Exploring the Depths of Deeper Learning

Session #2-Tuesday, July 11, 2023

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Access the Handouts

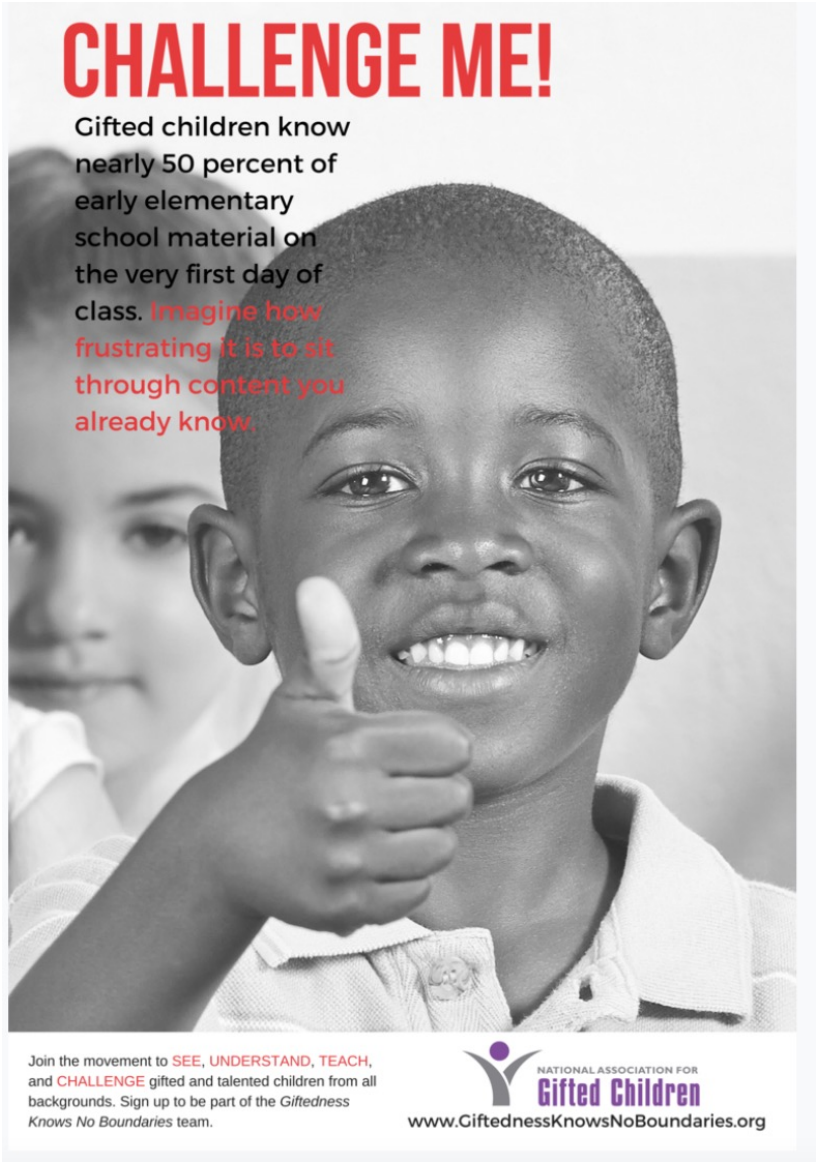
https://tinyurl.com/2sm5kdfy

- Access Handouts

Celebrations, Successes, and Questions

AGENDA. . . 1:30-3:00 p.m.

- Celebrations, Challenges, Questions You Have
- Thinking About the Teaching of Thinking
- Escalating Thinking and Student Discourse
- Creating Safe Environments for Critical Thinking and Probing Each Others' Ideas
- Tools and Strategies
  - Visible Thinking Routines
  - Skills of a Discipline "How to Think Like…."
  - Kaplan's Icons of Depth and Complexity
  - Richard Paul and Intellectual Traits



Cultivating a Culture of Thinking and Enhancing Academic Discourse in the Classroom

Let's Go to the Movies

Core Curriculum: https://vimeo.com/762351168
Curriculum of Connections: https://vimeo.com/765812516
*Curriculum of Practice: https://vimeo.com/767096102
Curriculum of Identity: https://vimeo.com/770062634

Problems with Teaching Process Skills

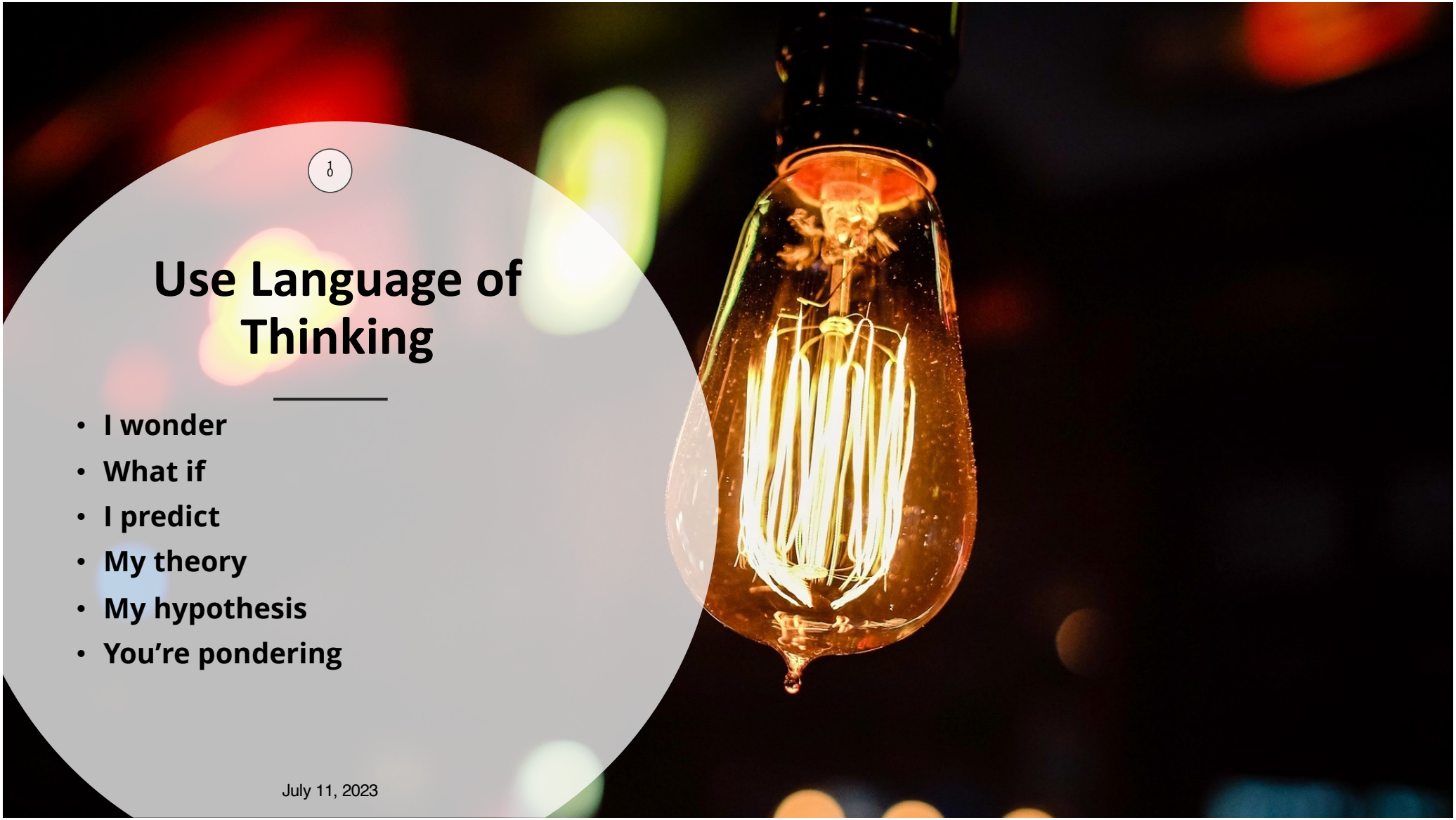
- We do not agree on which skills should be taught.
- We have not defined the skills to be taught.
- We rarely teach to thinking skills or any other process skills.
- Students are often exposed to skills overload.
- Skill strategies are rarely taught, yet often tested.
- Questioning strategies and exercises do not ensure mastery.

Teaching for Thinking……

1. Introduce the skill and give several examples.
2. Discuss its importance (when, where, how to use it).
3. Explain mental processes to do the thinking, model the process.
4. Let students practice the skill several times using personal, easy to understand content.
5. Put the skill into the content of your academic content.
6. Transfer the use of this skill in novel situations.

Use Language of Thinking

- I wonder
- What if
- I predict
- My theory
- My hypothesis
- You're pondering



Language of Thinking

Claim to Knowledge

- conjecture, conclude, believe, confirm, doubt, know, suggest, speculate, suspect, and theorize

Intellectual Process

- analyze, contemplate, discern, interpret, investigate, ponder, examine, and recollect

Kinds of Ideas or Outcomes

- conclusion, hypothesis, option, solution, reason, claim, and theory

Tishman, S., Perkins, D., (January, 1997). *The language of thinking*. Phi Delta Kappan, 368-374.

Teaching for Open-Mindedness and Critical Understanding

Creating a Safe Environment

- " What guidelines could we establish for ourselves that would not only make this a productive class, but would also make this a safe place for people to share what they are thinking and feeling, and a safe place for people to make mistakes and learn from them?"

Establishing ground rules or guidelines…

Listen	Listen respectfully, without interrupting.
Listen	Listen actively and with an ear to understanding others' views. (Don't just think about what you are going to say while someone else is talking.)
Criticize	Criticize ideas, not individuals.
Commit	Commit to learning, not debating. Comment in order to share information, not to persuade.
Avoid	Avoid blame, speculation, and inflammatory language.
Allow	Allow everyone the chance to speak.
Avoid	Avoid assumptions about any member of the class or generalizations about social groups. Do not ask individuals to speak for their (perceived) social group.

Sharing Your Thoughts…

It is okay to make mistakes. Mistakes are how we learn. Invite yourself and others to learn from mistakes by talking about their impact and how to avoid similar mistakes in the future.

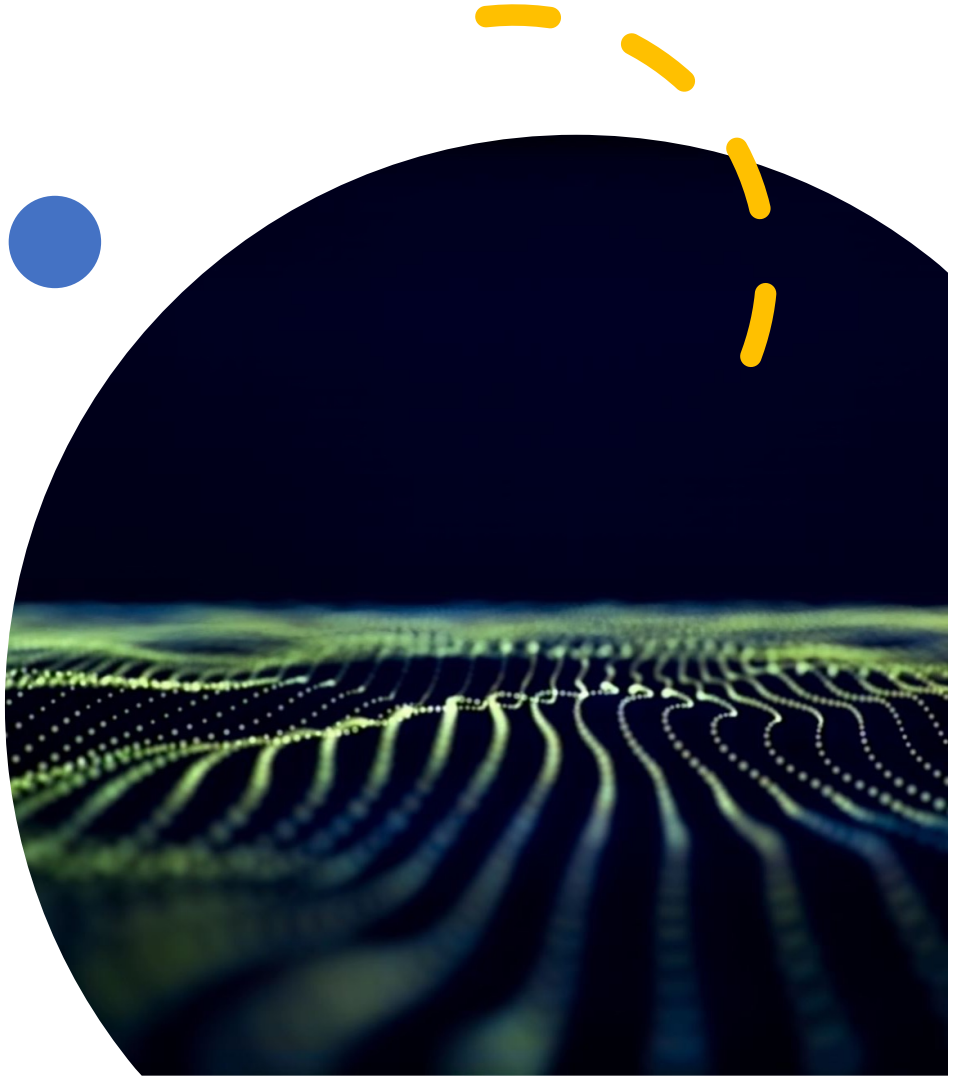
Demonstrate your reasoning. How are you building connections between pieces of evidence to justify your argument?

Acknowledge and value that each person brings different experiences, knowledge, and levels of awareness to the discussion. How can you build off of and further contribute to what other students have shared?

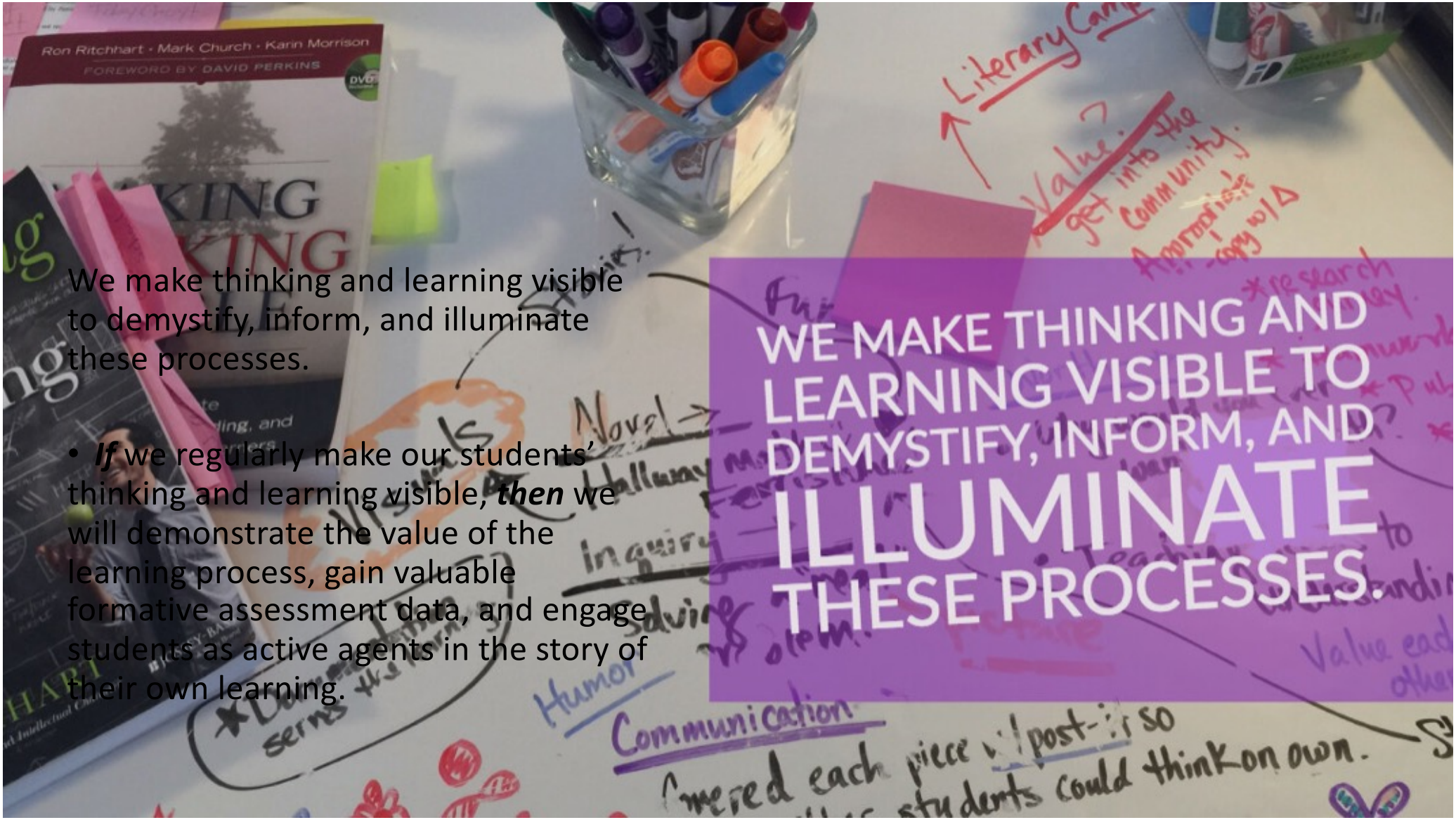
Connect the discussion to prior course material and discussions. What are the connections that might be emerging?

Emotions are okay and to be expected. Name your reaction and what you think is prompting it. Someone could learn about the impact of a particular idea or piece of knowledge.

You do not need to be the sole representative of any of the identities you hold. There is significant emotional labor involved with talking about your community's culture, and even then, you cannot speak for everyone.



Visible Tools and Strategies for Engaging and Advancing Student Thinking



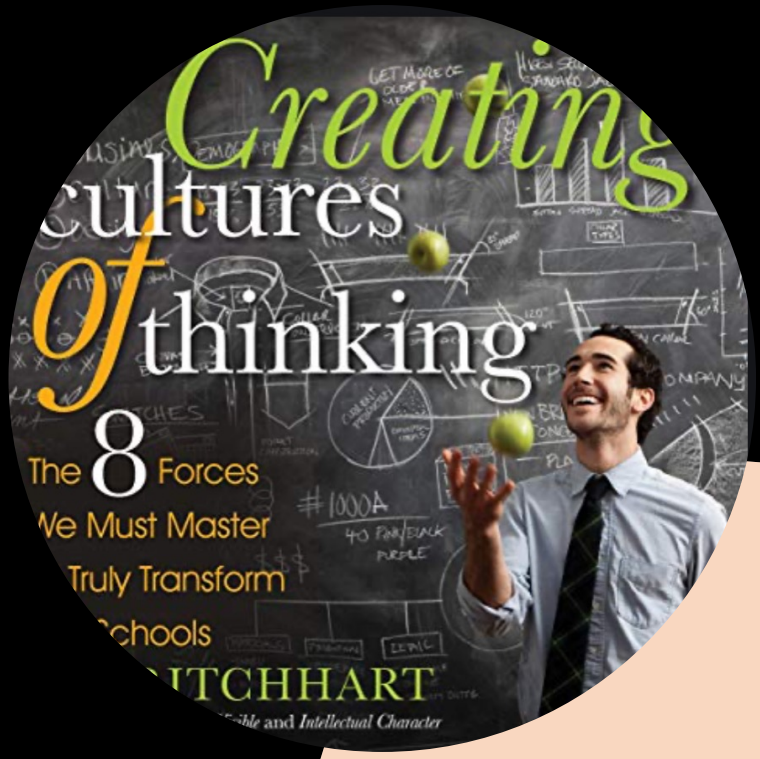
We make thinking and learning visible to demystify, inform, and illuminate these processes.

- ***If*** we regularly make our students' thinking and learning visible, ***then*** we will demonstrate the value of the learning process, gain valuable formative assessment data, and engage students as active agents in the story of their own learning.

Using Routines and Expectations…….To Engage in Discussions About What We Are Learning

Definition of a *Culture of Thinking*

- a group's collective as well as individual thinking is valued, visible, and actively promoted as part of the regular, day-to-day experience of all group members.



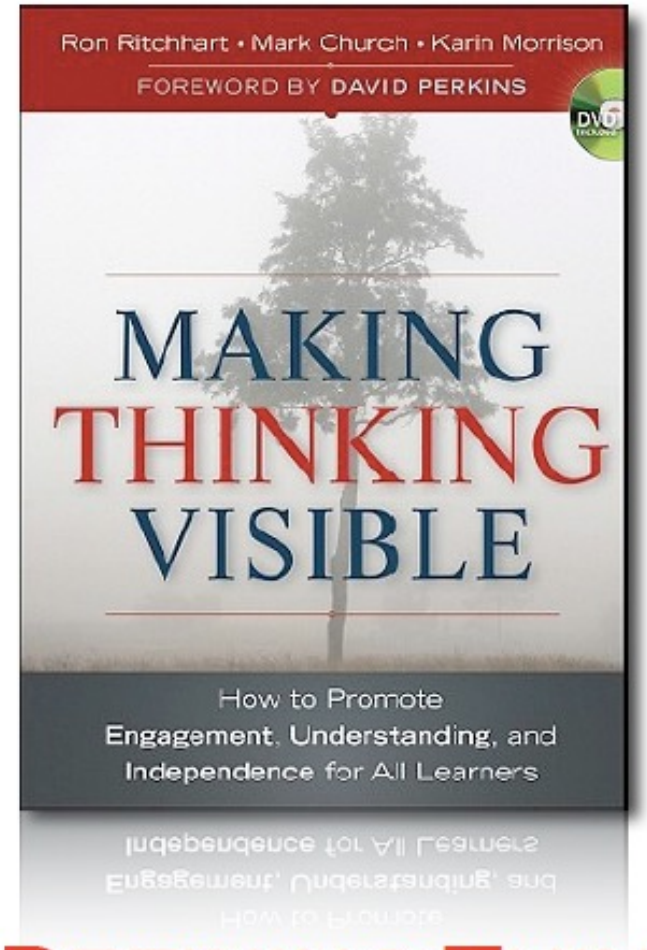
Developing *Cultures of Thinking*….Ron Ritchhart, David Perkins, Shari Tishman, Harvard University

enculturation

“Children grow into the intellectual life around them.”

Lev Vygotsky


ENCULTURATION
CHILDREN GROW INTO THE INTELLECTUAL LIFE AROUND THEM



- Simple Tools, used in one's learning to support specific thinking moves.
- Structures and scaffolds through which we explore, discuss, document, and direct our thinking and learning.
- Patterns of behavior that we adopt to help us use our minds well in new situations.

DEFINING THINKING ROUTINES

PZ

PROJECT ZERO

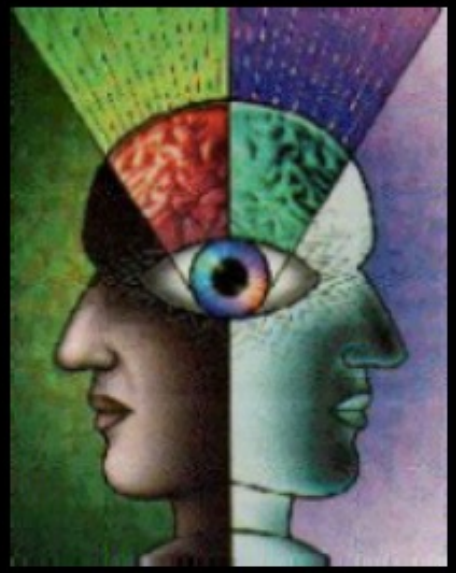
- "Thinking Routines are simple structures that can be used across various grade levels and content. What makes them routines, versus merely strategies, is that they get used over and over again in the classroom so that they become part of the fabric of classroom culture. The routines become the ways in which students go about the process of learning."

  -from Project Zero

Project Zero's Thinking Routine Toolbox

https://pz.harvard.edu/thinking-routines

Resources



Visible Thinking Website

http://www.pz.harvard.edu/projects/visible-thinking

ARTFUL THINKING

Artful Thinking Website

http://www.pzartfulthinking.org/index.php

AbD Agency by Design

Investigating the promises, practices, and pedagogies of maker-centered learning

MAKING THINKING HAPPEN

The official blog of the Agency by Design project

http://www.agencybydesign.org

What kinds of thinking do you value and want to promote in your classroom?

THINKING MOVES – *Making Thinking Visible*

- Observing closely and describing what's there
- Reasoning with evidence
- Making connections
- Considering different viewpoints and perspectives
- Capturing the heart and forming conclusions
- Wondering and asking questions
- Uncovering complexity and going below the surface of things.

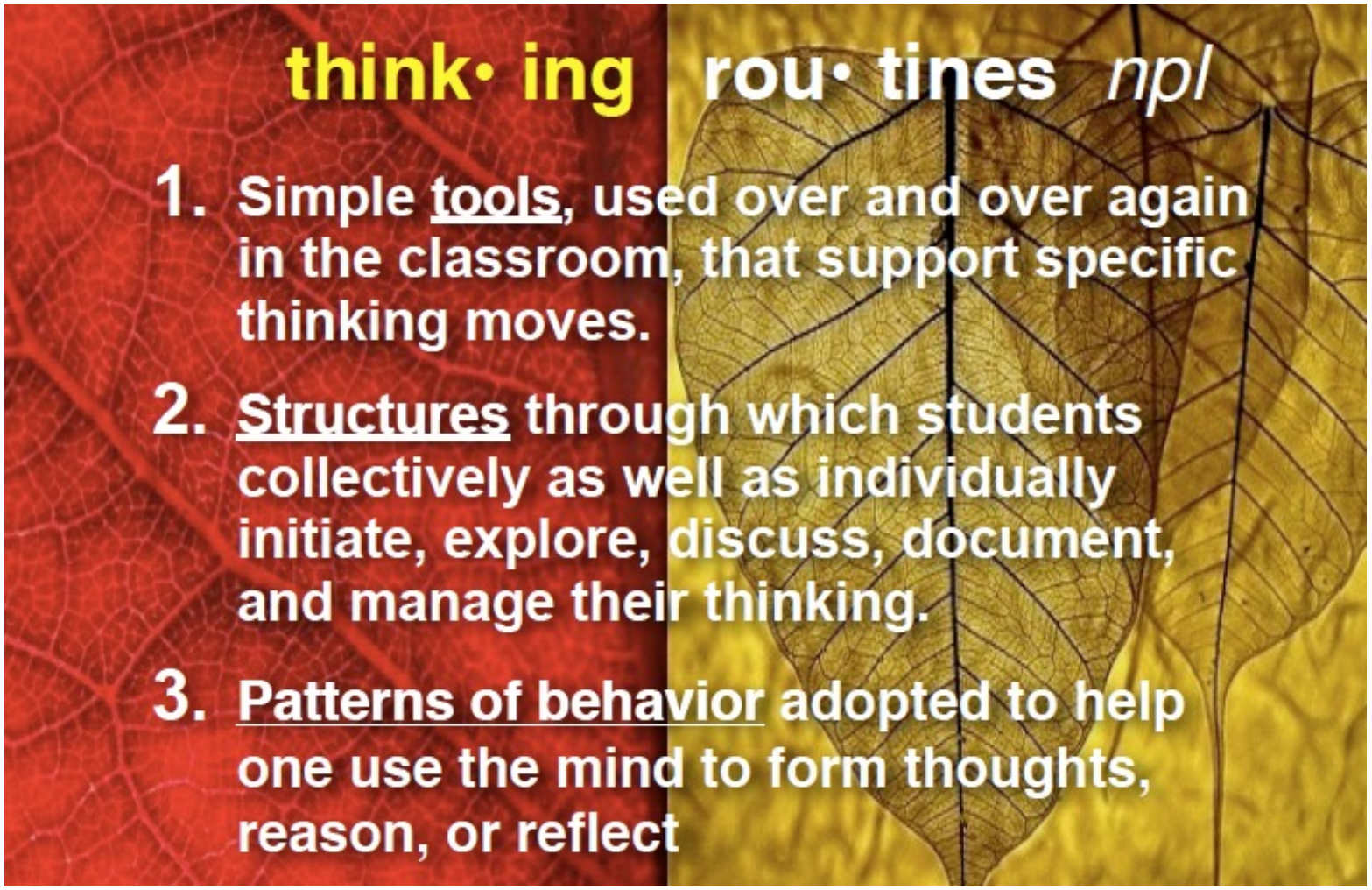
Dispositions

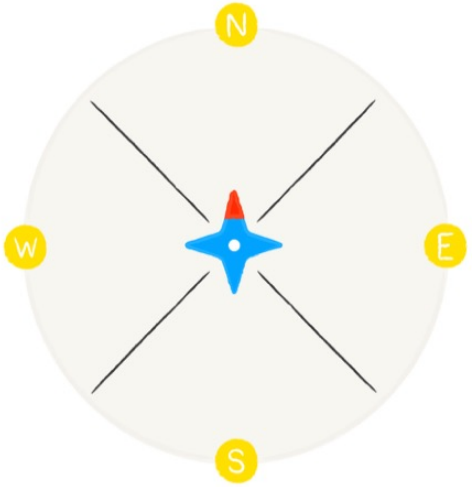
Critical Spirit

Curious
Skeptical
Open-Minded
Inquisitive
Imaginative
Strategic
Metacognitive
Reflective
Truth Seekers
Responsible
Independent
Listeners

Adventurous
Investigative
Original
Creative
Flexible
Questioning
Risk-Taker
Keen Mind
Considerate
Full of Wonder
Compassionate

Routine	Key Thinking Moves	Notes
Routines for INTRODUCING & EXPLORING IDEAS		
See-Think-Wonder	Description, Interpretation & Wondering	Good with ambiguous or complex visual stimuli
Zoom In	Description, Inference, & Interpretation	Variation of STW involving using only portions of an image
Think-Puzzle-Explore	Activating prior knowledge, wondering, planning	Good at the beginning of a unit to direct personal or group inquiry and uncover current understandings as well as misconceptions
Chalk Talk	Uncovers prior knowledge and ideas, questioning	Open-ended discussion on paper. Ensures all voices are heard, gives thinking time.
321 Bridge	Activates prior knowledge, questioning, distilling, & connection making through metaphors	Works well when students have prior knowledge but instruction will move it in a new direction. Can be done over extended time like the course of a unit.
Compass Points	Decision making and planning, uncovers personal reactions	Solicits the group's ideas and reactions to a proposal, plan or possible decision.
Explanation Game	Observing details and building explanations	Variations of STW that focuses on identifying parts and explaining them in order to build up an understanding of the whole from its parts and their purposes
Routines for SYNTHESIZING & ORGANIZING IDEAS		
Headlines	Summarizing, Capturing the heart	Quick summaries of the big ideas or what stands out
CSI: Color, Symbol, Image	Capturing the heart through metaphors	Non-verbal routine that forces visual connections
Generate-Sort-Connect-Elaborate: Concept Maps	Uncovering and organizing prior knowledge to identify connections	Highlights the thinking steps of making an effective concept map that both organizes and reveals one's thinking
Connect-Extend-Challenge	Connection making, identify new ideas, raising questions	Key synthesis moves for dealing with new information in whatever form it might be presented: books, lecture, movie, etc.
The 4 C's	Connection making, identifying key concept, raising questions, and considering implications	A text-based routine that helps identifies key points of complex text for discussion. Demands a rich text or book.
Micro Lab	A protocol for focused discussion	Can be combined with other routines and used to prompt reflection and discussion
I used to think	Reflection and metacognition	Used to help learners reflect on how their thinking has shifted and changed over time.
Routines for DIGGING DEEPER INTO IDEAS		
What makes you say that?	Reasoning with evidence	A question that teachers can weave into discussion to push students to give evidence for their assertions.
Circle Viewpoints	Perspective taking	Identification of perspectives around an issue or problem.
Step Inside	Perspective taking	Stepping into a position and talking or writing from that perspective to gain a deeper understanding of it.
Red Light, Yellow Light	Monitoring, identification of bias, raising questions	Used to identify possible errors in reasoning, over reaching by authors, or areas that need to be questioned.
Claim Support Question	Identifying generalizations and theories, reasoning with evidence, counter arguments	Can be used with text or as a basic structure for mathematical and scientific thinking.
Tug of War	Perspective taking, reasoning, identifying complexities	Identifying and building both sides of an argument or tension/dilemma
Word-Phrase-Sentence	Summarizing and distilling	Text-based protocol aimed at eliciting what a reader found important or worthwhile. Used with discussion to look at themes and implications.


think· ing rou· tines npl
1. Simple tools, used over and over again in the classroom, that support specific thinking moves.
2. Structures through which students collectively as well as individually initiate, explore, discuss, document, and manage their thinking.
3. Patterns of behavior adopted to help one use the mind to form thoughts, reason, or reflect



COMPASS POINT ROUTINE

Students can be presented with an idea and then they are asked to look at this idea using the compass point routine. Students record what *excites* 'E' them about the idea presented, and also consider the negative side of the idea by recording what *worries* 'W' them. They are then asked to think about what else they would *need* 'N' to know before accepting or denying the idea. Lastly, students are asked to record their *suggestions 'S'* for moving forward with the idea or to take a *stance* on an issue. Once complete, students can be asked to reflect on how their thinking has changed throughout the process.

THINK, PUZZLE, EXPLORE ROUTINE

This thinking routine can be used at the start of a new topic. It assists students in framing their inquiry, surfacing what they already know, and revealing new areas of interest. So, you could pose a new topic or have students read a specific article or passage from text, and then ask them the following questions that they could post a response to on the discussion board.

- What do you think about this topic?
- What puzzles you about this topic?
- What unresolved questions are in your mind?
- What other ideas do you have about this topic that need to be explored?

https://pz.harvard.edu/thinking-routines

Follow Students' Thinking

" Thinking skills develop as students make explicit their ways of thinking, hear alternative ways of thinking, and reflect on their thinking; therefore, the focus of our attention should not be on teaching students to think in a particular way, but on helping them explore and reflect on thinking processes they already use."

Unpacking Culture

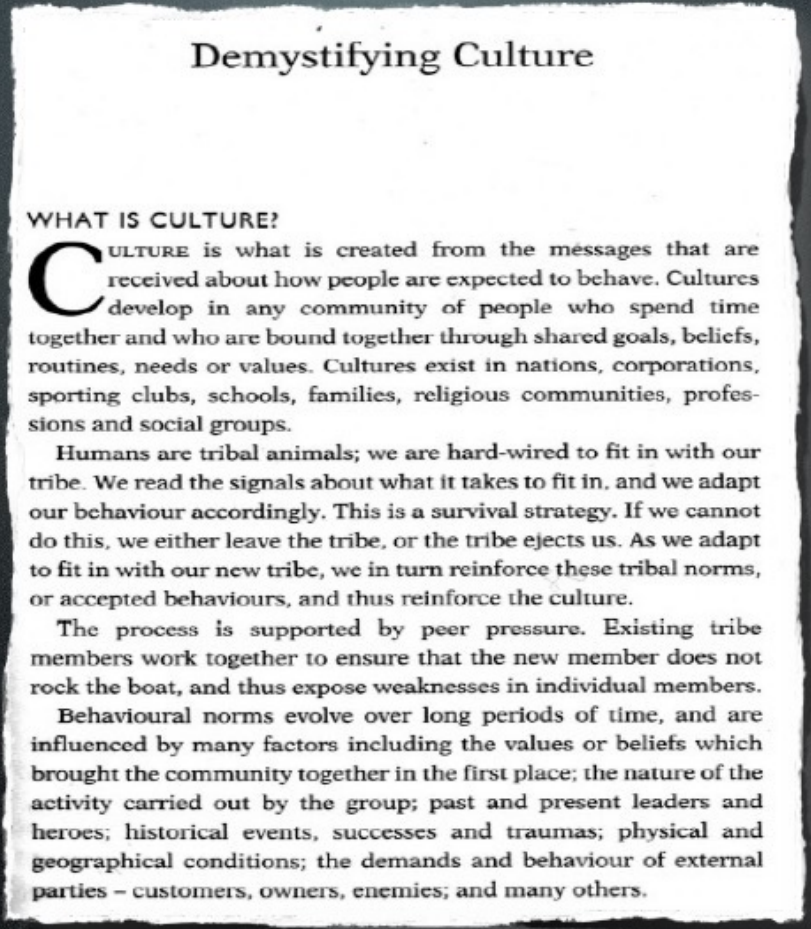
3, 2, 1, Bridge

3 Words

2 Questions

1 Metaphor

Unpacking Culture



Demystifying Culture

WHAT IS CULTURE?

CULTURE is what is created from the messages that are received about how people are expected to behave. Cultures develop in any community of people who spend time together and who are bound together through shared goals, beliefs, routines, needs or values. Cultures exist in nations, corporations, sporting clubs, schools, families, religious communities, professions and social groups.

Humans are tribal animals; we are hard-wired to fit in with our tribe. We read the signals about what it takes to fit in, and we adapt our behaviour accordingly. This is a survival strategy. If we cannot do this, we either leave the tribe, or the tribe ejects us. As we adapt to fit in with our new tribe, we in turn reinforce these tribal norms, or accepted behaviours, and thus reinforce the culture.

The process is supported by peer pressure. Existing tribe members work together to ensure that the new member does not rock the boat, and thus expose weaknesses in individual members.

Behavioural norms evolve over long periods of time, and are influenced by many factors including the values or beliefs which brought the community together in the first place; the nature of the activity carried out by the group; past and present leaders and heroes; historical events, successes and traumas; physical and geographical conditions; the demands and behaviour of external parties – customers, owners, enemies; and many others.

3 Words
2 Questions
1 Metaphor

There is a larger image of this in the Dropbox.

Unpacking Culture

3, 2, 1, Bridge

s

Making the Bridge….

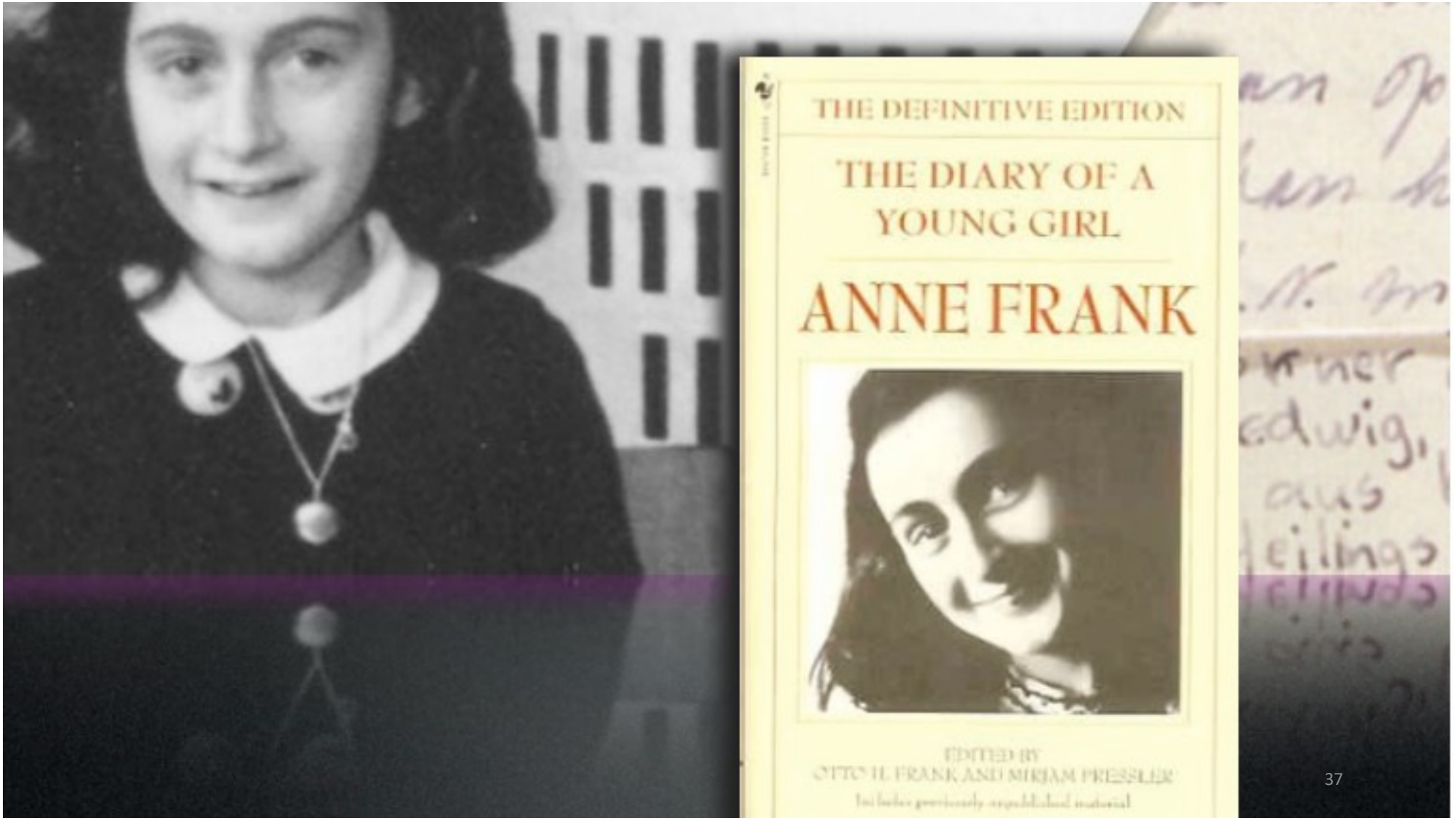
- Find a partner that you haven't talked to yet.
- Share with your partner your first 3-2-1 and your second 3-2-1.
- Discuss how your ideas shifted as a result of the reading.


CSI
IMAGE!
A Routine for Distilling the Essence of a Topic

Choose a ***color*** to represent a big idea that stood out for you

Create a ***symbol*** to represent one of those big ideas

Sketch an ***image*** to represent a big idea


THE DEFINITIVE EDITION
THE DIARY OF A YOUNG GIRL
ANNE FRANK
EDITED BY
OTTO H. FRANK AND MIRJAM PRESSLER

SUNDAY, 27 FEBRUARY ANNE FRANK, PG 253

COLOUR

Anne is unsure of what the future will hold for her and Peter. Black, like a chalkboard, represents all the different possibilities that could be drawn for their future.

SYMBOL

In this diary entry Anne doubts she can keep her longing to reach Peter under control. She must wait until the silence breaks between them and they can act as their true selves.

IMAGE

Through this passage Anne talks about how she and Peter aren't really as different as they seem on the surface. Just like these apples, they look different but taste similar.

Present and Have Students Enter Multiple Perspectives

- "Our challenge is to help students reach beyond the limits of their own experience and enter the experience of others. For example, ask students to suspend their disbelief temporarily and to attempt to understand how advocates of each perspective view the problem. Ask students to try to identify the truth in each position with which we can all agree. Examining each position from the perspective of the person holding it personalizes the position and makes it more available for consideration."

This routine can be used whenever students' initial thoughts, opinions, or beliefs are likely to have changed as a result of instruction or experience. For instance, after reading new information, watching a film, listening to a speaker, experiencing something new, having a class discussion, at the end of a unit of study, and so on.

Strategies for Engaging Students in Conversations/Discussions

Four Corner Conversations

1. Label the four corners of the room with signs reading: strongly agree, agree, disagree, strongly disagree.
2. Generate a list of controversial statements related to the material being studied. Statements most likely to encourage discussion typically do not have one correct or obvious answer, elicit nuanced arguments (e.g., "This might be a good idea some of the time, but not all of the time"), and represent respected values on both sides of the debate. *Examples of effective "Four Corners" statements:*
   - *The purpose of schooling is to prepare youth to be good citizens.*
   - *Individuals can choose their own destiny; their choices are not dictated or limited by the constraints of society.*
   - *One should always resist unfair laws, regardless of the consequences.*
   - *I am only responsible for myself.*

Four Corner Conversations

3. Students use graphic organizer or worksheet to mark their opinion (strongly agree, agree, disagree, strongly disagree), and then provide a brief explanation.
4. Read one of the statements aloud, and ask students to move to the corner of the room that best represents their opinion.
5. Ask for volunteers to justify their position. When doing so, they should refer to evidence from history, especially from material they learned in this unit, as well as other relevant information from their own experiences.
6. Encourage students to switch corners if someone presents an idea that causes a change of mind. After a representative from each corner has defended his or her position, you can allow students to question each other's evidence and ideas.
7. Debrief: Students can reflect in their journals about how the activity changed or reinforced their original opinion or chart the main for and against arguments on the board as a whole-class activity.

Use of Anticipation Guides

1. Technique to express an opinion about ideas before students encounter them in a text or unit of study.
2. Prepares students to recognize and connect to these themes as they surface in their learning. Reviewing anticipation guides at the end of a lesson or unit is one way to help students reflect on how learning new material may have influenced their opinions, perhaps by reinforcing previously held beliefs or by causing ideas to shift.
3. Design effective statements relating to universal themes and dilemmas and phrase in a way that make sense when applied to events in the unit of study and to situations in students' lives. Listed below are some suggested statements to prepare students to address the themes of justice and forgiveness:

- Punishing perpetrators for wrongdoing is necessary to achieve justice.
- Offenders should suffer for the crimes they have committed.
- Justice is best achieved when the perpetrators repair the harm they have caused.
- After a community has been through a time of conflict or violence, it is better for everyone to move on and forget the crimes or hardships of the past.
- The truth heals. Perpetrators should be encouraged to confess their crimes in exchange for lighter sentencing.
- An eye for an eye leaves everybody blind.

What is your opinion?

Read each statement; ***place an X on the spectrum*** *to show your opinion about the statement. As well, justify your opinion with* ***1-2 point form thoughts.***

BEFORE	Statement to Consider	AFTER
_____ *strongly agree* *strongly disagree* ***Justify your opinion:***	**The government should control all aspects of my life** (ex. education, religion, political gatherings, moral values, housing, employment, security/policing/military) **because they work hard to protect our country and know how best to meet our needs.**	_____ *strongly agree* *strongly disagree* ***Justify your opinion:***
_____ *strongly agree* *strongly disagree* ***Justify your opinion:***	**The government should have the right to suspend a person's activities if they pose a threat to the public. If someone is convicted of a crime, their human rights should be suspended indefinitely.**	_____ *strongly agree* *strongly disagree* ***Justify your opinion:***

Use of Anticipation Guides

Hamlet Anticipation Guide

Directions: On the continuum in front of each of the numbers, place an "x" that indicates where you stand in regard to the statement that follows. Be prepared to defend and support your opinions with specific examples (there's a little space to jot down notes for each).

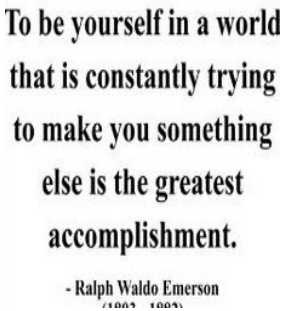
Strongly Agree Strongly Disagree

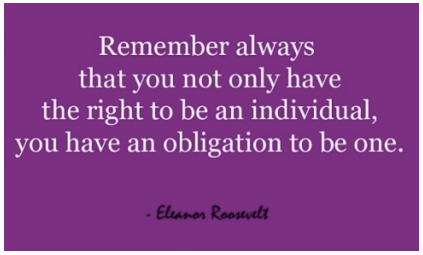
1. Families generally have a member's best interests in mind
2. Having a clear goal, and the ambition to achieve it, is honorable.
3. Power eventually corrupts the people who have it.
4. Revenge is the only way to gain true justice.
5. A person's immoral choices can come back to haunt him/her

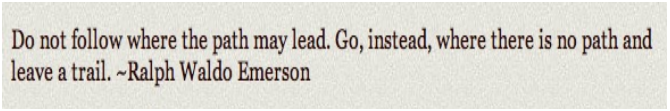
1. How common do you believe the act of revenge is in everyday life" Write about specific incidences, including any in which you were involved or have witnessed.
2. Do you consider yourself to be a "thinker" or "doer"? Explain your response?
3. Have you or has anyone else you have known every seen or claimed to have witnessed some kind of supernatural being? Explain the circumstances around the event. Do you believe in the supernatural? Explain.
4. Have you ever been the victim of unrequited love? How did you feel? Have you ever been the recipient of affection from someone whom you did not care about? How did you feel about this situation?
5. Write about a time when you discovered that someone was purposefully plotting against you for some reason. Explain the situation—how you felt, how it turned out.

The Tea Party Discussion Strategy

1. Give every student a quote on a related topic. For example, during *Fahrenheit 451 the quotes relate to conformity and nonconformity. When reading Lord of the Flies, the quotes are all about human nature. The students read their quote to as many classmates as they can in 5 minutes. Then we have a follow up conversation as a class about the quotes they found most interesting and powerful. Just the act of standing up and moving around makes this activity fun for students.*







Crowdsourcing Discussion Strategy

Engage students in a classroom to collectively compile or "crowdsource" information.

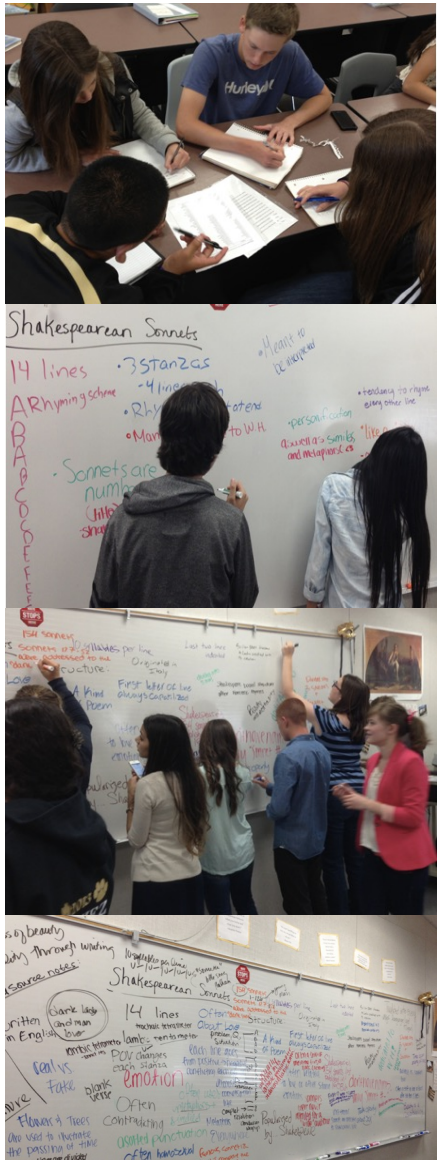
Step 1: Challenge students to generate information in collaborative groups.
(Handout "Sonnet 116" and have the explore how all sonnets share the same structure and similar characteristics. They discuss the sonnet and make a list of inferences about sonnets after examining, analyzing, and discussing this specific sonnet.

Step 2: Student compile information on large sheets of paper and post in the classroom.

Step 3: Encourage students to use mobile devices to further their research on sonnets. (Who were they written for? What are their intent and purpose? What themes were common?)

Step 4: Collectively review the crowdsourced information.

https://hollyclarkdotnet.wordpress.com/2013/11/03/how-to-use-crowdsourcing-in-the-classroom/

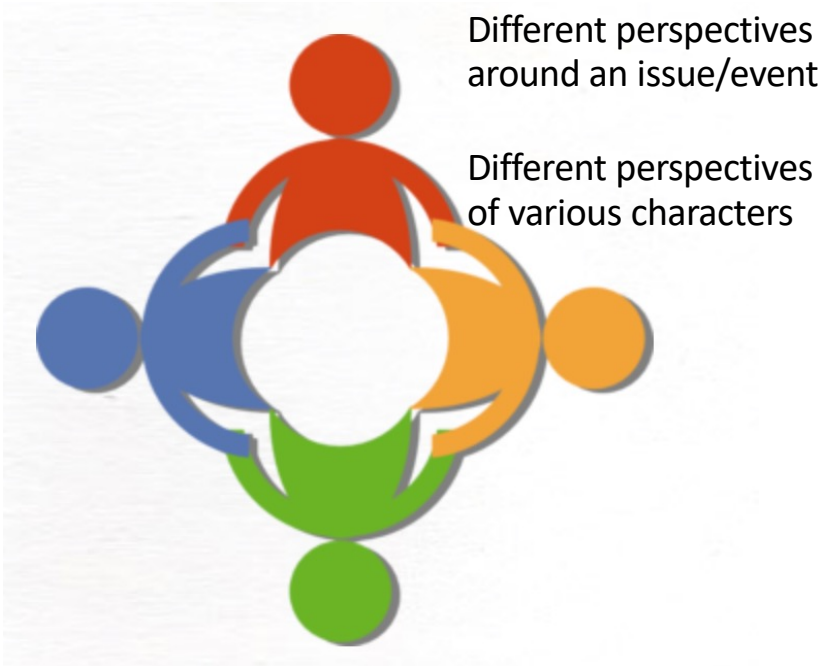


Circle of Viewpoints

48

- *Identify the different perspectives that could be present in or affected by what you have just read, seen, or heard. Record these in a circle with the issue or event at the center. Choose one of these perspectives to explore further, using the following prompts as a starting place:*

  I am thinking of [name the event/issue] from the point of view of...
- *I think... [describe the topic from your viewpoint. Be an actor—take on the character of your viewpoint]. Because... [explain your reasoning]*
- *A question/concern I have from this point of view is...*

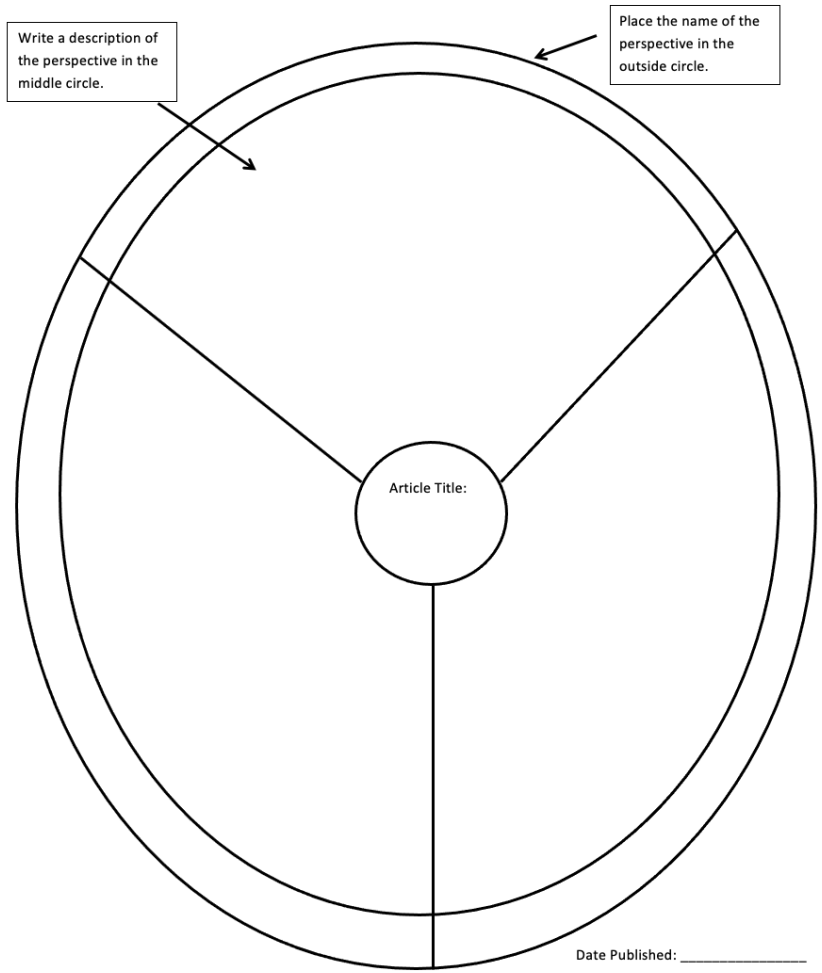


Different perspectives around an issue/event

Different perspectives of various characters

Circle of Viewpoints: Science Current Event Name _____

Identify at least three different perspectives (does not have to necessarily be human) around the issue/problem presented in the article you read. Then provide a description of each of those perspectives.



Tiered Tasks

Context: This activity is designed for use after other direct instruction on evaluating a speaker's argument**.** To launch, students do a quick write in response to the question, **"Does social media make people less social?"*** They share their thoughts with two to three peers before a whole class sharing of perspectives. Teacher polls class (aloud or using a site like PollEverywhere.com) to show the range or level of agreement. Students are then paired with a similar-readiness peer to watch and process Alison Graham's TedTalk "How Social Media Makes Us Unsocial."* After each viewing, partners compare and discuss their thinking before brief whole-class discussion wherein the teacher makes sure to use and reinforce the formal, academic vocabulary with all students.

**Other questions and content can be substituted.*

More Expert, Further from Self ⟷ **More Novice, Closer to Self**

TASK CARD 1: IN THE SPEAKER'S SHOES

Viewing 1: As you watch, outline the speaker's argument. Include her position, key claim(s), evidence, and reasoning. Try to make the structure of the argument clear.

Viewing 2: This time, try to identify the counterclaims that the speaker anticipates and/or addresses. Sometimes, it is more implied than explicit, so you will have to infer and think about her points from a different angle!

Viewing 3: For this last viewing, identify the modes of persuasion (and corresponding persuasive techniques) that the speaker uses. How intentional do these seem to be, and how can you tell?

TASK CARD 2: FEELINGS FOCUS

Viewing 1: As you watch, listen for how the speaker answers the question we just discussed. What does she believe and why? How does her talk make you feel—about yourself, about others, etc.?

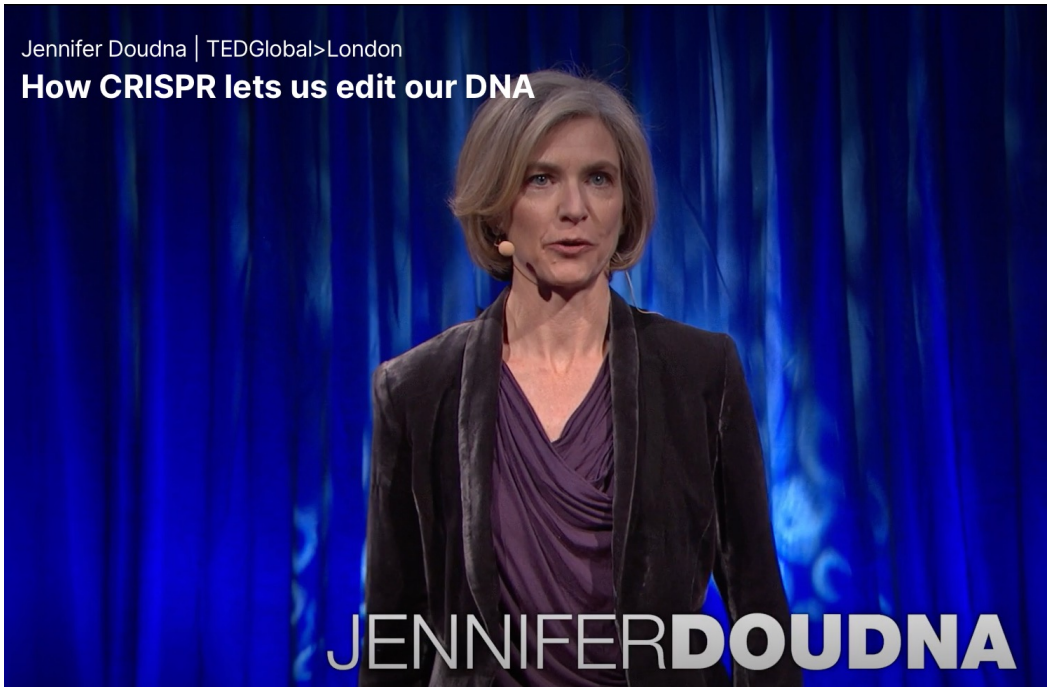
Viewing 2: This time, listen for what you feel like are the speaker's strongest and weakest points. What do and don't you find convincing or easy to agree with? Why?

Viewing 3: For this last viewing, identify one persuasive technique the speaker uses that you feel is effective. What mode of persuasion is it? How does it make the audience feel, and why?

Come together: Students form quads with another partnership to rate the content of the talk and the speaker's techniques on a class-generated scale. Students swap partners for a research task where they seek out evidence that would challenge or confirm the speaker's argument. ***Optional:*** Students use their quick writes, the TED Talk, and other resources to develop an argument essay or speech on the topic.

What made you STOP AND PAUSE in your reading, viewing, and thinking…..

Providing students with a common basis for understanding from the start will help keep the discussion focused and provide concrete case studies or examples. For instance, you can assign readings on a specific conflict, instruct students to select their own readings to bring to class, or show a video clip to prompt discussion. Another option is to have students review materials during class and follow up with a structured discussion.



https://www.ted.com/talks/jennifer_doudna_how_crispr_lets_us_edit_our_dna?language=en#t-2315

Teach About Interconnectedness

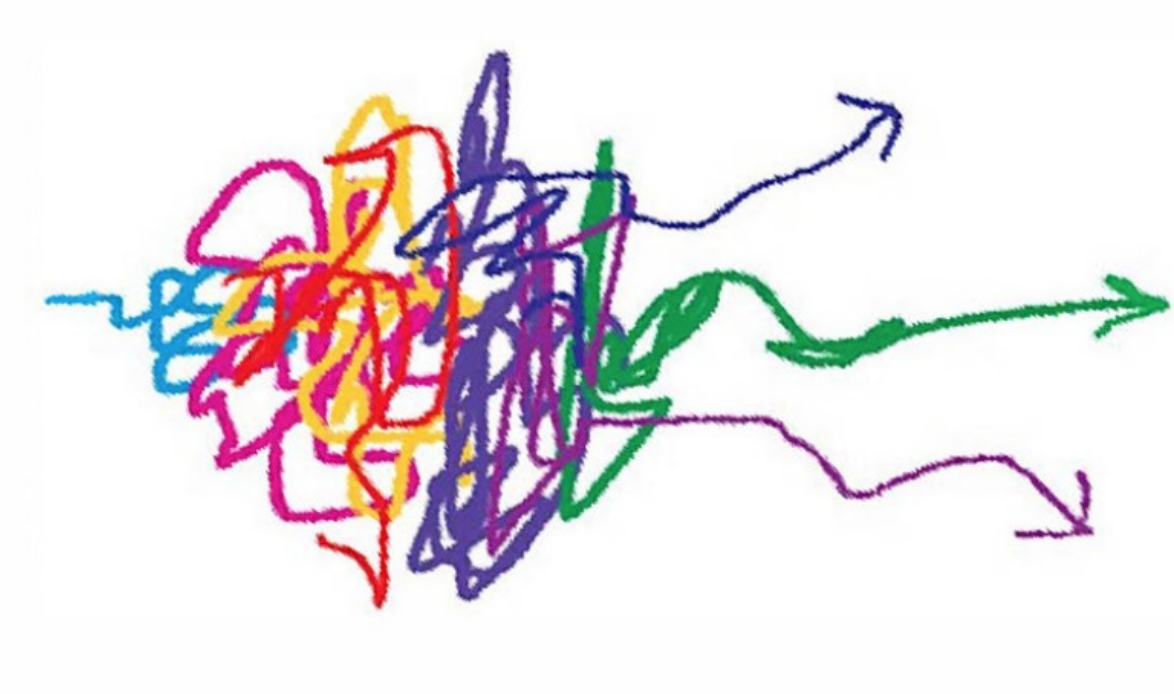
Some of the Visible Thinking Routines can assist students in examining the interconnectedness of ideas….factors that influence ideas….other contributions of an idea….by looking at issues as a system.

SEE THINK WONDER

WHAT MAKES YOUR SAY THAT?

Speculation
Evidence
Claim

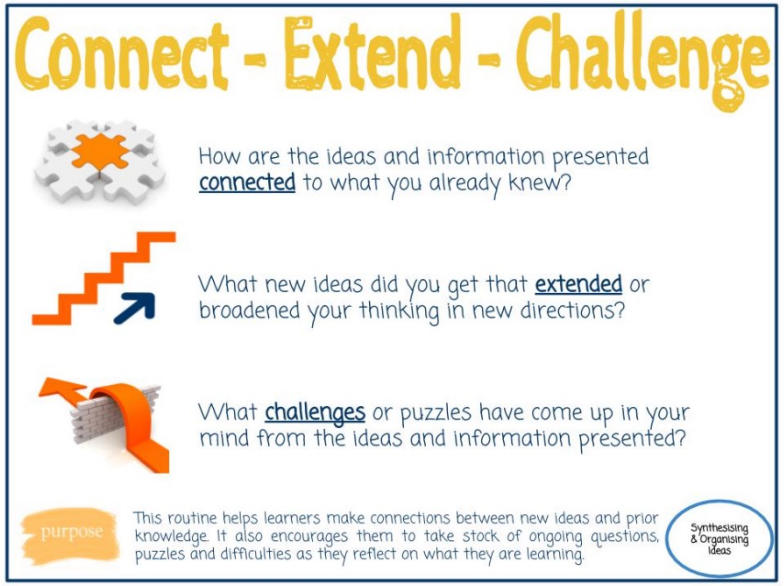
John Gast, ***American Progress***, 1872. The artist depicts Columbia, an allegorical figure of America, bring elements of 'civilization' west. As railroads, settlers, and telegraph wires come west, American Indians and bison scatter before them. Image credit: Wikimedia Commons

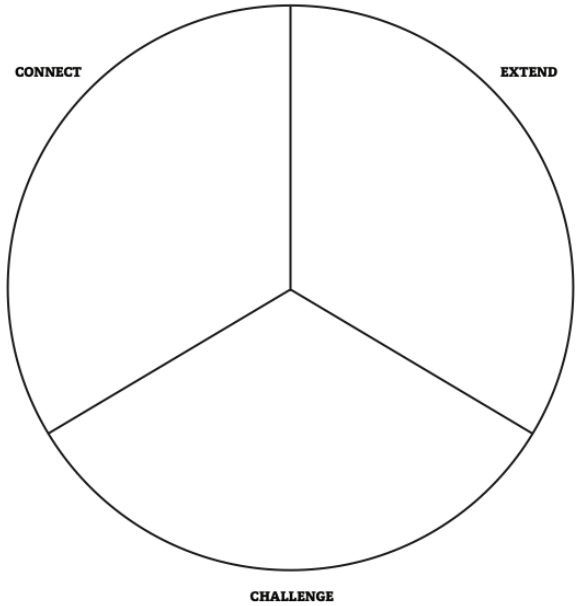


Parts, Purposes, Complexities

A routine for looking closely at systems. . .

- Choose an object or system and ask: What are its various pieces or components?
- What are its **parts**? What are its **purposes**?
- What are the purposes of each of these parts?
- What are its **complexities**? How is it complicated in its parts and purposes, the relationship between the two, or in other ways?





The 4 C's

Connections: Challenge: Concepts: Changes:

- What *connections* do you draw between the text and your own life or your other learning?
- What ideas, positions, or assumptions do you want to *challenge* or argue with in the text?
- What key *concepts* or ideas do you think are important and worth holding on to from the text?
- What *changes* in attitudes, thinking, or action are suggested by the text, either for you or others?

Connect – Extend - Challenge

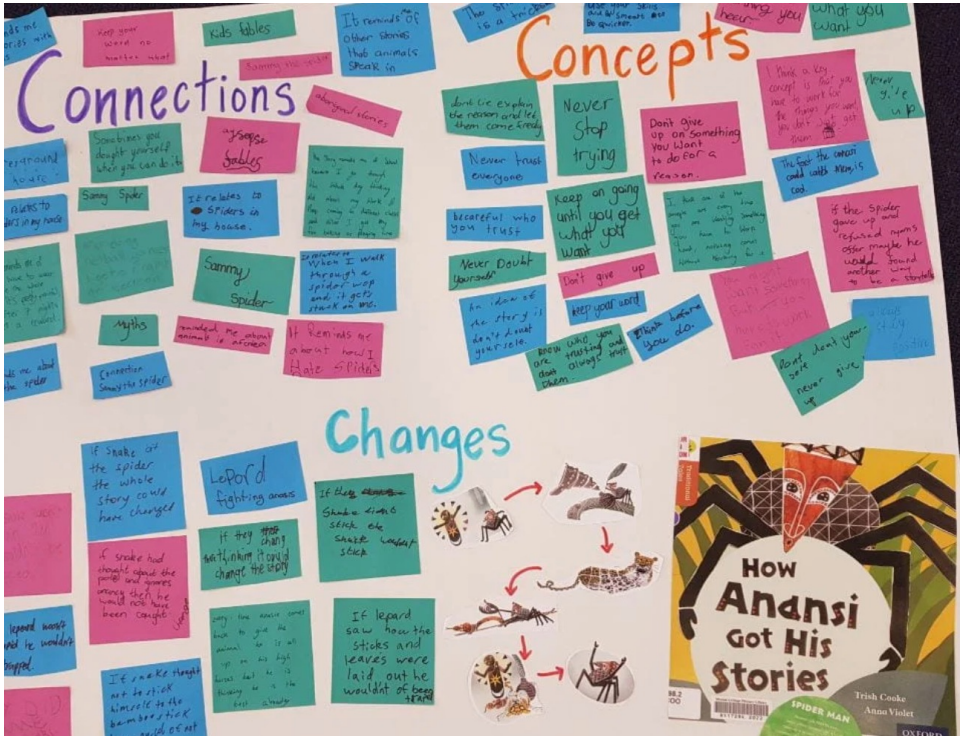
The book *How Anansi got his stories* by Cooke and Violet is short enough to read fully and allow time for students to respond to 3 of the 4C questions.

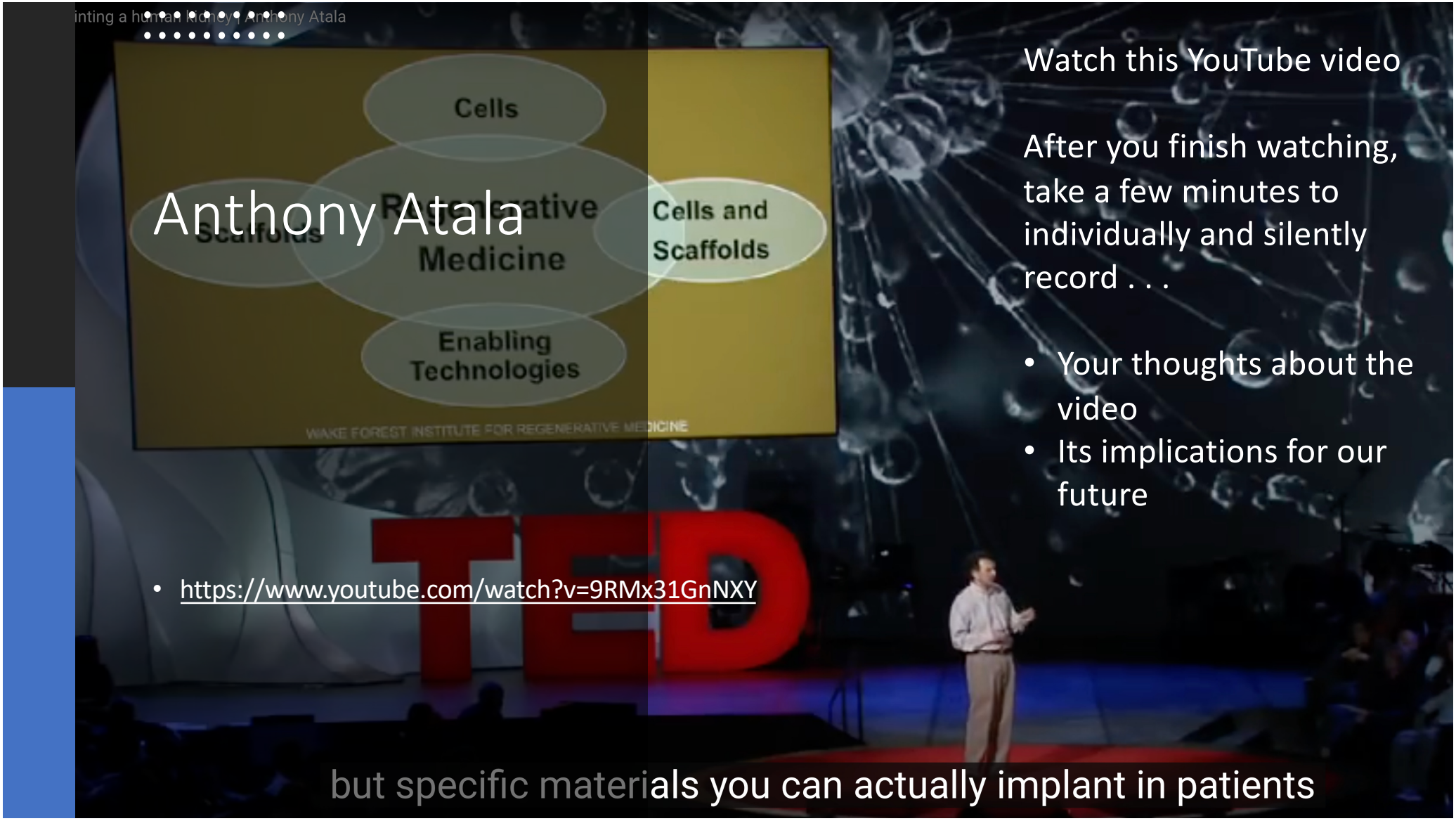
Connections – What connections do you draw between the text and your own life and/or other learning?

Concepts – What key concepts or ideas do you think are important and worth holding onto from the text?

Changes – What changes in attitudes, thinking, or action are suggested by the text, either for you or others?

Challenges – What challenges or puzzles have come up in your mind from the ideas and information presented?





Anthony Atala

Watch this YouTube video

After you finish watching, take a few minutes to individually and silently record . . .

- Your thoughts about the video
- Its implications for our future

- https://www.youtube.com/watch?v=9RMx31GnNXY

Discussion

	***Connections*: What connections do you draw between this video and your own life or learning?**
→←	***Challenge*: What ideas, positions, or assumptions do you want to challenge or argue with from the video?**
o	***Concepts*: What key concepts or ideas do you think are important and worth holding onto from the video?**
Δ	***Changes*: What changes in attitudes, thinking, or action are suggested or reflected by the video, for secondary teachers?**

Analytic Teams

HOW TO START

- Choose a reading assignment, lecture, or video topic that requires analysis.
- Assign teams of 4 to 5 students to breakout rooms or discussion forums.
- Assign each team member to an analysis role, such as: Proponent, Critic, Example Giver, Summarizer, or Question Preparer.
- Inform students that they will respond to the assignment according to their designated role.
- Conclude by having groups write a team analysis that they share in a whole class discussion.

Claim, Support, Question

Make a ***claim*** about the topic

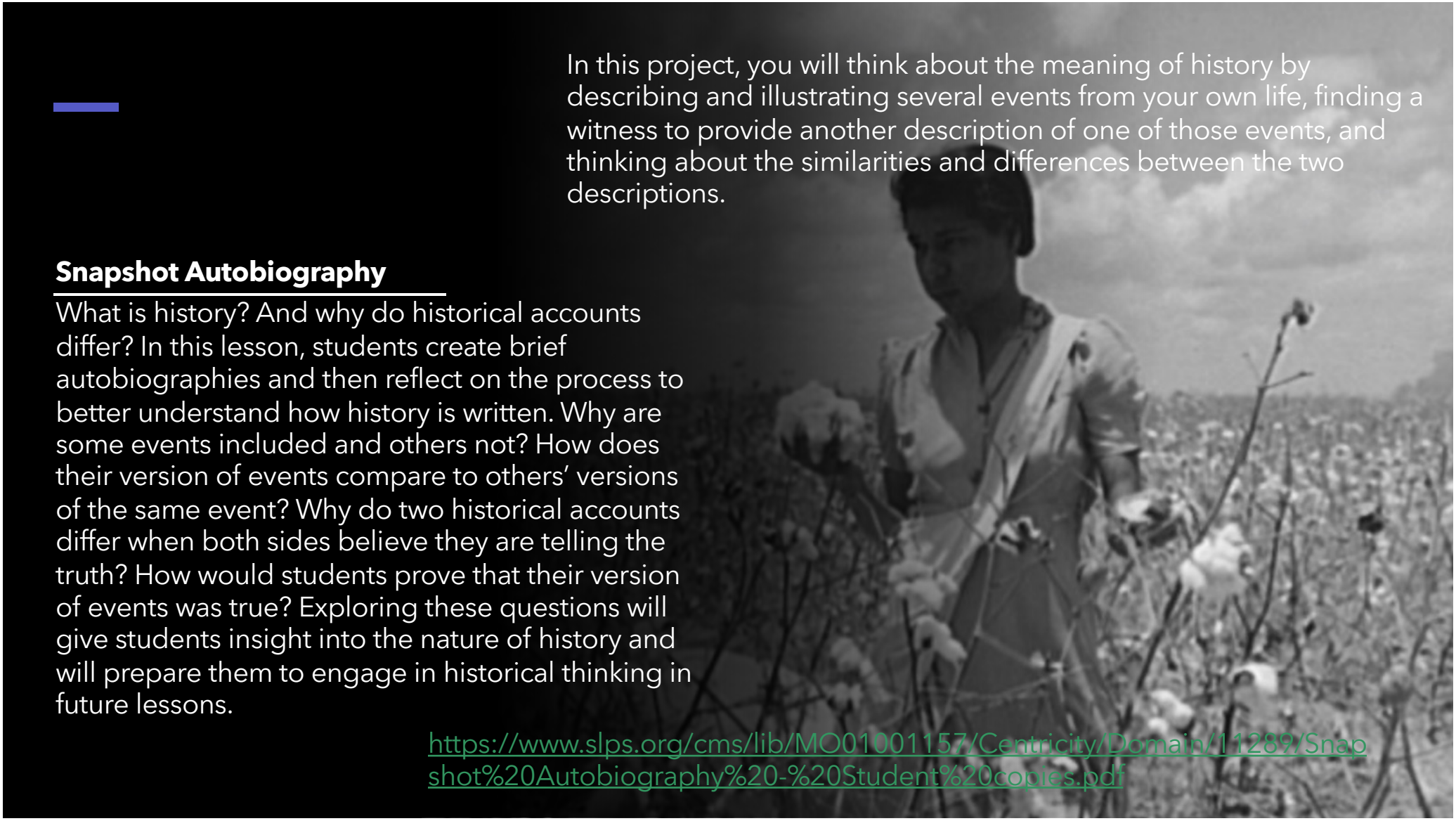
- *Claim*: An explanation or interpretation of some aspect of the topic.

Identify ***support*** for your claim

- *Support*: Things you see, feel, and know that support your claim.

Ask a ***question*** related to your claim

- *Question*: What's left hanging? What isn't explained? What new reasons does your claim raise?



In this project, you will think about the meaning of history by describing and illustrating several events from your own life, finding a witness to provide another description of one of those events, and thinking about the similarities and differences between the two descriptions.

Snapshot Autobiography

What is history? And why do historical accounts differ? In this lesson, students create brief autobiographies and then reflect on the process to better understand how history is written. Why are some events included and others not? How does their version of events compare to others' versions of the same event? Why do two historical accounts differ when both sides believe they are telling the truth? How would students prove that their version of events was true? Exploring these questions will give students insight into the nature of history and will prepare them to engage in historical thinking in future lessons.

https://www.slps.org/cms/lib/MO01001157/Centricity/Domain/11289/Snapshot%20Autobiography%20-%20Student%20copies.pdf

1. **Make a claim and explain your rationale.** Say what you think, and why.	**2. Add or supporting evidence for the claim.** Read your peer's claim. In this box, add something that would *support* that claim or make it stronger.
3. Make a counter-claim or provide evidence that challenges the claim. In this box, make a claim or provide evidence that *argues against* what is written in boxes 1 and 2.	**4. Add your "two cents."** Read what is written in the three boxes. Add your opinion and your reasoning in this box.

Jigsaw

Choices

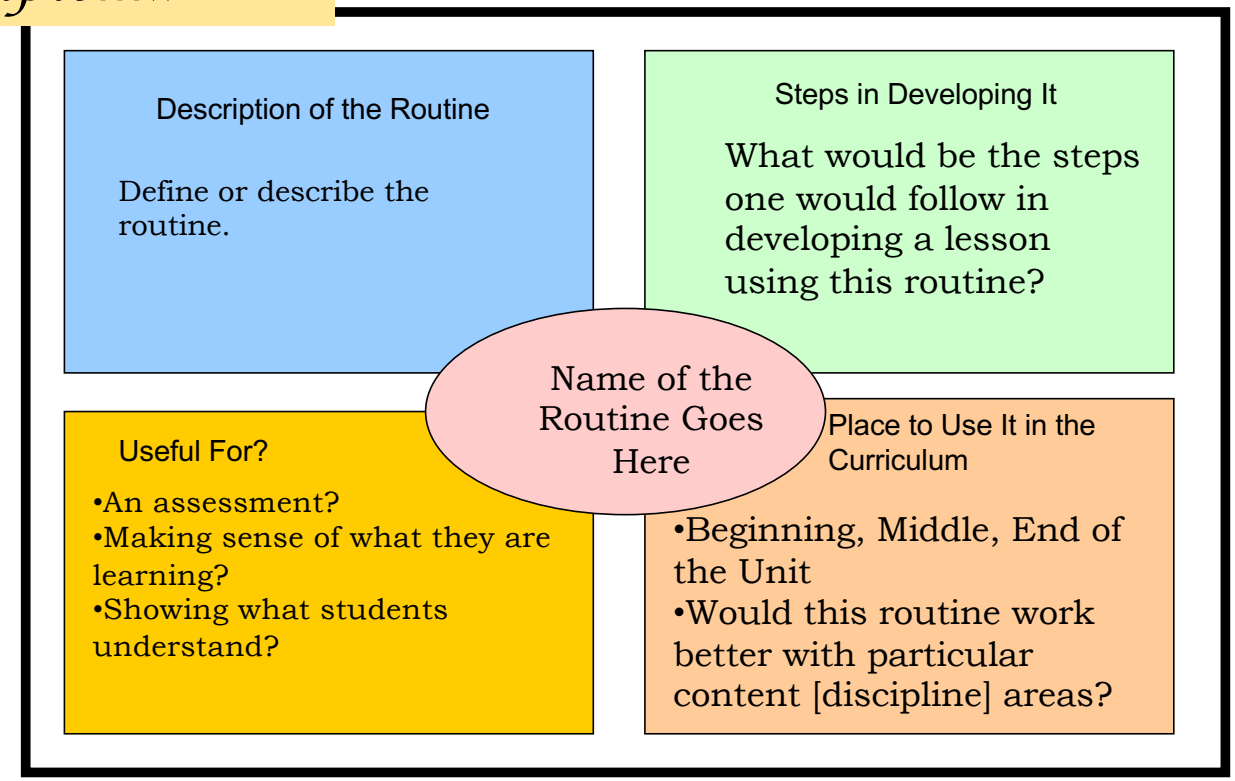
1. Core Routines
2. Possibilities & Analogies
3. Perspectives, Controversies, & Dilemmas
4. Objects and Systems
5. Perspective Taking
6. With Art or Objects
7. Digging Deeper into Ideas
8. Synthesizing and Exploring Ideas
9. Introducing and Exploring Ideas
10. Global Thinking

Form Groups of 4-6 people

- **Decide who will represent your group at each station.**
- **Representatives become the expert about a particular strategy by reviewing the descriptions and examples found at: http://pz.harvard.edu/thinking-routines**
- **Use your Frayer Diagram handout to record what your group believes is most important to share with their group.**
- **Return to your original group to share her/his expertise with the group.**

Directions: Complete the chart to show what you know about _____ Write as much as you can.

For Example…..



Thinking Routines As Structures

- That reveal students' thinking and make it visible.
- Provide a structure for the discussion of students' thinking and the sharing of ideas.
- Scaffold & direct thinking in ways that deepen understanding

http://acultureofthinking.weebly.com

http://visiblethinking.weebly.com/daily-routines.html

http://www.rcsthinkfromthemiddle.com/thinking-routines.html

https://www.nytimes.com/column/learning-whats-going-on-in-this-picture

Popplet

Popplet is a visual thinking and presentation tool allowing students to collaborate with one another, organize information and present information in the form of a web. It is available web based, but is also an app on the iPad.

With a web-bsed account, you may have up to five popplets at a time. Once you create a popplet, you add popples, boxes of text, videos, pictures, links or drawings, to your popplet. Each popple has a line on each side to drag and connect to other poppies.

http://popplet.com

Padlet

Padlet is very versatile and one of my favourite tools to use in the classroom. It is a great way for students to share their ideas, and work cooperatively towards building understanding around an idea.

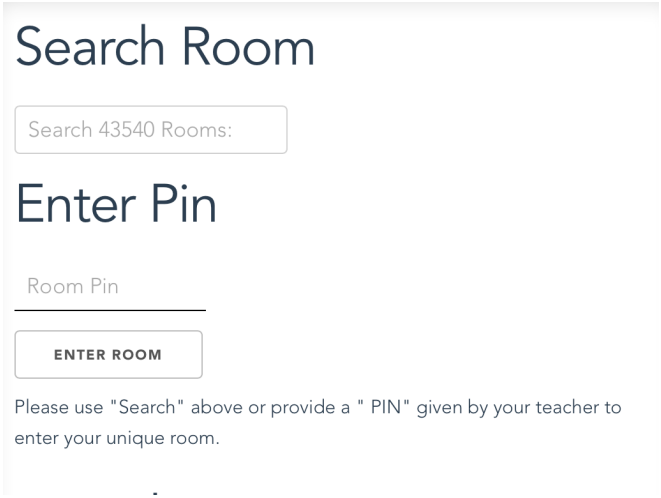
See my list of ways that you can use Padlet to support learning & literacy in your classroom!

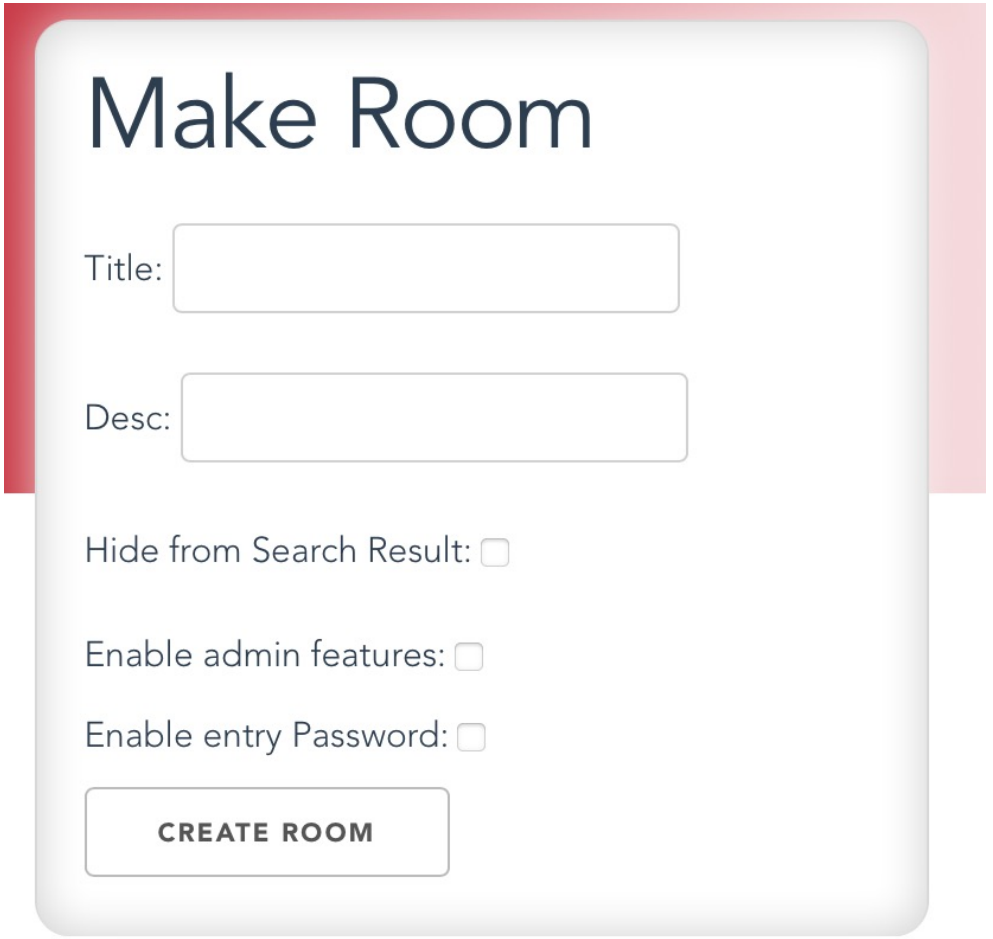
https://padlet.com/my/dashboard

Tools for Communicating Thinking

YoTeach!
By PALMS
The new alternative to Todaysmeet

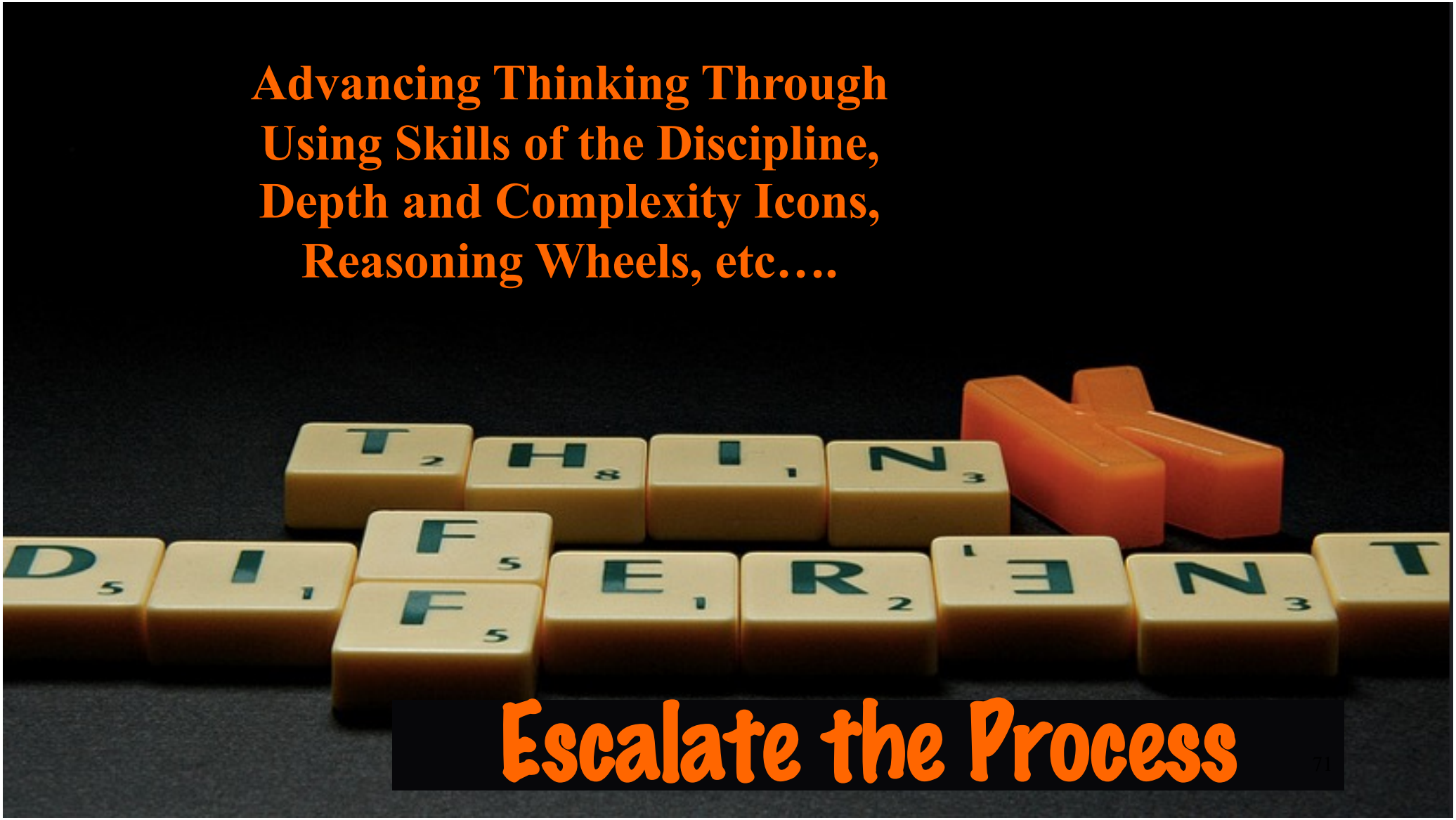
BACKCHANNELING DISCUSSIONS





https://yoteachapp.com

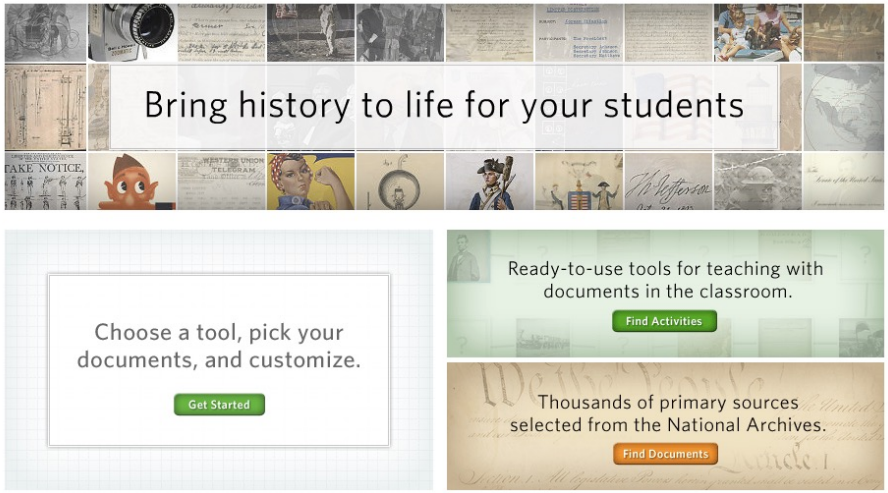
Advancing Thinking Through Using Skills of the Discipline, Depth and Complexity Icons, Reasoning Wheels, etc….



Asks students to use ***processes and materials*** *that approximate those of an expert, disciplinarian, or practicing professional.*

Using the Tools of the Scholar
National Archives

Think Like a Historian
https://sheg.stanford.edu/history-lessons



http://docsteach.org

https://www.gilderlehrman.org

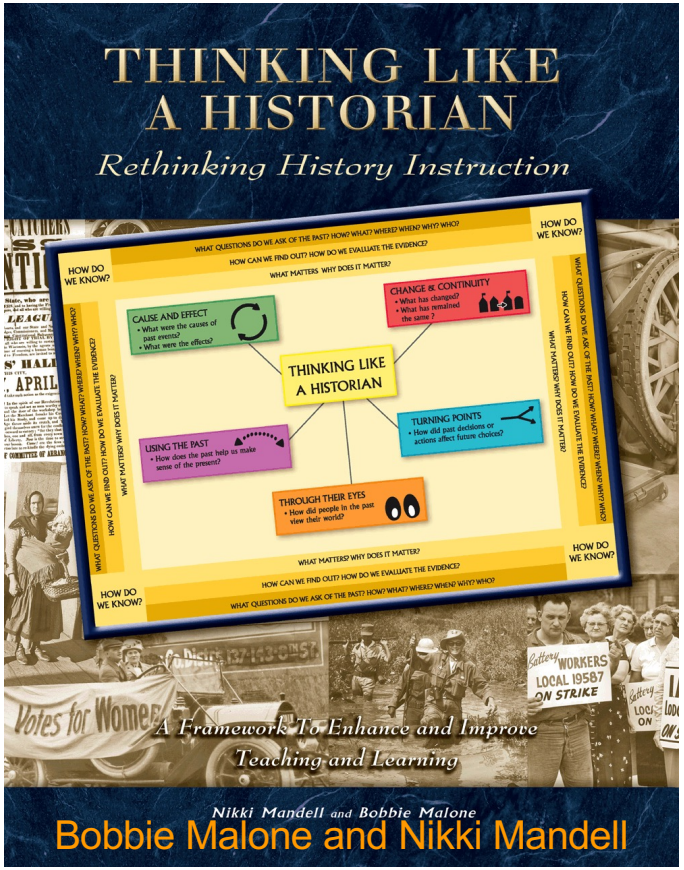
Think Like a Mathematician
https://www.insidemathematics.org/common-core-resources/mathematical-practice-standards

Learning How to Think Like a Historian…Evaluating Sources

https://sheg.stanford.edu/history-lessons

- Not all historical sources are equal
- Consider ways to assess the validity of the sources
- Multiple sources are needed in order to fully understand the complexity and importance of any historical event , era, person or group.
- DBQ's provide multiple sources for students to use to draw conclusions and make interpretations.

https://www.nysut.org/~/media/files/nysut/resources/2017/edvoice/edvoice_x_01_learninghistorians.pdf?la=en



WHAT QUESTIONS DO WE ASK OF THE PAST?

THINKING LIKE A HISTORIAN

CAUSE AND EFFECT

What were the causes of past events?

What were the effects?

- Who or what made change happen?
- Who supported change?
- Who did not support change?
- Which effects were intended?
- Which effects were accidental?
- How did events affect people's lives, community, and the world?

CHANGE AND CONTINUITY

What has changed?

What has remained the same?

- Who has benefited from this change?
- Who has not benefited? And why?

TURNING POINTS

How did past decisions or actions affect future choices?

- How did decisions or actions narrow or eliminate choices for people?
- How did decisions or actions significantly transform people's lives?

USING THE PAST

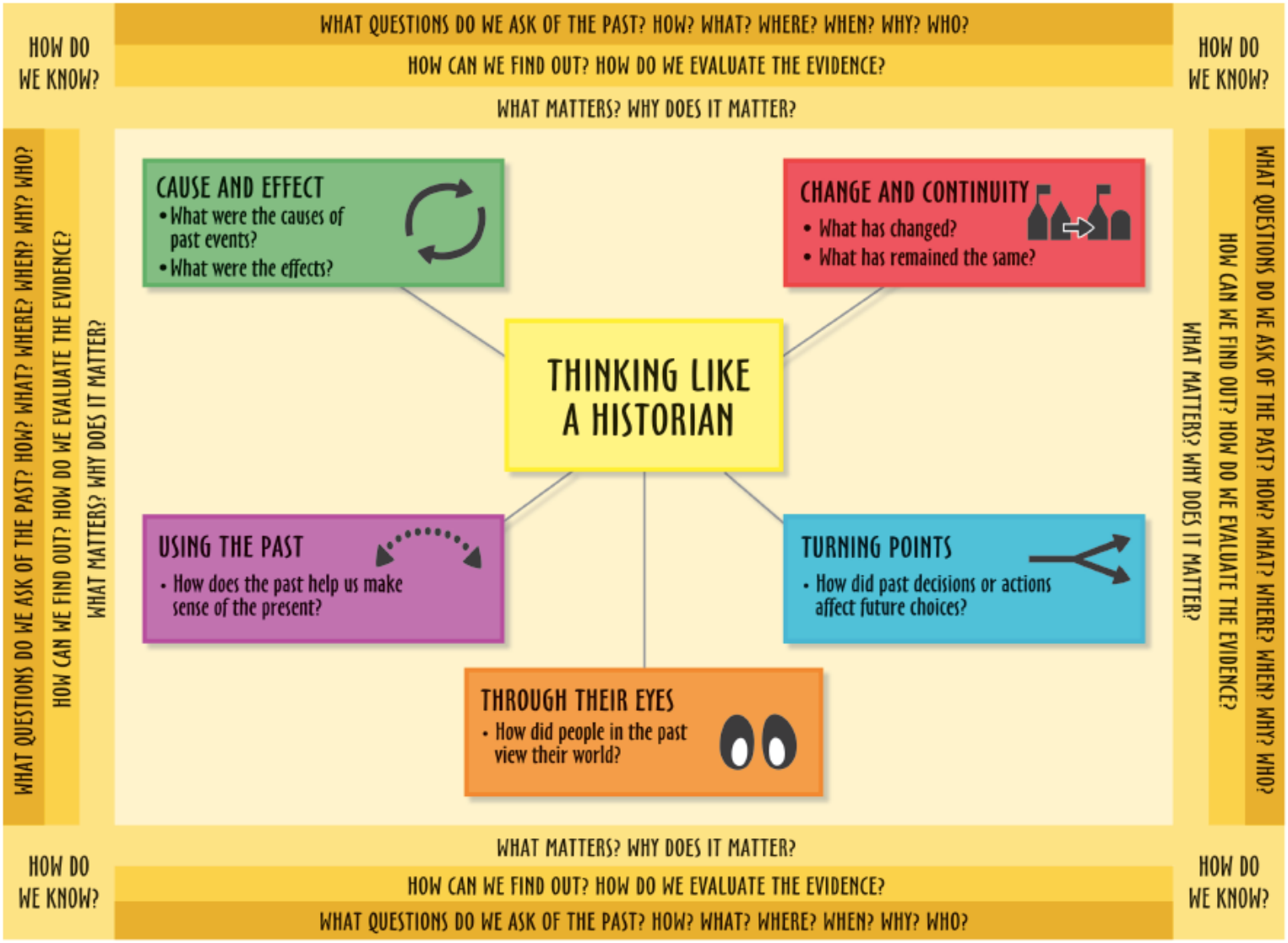
How does the past help us make sense of the present?

- How is the past similar to the present?
- How is the past different from the present?
- What can we learn from the past?

THROUGH THEIR EYES

How did people in the past view their world?

- How did their worldview affect their choices and actions?
- What values, skills and forms of knowledge did people need to succeed?


HOW DO WE KNOW?
WHAT QUESTIONS DO WE ASK OF THE PAST? HOW? WHAT? WHERE? WHEN? WHY? WHO?
HOW CAN WE FIND OUT? HOW DO WE EVALUATE THE EVIDENCE?
WHAT MATTERS? WHY DOES IT MATTER?
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• What were the causes of past events?
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THINKING LIKE A HISTORIAN
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HOW CAN WE FIND OUT? HOW DO WE EVALUATE THE EVIDENCE?
WHAT MATTERS? WHY DOES IT MATTER?
HOW DO WE KNOW?

HISTORICAL THINKING CHART

Historical Reading Skills	Questions	Students should be able to . . .	Prompts
Sourcing	• Who wrote this? • What is the author's perspective? • When was it written? • Where was it written? • Why was it written? • Is it reliable? Why? Why not?	• Identify the author's position on the historical event • Identify and evaluate the author's purpose in producing the document • Hypothesize what the author will say before reading the document • Evaluate the source's trustworthiness by considering genre, audience, and purpose	• The author probably believes . . . • I think the audience is . . . • Based on the source information, I think the author might . . . • I do/don't trust this document because . . .
Contextualization	• When and where was the document created? • What was different then? What was the same? • How might the circumstances in which the document was created affect its content?	• Understand how context/ background information influences the content of the document • Recognize that documents are products of particular points in time	• Based on the background information, I understand this document differently because . . . • The author might have been influenced by _____ (historical context) . . . • This document might not give me the whole picture because . . .
Corroboration	• What do other documents say? • Do the documents agree? If not, why? • What are other possible documents? • What documents are most reliable?	• Establish what is probable by comparing documents to each other • Recognize disparities between accounts	• The author agrees/disagrees with . . . • These documents all agree/ disagree about . . . • Another document to consider might be . . .
Close Reading	• What claims does the author make? • What evidence does the author use? • What language (words, phrases, images, symbols) does the author use to persuade the document's audience? • How does the document's language indicate the author's perspective?	• Identify the author's claims about an event • Evaluate the evidence and reasoning the author uses to support claims • Evaluate author's word choice; understand that language is used deliberately	• I think the author chose these words in order to . . . • The author is trying to convince me . . . • The author claims . . . • The evidence used to support the author's claims is . . .

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UMBC Center for History Education

History Labs

GO TO THE HISTORY LABS

HISTORY LABS TEMPLATE

A Guided Approach to Historical Inquiry in the K-12 Classroom

- What is a History Lab?
- Developing Overarching Questions
- Building Background Knowledge
- Conducting Source Work
- Presenting and Supporting Interpretations
- Assessing Student Learning

What is a History Lab?

https://www.umbc.edu/che/historylabs/index.php

Thinking Like a Mathematician-Problem Solving

To promote problem solving, ask...

- What information to you have? What do you need to find out?
- What strategies are you going to use?
- How would you describe the problem in your own words?
- What do you know that is not stated in the problem?
- Could you try it with simpler numbers? Fewer numbers? Create a diagram? Make a table?

1/2 + 1/3 = 5/6 When would you need to know this? Pose a math problem using this information with an appropriate context.

To make connections among ideas and applications, ask...

- How does this relate to…?
- What ideas that we have learned were useful in solving this problem?
- Can you give me an example of. . .?

Explain to someone unfamiliar with multiplying how to solve a 2-digit by 2-digit question. Give an example. Solve it in 2 different ways.

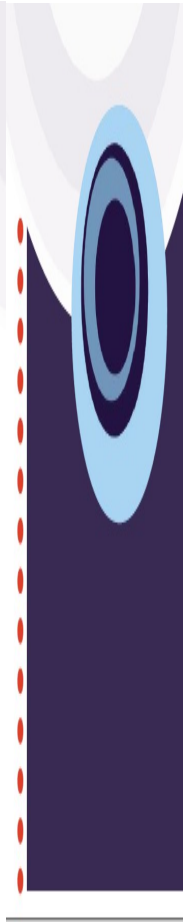
To encourage reflection, ask. . .

- How did you arrive at your answer or solution?
- Does the answer seem reasonable?
- What are some key points or big ideas of this lesson?
- How does today's problem remind you of a problem that you have solved before?

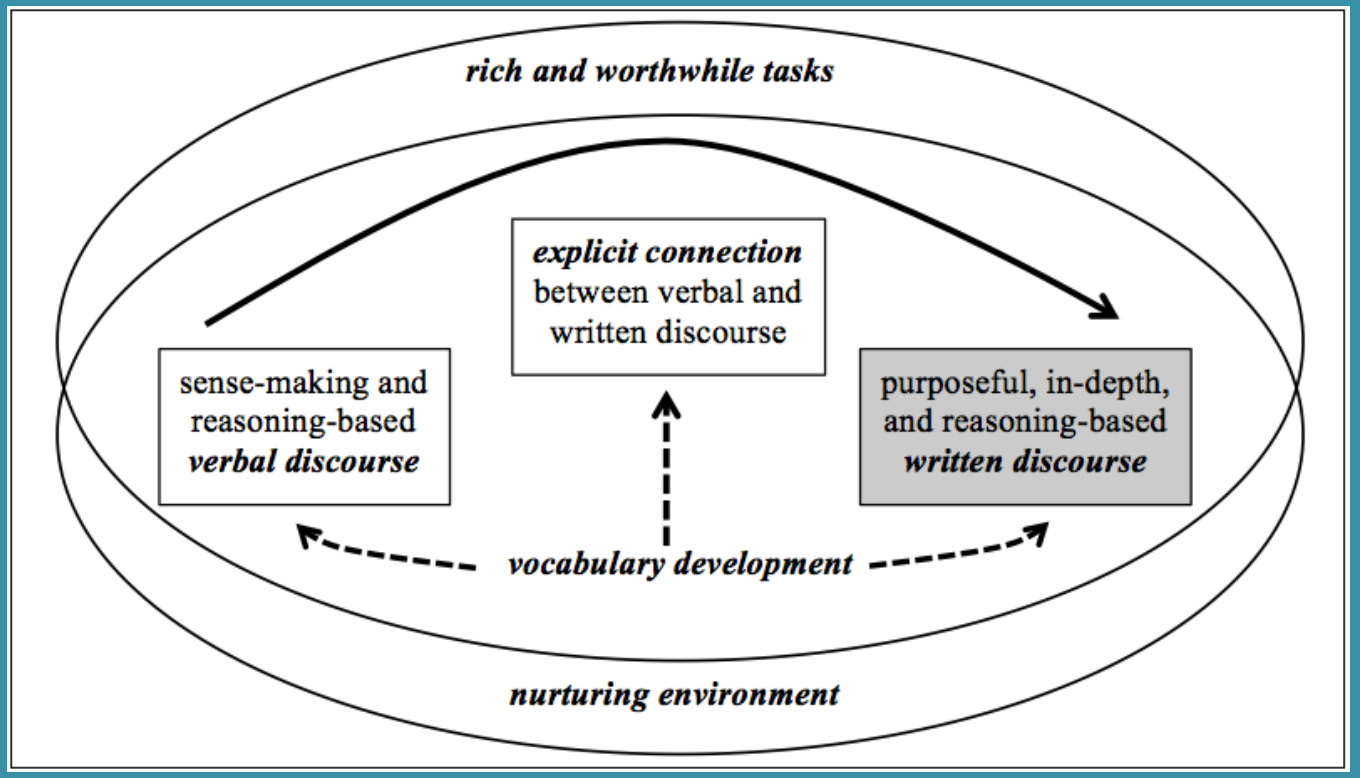
Purposes and Prompts to Make Talk Accountable

Purpose	Sample Prompt
Ask questions to clarify understanding	*Can you tell me more about...?* *Would you say that again?,* *Can you give me an example of what you mean?*
Give a reason to support an idea	*This reminds me of...because...* *I think this is true because...*
Ask for evidence when something sounds inaccurate or vague	*I'm not sure about that. Can you tell me why you think it's true?* *Can you show me a place in the text that supports your idea?*
Give evidence to support statements	*It says here... (read a passage from a text that illustrates the idea).* *Here is another source that says...(read from another supporting source of information)*
Use ideas from others to add to your own	*I agree with...because his/her idea reminds me of...*

Adapted from Fisher, D., Frey, N., & Rothenberg, C. (2008). *Content-Area Conversations: How to Plan Discussion-Based Lessons for Diverse Language Learners*. ASCD: Alexandria, VA.



Student Mathematician Discourse Framework



(Casa, 2014)

COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

youcubed®

Data Science Lessons

https://www.youcubed.org/week-inspirational-math/

Week of Inspirational Math(s)

Choose your own maths adventure with our interactive tools that allow you to build a custom playlist of inspirational maths activities and messages! To build your WIM week, select one video, one resource for creating a positive maths community, and one task per day and add to your playlist. Then click "See Summary" to play videos, download materials and save/share your WIM week! **Check out these pre-made playlists curated by the youcubed team for first grade, middle school and high school and share your playlist on social media with #myWIM!**

Tasks

Grades

Topics

Exploring Exponents

10 11 12 Number Sense Patterns + Generalizations

Penny Collection

3 4 5 6 7 8 9 10 Number Sense

Math Talks

https://www.sfusdmath.org/math-talks-resources.html

More Resources for Math Talks

Download the Math Talks Descriptions from our Math Teaching Toolkit here > > >

Math Talks

Why Math Talks?

Read about how Math Talks can strengthen accuracy, efficiency, and flexibility in **this** article by Sherry Parrish from Teaching Children Mathematics.

Effective Questioning - a list of questions from the **Math Teaching Toolkit** that can be used in Math Talks.

How We Do Math Talks from Fawn Nguyen

Math Talk Planning Tool

Download this helpful tool to help you plan for your Math Talks.

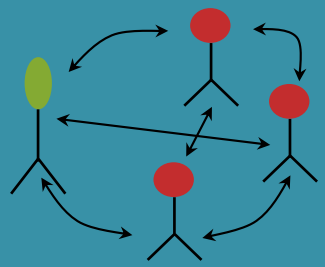
Other Tools

This folder includes a variety of helpful tools for deepening math talks, planning, and assessing. Including:

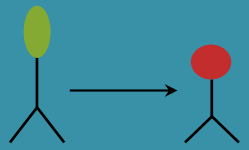
- Math Talks Process
- Math Talks Process / Planning Sheet
- Math Talks Rubric
- Math Argumentation Rubric

Talk Moves
= Facilitate Thinking

Towards this…



…rather than this.



Talk Moves.....

https://www.emc3mathsteaching.com/approach

WAIT TIME	Purpose	What might it sound like in the classroom?
	• Allows time for students to organise their thinking • Allows for more considered responses	"Take some time to think." "I'm going to give you some time to think about your answer before I ask you to respond." "Be prepared to share your thinking with a partner."
TURN AND TALK		
	• Provides opportunities for students to share ideas and build confidence • Students rehearse and clarify their responses before sharing with the whole group	"Turn and talk to the person next to you." "Share your thinking about ..." "How is your thinking similar or different?" "What strategy did you use to ...?" "Be prepared to share your discussion with the group. I may ask you to share what your partner said as well as your own thinking."
REVOICING		
	• Useful for clarifying meaning • Used to highlight an important idea or reveal a misunderstanding • Assists students in linking everyday language with more precise and sophisticated language	"So you're saying ... Do I have that correct?" "Are you saying that ...?" "I think I could also explain your thinking by saying ... Do I have that right?"

Talk Moves

REASONING		
	• Encourages students to justify or elaborate their own thinking, providing evidence • Exposes students to the thinking of others, expanding their own perspectives • Useful for clarifying meaning	"Can you explain that further?" "What evidence did you use?" "Do you agree or disagree with ____ idea ? Why?" "Can you convince ____ that ...?"
ADDING ON		
	• Invites students to participate in the discussion by building on the ideas of others • Helps build substantive conversation and promotes deeper reasoning	"Does anyone have something else to add?" "I agree with ____ because ..." "I disagree with ____ because ..." "Can you say some more about that please? What else do you ....?

Talk Moves

REPEATING

- Slows the pace of a lesson when concepts are complex or deserve extra attention
- Adds emphasis to important ideas

"Can you repeat or rephrase what ____ said about ...?"

"I think we should go back to what ____ said about ... It was important. Can you repeat what ____ said please?"

"How could you summarise that discussion?"

REVISE YOUR THINKING

- Indicates to students that it is acceptable to change thinking once new knowledge is understood
- Provides an opportunity to reflect on and review learning

"Has anyone revised their thinking? Why?"

"Would anyone change their strategy/thinking now? Why?"

"How has your thinking/understanding changed? What was your 'ah-ha' moment?"

Developed from: Way, J. & Bobis, J. (2017). The literacy of mathematics. PETAA Paper, 208. Primary English Teaching Association Australia (PETAA), Sydney

Capturing Thinking on the Talk Frame

This instructional tool helps students engage in discussions that foster reasoning, then settle on correct mathematics.

By Tutita M. Casa

The National Council of Teachers of Mathematics (NCTM 1991, 2000) recommends that students be positioned as sense makers who weigh one another's ideas and judge their mathematical validity. Teachers may want to facilitate such discussions, but—

> the prospect of creating such a community is daunting to many teachers. They often do not know where to begin to create the discourse practices described by NCTM. (Hufferd-Ackles, Fuson, and Sherin 2004, p. 81)

Teachers who allow students to have a greater voice in the discussion find it more challenging to manage the direction of the talk, particularly when students voice misconceptions in their thinking. Anticipating how the discussion will unfold is a significant undertaking, as is guiding it toward mathematically valid ideas while valuing students' ways of thinking (Hufferd-Ackles, Fuson, and Sherin 2004; Staples 2007).

Given that many teachers find NCTM's recommendations challenging, I developed a talk frame as a practical teaching and learning aid that values students' evolving thoughts as teachers guide them toward correct mathematical conclusions. The talk frame displays an organized written record of a discussion. It captures students' rewording of a question addressing a significant topic, their evolving reasoning, and the mathematically valid conclusions. The teacher paraphrases and records student thinking and regularly checks with students to make sure that she writes accurate representations.

I first discuss the nature of tasks that would be appropriate to use with the talk frame. I then share a lesson using the talk frame and present a general overview of how to implement it.

Other graphic organizers?

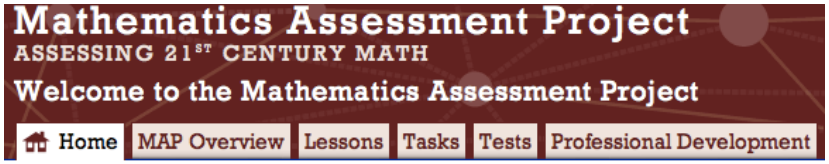
What's the "right" way to use them?

Mathematical Resources

THAT HELP YOU TIER OR MAKE A LEARNING TASK MORE COMPLEX

Dr. Linda Sheffield

http://www.lindajsheffield.com



http://map.mathshell.org/materials/index.php

http://www.insidemathematics.org/tools-for-educators

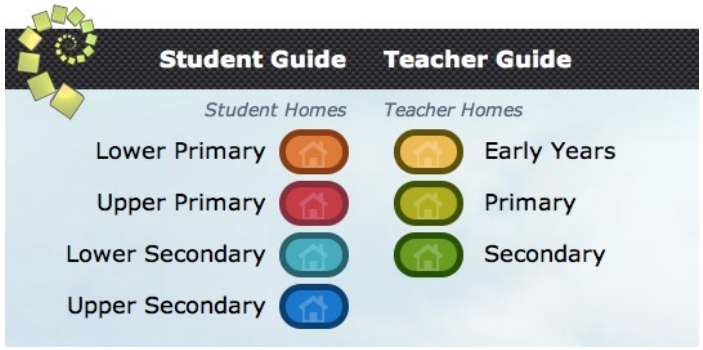
Illustrative Mathematics

https://www.illustrativemathematics.org

ILLUMINATIONS
Resources for Teaching Math

http://illuminations.nctm.org

NRICH enriching mathematics



http://nrich.maths.org/frontpage

Thinking Like a Scientist

STUDENT SCIENCE
A RESOURCE OF THE SOCIETY FOR SCIENCE & THE PUBLIC

https://student.societyforscience.org/how-think-scientist

http://undsci.berkeley.edu/article/howscienceworks_01

How simple ideas lead to scientific discoveries - Adam Savage9191

http://ed.ted.com/on/LuIzlBUo/discussions/what-do-you-think-it-means-to-think-like-a-scientist

https://www.ted.com/talks/anthony_atala_printing_a_human_kidney?language=en

Interesting Science Curriculum
Based on a Storyline Approach. . .

https://www.nextgenstorylines.org

A LITTLE
SOMETHING
extra.

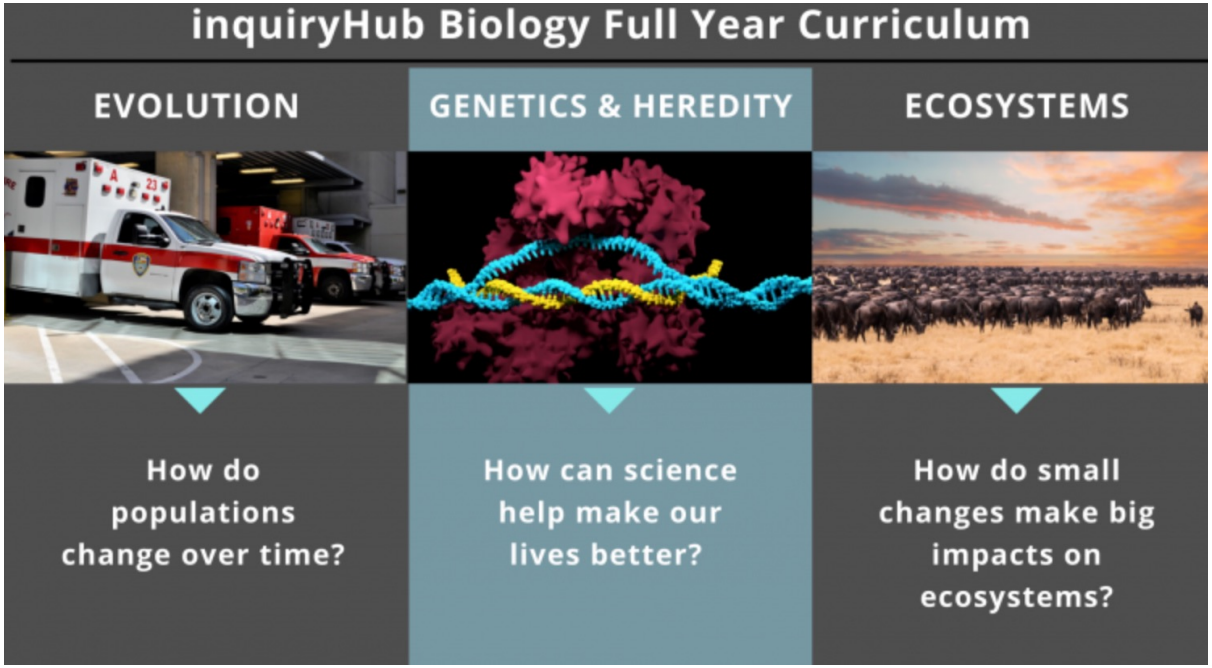
MPRES Toolkit for Teachers Conceptual Change

A professional development resource to train teachers in the Framework for K-12 Science Education and the Next Generation Science Standards

Toolkit Format

Each Practice is outlined in the toolkit following the predicted continuum of change for teacher growth through both reflective questions and activities for the Practice in the classroom, connected to relevant Crosscutting Concepts.

http://www.mtscienceeducation.org/toolkit-home/



https://www.colorado.edu/program/inquiryhub/about-inquiryhub

- inquiryHub high school and middle school curricula are guided by the Next Generation Science Standards (NGSS). Using research-based approaches to teaching science in a deeply digital environment, students contribute resources, observations, data, and analyses to solve larger scientific problems.

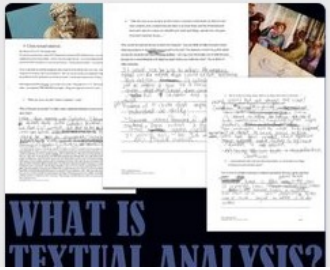
Promoting Critical Thinking

Pinterest

https://www.pinterest.com/jannleppien/promoting-critical-thought/

88 Depth and Complexity Task cards for any novel, picture book, anthology story, etc. Can be used in grades 4-10+!

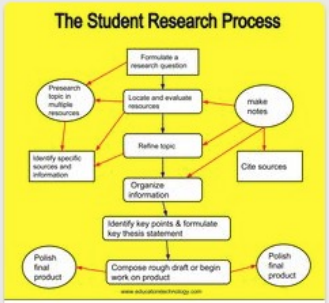
Pinned from teacherspayteachers.com



Thinking Outside the Blank: 8 Critical Thinking Activities for ESL Students

Pinned from busyteacher.org

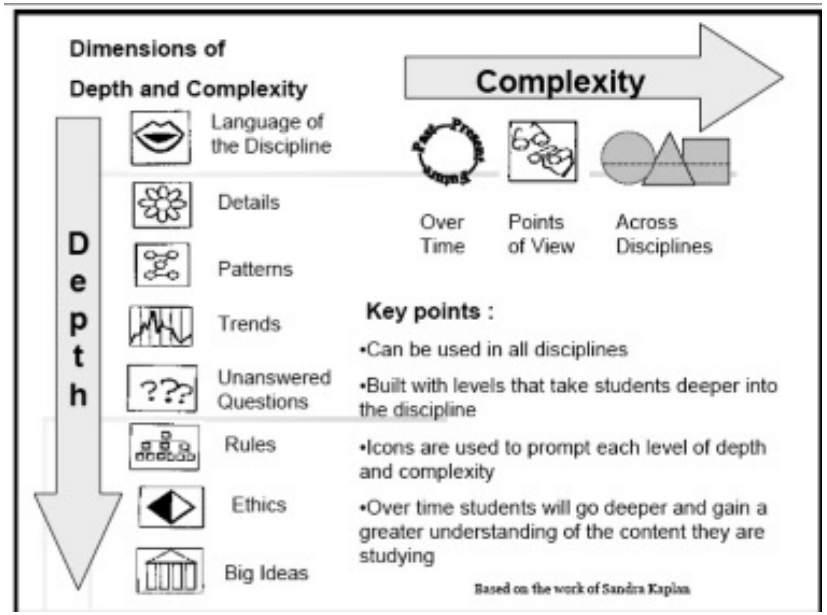
Pinned from edutopia.org



A Good Poster on Student's Critical Thinking Processes When Doing Research ~ Educational

QUESTIONS THAT HELP YOU TIER OR MAKE A LEARNING TASK MORE COMPLEX

Dr. Sandra Kaplan
Depth and Complexity, and
Content Imperative Icons



http://envisiongifted.com/critical-thinking.html

Byrdseed

http://www.byrdseed.com/introducing-depth-and-complexity/

Depth and Complexity

- Dr. Sandra Kaplan, University of Southern California
- Inherent in all disciplines of study
- Increases sophistication of content
- Fosters the skills necessary to think critically, analytically and creatively
- Positively affects student understanding across the disciplines
- Increases intellectual demand to work in "expert" like ways

Depth

- Studying many aspects of a single topic
- Going deeper into a subject
- Becoming an "expert" in a subject

Complexity

- Making connections across several topics

  or academic subjects

- Seeing relationships

  between seemingly

  unconnected ideas or

  concepts

Depth and Complexity Defined

Depth Thinking Tools	
	Language of the Discipline: Vocabulary related to content or discipline being studied. May include phrases, signs/symbols, figures of speech, or abbreviations.
	Details: Information that enhances understanding. May include parts, factors, attributes, traits, or variables.
	Patterns: Reoccurring elements or factors in ideas, objects, stories, & events. Items may be predictable, repetitive or ordered.
???	**Unanswered Questions**: Information or ideas that are unclear, unresolved, or not fully developed. May include the unknown, unexplored or unproven.
	Rules: Organization elements that create structure, order or sequence. May include hierarchy, guidelines, or classification.
	Ethics: Moral principles or conflicts surrounding different points of view on events, ideas, or issues. May include bias, values, or judgments.
	Trends: General direction of change. Direction may be influence by varied forces. May include current styles or tendencies.
	Big Idea: General statement about a principle, theory, concept or idea. May include a main idea, universal concept or generalization.
Complexity Thinking Tools	
PAST · FUTURE · PRESENT	**Over Time**: How people, ideas, events and elements change over time. May include comparing past, present and future, predicting, or connecting points in time.
	Multiple Perspectives: Different points of view on ideas, events, people and issues. May include roles, careers, fields, or opposing viewpoints.
	Across Disciplines: Connections within, between and across subject areas. May include connections, linked ideas, or integrations.

Depth and Complexity developed under the auspices of OERI, Javits Curriculum Project T.W.O., Dr. Sandra Kaplan , 1996

Understanding the Depth and Complexity Framework

Depth Thinking Tools
Language of the Discipline
Details
Patterns
Unanswered Questions
Rules
Ethics
Trends
Big Idea
Complexity Thinking Tools
Over Time
Multiple Perspectives
Across Disciplines

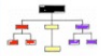
Tools to understand the content of the topic at a deeper level

Tools to facilitate a complex understanding of the topic.

Steps to Teaching Depth and Complexity

1. Define the meaning
2. Link to prior knowledge
3. Apply to new learning
4. Extend by applying to real world

Depth & Complexity Iconic Prompts

	Icon	Definition	Example
Language of the Discipline		What vocabulary terms are specific to the content or discipline?	Tools Jargon Icons Acronyms Special phrases Terms Slang Abbreviations
Details		What are the defining features or characteristics? Find examples and evidence to support opinions and ideas.	Parts Factors Attributes Variables Distinguishing Traits
Patterns		What elements reoccur? What is the sequence or order of events? Make predictions based on past events.	Predictability Repetition
Trends		Note factors (Social Economic, Political, Geographic) that cause events to occur. Identify patterns of change over time	Influence Forces Direction Course of Action Compare, Contrast and Forecast
Rules		What structure underlies this subject? What guidelines or regulations affect it? What hierarchy or ordering principle is at work?	Structure Order Reasons Organization Explanation Classification "Because..."
Ethics		What moral principles are involved in this subject? What controversies exist? What arguments could emerge from a study of this topic?	Values Morals Pro and Con Bias Discrimination Prejudice Judging Differing Opinions Point of View Right and Wrong Wisdom
Big Ideas		What theory or general statement applies to these ideas? How do these ideas relate to broad concepts such as change, systems, chaos vs. order, etc? What is the main idea?	Draw conclusions based on evidence Make generalizations Summarize Theory Principle Main Idea
Unanswered Questions		What information is unclear, missing, or unavailable? What evidence do you need? What has not yet been proven?	Missing Parts Incomplete Ideas Discrepancies Unresolved issues Ambiguity
Changes over Time		How are elements related in terms of the past, present, and future? How and why do things change? What doesn't change?	Connecting points in time Examining a time period Compare and Contrast
Across the Disciplines		Relate the area of study to other subjects within, between, and across disciplines.	Connect Associate Integrate Link Ideas Cross-Curricular study
Multiple Perspectives		How would others see the situation differently?	Different roles and knowledge Opposing viewpoints

Prompts for Depth

- What details further the understanding of this area of study?
- How can study of the known be directed toward the unknown, the concrete to the abstract, and the familiar to the unfamiliar?
- What facts, concepts, generalizations, principles and theories are related to the area of study?
- What patterns or trends exist within the area of study?
- What structure(s) and rule(s) characterize the area of study?

Complexity

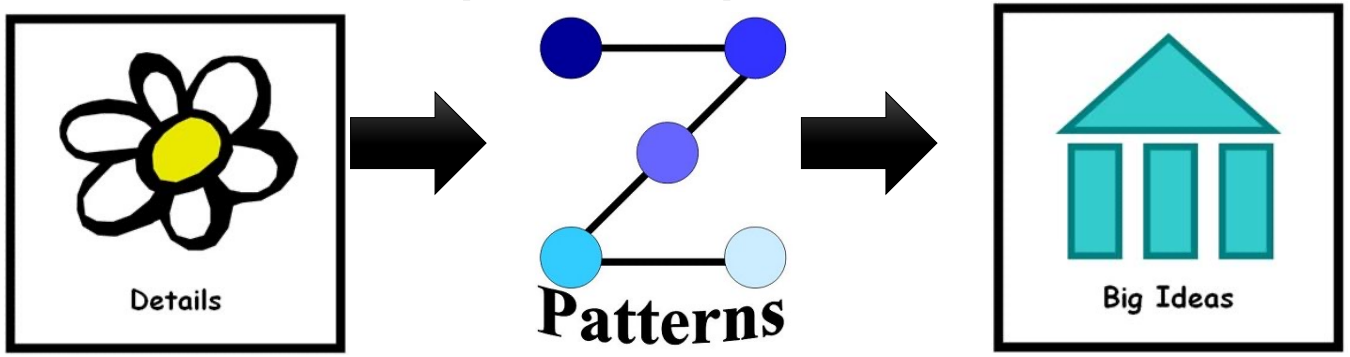
Broadening or extending the learner's understanding of the discipline area or areas under study by asking him/her to make connections, relationships and associations

- between, within and across subjects and disciplines
- from multiple perspectives, and
- across time.

Consider inserting a prompt (or two or three) for depth and complexity into the learning target for a lesson:

- Explain how microbes are harmful and helpful **using the language of the discipline.**
- Describe **multiple perspectives of** characters in a story (e.g. their traits, motivations, or feelings).
- Use graphs to compare data and solve problems **based on patterns and trends over time.**
- Compare and contrast **ethical considerations of** cultural aspects among two different countries.

Take a Fairy Tale-Using Depth and Complexity… How would you sequence the prompts?



What important details do you notice about:

- Characters
- Settings
- Events
- Problem/solution

What patterns do you notice among the:

- Characters
- Settings
- Events
- Problem/solution

Based on one or more of these **patterns,** write a **big idea** about fairytales:

- **"All fairytales…"**
- **"Fairytales must…"**

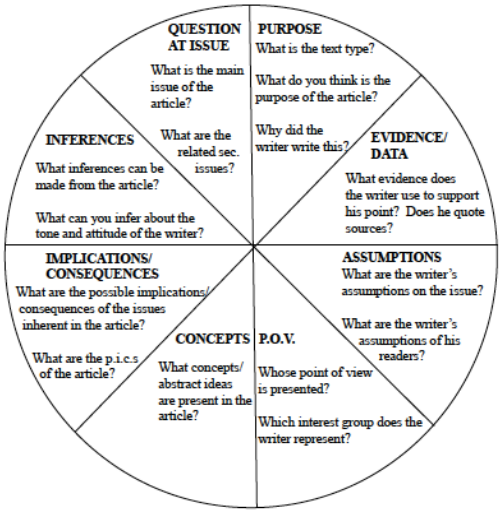
DEFINING THE CONTENT IMPERATIVES

TYPES	DEFINITIONS	QUESTIONS	RELATIONSHIP TO THE DIMENSIONS OF DEPTH/COMPLEXITY
Origin 	▪ Defining the beginning, root, or source of an idea or event	How did this [ ] get started?	 trends  unanswered questions
Contribution 	▪ Defining the significant part or result of an idea or event	What are the significant effects of [ ] ?	 overtime  perspectives  rules
Parallel 	▪ Defining ideas or events that are similar and can be compared to one another	How are the [ ] and [ ] related?	 details  patterns
Paradox 	▪ Defining the contradictory elements in an event or idea	What are the differences between the various conclusions made about [ ] ?	 details  ethics  perspectives
Convergence 	▪ Defining the meeting point of the elements that describe an event or idea	What are the factors that come together to describe or explain [ ] ?	 details  patterns

Sandra N. Kaplan, University of Southern California

https://depthcomplexity.com/content-imperatives/#:~:text=Just%20as%20keys%20unlock%20a,inquiry%20about%20the%20subject%20matter.

READING & ANALYSING ARTICLES USING
PAUL'S WHEEL OF ANALYSIS*



8 Possible Points of Entry (P.O.E.)

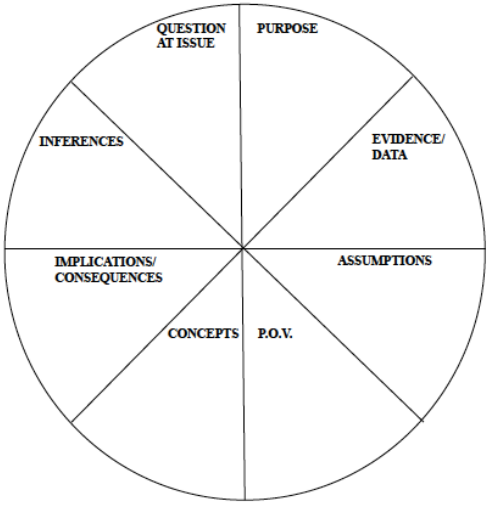
*Based on Joyce Van Tasselbaska's modification of Paul's Reasoning Model

https://community.criticalthinking.org/wheelOfReason.php

READING & ANALYSING ARTICLES USING
PAUL'S WHEEL OF ANALYSIS* TEMPLATE

Title of article : _____ Writer : _____

Article taken from _____ Issue : _____



*Based on Joyce Van Tasselbaska's modification of Paul's Reasoning Model

QUESTIONS THAT ESCALATE CRITICAL THINKING..

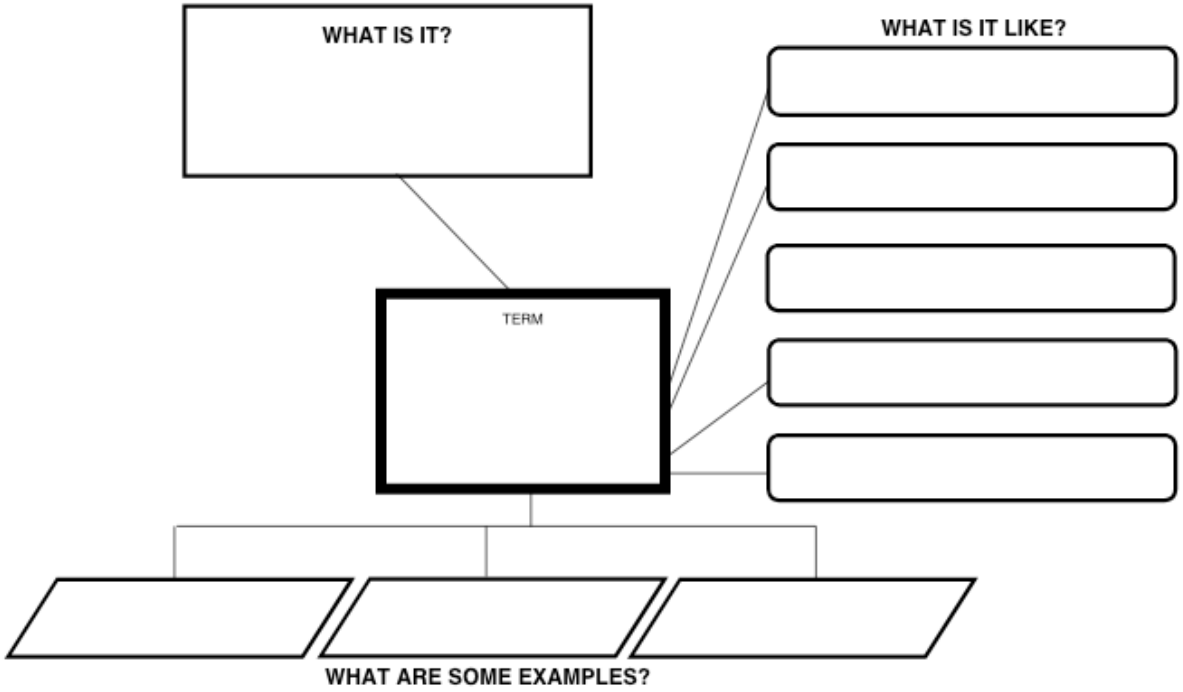
Conceptual Clarification Questions

Get them to think more about what exactly they are asking or thinking about. Prove the concepts behind their argument. Basic 'tell me more' questions that get them to go deeper.

- ***Why are you saying that?***
- ***What exactly does this mean?***
- ***How does this relate to what we have been talking about?***
- ***What is the nature of ...?***
- ***What do we already know about this?***
- ***Can you give me an example?***
- ***Are you saying ... or ... ?***

CONCEPT of DEFINITION MAP

[Schwartz & Raphael, 1985]



Probing Assumptions

Probing of assumptions makes them think about the presuppositions and unquestioned beliefs on which they are founding their argument. This is shaking the bedrock and should get them really going!

- ***What else could we assume?***
- ***You seem to be assuming … ?***
- ***How did you choose those assumptions?***
- ***Please explain why/how … ?***
- ***How can you verify or disprove that assumption?***
- ***What would happen if … ?***
- ***Do you agree or disagree with … ?***

Probing Rationale, Reasons and Evidence

When they give a rationale for their arguments, dig into that reasoning rather than assuming it is a given. People often use un-thought-through or weakly understood supports for their arguments.

- ***Why is that happening?***
- ***How do you know this?***
- ***Show me ... ?***
- ***Can you give me an example of that?***
- ***What do you think causes ... ?***
- ***What is the nature of this?***
- ***Are these reasons good enough?***
- ***Would it stand up in court?***
- ***How might it be refuted?***
- ***How can I be sure of what you are saying?***
- ***Why is ... happening?***
- ***Why? (keep asking it -- you'll never get past a few times)***
- ***What evidence is there to support what you are saying?***
- ***On what authority are you basing your argument?***

Name: _____ Period: _____

Prediction Guide

Making Predictions	Grounding Predictions	Revisiting Predictions
• What will the text be about? • What will happen later in the text? • What are different possible outcomes?	• What are you basing your predictions on? • Are you equally confident that all of your predictions about the text will come true?	• As you read, keep track of your predictions • Are you predictions confirmed or disconfirmed? • Do you need to revise your predictions based on what you have read?

Processing Predictions
• How did the process of making and revisiting predictions help you to understand the text?

Questioning Viewpoints and Perspectives

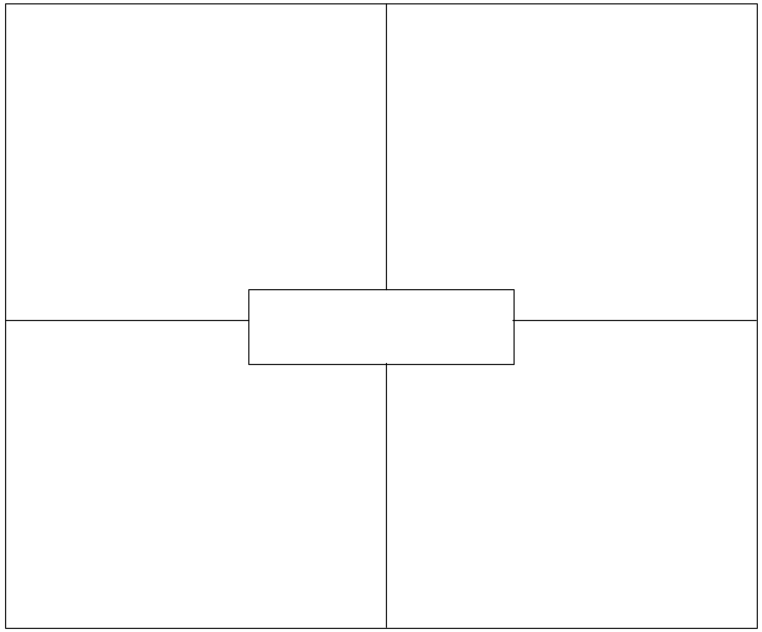
Most arguments are given from a particular position. So, attack the position. Show that there are other, equally valid, viewpoints.

- *Another way of looking at this is ..., does this seem reasonable?*
- *What alternative ways of looking at this are there?*
- *Why it is ... necessary?*
- *Who benefits from this?*
- *What is the difference between... and...?*
- *Why is it better than ...?*
- *What are the strengths and weaknesses of...?*
- *How are ... and ... similar?*
- *What would ... say about it?*
- *What if you compared ... and ... ?*
- *How could you look another way at this?*

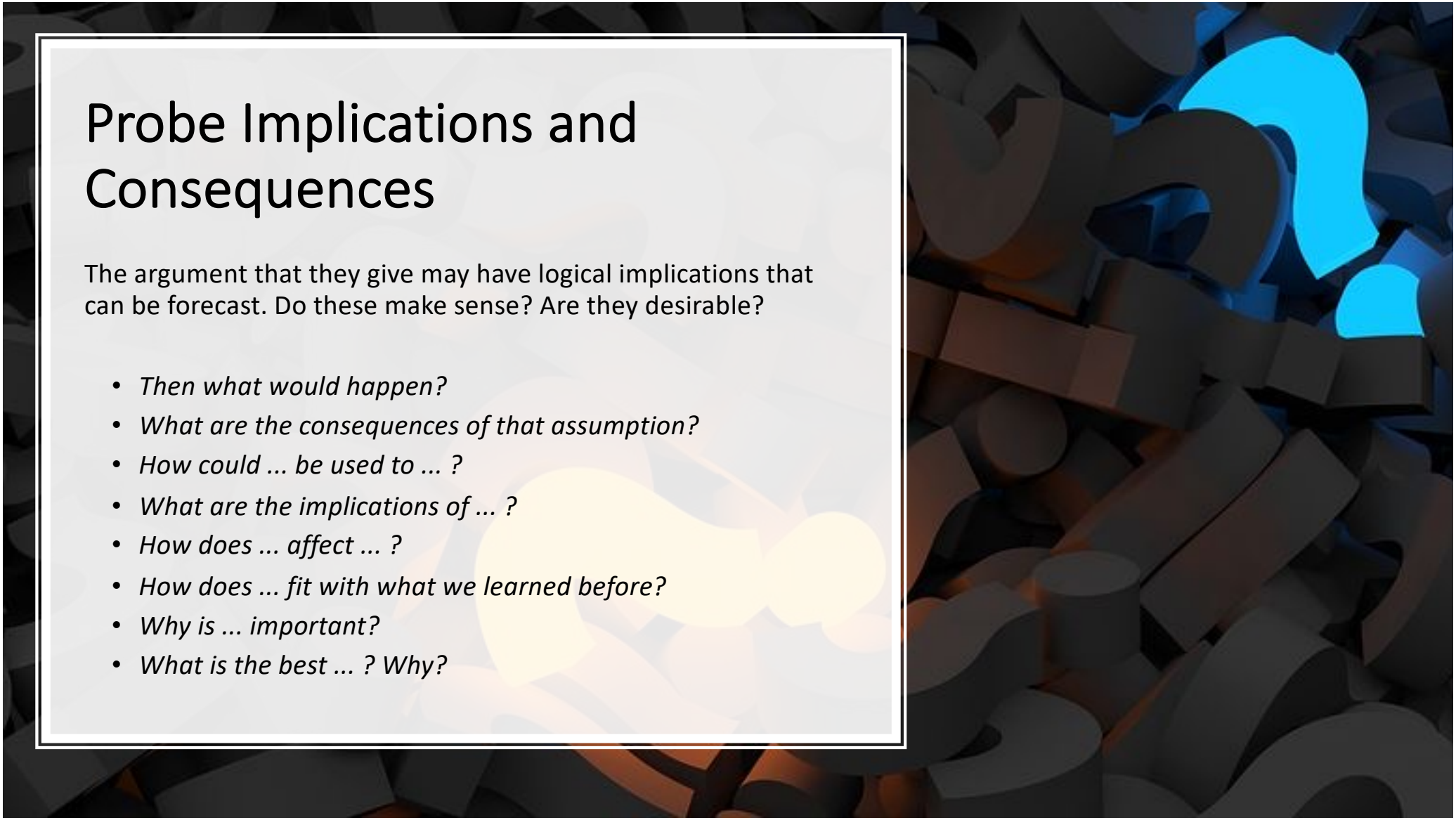
Four Square Perspective

Name _____ Class _____
Date _____ Block / Period _____

Different Perspectives on:
_____
_____



Conclusions / Connections / Questions / Realizations . . .



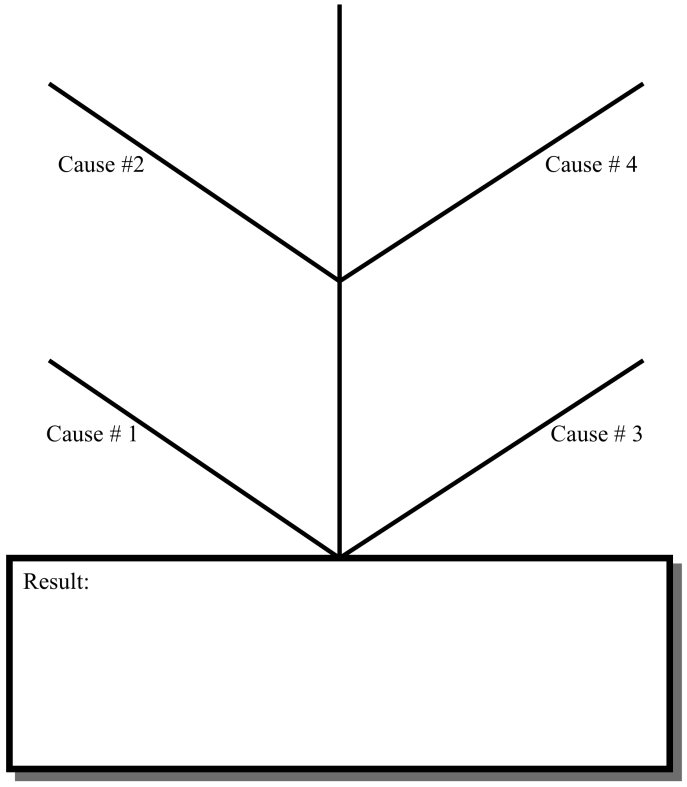
Probe Implications and Consequences

The argument that they give may have logical implications that can be forecast. Do these make sense? Are they desirable?

- *Then what would happen?*
- *What are the consequences of that assumption?*
- *How could ... be used to ... ?*
- *What are the implications of ... ?*
- *How does ... affect ... ?*
- *How does ... fit with what we learned before?*
- *Why is ... important?*
- *What is the best ... ? Why?*

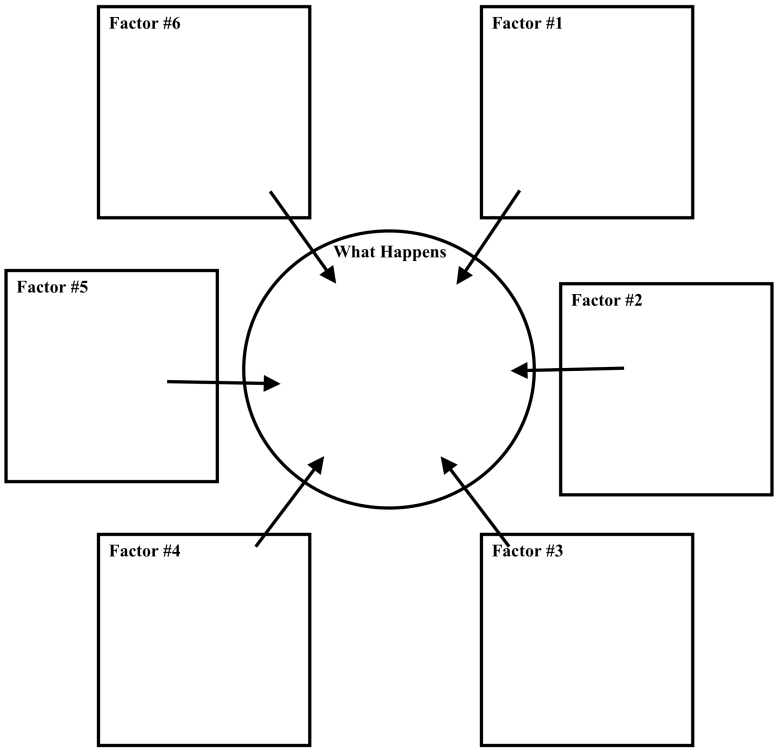
FISHBONE MAP

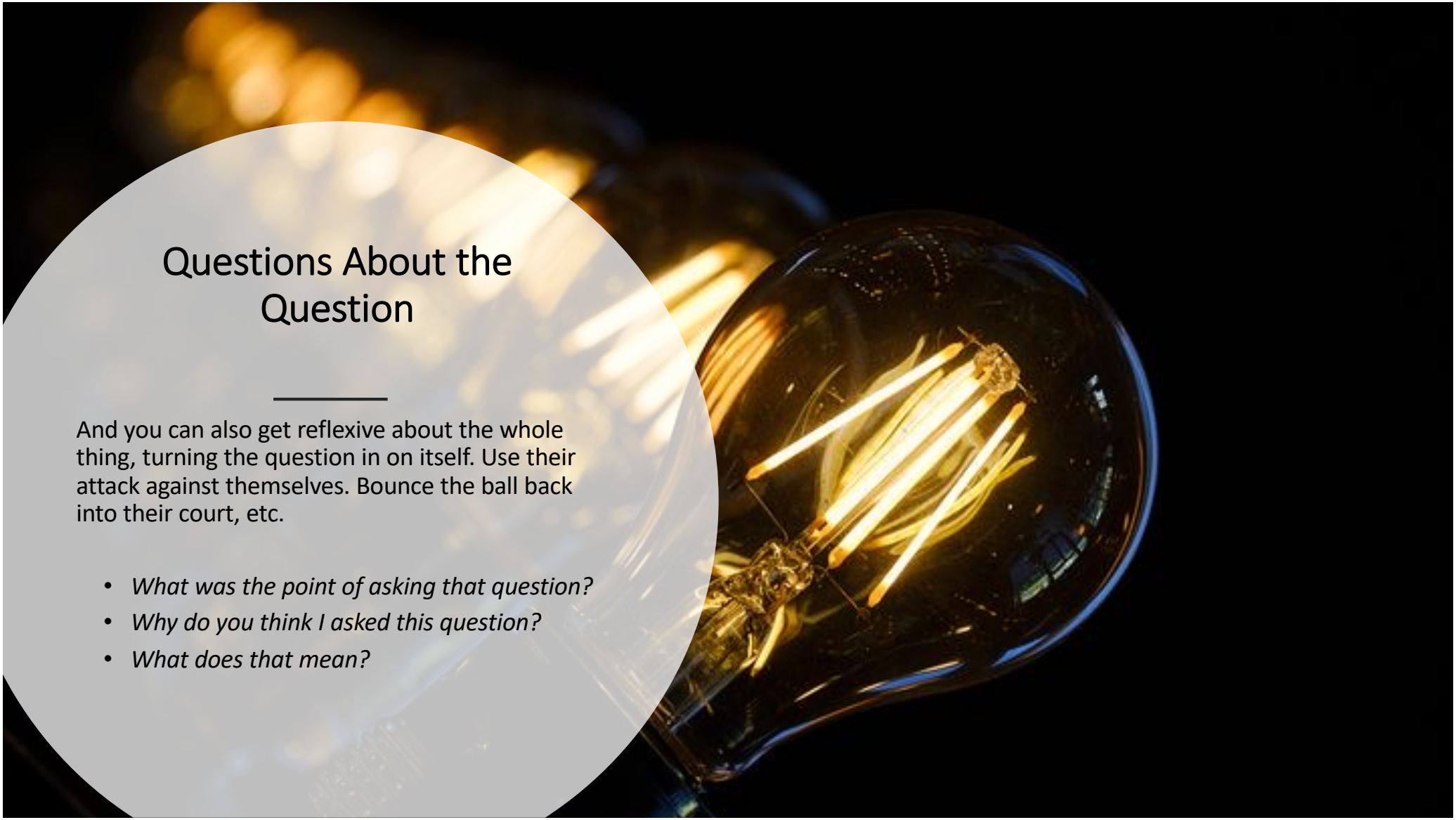
Name:_____ **Date:**_____



TOPIC: _____

Name:_____ Date:_____





Questions About the Question

And you can also get reflexive about the whole thing, turning the question in on itself. Use their attack against themselves. Bounce the ball back into their court, etc.

- *What was the point of asking that question?*
- *Why do you think I asked this question?*
- *What does that mean?*

Questioning Framework Examples Across Grade Levels and Content Areas

Questions Based on Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001)			
Question Type	**Nature of Question**	**Potential Stems**	**Sample Questions or Prompts**
Remembering	Recalling or recognizing information. Questions ask students to *define, name, recall, repeat,* or *state*.	The majority of "Remembering" questions begin with the word *who*, *what*, *when*, or *where*.	• What is a "stanza" in poetry? • When did the United States gain its independence? • What are the properties of a triangle? • Who invented the lightbulb?
Understanding* *This is *not* the deep and transferable "understanding" discussed in Chapter 2 (UBD).	Comprehending or grasping prior learning. Questions ask students to *describe, discuss, explain, paraphrase,* or *summarize*.	• Explain the process of _____. • Describe how to _____. • Summarize _____. • In your own words, tell _____.	• Explain the conflict in the story you are reading. • Summarize the events that led up to the beginning of the Revolutionary War. • Describe the steps to follow when solving a long division problem. • How does an elephant stay cool?
Applying	Using information to solve a problem or complete a task. Questions ask students to *demonstrate, illustrate, interpret, solve,* or *use*.	• Demonstrate the process of _____. • Illustrate how _____. • Determine how _____ works. • Use _____ to solve this problem: _____.	• How would you correct this flawed sentence? • Illustrate how one check or balance works in the branches of the U.S. government. • What are the errors in this solution to the problem? • How could the weaknesses in this experiment's design be improved?

Questioning Framework Examples Across Grade Levels and Content Areas

Question Type	Nature of Question	Potential Stems	Sample Questions or Prompts
Analyzing	Breaking down material, examining organizational structure, finding patterns, or relating ideas. Questions ask students to *categorize, compare, contrast, discriminate,* or *distinguish.*	• _____ is an example of _____ because _____. • What are the similarities and differences between _____ and _____? • How does _____ affect _____? • _____ is/is not an example of _____ because _____.	• What internal conflict is the character in this story experiencing? How do you know? • How are the buildings of Ancient Rome and Greece similar? Different? • Is there another way that we could write the same equation to see if it would still work? • Is _____ an Arctic animal? Why or why not?
Evaluating	Appraising or critiquing based on specific standards or criteria. Questions ask students to *appraise, defend, judge, justify,* or *support.*	• How effective is _____? Why? • Which is better/stronger/more defensible: _____ or _____? Why? • Support the argument that _____. • Is _____ safe/helpful/ beneficial for _____? Explain. • Why might _____ agree/disagree with _____? Explain.	• How effective is the writer's use of imagery (ability to use words to paint pictures in your head)? Explain. • Why might some people have disagreed with the Boston Tea Party, and how would they defend their opinion? • How effective was [this former student] at solving this problem? • Will planting trees really help the environment? Why or why not?
Creating	Combining and integrating ideas and information into new schematics, products, plans, patterns, or structures. Questions ask students to *construct, design, develop, formulate,* or *propose.*	• Design a new way to _____. • Develop a theory about _____. • Propose a plan to _____. • Imagine a situation in which _____. • Formulate a new _____ using _____.	• Formulate a new story featuring the same characters facing a different conflict. • Propose a plan to help your classmates distinguish among the different regions. • What is another way to solve this problem, and how might it help people? • Imagine a world in which everyone sorts their trash and recycling. Develop a plan that would make that happen in real life.

Questioning Framework Examples Across Grade Levels and Content Areas

Questions Based on The Six Facets of Understanding (Wiggins & McTighe, 2006)			
Facet	**Nature of Question/ Prompt**	**Potential Stems**	**Sample Questions or Prompts**
Explain/ Explanation	Put information, ideas, principles, and processes into own words and explain thinking.	• What is the key idea in _____? • What caused _____? What are the effects of _____? • What are examples of _____? • How did _____ come about? • What might happen if _____? • What are some common misconceptions about _____? • What are some examples of _____? • How might we confirm/prove/justify _____? • How is _____ connected to _____?	• Draw and label a simple diagram that shows how plants "feed" themselves. Then explain what your diagram shows. • Think about a swimming pool. What is the difference among the *area* of the pool, the *perimeter* of the pool, and the *volume* of the pool? • What caused the American Revolution? • Circle the metaphor in the song/poem excerpt below. Then explain why you think this is a metaphor. • Give examples and nonexamples of symmetry.
Interpret/ Interpretation	Make sense of information, ideas, principles, and processes by creating comparisons, analogies, or stories.	• How is _____ like a _____? • What is the meaning of _____? • How does _____ relate to _____? • What are the implications of _____ for _____? • What does _____ reveal about _____? • What does _____ have to do with _____? • Explain _____ to an audience of _____.	• How is a plant like a human? • How does "manifest destiny" relate to us? • Write a story for this number model. • Use your own words to paraphrase this idea: _____. • Explain to an audience of preschoolers why we *need* standard units of measurement. Be sure to use examples and analogies they would understand.

Questioning Framework Examples Across Grade Levels and Content Areas

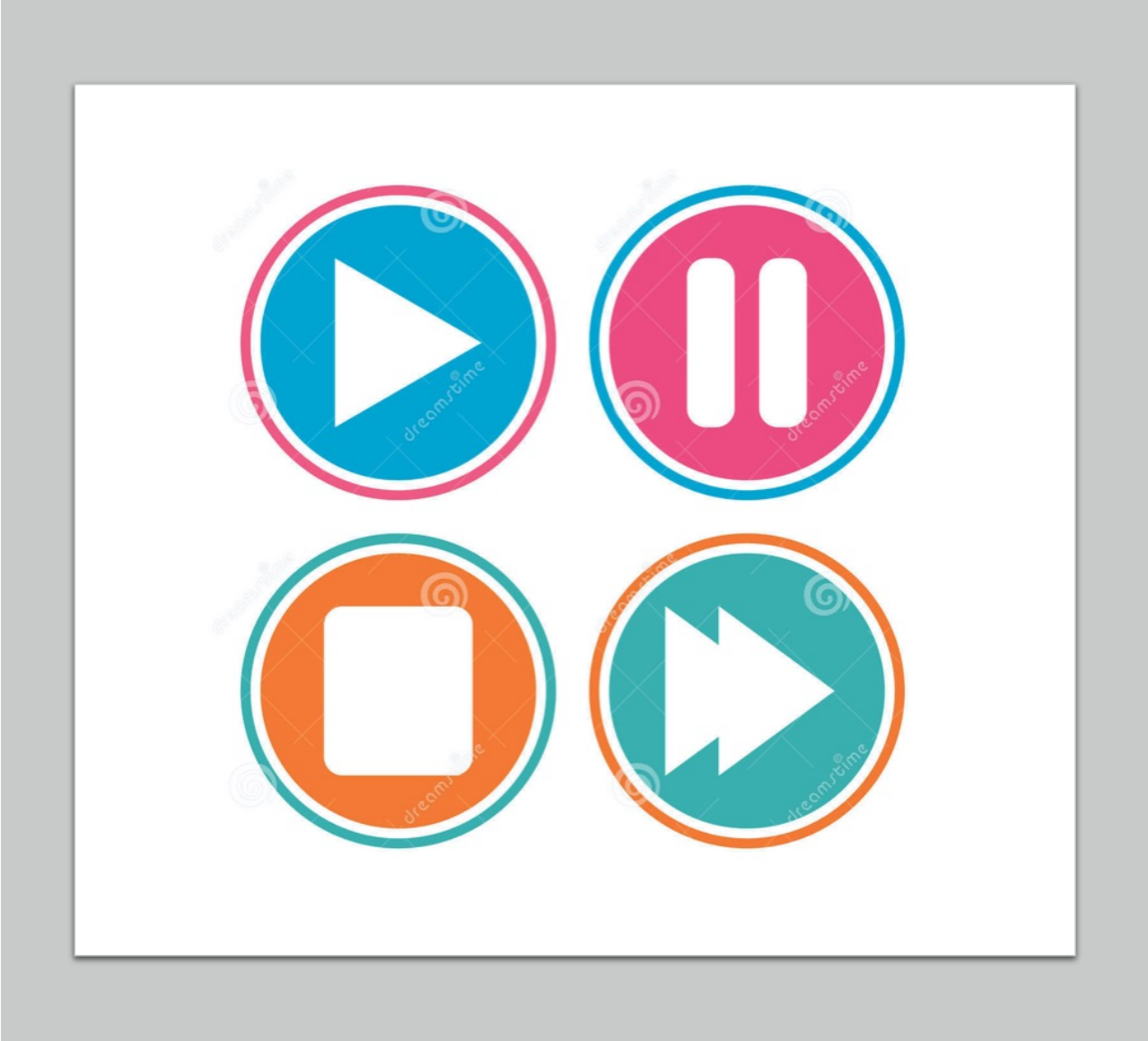
Facet	Nature of Question/ Prompt	Potential Stems	Sample Questions or Prompts
Apply/ Application	Use information, ideas, principles, and processes in new contexts and situations.	• How could someone use _____to _____? • How is _____ applied in the larger world? • Where do we see _____ in the world today? • How could _____ help/benefit _____? • Solve _____. Name a real-life situation in which you might use _____. • Use _____ to create a _____ that shows _____.	• Create a table for these data that makes them easier to understand. • When would it be more appropriate to use the *mode* of a set of data rather than the *mean*? • Revise this paragraph for capitalization and punctuation. • Name three ways that someone could use fractions to plan a birthday party. • Choose your favorite symmetrical object in the classroom. Make a list of all the ways that this object's symmetry helps it do its "job."
Demonstrate/ Have perspective	Recognize and articulate the many possible different viewpoints regarding a situation.	• What are different points of view about _____? • How might _____ look from _____'s point of view? • What are the benefits and limitations of this _____? • How is _____ similar to/different from _____? • What are other possible reactions to _____? • What are the strengths and weaknesses of _____? • What are the limits of_____? • What's the evidence for_____? Is the evidence reliable? Sufficient? • Is it ever OK for _____? Why or why not?	• Analyze this student's work from a class several years ago. What did he or she do well? What did he or she not do well? • What are the benefits and limitations of using a bar graph to display these data? • How might the problem in the story look from [this character's] point of view? • Give the pros and cons of relying on GPS for directions. • Argue that a car is a *need*. Then argue that it's a *want*.

Questioning Framework Examples Across Grade Levels and Content Areas

Questions Based on The Six Facets of Understanding (Wiggins & McTighe, 2006)			
Facet	**Nature of Question/ Prompt**	**Potential Stems**	**Sample Questions or Prompts**
Display empathy/ Empathize	Take on the viewpoint, concerns, or opinions of another and argue from that perspective.	• What would it be like to walk in the shoes of _____? • How might _____ feel/have felt about _____? • How can I reach a better understanding about _____? • What was _____ trying to make _____ feel or see [about _____]? • One misunderstanding someone might have about _____ is _____.	• What would it be like to walk in the shoes of a Native American child? • Respond to someone who might say that capitalizing doesn't matter. • Assume the role of the main character and explain why you made the choice you did in this chapter. • What is one misconception that someone might have about *scale*? What would you say (or do or show) to correct that misconception? • What did the author want you (the reader) to better understand after reading this story? How do you know?
Self-reflect	Reflect on one's own connection to, use of, and strengths and weaknesses with regard to the ideas and processes.	• How do I know _____? • What are the limits of my knowledge about _____? • How are my views about _____ shaped by my [experiences/habits/prejudices/styles]? • What are my "blind spots" about _____? (What *don't* I know?) • How can I best show _____? • What are my strengths and weaknesses in _____? • What is one question people should ask themselves when they _____? • What is a mistake that someone might make in trying to _____? Why might he or she make that mistake?	• What is a mistake someone might make when adding or subtracting fractions? Why might he or she make that mistake? • What don't you understand yet about using quotation marks? • How has your understanding of the writing process changed over the past month? • How can a person know when to use an estimate and when to use an exact measurement? • What should people be sure to do when working on the kind of problem we've been learning about this week? *They should be sure to . . . because. . . .*

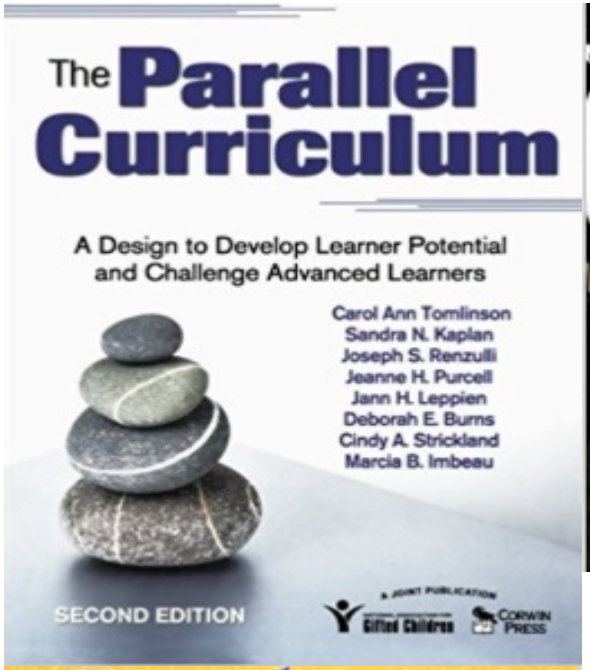
STOP and PAUSE

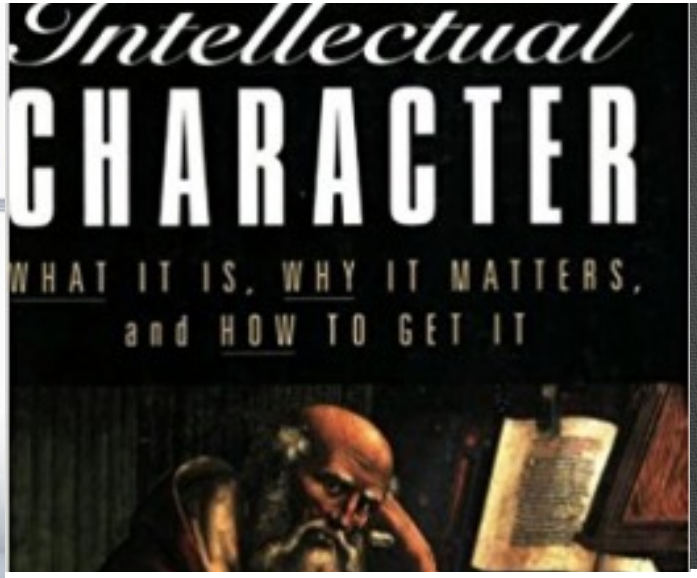
- Based on the information provided, what questions might you have?

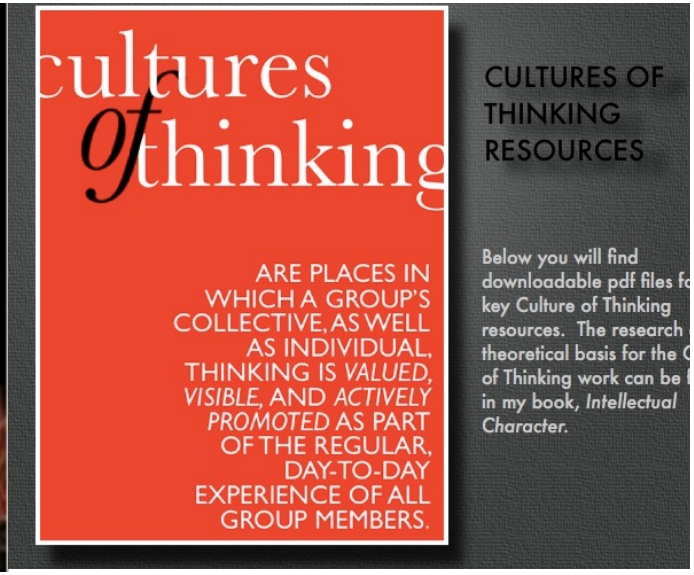


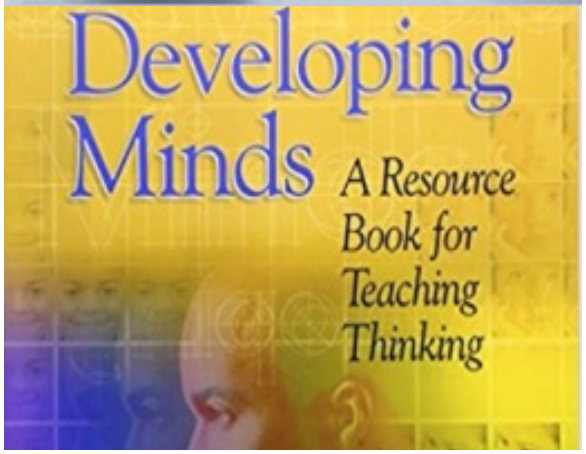
Curricular Tasks Promote Understanding and Routines Help Investigate the Ideas

The great questions want to be answered in each of us. We almost can't help but attend when those questions are raised. ***To teach is to help our students raise questions they care about and to set out together to look for answers.***



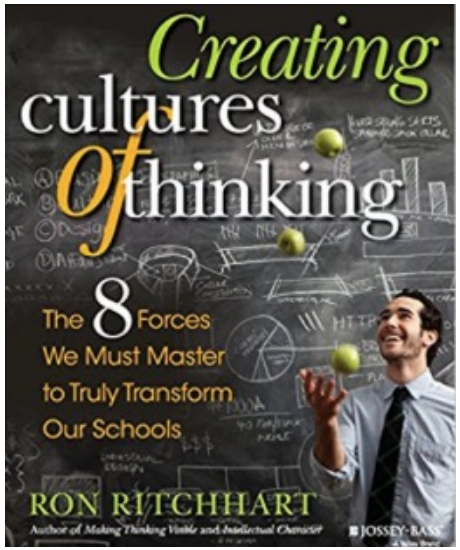


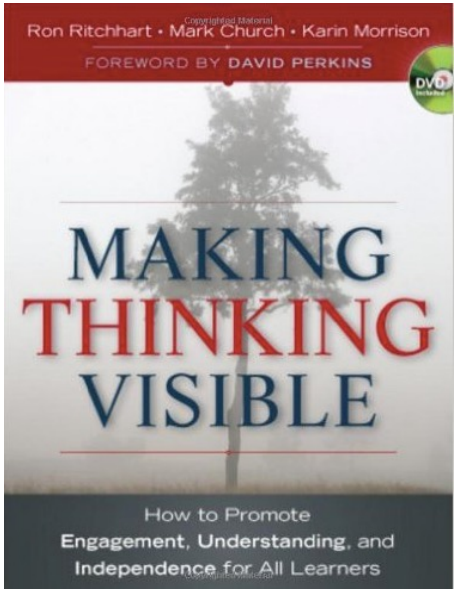


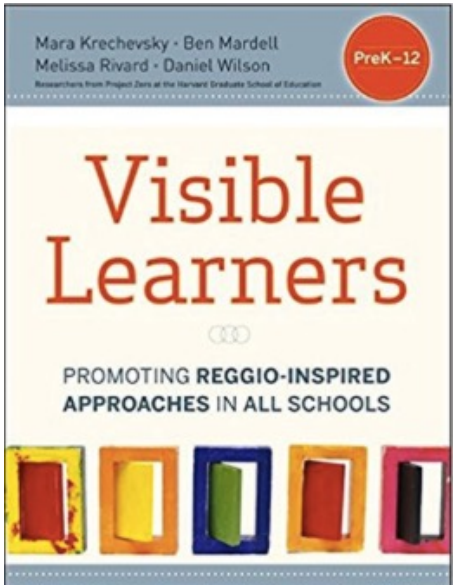


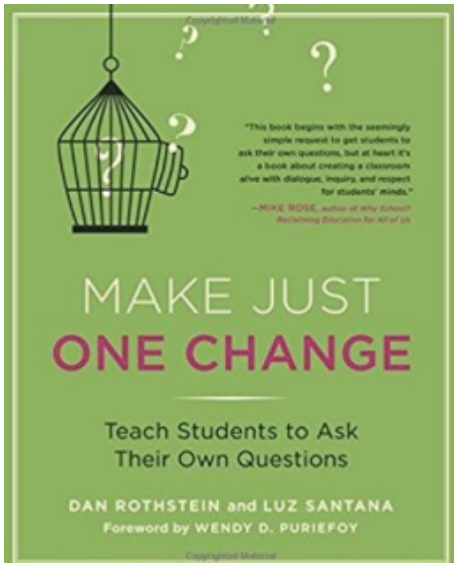
And others.....

Culture of Thinking Reosurces:
http://www.ronritchhart.com/COT_Resources.html









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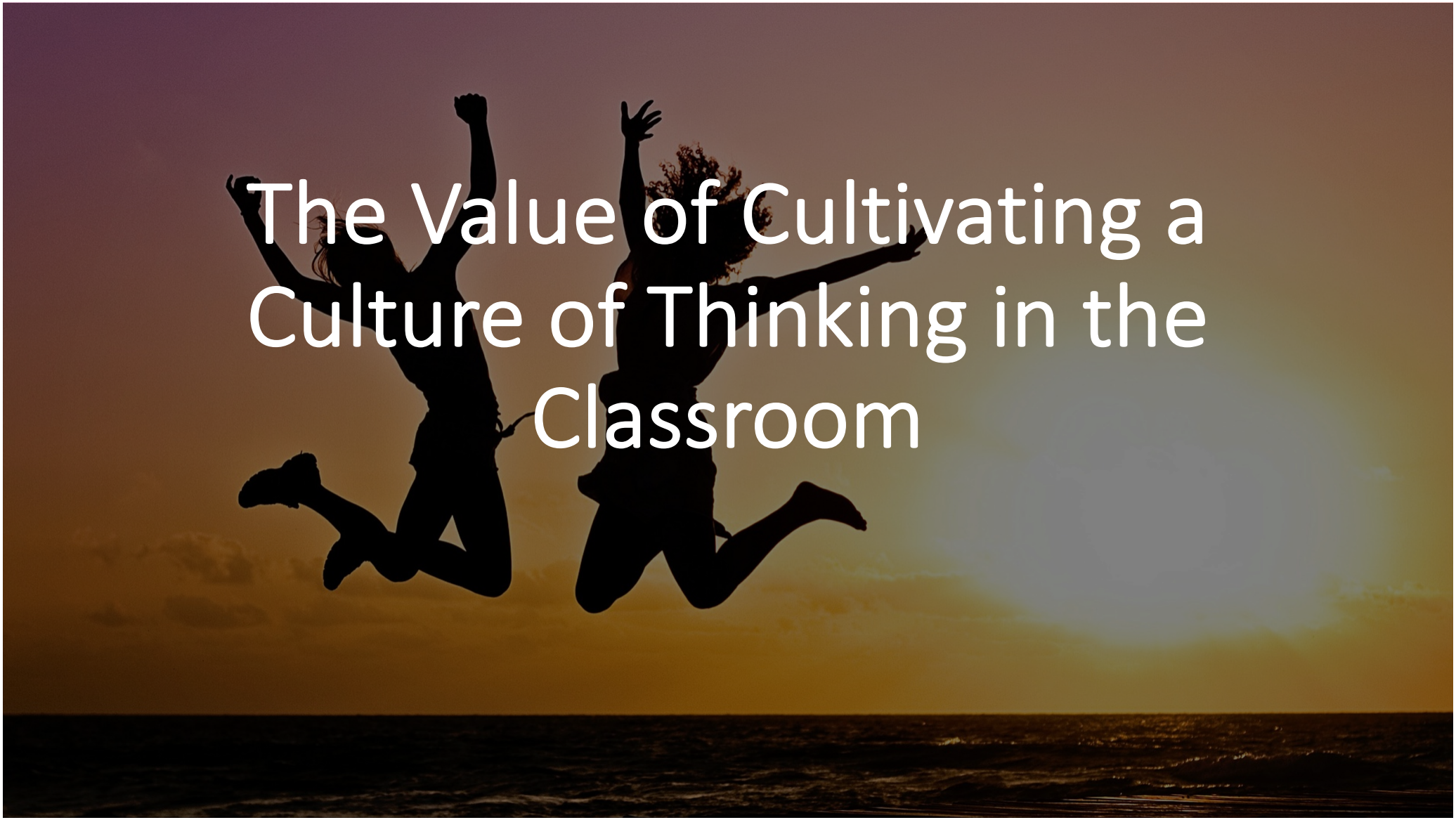
The Value of Cultivating a Culture of Thinking in the Classroom


Thank you!