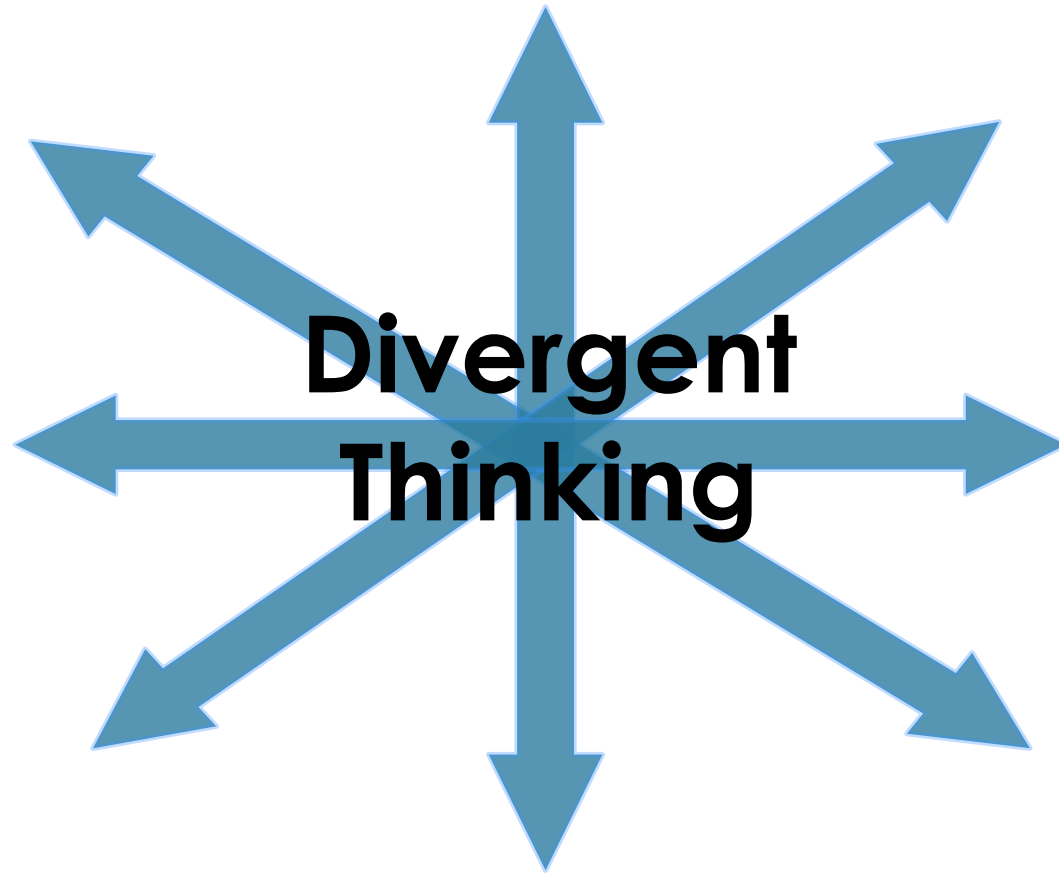
Closed-Ended:

Answered with “yes,” “no” or one word

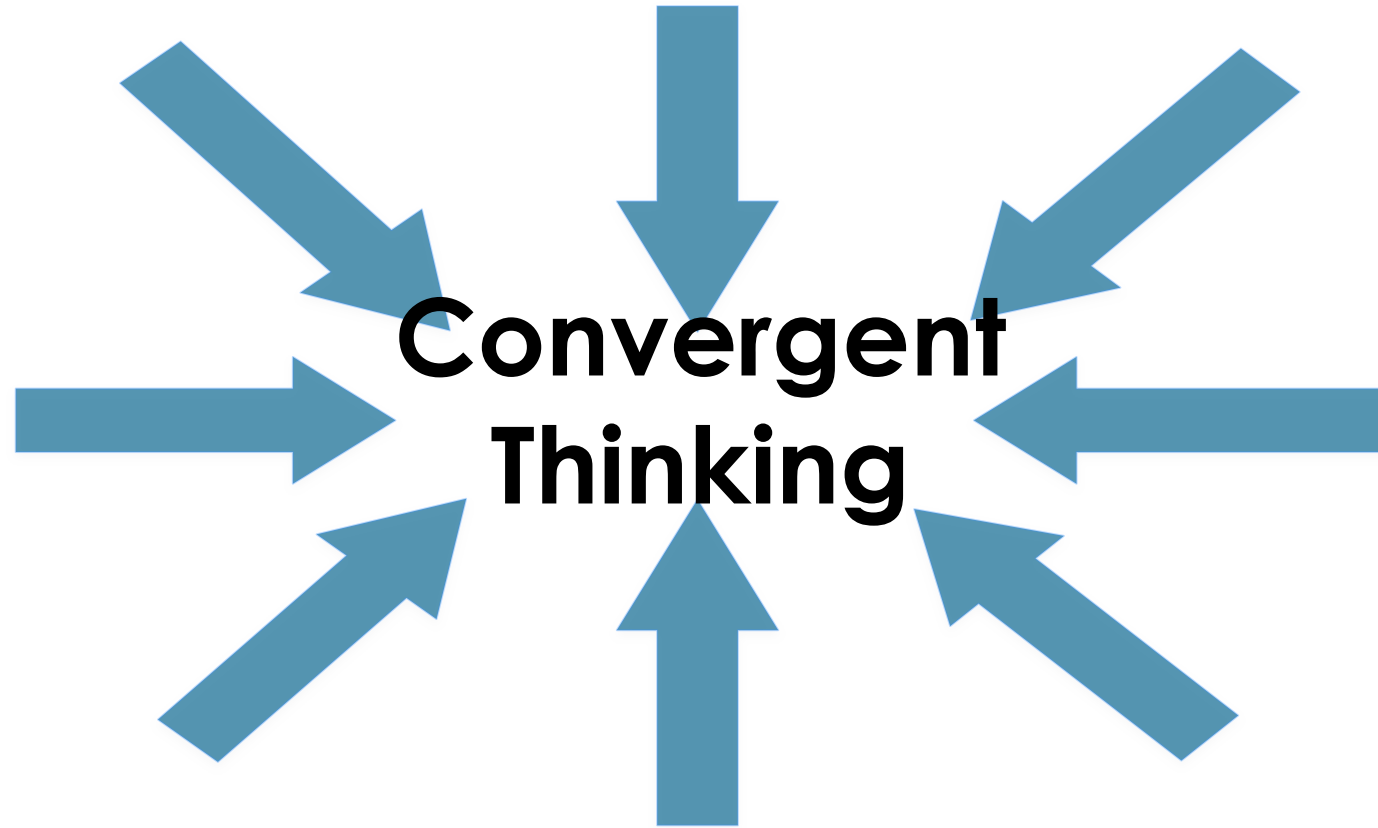
Open-Ended: Require longer explanation

Three thinking abilities
with one process

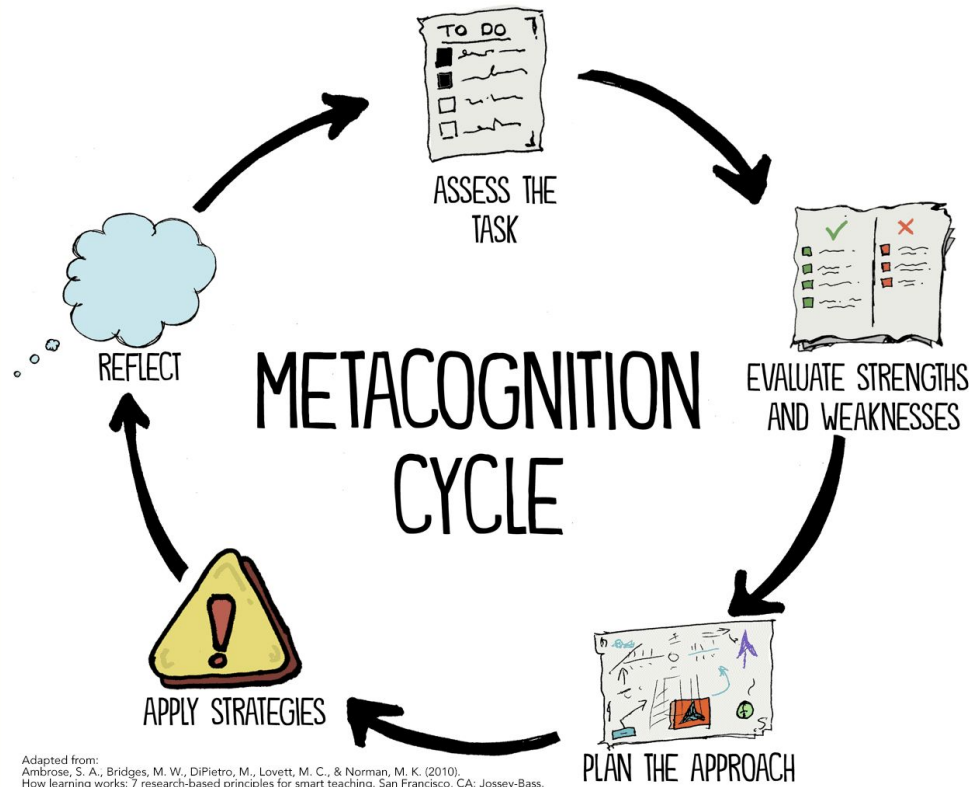
Thinking in many different directions



Narrowing Down, Focusing

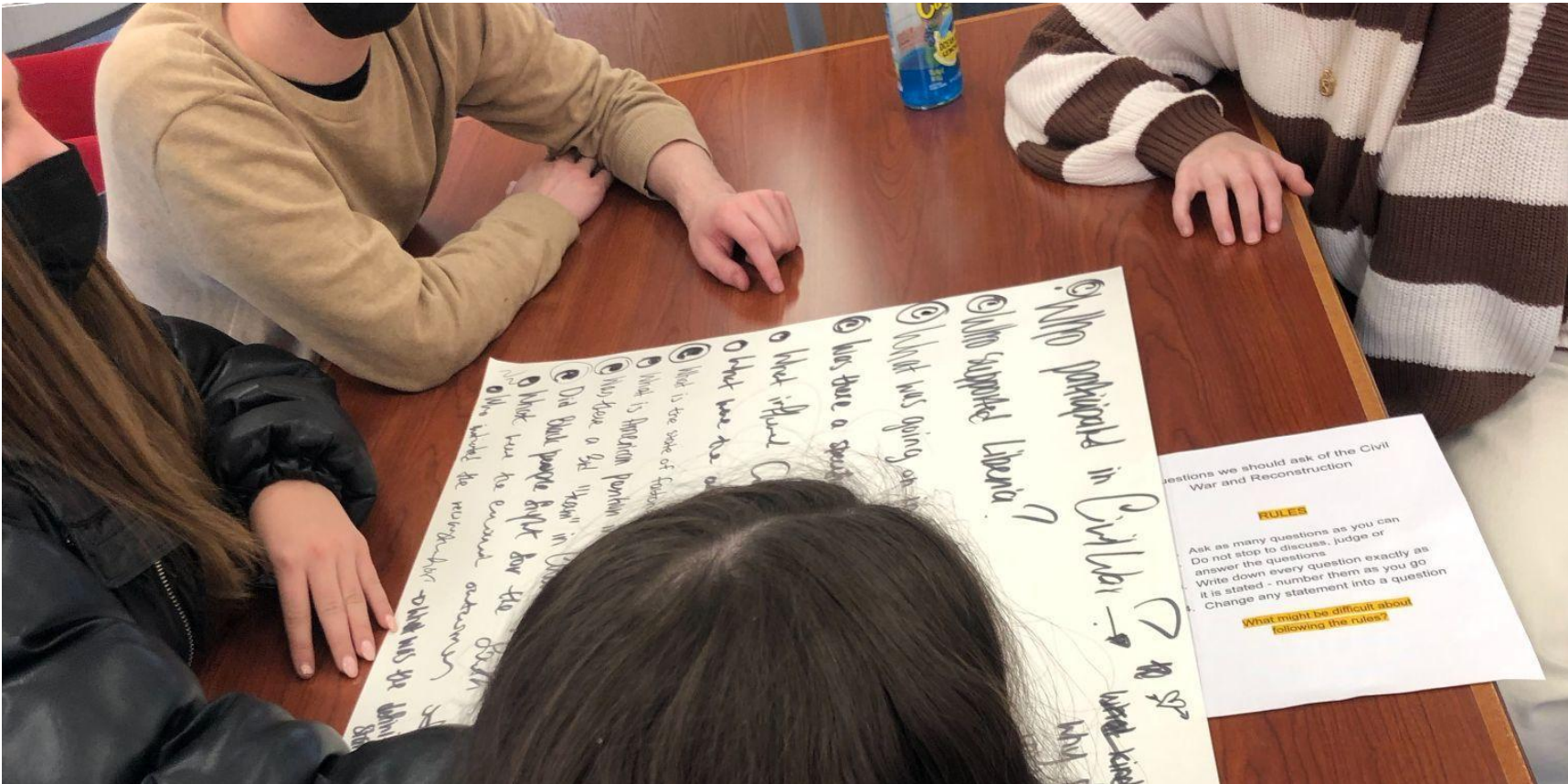


Thinking about Thinking



Metacognition

Adapted from:
Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010).
How learning works: 7 research-based principles for smart teaching. San Francisco, CA: Jossey-Bass.



+ Exploring Applications for Primary Source Learning, Media Literacy & Research

Classroom Example: 7th Grade

Teacher: Melissa Lawson, Folsom, CA

Topic: Japanese American Incarceration during World War II

Purpose: To help students engage with primary sources to begin a research process.



Question Focus



Lange, Dorothea. (1942)
Oakland, CA, Mar. 1942.

A large sign reading "I am an American" placed in the window of a store on December 8, the day after Pearl Harbor. The store was closed following orders to persons of Japanese descent to evacuate from certain West Coast areas.

[Photograph] Retrieved from the Library of Congress,
<https://www.loc.gov/pictures/resource/cph.3a24566/>.

Selected Questions

- 1) Why is the car there?
- 2) Who was the owner of the car?
- 3) Is that a BMW or something?
- 4) Where is this?
- 5) Who took the photograph?
- 6) Why is there a sign that says, I am an American?
- 7) Who is "I"?
- 8) What does "Wanto Co.," mean?
- 9) Who wrote the "I Am an American" sign?
- 10) Was the 'I am American' because the owner was of Japanese heritage and defending him/herself from prosecution? (after Pearl Harbor)
- 11) When the picture was taken, was the store open or closed?
- 12) Why was this picture taken?
- 13) What year is this from?
- 14) Who decided to close the store?
- 15) What happened to the store after this?
- 16) What happened to the Japanese Americans?
- 17) Did they ever get full fledged justice?

Asking and Answering via Padlet

Student Reflections

- “I learned that we cannot draw conclusions just by looking at a picture once. You can look at it and ask questions to learn more. I am wondering if we can use this technique on other things.”
- “Not only did I learn about the picture we were analyzing, but I learned that asking questions makes me want to think more and it makes me curious. Once I started asking questions and reading other people’s responses, I was very interested and curious about the questions that were posted.”
- “I learned that I should have been using this for my History Day paper.”

QFT AND STANDARDS ALIGNMENT

Across NGSS, NCTE, NCSS, ACRL, and AASL standards, **asking meaningful questions is at the heart of authentic learning.** Each framework centers curiosity and student agency—**empowering learners to generate, refine, and pursue their own questions** as a pathway to deeper understanding, critical thinking, and informed action across disciplines.

ALIGNMENT WITH AASL STANDARDS

1. Inquire – Build new knowledge by inquiring, thinking critically, identifying problems, and developing strategies for solving problems

QFT Alignment:

The entire QFT process begins here — students generate questions, categorize them as open or closed, prioritize them, and use them to guide inquiry.

Connection: QFT transforms curiosity into inquiry-based learning.

Example: Students use QFocus prompts to develop their own research questions rather than being given topics.

2. Include – Demonstrate an understanding of and commitment to inclusiveness and respect for diversity in the learning community

QFT Alignment:

Because every student's question is valued equally and judgment is suspended, QFT creates an inclusive environment where all voices are heard.

Connection: It empowers quieter or marginalized students to contribute meaningfully.

Example: During the “produce questions” step, all student contributions are recorded without evaluation.

AASL Standards (con't)

3. Collaborate – Work effectively with others to broaden perspectives and work toward common goals

QFT Alignment:

Students work in groups to generate, improve, and prioritize questions. They learn to negotiate meaning, listen to peers, and reach consensus.

Connection: Collaboration drives collective inquiry.

Example: Groups decide which questions best support the QFocus or learning objective.

4. Curate – Make meaning for oneself and others by collecting, organizing, and sharing resources of personal relevance

QFT Alignment:

Once students develop their own questions, they seek, evaluate, and organize information to answer them.

Connection: Students become curators of their own learning path.

Example: After prioritizing questions, they gather primary and secondary sources to explore answers.

AASL Standards (con't)

5. Explore – Discover and innovate in a growth mindset developed through experience and reflection

QFT Alignment:

QFT encourages intellectual risk-taking and reflection through question revision and evaluation.

Connection: Students refine questions, test their assumptions, and reflect on their learning process.

Example: The final QFT step (“Reflect on what you learned”) directly mirrors the “Explore” foundation.

6. Engage – Demonstrate safe, legal, and ethical creation and sharing of knowledge products independently while engaging in a community of practice

QFT Alignment:

QFT culminates in students using their questions to create and share original work responsibly.

Connection: They take ownership of inquiry, leading to ethically sourced, student-driven outputs.

Example: Students use their questions to frame projects, presentations, or digital storytelling pieces shared with peers or the public.

Alignment with the ACRL Framework

The Question Formulation Technique (QFT) aligns well with the Association of College and Research Libraries (ACRL) Framework for Information Literacy. Here is how QFT corresponds to specific frames within the ACRL framework:

1. Authority Is Constructed and Contextual

The QFT encourages learners to question the sources and context of information. By generating questions about authority, students learn to evaluate the credibility and relevance of different sources based on specific situations.

2. Information Creation as a Process

The QFT promotes understanding that information does not just exist but is created through various processes. By formulating questions, learners begin to explore how different types of information are produced and for what purposes.

3. Information Has Value

Through the QFT, students formulate questions about the value of information—who benefits from it, how it is shared, and its implications in various contexts. This fosters an appreciation for intellectual property and the ethical use of information.

ACRL Framework (con't)

4. Research as Inquiry

The QFT is rooted in the idea of inquiry, where learners are encouraged to ask questions that lead to deeper investigation. This reflects the iterative nature of research, as students refine their questions to guide their inquiry process effectively.

5. Scholarship Is a Conversation

The QFT enables students to contribute to scholarly conversations by formulating questions that can lead to discussions and debates within their fields of study. It highlights the collaborative aspect of scholarship as students seek to engage with others' ideas and questions.

6. Searching as Strategic Exploration

By generating questions, students become better equipped to approach the research process strategically. QFT helps learners frame what they need to search for, thereby enhancing their ability to formulate effective search strategies.

The QFT not only enhances students' questioning skills but also directly supports the ACRL Framework's emphasis on developing critical thinking, research skills, and an understanding of information literacy as a holistic process.

A Few Thoughts

- Coming up with a Q Focus is challenging - provocative statement vs. focused image.
- Collaborating and preparing faculty is critical.
- Student Questions are Helpful in Research Conferences.
- Students often choose questions I would not rate as the top three - this is why the Parking Lot is important.
- It's Hard to Watch Students Struggle.
- It's Hard for Teachers to Watch Their Students Struggle.
- Save Those Posters!

Example: Research

Topic: Creator Bias & Primary Sources

QFocus: Begins with a provocative statement and moves to primary sources from the LOC and additional sources.

Purpose: To explore iconic primary source photographs by examining the lens of the photographer

Question Focus

"A photograph is shaped more by the person behind the camera than by what's in front of it."

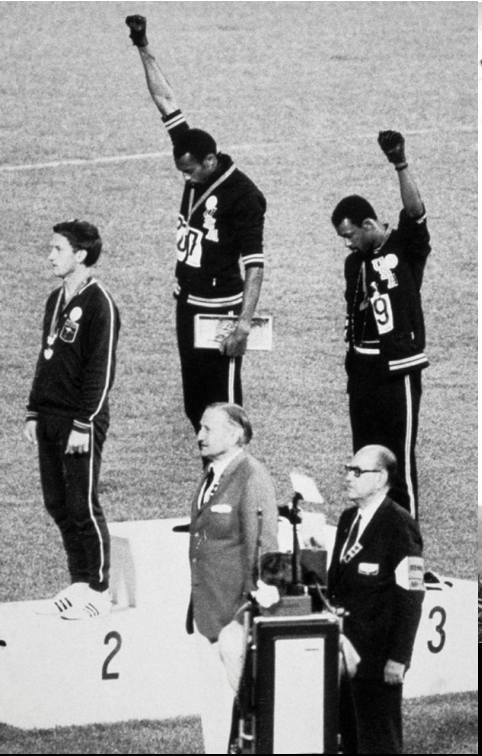
The image consists of two photographs. The left photograph shows a group of students gathered around a wooden table. A large sheet of paper is spread out on the table, covered with handwritten notes and a drawing. The notes include questions like "Who participated in Civil War?", "Who supported Lincoln?", "What was going on in NJ?", "Was there a specific line dividing the Union of Confederation?", "What impact did war have?", "What was the cause of failure in Civil War?", "What is the position in the North's Regt. Army?", "Did the people fight for the South?", "What was the central outcome?", and "What was the result of the war?". A drawing of a sword is also visible. The right photograph shows a group of students sitting at a dark table. A large sheet of paper is spread out on the table, covered with handwritten notes. The students are looking at the paper, and one student is writing on it. The background shows a classroom setting with windows and framed pictures on the wall.

Student Questions

1. How does the subject affect the photo?
2. Did the old cameras have a part in this?
3. Do men shape their photos more than women?
4. How does light play a role in this?
5. **Can you show me some examples?**
6. How do you measure the “shaping?”
7. Does the age of the photographer or subject play a role?
8. How did the time period the photo was taken play a role in the shoot?
9. **Did the development of film and printing play a role?**
10. **Do politics/religion play a role?**

Next Steps with Student Questions

- Following the QFT, students explored a set of iconic primary source photographs from the Library of Congress and additional sources.
- Students chose three primary source images that appealed to them and added an observation, reflection, and additional questions to each of their three chosen pictures.
- Using their priority questions as a lens, as well as additional collections and databases, students created an Adobe Spark webpage on a topic of choice.



Exploring Iconic Primary Source Photographs



Analyzing Primary Source Photographs

OBSERVE:

- What do you notice first?
- What do you notice that you can't explain?
- What do you notice that you didn't expect?

REFLECT:

- Where do you think this came from?
- Why do you think somebody made this?
- What do you think was happening when this was made?
- Who do you think was the audience for this item?
- Why do you think this image is important / iconic?
- If someone made this today, what would be different?
- What can you learn from examining this?

QUESTION:

- What didn't you learn that you would like to know about?
- What questions does this question raise?
- What do you wonder about ... (who)?
- What do you wonder about ... (what)?
- What do you wonder about ... (when)?
- What do you wonder about ... (where)?
- What do you wonder about ... (why)?
- What do you wonder about ... (how)?



Example: Research

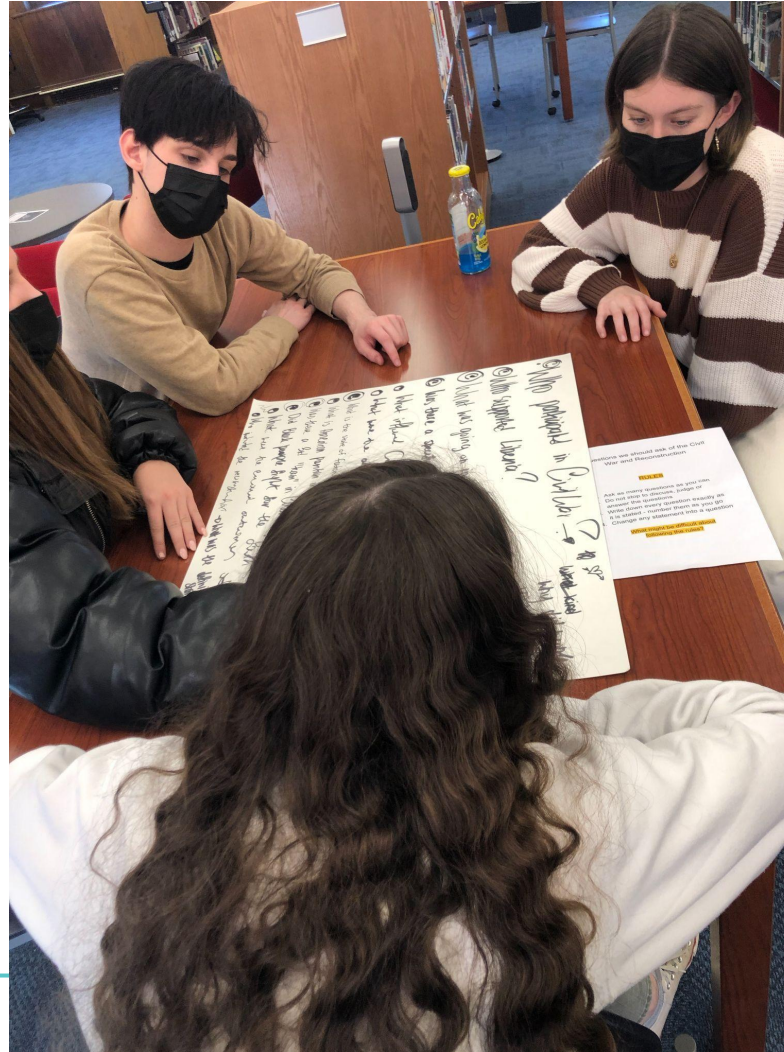
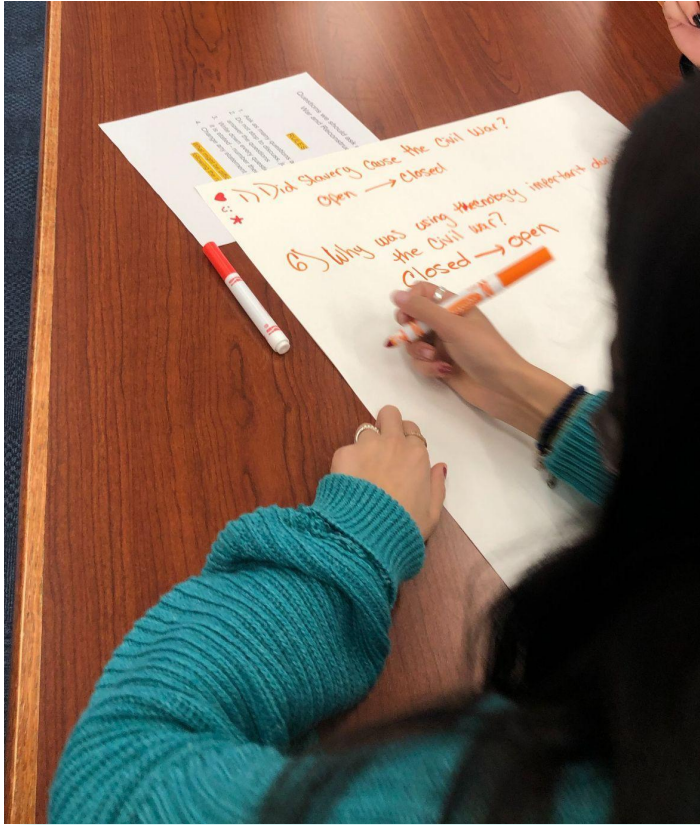
Topic: Civil War & Reconstruction

Purpose: In preparation for a primary source set project creating an Adobe Spark Video

Question Focus

**Questions we should ask of the
Civil War and Reconstruction**

The QFT in Action



Questions we should ask of the Civil War and Reconstruction

Bella, PARIS, Kevin

CIVIL WAR + RECONSTRUCTION Qs.

- 1) How did differing views on slavery & immigrants impact the politics/elections during the time?
- C 2) What were the casualties during the C. W. for both sides?
- ★ C 3) Military tactic differences between North & South?
 - Did North have more people and worse strategy / commanders
 - while South had less people and better strategy?
- ★ ○ 4) How did the differing views on slavery after the civil war lead to forces that opposed the antislavery movement?
 - could the anti-slavery and pro-slavery groups handle their differences better?
- 5) To what extent did the Republican party change its rhetoric to accommodate opposing views? The Democratic party? ^{How} Did this accommodation / lack thereof influence the election? The civil war?
- ★ ○ 6) What advantages / causes were most important to the casualty count? The war outcome?

Questions we should ask of the Civil War and Reconstruction

1) Did Slavery cause the Civil War?
Open → Closed

6) Why was using technology important during the Civil War?
Closed → Open

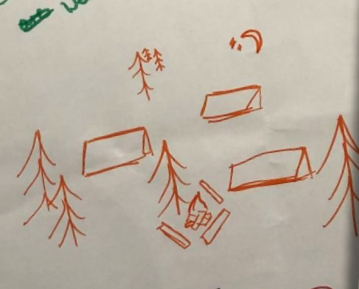
11) What did we get out of the War after it ended?
- important for reconstructions
- learn from mistakes

12) What effect did the war have on the economy?
- moving forward
- daily life how was it?

17) Where were the Native Americans?
- how other types of people were affected
- their land/culture
- westward expansion?

- 1) What was the cause of the Civil War? O
- 2) What are the basics of the Civil War? O
- 3) What did Lincoln do in the Civil War? O
- 4) What were the beliefs of the 2 sides? O
- 5) What was the # of deaths & injuries? C
- 6) What kind of technology did they use? C (change)
- 7) What effect did this have on the economy? O
- 8) Who were the key people in society who affected the Civil War? C
- 9) How close was it? O
- 10) What was the end goal of both sides? O
- 11) What did we get out of it after the war ended? O
- 12) How long did the war last? C
- 13) What happened to the South after the war ended? O
- 14) Were Jim Crow laws/Black codes before or after the Civil War? C
- 15) How did the amendments change or affect the war? O
- 16) Did people's beliefs change after the war? C
- 17) Where were the Native Americans? C
- 18) Did slaves fight? C
- 19) Were there black soldiers? C
- 20) Were plantations still being run during the war? C
- 21) How were immigrants affected? O

Questions we should ask of the Civil War and Reconstruction

1. Who are the leaders? What time period? Economic, social, geographical effects. C, (10)
 2. Who is Lincoln, Robert & Lee C
 3. What weapon and technology? C
 4. Differ from previous wars? O
 5. Underground railroad? C/O
 6. What's the difference in serving for north & south for soldiers. C
 7. How many black people are involved C
 8. International view. O 2.
 9. Childrens & women's role O? Which women were major figures
 10. impact internationally O
 11. Arts, literature impact O
 12. Major spies C
 13. Major battles & treaties C
 14. Middle class families affected C
 15. Boundary States switch sides? C
 16. Legal legacy? O
- 

1. What is the Civil war (CW) C/O
 - It is the biggest war in US
 - The context for EVERYTHING.
2. How? What was Lincoln's role in the CW
 - When he was elected in 1860, what was his 1st action?
3. What was the impact of CW
 - One of the major cause of CW
 - leads to the freedom of slave
 - changes social structure.
4. How did it impact slavery O
5. How did technology developed in CW O
6. What was the international relationship between US & other countries C
7. How did the North & South
 - make peace C
 - their different power caused war
 - The process of compromise change US society
8. How did the republican party impact CW O
9. What is the economy situation. C
10. Who was allowed to serve in the military. C
11. What is the women's role in this era, did this grant them more freedom O
12. What is the educational system like. C

The value of open and closed questions

Open ended Q

- More discussion
- Bring in ideas
- More open to interpretation
- ~~Not~~ *neces* more than 1 right answer

Close ended

- Right answer, Clarity

Student Questions (top three)

1. What is the Civil War?
2. How did it impact slavery?
3. How did the North and South make peace?

1. What is the legal legacy?
2. International role?
3. What was the role of women and children?

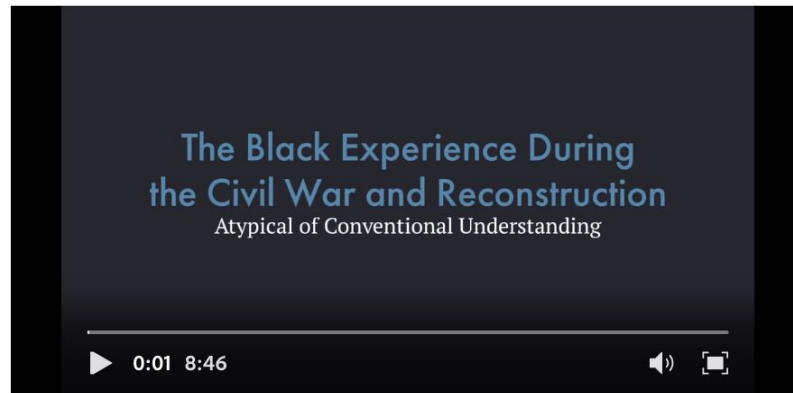
1. What did we get out of the war after it ended?
2. What effect did the war have on the economy?
3. Where were the Native Americans?

Student Questions (parking lot)

1. What is the Civil War?
2. What is the reconstruction era?
3. Who was involved?
4. What technology was used?
5. Why did it stop?
6. How did it end?
7. What haven't historians learned yet?
8. What took so long?
9. Why hasn't it happened again?
10. When did succession first become a possibility?
11. Where was it most impactful?
12. Who has it been most impactful to?
12. Whose story was saved?
13. Were there foreign powers included?
14. How much was the public involved?
15. What info was shared with the public?
16. Did the public want a war?
17. How closely were Black people involved?
18. What percentage of people were opposed to it?
19. What kind of atmosphere was in Congress after southern states came back?

The End Product - Spark Videos

Anlin | The Black Experience



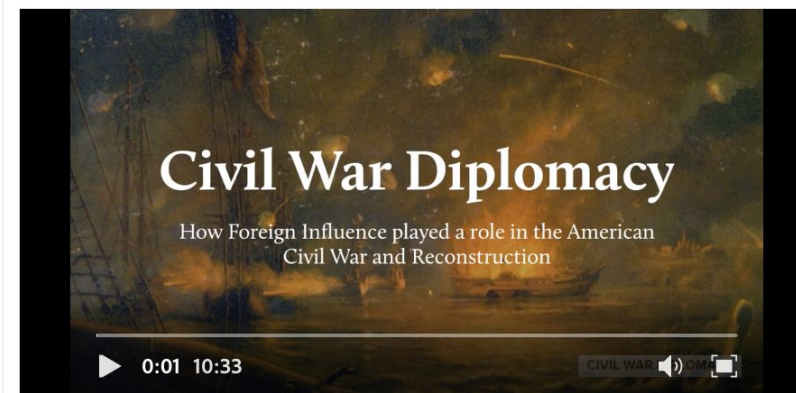
Bella | Weapons Used in the Civil War



Claudia | The Union's Victory



Dora | Civil War Diplomacy



Literature: Some Authentic Voices are Missing from *The Things We Carried*

SOME AUTHENTIC VOICES ARE MISSING FROM THE THINGS THEY CARRIED

- 1 → What are the voices missing? C
- 2 → *What do they symbolize? O
- 3 → Do the voices have backgrounds? C
- 4 → *How do we identify the missing voices? O
- 5 → What is considered a "missing" voice? O
- 6 → *Why were they excluded? O
- 7 → How are the voices depicted in the story? C/O

OPEN QUESTIONS

- How do the backgrounds influence the voices? (3)

CLOSED QUESTIONS

- Where are the missing voices shown? (4)

1. What Voices? O

2. Why are they missing? O

3. What makes voices authentic? O

4. Why are we doing this? C

5. Are people the voices? C

6. Do the voices come from both sides of the war? C

7. How many voices? C

8. What are the voices that are shown? C

Some authentic voices are missing from *The Things They Carried*

©1.★ Does O'Brien leave ~~the~~ these authentic voices out on purpose?

Q2. What makes somebody's voice authentic?

©3.★ What is the importance of authentic voices?

©4.★ How do these voices contribute to the story?

5.

↳ ~~What~~
Do the voices add ~~or~~ to the importance of the story?

Taylor is the BEST!

Student Questions (top three)

1. How do we identify the missing voices?
2. Why were they excluded?
3. What do they symbolize?

1. Why are they missing?
2. Do they come from both sides of the war?
3. Why are we doing this?

1. Does O'Brien leave these authentic voices out on purpose?
2. What is the importance of authentic voices?
3. How do those voices contribute to the story?

Next Steps with Student Questions

- Following the QFT, students chose a missing voice.
- Students researched their missing voice using primary source material: newspaper and magazine articles, journals, news reels, images, etc.
- The final projects varied from short documentary style films, narrated slideshows, etc.

AB Calculus: Mathematics is Deeply Embedded in the Universe

IN THE UNIVERSE

01. Why is it mathematical?
02. How is it mathematical?
- c 3. What is mathematical?
04. How deep is the math?
05. How much math is in it?
06. What am I?
07. What is life?
- c 8. What does "I am therefore I am" mean?
09. Why patterns?
- c 10. Why recurring patterns?
- c 11. Why are there recurring patterns?
012. Where is ~~the~~ the universe mathematical?
013. Am I math???
014. Or am I not math?
015. Why am I math or not math?
- c 16. What makes something mathematical or not mathematical?
017. Is there math outside of the universe?
- c 18. Is there math on mars?
- c 19. What is math?
020. What is math without humans?

is That's the prompt? 1 c
When were numbers created? 2 c
Numbers? 0

What is the history of 0? 3 0

Does time have symmetry? 4 0

What is relation b/t chaos & symmetry 5 0
How did we create our time system c

How did people know if it was perfectly symmetrical? 6 0
Is stillness inconceivably chaotic? 7

Is there a golden ratio of organization? 8 0

Is there symmetry in how the left brain and right brain works? 9 c

Why do we have a leap year? 10 c

What is nothing? 11 0

How do people work with things/tech without 1 c
numbers? 0

What is math? 13 0

Why is math important? 14 0

How does math relate to life? 15 0

What is infinity? 16 0

C -> 0

Why do we need a leap year?

AB Calculus: Mathematics is Deeply Embedded in the Universe

1. Why is Math filled with Chaos? ○

↓

2. What is Chaos? <

Where is chaos seen?

3. Why do we have counting ~~markers~~ ^{numbers}? ○

★ 4. How can you connect science and math? ○

★ 5. How has math contributed to society? ○

6. What if we didn't have math? <

7. Where does math come from? <

★ 8. How are new mathematical ~~studies~~ discoveries made? <

9. How does math change? ○

Does math change?

Student Questions (top three)

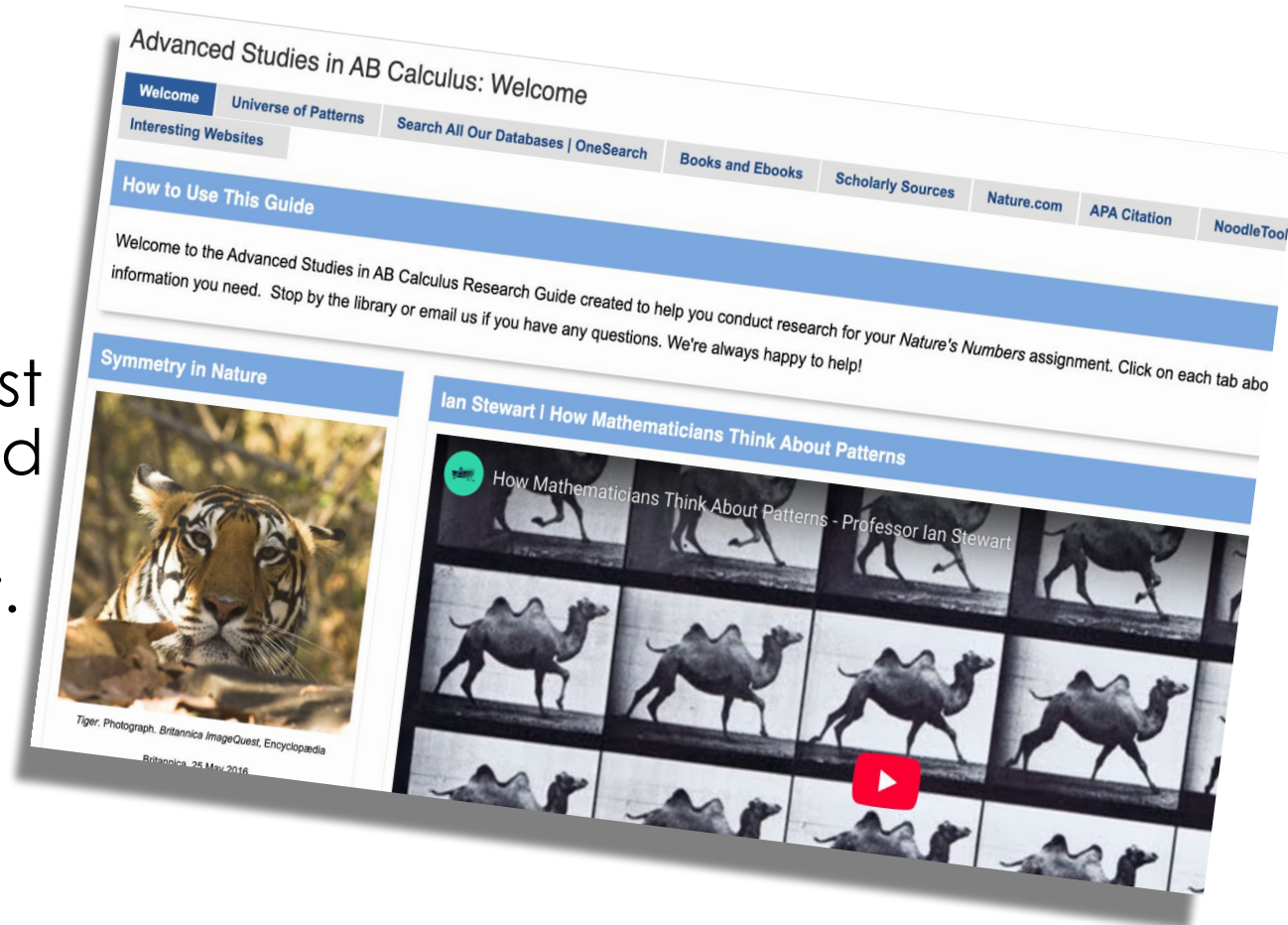
1. How deep is the math?
2. Why are there recurring patterns?
3. What is math without humans?

1. Does time have symmetry?
2. What is nothing?
3. What is math?

1. How can you connect science and math?
2. How has math contributed to society?
3. How are new mathematical discoveries made?

Next Steps with Student Questions

- Following the QFT, students
- read *Nature's Numbers: The Unreal Reality Of Mathematics*
- by Ian Stewart
- Students chose a topic of interest relating to *Nature's Numbers* and used additional resources from the research guide seen at right.
- The final projects were presentations in a variety of formats.



The Maria Randall Allen '42 Archives documents the history of Westover as much by what is in the collection as by what is missing. Neutrality is a myth.

What is missing from the archives?° (time periods? perspectives, traditions, items, etc.)
What dates are missing from the archives?

What do we know the most about?°

What do we know the least about?°

What does neutrality mean in this context?°

Who recorded the most information?° What position were they in to record the most information?

What are some of the mysteries/unanswered questions about Westover?

How does what is missing inform us?°

- What are some of the mysteries of Westover? (Combined multiple of our questions)
- How does what is missing inform us? (Asks more about the first statement)
- What does neutrality mean in this context? (How does this statement relate to the archives? Might find out more about the archives through this question)

Q 1.) how can we further improve the archives?

Q 2.) how have large scale historical events impacted the history of Westover? ☆

Q 3.) would an outsider view the archives as neutral?

(4.) what constitutes as "neutral?"

☆ Q 5.) how do we distinguish as ~~an~~ collector of archives?

☆ Q 6.) do the archives favor one side over another?

Q 7.) what qualifies as something that can be part of the archives? ☆

Q 8.) how has the history of Westover made it into the institution that currently stands?

C → Q 1.) is neutrality required? ☆

Q → C.) ~~the archives are not neutral~~

does Westover's history impact the current institution

why?

- 2.) because over a century has passed since WO's founding
- 3.) because it is an important question / is it our responsibility to do so
- 7.) because certain skills are required

Resources for further learning

[Lesson Plan for US History Projects](#)

[Research Guide for US History](#)

[Iconic Photos](#)

[Research Guide for Advanced Studies in AB Calculus](#)

[QFocus for a Variety of Disciplines / Courses](#)

[Primary Source Starter Pack](#)

Links to Tutorials for Searching the Library of Congress Collections



Looking for a National History Day topic on revolution or change in the 1960s? Explore the Library of Congress collections to uncover powerful stories, movements, and moments that shaped a transformative decade.



This tutorial introduces the Library of Congress website—the world’s largest digital library—and guides you step by step in finding, filtering, and citing primary sources for research, teaching, and discovery.

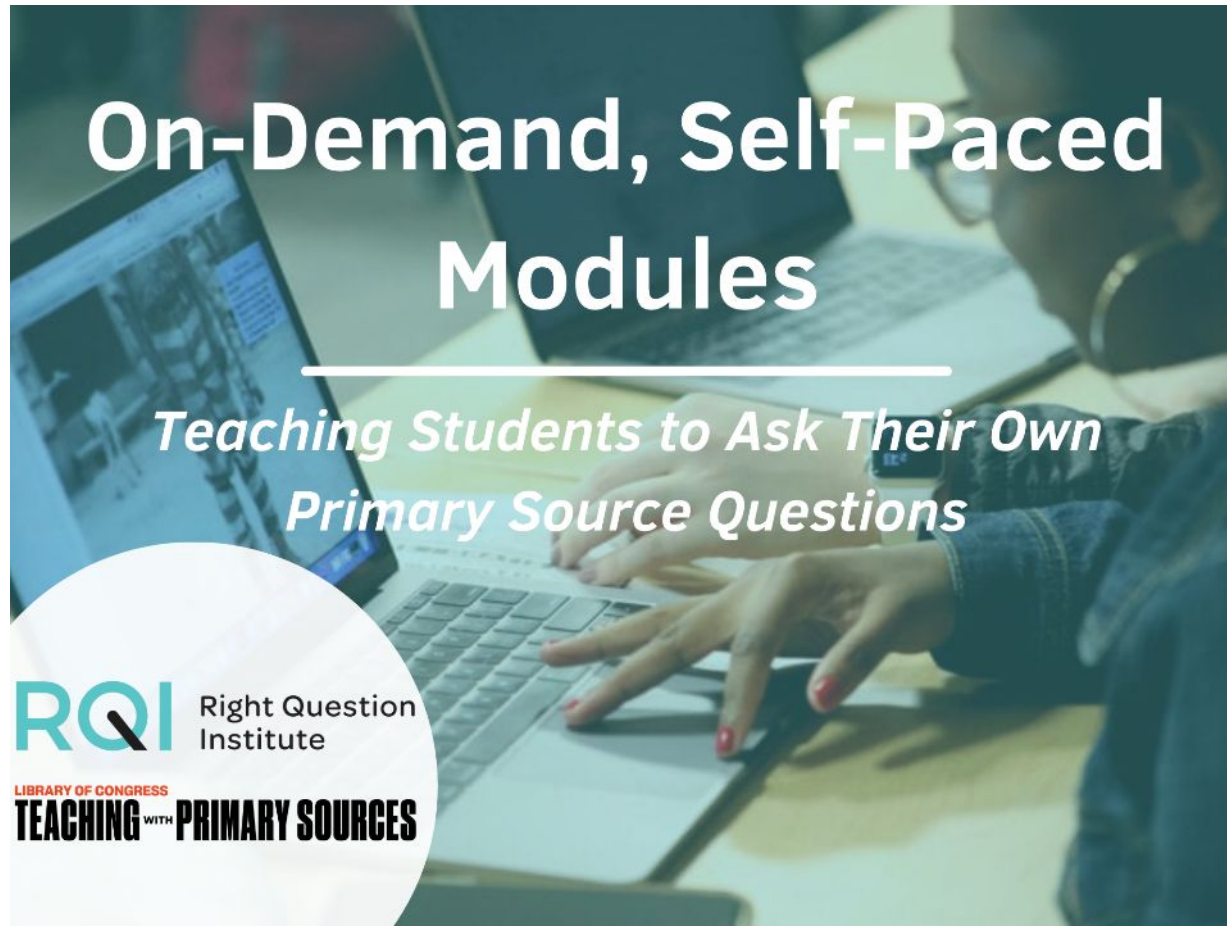


Explore the Library of Congress photo collections on Flickr—over 44,000 images spanning history, science, art, and more—to spark curiosity, invite discovery, and inspire meaningful classroom connections.



Embrace serendipity and let curiosity lead the way—exploring the vast collections at LOC.gov can spark discovery and meaningful connections across history, science, art, and every subject in between.

Tour of RQI Resources for further learning



Watch videos to hear from teachers and students

Check out real lesson plan examples

Learn more on your own time

Explore our free [Resource Hub](https://rightquestion.org/primary-sources) for Using the QFT with Primary Sources at rightquestion.org/primary-sources

Thank you!