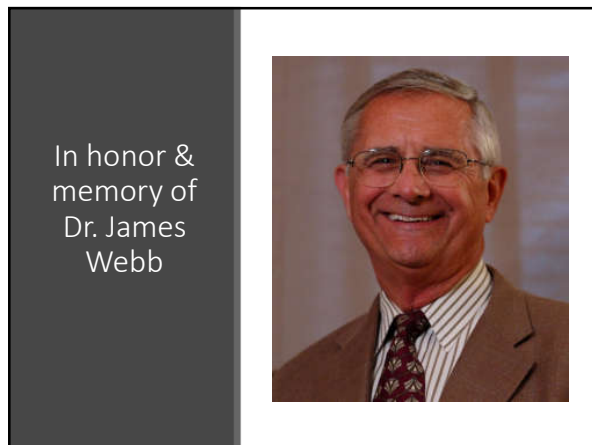


SYMBOLS:

- share information
- create expectation
- convey emotion
- tell us what to do/not do
- can change meaning



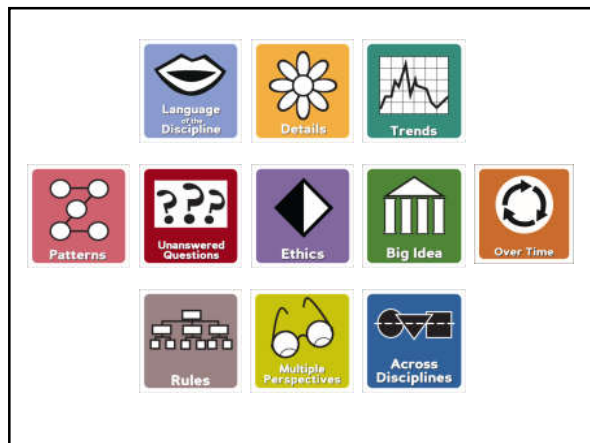
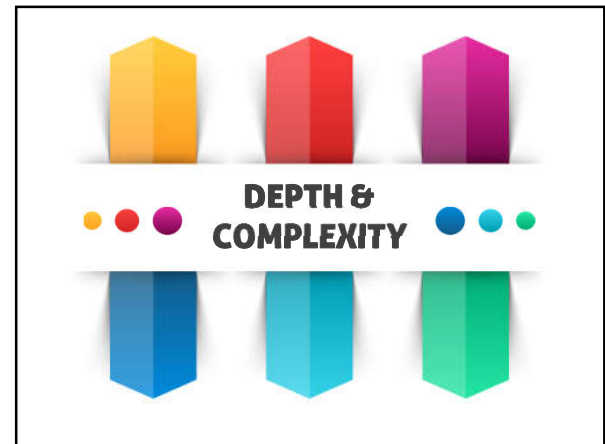
We are
surrounded
by symbols.

Think of a Symbol.

Criteria:

- easily recognizable
- emotion level ≥ 6
- be able to describe its effect (create expectation; convey info, etc.)

We're going to use
 11 symbols to help
 us engage with our
 learning.



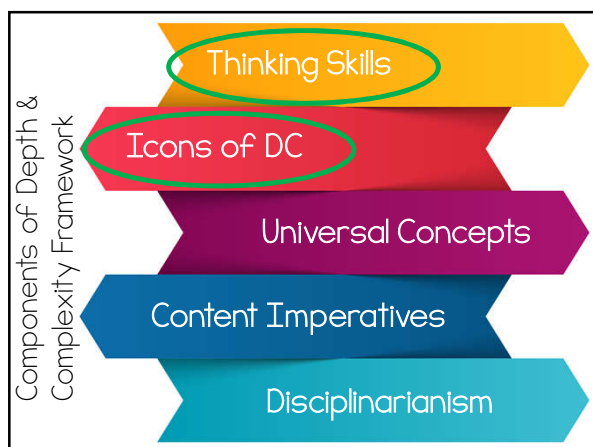
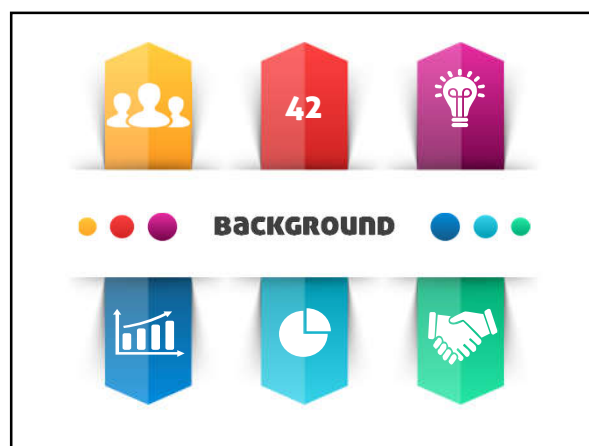
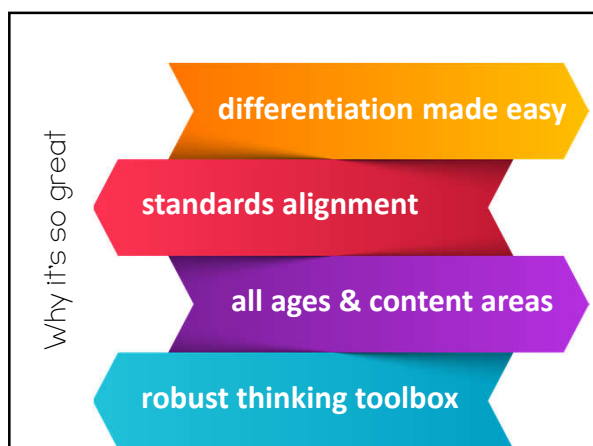
bit.ly/intro-icons

And they will...

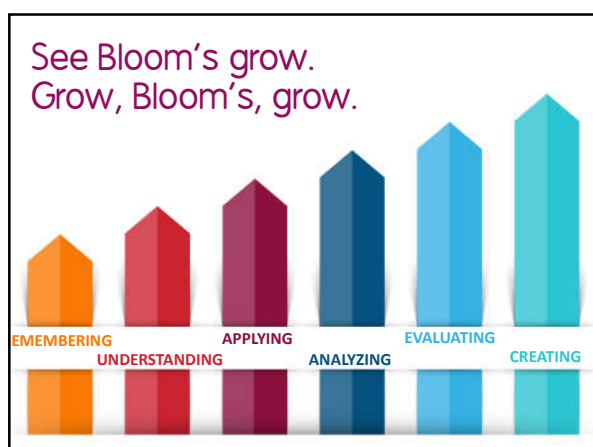
- share information
- create expectation
- give common vocabulary
- tell us what to do/not do
- change meaning

DEPTH & COMPLEXITY

**a FRAMEWORK for
 academic exploration
 to help raise thinking
 skills**



**We are looking
through a lens
that pivots .**



DEPTH & COMPLEXITY

**the icons are a path to
understanding the
thinking lens we're
using for that
experience**

DEPTH & COMPLEXITY

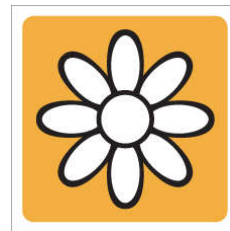
The eleven elements
are not in any
particular order.

DETAILS

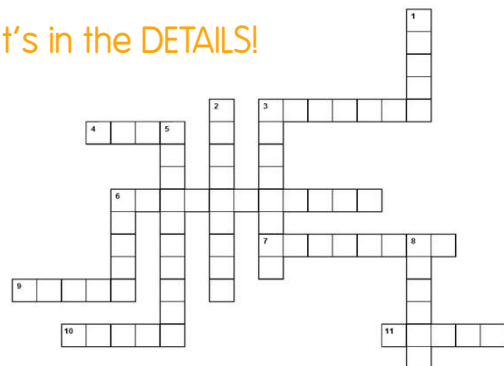
What We'll Do Today:

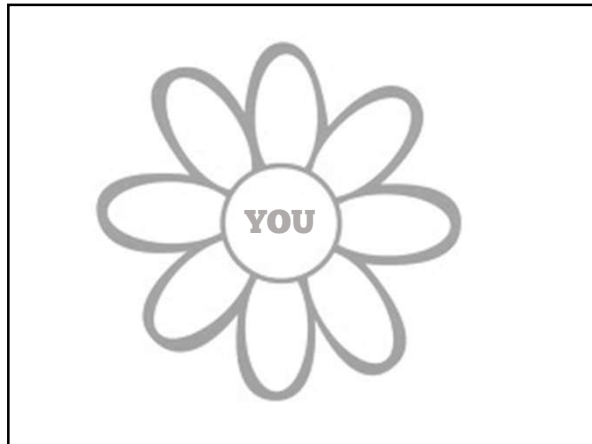
- Understand the eleven elements of the framework represented by the icons
- Apply them to our content
- Know how to introduce them to students

DETAILS



It's in the DETAILS!





IMPLEMENT: ELA

List three traits of each character and then show how that character is connected to the character(s) with whom they share connectors.

```

graph TD
    Charlotte --- Elizabeth
    Charlotte --- MissBingley[Miss Bingley]
    Elizabeth --- Jane
    Elizabeth --- Bingley
    Elizabeth --- Darcy
    MissBingley --- Bingley
    MissBingley --- Darcy
    Bingley --- Darcy
    
```

IMPLEMENT: Social Studies

List at least 8 details about Abraham Lincoln.

Which details are most important?
How can you support that opinion?

What ideas do we most associate with him?

List & draw 8 details about polygons.

IMPLEMENT: ELA

Using a sociogram with Details

IMPLEMENT: Science

Identify the boiling and freezing /melting points of water in Fahrenheit and Celsius and the average temperature of the world's oceans.

iMPLEMENT: Art

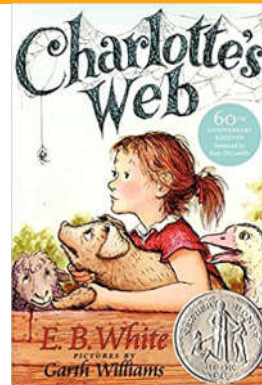
Compare the attributes of the self-portraits of Rembrandt & Van Gogh. Include line, shape, form, texture, color, value, and space.



iMPLEMENT: ELA

How was Fern a friend to Wilbur?

How was Templeton a friend to Wilbur?



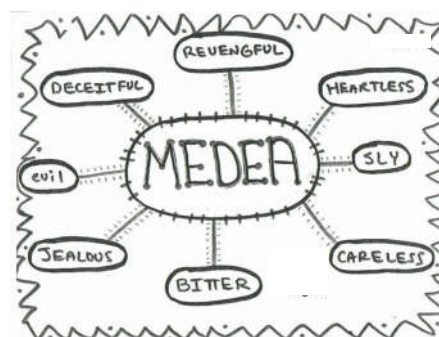
iMPLEMENT: Math

Place Value:

The tens' column is _____ times the value of the ones' column and _____ the value of the hundreds column.



Bubble Map +



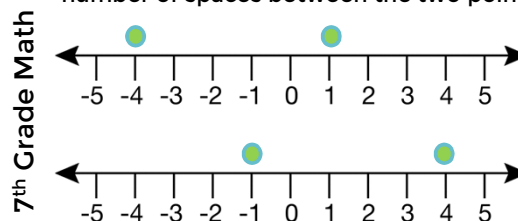
iMPLEMENT: Math

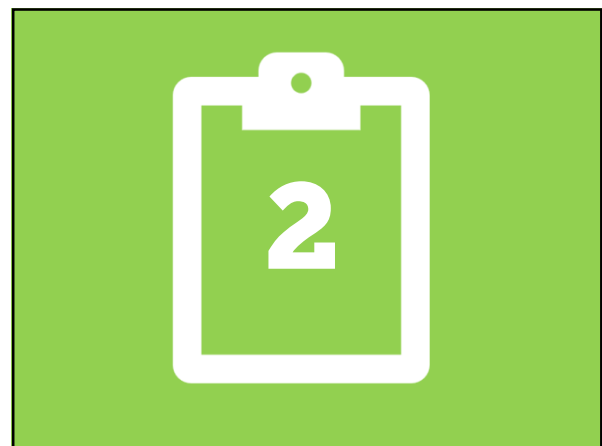
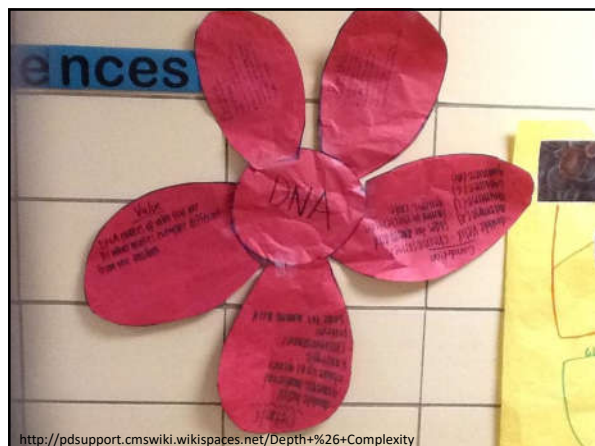
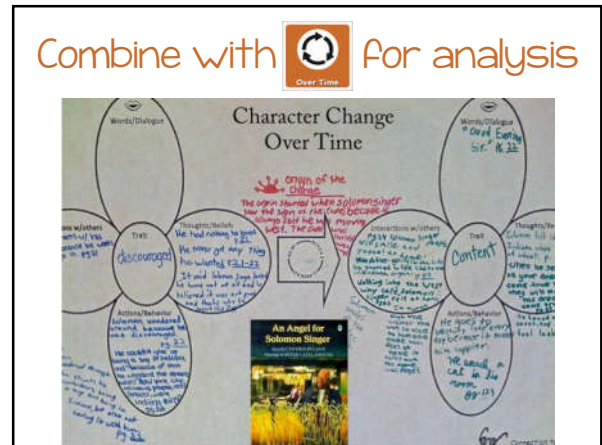
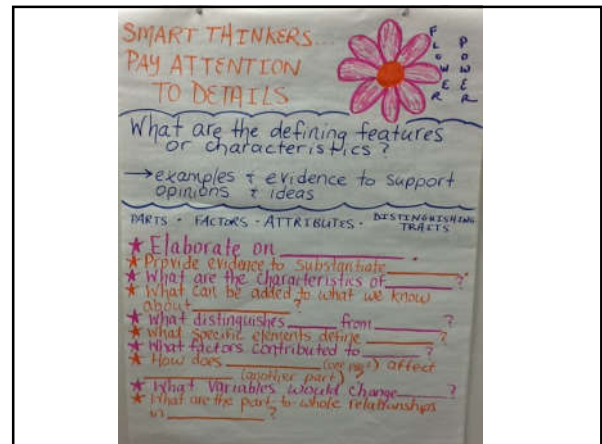
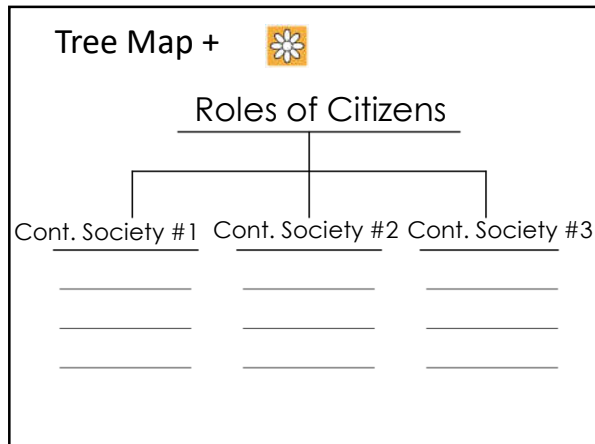
Place Value:

In the number 5,496, which number is in the column that is one-tenth the value of the column that has the 4?



Find the distance between the two points on each number line by counting the number of spaces between the two points.





WHAT AM I?

You must
have a
license.

Always
wear your
seatbelt.

Signal 100
feet before
a turn.

Obey the
speed limit.

Yield to
pedestrians.

WHAT AM I?

Sentences
begin with a
capital
letter.

"i" before "e"
except
after "c"

{& a bunch of other exceptions}.

Sentences
begin with a
capital
letter.

Use the
possessive
in front of
a gerund.

WHAT AM I?

Waft, don't inhale.

Never look into a container that is being heated.

Do not return unused chemicals to their original container.

I have to have three sides.

I have to have three angles.

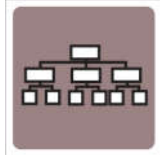

If one of my angles is 90° , I'm right.

The sum of my interior angles is 180° .


Tie long hair back.

RULES

RULES

WHAT ARE THE RULES OF THIS?

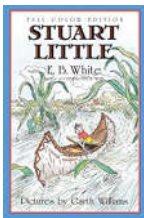


Hate this game?
You're playing it wrong.



IMPLEMENT: Secondary ELA

How is the behavior of Stuart Little different from that of real mice?



RULES INCLUDE:



standards
directions
methods
organization
usual behavior

IMPLEMENT: Middle School PE

What constitutes a legal underhand serve for net & wall games such as badminton, volleyball or pickleball? Demonstrate three legal serves & one illegal serve.




https://commons.wikimedia.org/wiki/File%3APickleballs_on_Court.jpg

IMPLEMENT: ELA

Identify the phrases in the following sentences.
 Label the underlined words: par = participial
 ger = gerund inf = infinitive appos = appositive prep = prepositional

1. There was no talk in all England but of the new baby, Edward Tudor, Prince of Wales, who lay lapped in silks and satins, unconscious of all this fuss, and not knowing that great lord and ladies were tending him . . .

2. The windows were small, glazed with little diamond-shaped panes, and they opened outward, on hinges, like doors.

IMPLEMENT: Social Studies

Compare and contrast the ways of life of American Indian groups in Texas and North America before European exploration.

This Tribe That Tribe

Rules Write a rule that explains how to find the distance between a positive integer and a negative integer.

Which one does not belong?

31	28
23	29

IMPLEMENT: Science

What are the rules the planets follow in relationship to the Sun? What would happen if Earth suddenly went rogue?

What are the rules associated with maps? Put a star next to the most important rule.

What is a rule in your discipline?

[write it down]

The questions that p_____ face as they raise ch_____ from in_____ to adult life are not easy to answer. Both fa_____ and m_____ can become concerned when health problems such as co_____ arise any time after the e_____ stage to later life. Experts recommend that young ch_____ should have plenty of s_____ and nutritious food for healthy growth. B_____ and g_____ should not share the same b_____ or even sleep in the same r_____.



The questions that **poultrymen** face as they raise **chickens** from **incubation** to adult life are not easy to answer. Both **farmers** and **merchants** can become concerned when health problems such as **cough** arise any time after the **egg** stage to later life. Experts recommend that young **chicks** should have plenty of **sunshine** and nutritious food for healthy growth. **Banties** and **geese** should not share the same **barnyard** or even sleep in the same **roost**.

FILL ME IN



In school: 3,000 per year

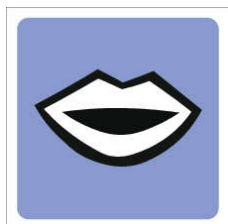
Pre-school: 840 per year

Think of a field, domain, or content area.

Next, think of 5 words that are the LotD of that field & write them on your Experience Sheet.

Do not share.

LANGUAGE OF THE DISCIPLINE



Find someone from another table in your same card suit.

Share your words with each other and guess your respective fields.

If you finish before time is up, think of more words for the other person's list.

Who am I?

iMPLEMENT

iMPLEMENT: Elementary Science

What do these words have in common?

- cirrus
- stratus
- cumulonimbus
- stratocumulus



1. What are two words that are missing that should be on the list?
2. Draw a picture of one you think would not be good if you were at a picnic.

iMPLEMENT: Middle School ELA

Word Interview: Word conflict

What words mean the same as you?

What makes you happy?

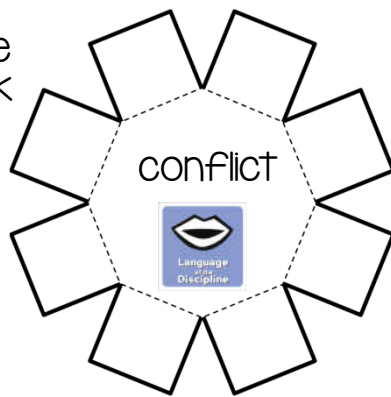
Who or what is your best friend?

What do you dislike most?

If you could give anyone advice, who would you give it to and what would you say?



What are words we use to talk about conflict?



iMPLEMENT: Middle School ELA

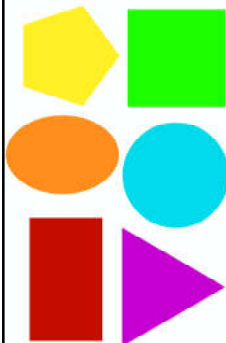
The distance from zero of a number on the number line is called the Absolute Value of a number.

Write an antonym for the name.

variable meaninglessness



iMPLEMENT: Math

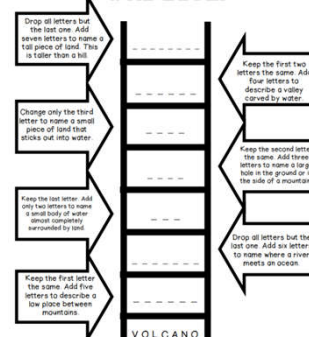


1. What are the three most important words you'd need to describe these shapes?
2. If you couldn't use the word "triangle", what would be a word you could use to describe that shape?



iMPLEMENT: Elementary Science

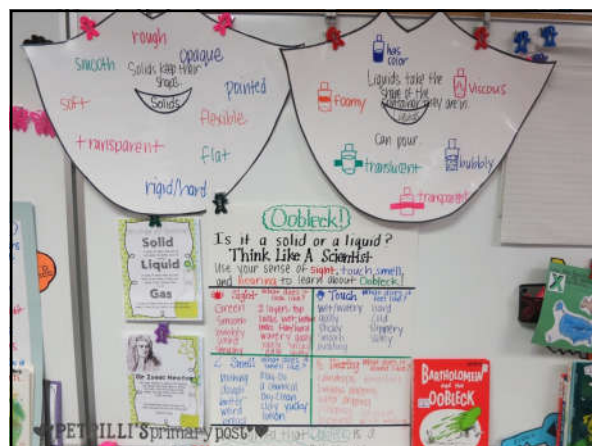
WORD LADDER



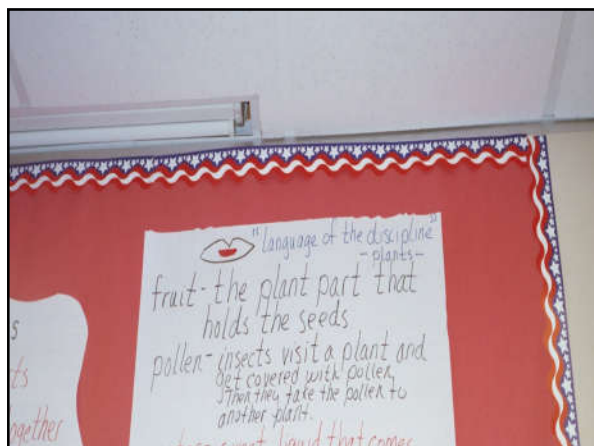


The word “integer” is from the Latin from *in-* “not” + root of *tangere* “to touch.” It means “whole” or “untouched.”

Why is this a good name for this set of numbers?



The section of the number line between two numbers is called an “interval.” What would be another word that would be a good term for this?



Shall we play a game?

Okay /Not Okay

Not really stopping at a stop sign out in the middle of nowhere.

Ordering something you don't really want to get your order to qualify for free shipping, knowing you're going to send it back.

© ATHLETA

FREE SHIPPING ON ORDERS OF \$50 OR MORE. DETAILS

OLD NAVY

WOMEN

WOMEN'S PLUS

MATERNITY

MEN

GIRLS

Taking ALL of a sale item at a grocery store.

Taking shampoo/ conditioner/ soap from hotel rooms, even if you didn't use it while you were there.

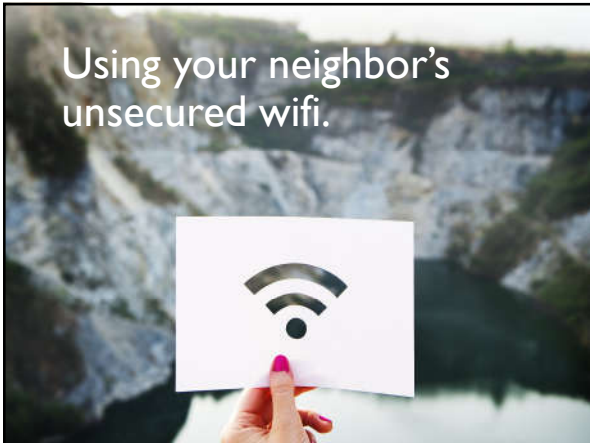
22-year-old son says, "That's just capitalism."

Calling in sick, and not leaving any directions for a sub.

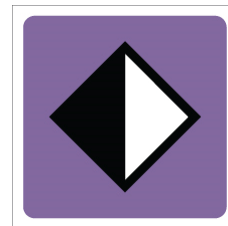


Ethics

Using your neighbor's unsecured wifi.



Ethics



Buy an item of clothing to wear for a special occasion, and leaving the tag on so you can return it after the event.



values  What is Right?
fairness philosophies
controversy
STANDARDS
JUSTICE morals

Find the length of each line segment. For each graph give an ordered pair to extend each of the line segments.

Find the length of each line segment without graphing.

(2, 5) (2, 11) _____
 (-6, 2) (-6, 9) _____
 (7, -5) (3, -5) _____

AB _____ Ordered pair _____ RS _____ Ordered pair _____
 UT _____ Ordered pair _____ MN _____ Ordered pair _____ FG _____ Ordered pair _____

Joe took a taxi across town for a meeting. The coordinates are shown below. (Each unit on the grid = 1 city block.)
 The taxi company Joe used charges \$2 per city block of travel. The driver charged Joe \$15 for the fare.
 Was this a fair price for the fare? How do you know? Prove your answer with evidence.

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IMPLEMENT: ELA

180 perfectly passing mystery & a broken masterpiece

Under the Egg
 Laura Marx Fitzgerald

Should great art belong to private owners or public institutions? Cite a character for each position and, using examples from the text, defend their point of view.

each graph give an ordered pair to extend each of the line segments.

Find the length of each line segment without graphing.

(2, 5) (2, 11) _____
 (-6, 2) (-6, 9) _____
 (7, -5) (3, -5) _____

UT _____ Ordered pair _____ MN _____ Ordered pair _____ FG _____ Ordered pair _____

Coordinates are shown below. (Each unit on the grid = 1 city block.)
 travel. The driver charged Joe \$15 for the fare.
 Prove your answer with evidence.

IMPLEMENT: Elementary Science

3-LS2 Ecosystems: Interactions, Energy, and Dynamics

Interactions, Energy, and Dynamics

Understanding can:
 an argument that some animals form groups that help members survive.

Expectations above were developed using the following documents from the NRC document *A Framework for K-12 Science Education*:

Practices	Disciplinary Core Ideas	Crosscutting Concepts
Evidence Evidence in 3-5 builds on K-2 critiquing the scientific method by peers by citing natural and designed world(s), evidence, data, and/or a	LS2.D: Social Interactions and Group Behavior Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (Note: Moved from K-2). (3-LS2-1)	Cause and Effect Cause and effect identified and explained

Grade: N/A
 Levels: **1.LS1.B** (3-LS2-1); **MS.LS2.A** (3-LS2-1); **MS.LS2.D** (3-LS2-1)
 Connections:

First, intro
content in your
fave way.

{Here's an example}

Next, they'll
come back to
class & we'll
read this book,
looking for
connections
between it and
the video.

99 strange collective animal names

Whether it's a shrewdness of apes or a zeal of zebras, lots of animals have bizarre names when they cluster into crowds.

1st, we'll have a little fun with crazy names for groups of animals.

My advanced learners will read a scholarly article instead.

Why Live in Groups

There are several major disadvantages to living in groups:

1. Greater competition for food, mates, sleeping sites
2. Increase parasite and disease load.

There is an incidental reason why some animals live in groups. E.g., birds don't nest on cliffs because they are attracted by a scarce resource: cliff swallows.

How do individuals benefit by living in groups?

1. **Cooperative food collection.** Wolves hunt together. By doing so each can more easily track and catch a large game. Although the individual has to share meat, each still benefits from group hunting. In primates, hunting is less important. Chimps hunt some but meat is not a major part of their diet. Hunting is important in many human societies, however.
2. **Sleeping together to conserve warmth.** This explains why individuals form groups at night but explain why groups are maintained during the day.
3. **Shared information.** By forming groups, individuals can share information. For example, frugivores let each other know where fruit trees are.
4. **Protection from predators.** There are three reasons why individuals benefit from living in groups: (1) up to a point, the group can detect predators more easily than an individual can. (2) The group can defend itself more effectively than an individual can. (3) The group can protect its young more effectively than an individual can.

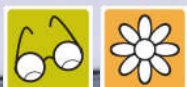
I'll flip the classroom & have them watch this video at home.

Next, the students will create a tree map classifying animals by the reasons they group.

```

graph TD
    Root[ ] --- safety[safety]
    Root --- food[food]
    Root --- social[social]
    safety --- s1[ ]
    safety --- s2[ ]
    safety --- s3[ ]
    food --- f1[ ]
    food --- f2[ ]
    food --- f3[ ]
    social --- soc1[ ]
    social --- soc2[ ]
    social --- soc3[ ]
  
```

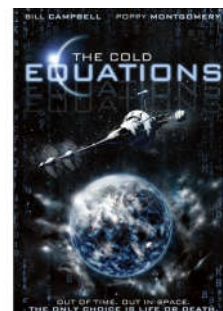

My advanced students will create a persuasive piece (brochure or commercial) encouraging the polar bear to begin living in groups.



IMPLEMENT: ELA

What is the ethical dilemma faced by Barton in *Cold Equations*?

So shallow; go deeper.



And then....enter ETHICS.

Students will debate:



Resolved: It is fair for packs of animals to hunt in order to kill a solitary animal.



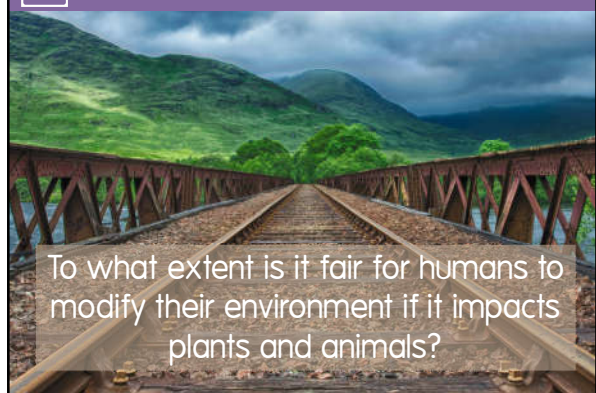
IMPLEMENT: ELA

Find a solution to Barton's ethical dilemma in *Cold Equations*.



IMPLEMENT: social studies

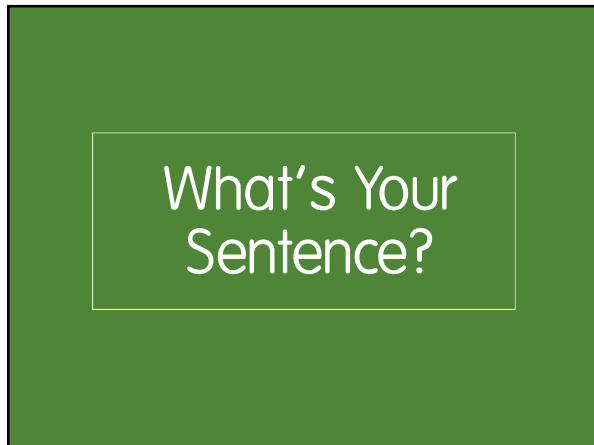
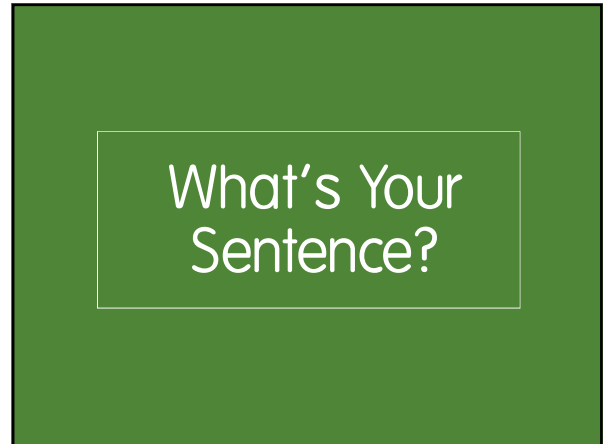
To what extent is it fair for humans to modify their environment if it impacts plants and animals?



IMPLEMENT: ELA

Hold a mock trial for Barton.







- ☐ Lab safety
- ☐ Multiplication
- ☐ Democracy
- ☐ Poetry
- ☐ The treble clef
- ☐ Irregular verbs



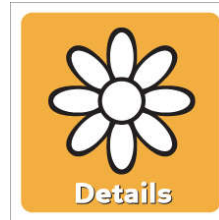
Capture everything you know about something in one sentence.



Can be complicated, even for things that seem simple...and the reverse is also true.

It can get you
into trouble.

**ALWAYS SUPPORT BIG IDEA
WITH DETAILS.**



God is love.
Love is blind.
Stevie Wonder is blind.
Stevie Wonder is God.



iMPLEMENT

Ian's idea...



Lead students to or through Big Idea by integrating with Across Disciplines.

Identify **four** traits of that character. For **two** of the traits, list **two** consequences of that trait. If the consequence is positive, put a + sign next to it.

Pick **one** character from the story.

Thinking of what you just identified and considered, do you think the character's traits were a hindrance or a help to him/her and why?

Big Idea

Across Disciplines

Lead students to or through Big Idea by integrating with Across Disciplines.

RULES of VALUE

Algebra
The value of x on the value of y .
The value of the input on value of output.

Place Value
The value of a number depends on its place.
Digit: 12345
not the same value.

Science
The value of the object depends on the mass.

Measurement
The area of the room/the width and length.
13 area 12.

?? How does the moon affect the tides in the sea?

Big Idea

Across Disciplines

It can be used as a group or whole class activity.

People can use the power of the environment to survive.

Competition for natural resources can lead to conflict between groups of people.

Shifts in power can lead to change.

The rules for gender in a society influence the power people have.

Big Idea

Identifying Theme

Title: Wilfred Gordon MacDonell Partridge - no clues

Significance? The Grumpy Man says I want to be happy.

Character(s) 3 lessons learned: Grumpy, Metaphor.

Theme: Wilfred Gordon MacDonell Partridge - Grumpy & Metaphor.

Details Converge to reveal theme.

Literary Devices: Symbolism, Irony.

Time/Place: Grumpy & Metaphor.

Big Idea

Lead students to or through Big Idea by integrating with Across Disciplines.

RULES of VALUE

Algebra
The input depends on the output.

Place Value
In rounding the first number depends on the number in front of them.
1,235

Science
The human body (long work) depends on the human body's nerves and bones.

Measurement
The amount of inches on a ruler depend from a ruler or is it.

Big Idea

Across Disciplines

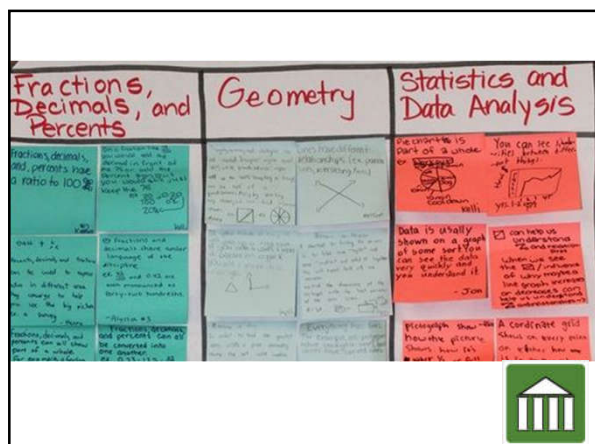
Examining Relationships to See % and Relationships

Fractions, Decimals, and Percents

Geometry

Statistics and Data Analysis

Big Idea



IMPLEMENT: Middle Math (8th)

Why can't these systems of linear equations be solved?
(eyes & brains only)

$$3x + 2y = 5 \text{ and } 3x + 2y = 6$$

$$2x + 6y = 12 \text{ and } 2x + 6y = 10$$



IMPLEMENT: Elementary Math

Ian's example...

Ask students to group up (or **work solo**). Give them these examples:

- $5^2 = 25$
- $4^2 = 16$
- $3^2 = 9$

Ask them to determine the job of that *incredible flying two*.



IMPLEMENT: Middle Math (8th)

Can these be solved?

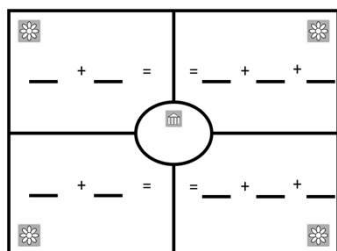
$$3x + 2y = 5 \text{ and } 3x + 2y = 6$$

$$2x + 6y = 12 \text{ and } 2x + 6y = 10$$



IMPLEMENT: Elementary Math

Lisa's example...



Differentiate it (need support):

Big Idea: Some _____
can be _____ through
_____ and don't
need to be calculated.

Word Bank:
solved inspection problems



Differentiate it (advanced):

Which of the two Big Ideas below have the most application to other math problems as well?



Some problems can be solved by inspection and don't need calculation.



Variables must have unique values in a system of equations.

IMPLEMENT: Science

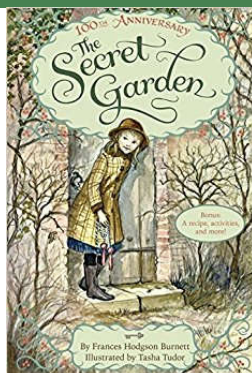
Option 1: The teacher can give students the Big Idea and ask them to support it.



Support with  Ethics and  Change Over Time the Big Idea that recycling shows respect for other people.

IMPLEMENT: Elementary ELA

What can you say about the importance of outdoor spaces based on this book alone?



IMPLEMENT: Social Studies

Option 2: The teacher can ask students to generate Big Ideas.



What are three possible Big Ideas of the Indian way of life?



What is the Big Idea of the US Constitution?

IMPLEMENT: Elementary ELA



What other texts have we read this year that have the same or similar Big Idea?



IMPLEMENT: Science

Option 1: The teacher can give students the Big Idea and ask them to support it.



Support with  Details and  Patterns the Big Idea that a change in the environment that causes one organism to thrive may cause another to perish.

IMPLEMENT: ELA

An item that was really important to _____ was _____ because _____

Another way to solve the problem of _____ might have been to _____

By the end of the story, _____ learned that _____

It seemed unfair that _____



Titanic WAS NOT sunk by Iceberg – new evidence suggests shock theory to disaster

THE Titanic was NOT sunk after striking an iceberg. It has sensationally been claimed more than a century since the ship disaster.

By **SEAN MARTIN**
PUBLISHED: 04:12, Wed, Jan 4, 2017 | UPDATED: 07:40, Wed, Jan 4, 2017

SHARE **f** **TWEET** **G+** **✉** **2K** **103**

Titanic NOT sunk by iceberg documentary claims **< Share**



Millennium Problems

Yang-Mills and Mass Gap
Experiment and computer simulations suggest the existence of a "mass gap" in the solution to the quantum versions of the Yang-Mills equations. But no proof of this property is known.

Riemann Hypothesis
The prime number theorem determines the average distribution of the primes. The Riemann hypothesis tells us about the deviation from the average. Formulated in Riemann's 1859 paper, it asserts that all the "non-obvious" zeros of the zeta function are complex numbers with real part 1/2.

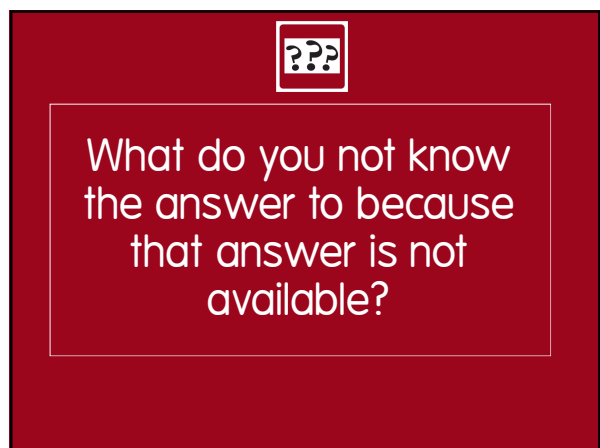
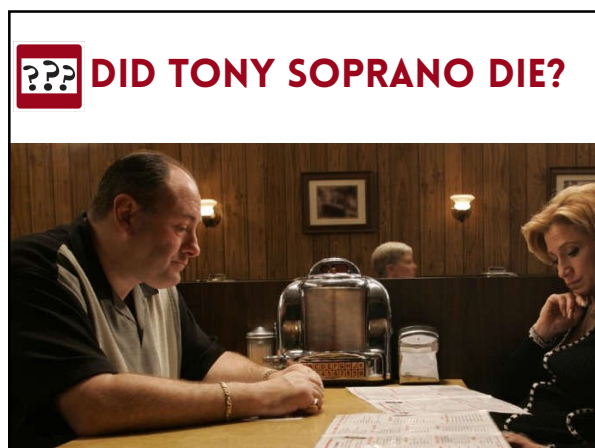
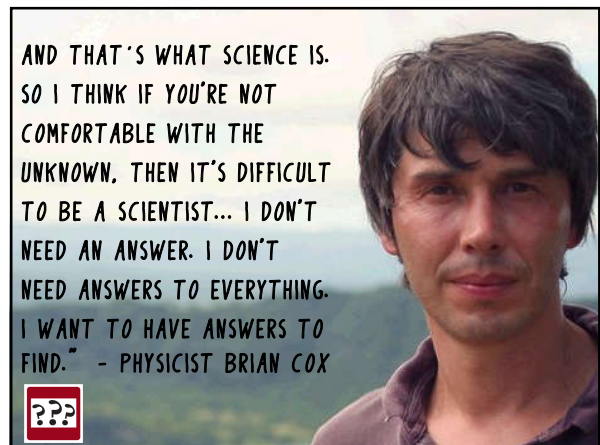
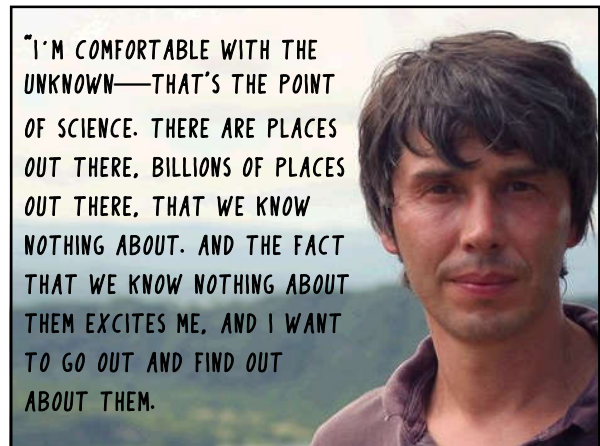
P vs NP Problem
If it is easy to check that a solution to a problem is correct, is it also easy to solve the problem? This is the essence of the P vs NP question. Typical of the NP problems is that of the Hamiltonian Path Problem: given n cities to visit, how can one do this without visiting a city twice? If you give me a solution, I can easily check that it is correct. But I cannot so easily find a solution.

Navier-Stokes Equation
This is the equation which governs the flow of fluids such as water and air. However, there is no proof for the most basic questions one can ask: do solutions exist, and are they unique? Why ask for a proof? Because a proof gives not only certitude, but also understanding.

Hodge Conjecture
The answer to this conjecture determines how much of the topology of the solution set of a system of algebraic equations can be defined in terms of further algebraic equations. The Hodge conjecture is known in certain special cases, e.g., when the solution set has dimension less than four. But in dimension four it is unknown.

Poincaré Conjecture
In 1904 the French mathematician Henri Poincaré asked if the three dimensional sphere is characterized as the unique simply connected three manifold. This question, the Poincaré conjecture, was a special case of Thurston's geometrization conjecture. Perelman's proof tells us that every three manifold is built from a set of standard pieces, each with one of eight well understood geometries.

Birch and Swinnerton-Dyer Conjecture
Supported by much experimental evidence, this conjecture relates the number of points on an elliptic curve mod p to the rank of the group of





What is something you do not know the answer to but you could find with currently available knowledge?

UNANSWERED QUESTIONS



What is something you know, but other people disagree with you about?

Unanswered Questions

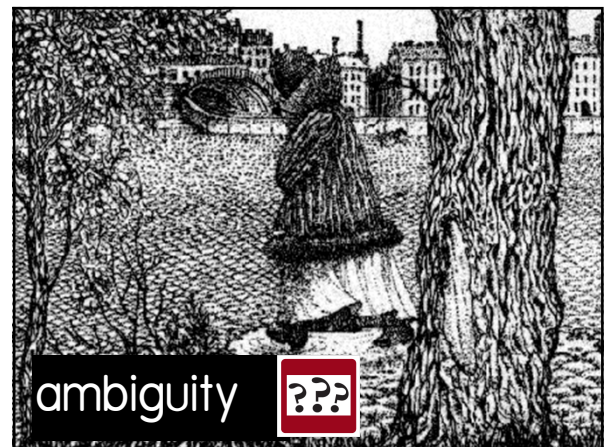
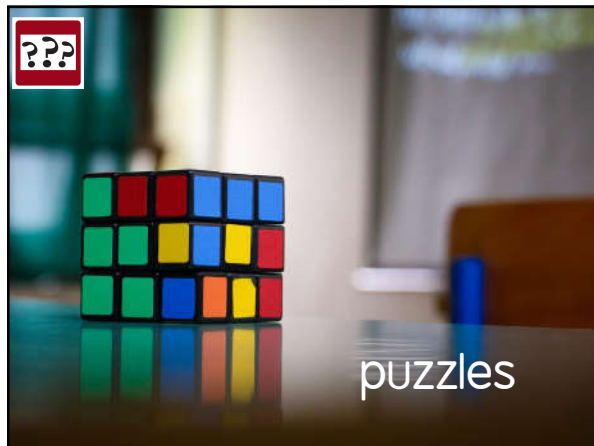


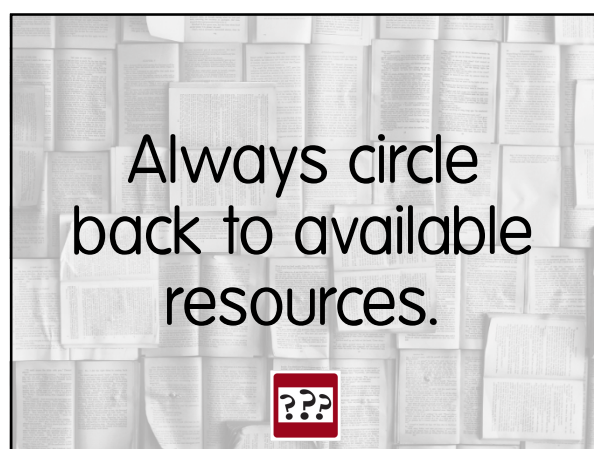
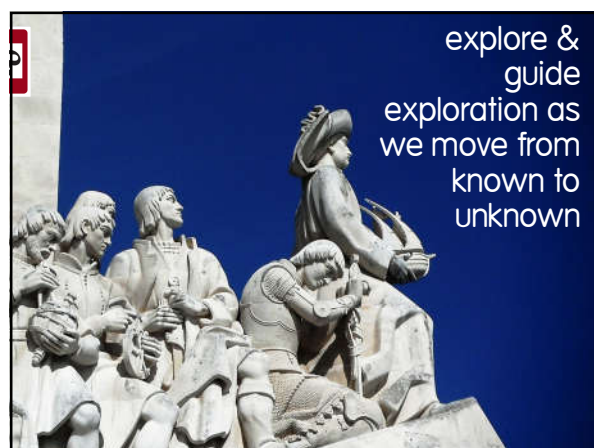
Dice Game

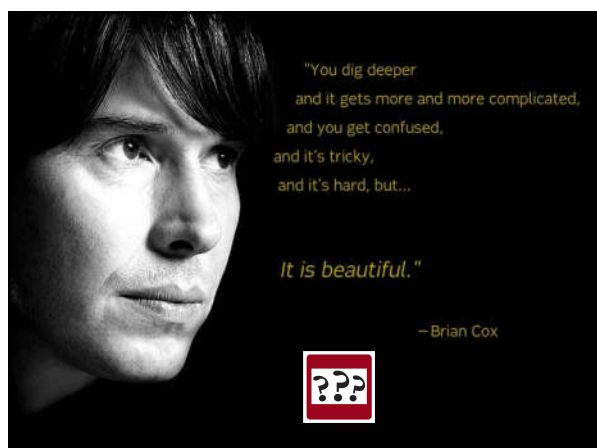


- Share an unanswerable question.
- What is your go-to answer source?
- What is something you think that people sometimes disagree with you about?
- What do you think happened to Amelia?
- What is something your students often think is right that is actually wrong?
- What something parents often think is correct that is actually inaccurate?









???

IMPLEMENT: Elementary SS

Mid Level:
Compare the unanswered questions that guided L&C with those that guided another explorer.

What would happen if a number line were not a straight line?

???

Unanswered Questions

Create a visual representation of real numbers that is not a straight line.

What are the advantages and disadvantages of your representation?

-5 -4 -3 -2 -1 0 1 2 3 4 5

???

IMPLEMENT: Elementary SS

High Level:
Should Lewis be considered a failure for not finding something that did not exist?

???

IMPLEMENT: Elementary SS

Low Level :
What unanswered questions guided the Corps of Discovery?

???

IMPLEMENT: Elementary SS

High Level:
What evidence exists that there was another presidential agenda?



DISCOVERING Lewis & Clark

Home → The Nation Home → Nathaniel Pyle's Mission

Participate

Questions for Consideration

by Robert Hunt, Seattle, Washington

Concerning Lewis's mission and orders, it is true enough to say, as Jefferson himself did, rather sordidly in a special context, that the mission was "single"—"the direct water communication from sea to sea." But, despite this statement and the liberal terms of Jefferson's instructions, should the matter be left at that?

Was Lewis's task solely, even primarily, to find a Northwest Passage? Or the shortest route for commerce? Can he be faulted, or his mission considered a failure, for not finding something which did not exist? And was Jefferson's overriding premise "wrong," or his "rationale for the entire expedition . . . inherently flawed" on that account? Must not the surrounding historical and political circumstances of the Expedition come into focus here?

One turns to related documents for references about the mission. For example, the background for the British passport: the British Chargé d'affaires, Edward Thornton, noted in his report that the "ostensible object" of the voyage was "extending the

Remember: direct to quality resources

More questions:

Concerning the risk of dividing the party into smaller "defensible units," one recalls that the original concept of the Corps was for a body of not more than 8 or 10 men. In that light, was the Expedition "indefensible" at the outset? Jefferson himself felt that "such numbers will be sufficient to secure . . . against opposition of individuals or of small parties," but, with due admonishment for safety's sake, left to Lewis's discretion "the degree of danger" to be risked knowing full well that, as Lincoln had commented, "Capt. Lewis . . . will be much more likely, in case of difficulty, to push too far, than to


IMPLEMENT: math

How could the government pay for things if we didn't have taxes? Consider the fairness of your idea.



Go to www.menti.com and use the code 24 80 78

Which thing in the picture is the most important thing to Bud?




IMPLEMENT: science

If moons serve an important purpose, why don't all planets have them? Would you rather live on a planet with zero, one, or many moons?



Go to www.menti.com and use the code 24 80 78

Which thing in the picture is the most important thing to Bud?



Option 1 Option 2 Option 3



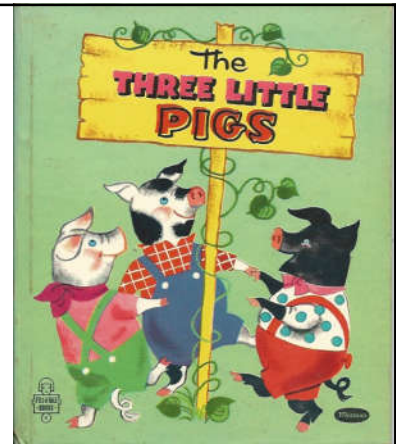
How does using a graph clarify this problem?



What new questions does the solving of this problem create?

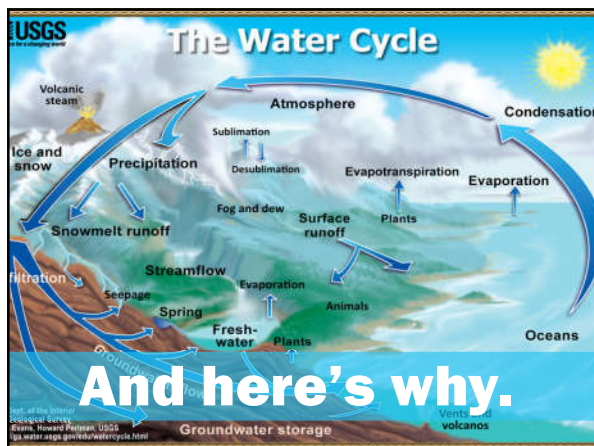
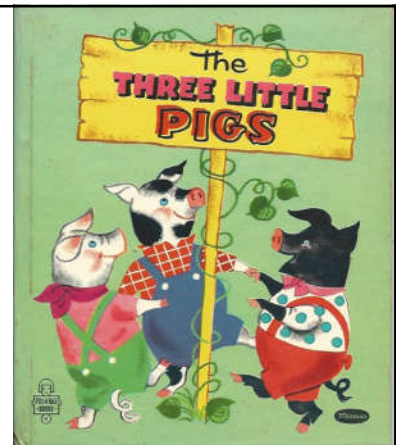


Little pig,
little pig,
Let ___ ___!

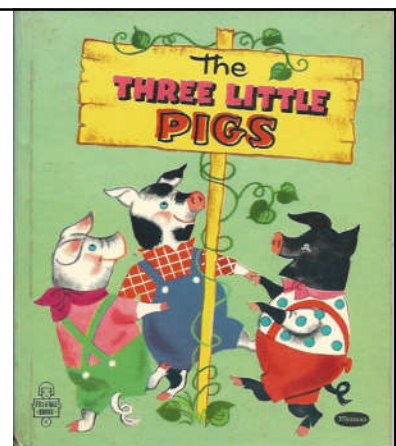


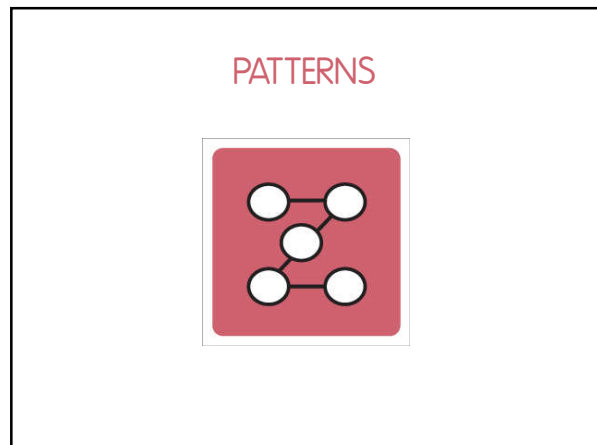
Not by
the ____

____!



Or I'll
huff and
I'll puff
and I'll
[insert
threat].



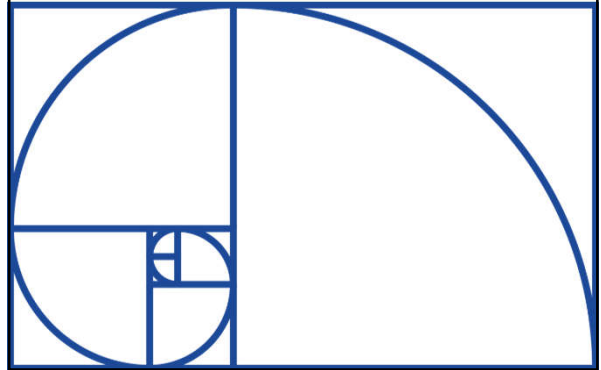


AGREE/DISAGREE:

If you see repetition, look for a pattern.



Patterns occur in all domains.

**AGREE/DISAGREE:**

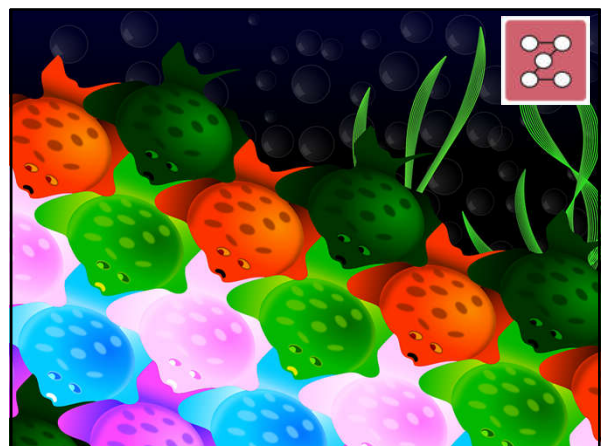
Patterns cannot be man-made. They can only be natural.

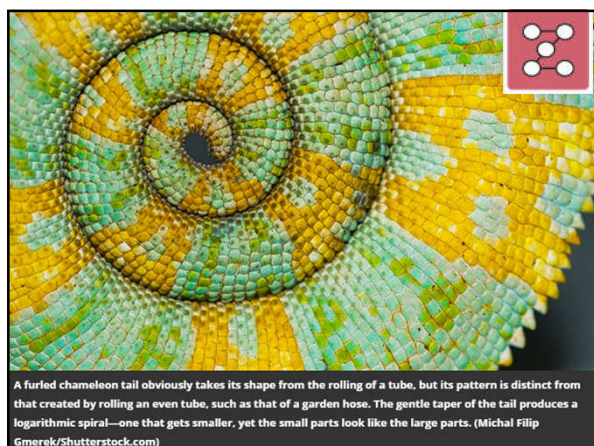



conflict — war — peace
[optional step: seeds of next war]

AGREE/DISAGREE:

A recurring element could be considered a pattern.




LH PATTERNS FOR THE 12-BAR BLUES


WHOLE NOTES

C F G

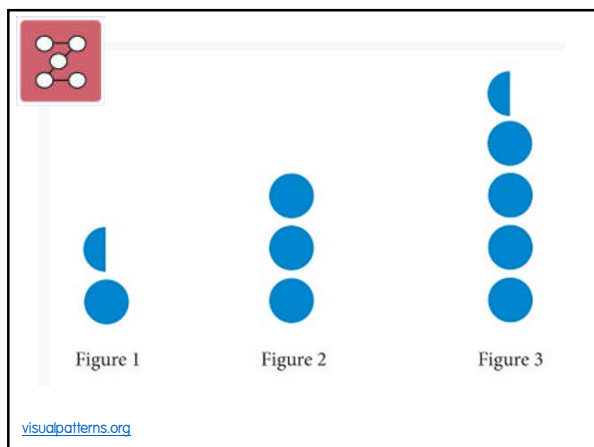


BLOCKED 8THS & 6THS

C F G

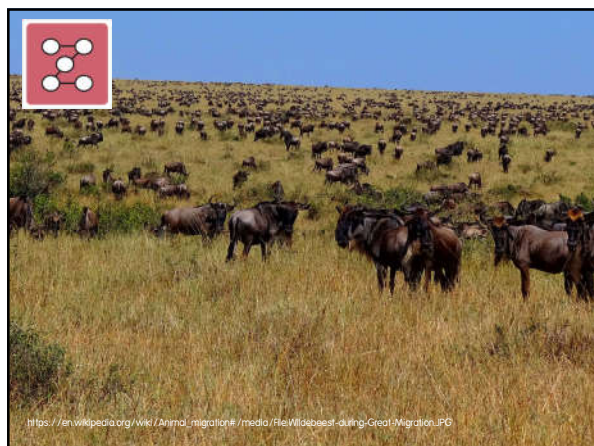


<http://colorinmypiano.com>



What is a pattern in your discipline?

[stand when you can think of one]




Could you ask them to

DESCRIBE THE PATTERN?



Could you ask them to

EVALUATE THE PATTERN'S IMPORTANCE?




Could you ask them to

RECOGNIZE WHEN/WHERE A PATTERN BREAKS?




Could you ask them to

COMPARE THE PATTERN TO ANOTHER PATTERN?




Could you ask them to

SEE THE PATTERN OUT OF SEQUENCE AND FIX IT?



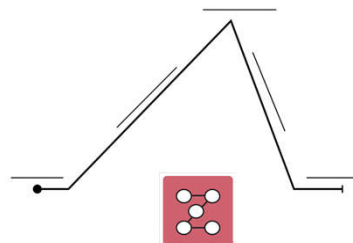
Could you ask them to

IDENTIFY PRIMARY AND SECONDARY PATTERNS?



IMPLEMENT: ELA







Outline the plot of your story.



IMPLEMENT: Math

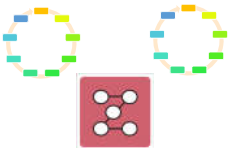
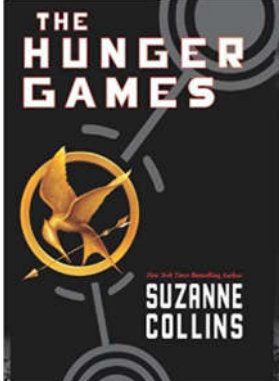
How does this pattern allow you solve the problem?

Multiplication Arrays
Directions: Circle the problem shown by the array.

 $4 \times 5 = 20$ $5 \times 3 = 15$ $4 \times 6 = 24$	 $5 \times 7 = 35$ $7 \times 7 = 49$ $5 \times 7 = 35$
 $6 \times 3 = 18$ $6 \times 5 = 30$ $4 \times 6 = 24$	 $4 \times 5 = 20$ $5 \times 5 = 25$ $5 \times 5 = 25$
 $8 \times 2 = 16$ $9 \times 2 = 18$ $9 \times 2 = 18$	 $4 \times 7 = 28$ $8 \times 4 = 32$ $4 \times 8 = 32$

IMPLEMENT: ELA

Differentiate It:
Compare and contrast the heroic journey of Katniss with that of Theseus.

IMPLEMENT: Social Studies



Trace the progress of European colonization in America.

```

graph LR
    A[1565 founding of St. Augustine] --> B[ ]
    B --> C[ ]
    C --> D[ ]
    D --> E[ ]
    E --> F[ ]
    F --> G[ ]
    G --> H[ ]
    H --> I[ ]
    
```

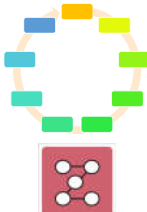
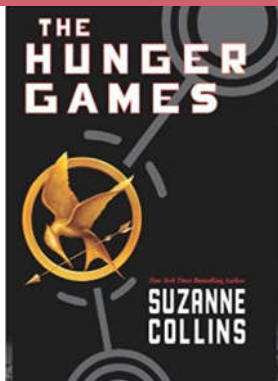
IMPLEMENT: Middle School ELA

Create an image essay illustrating the archetypes found in *The Outsiders*.



IMPLEMENT: ELA

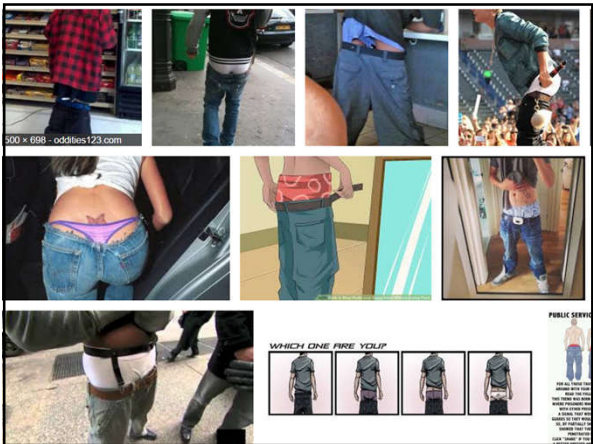
How does / does not Katniss follow the pattern of the heroic archetype?

IMPLEMENT: Middle School ELA

Differentiate it:
Create an image essay contrasting the archetypes found in *The Outsiders* to those found in *A Wrinkle in Time*.



TRENDS

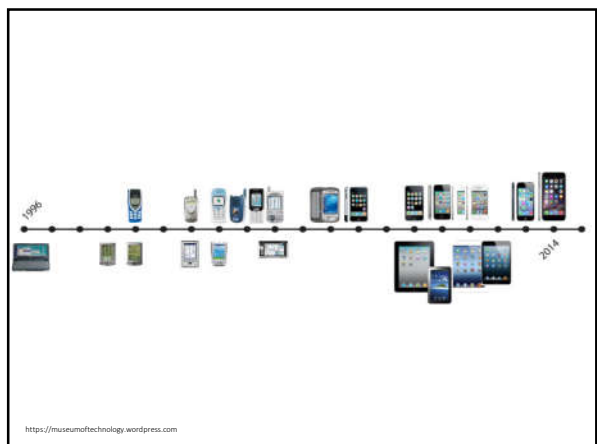
Cause & Effect

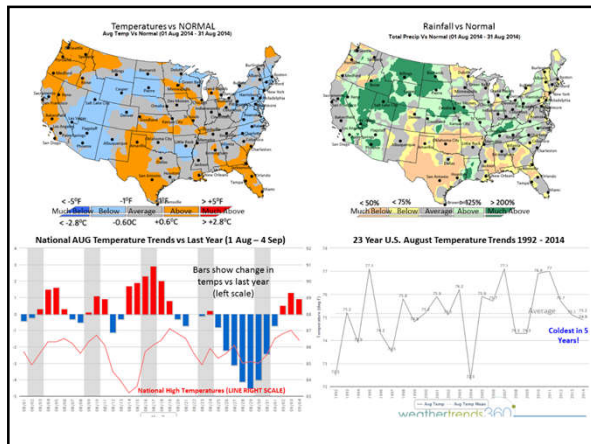
a general direction in which something is developing or changing

TRENDS



influences that affect change

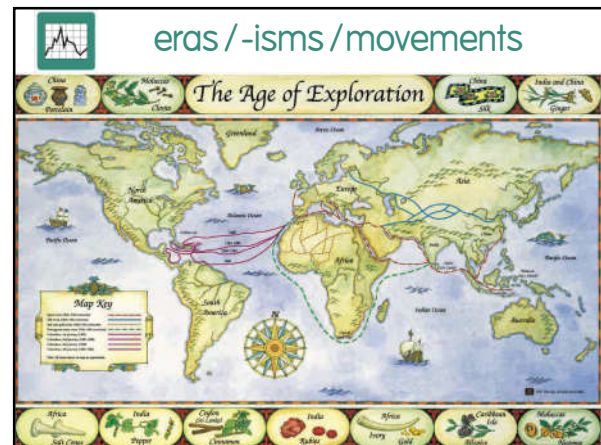




Some disciplines
are a natural fit.



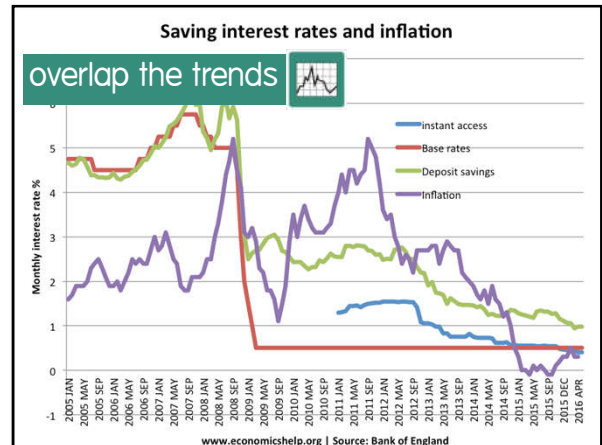
brookingsinstitute.edu


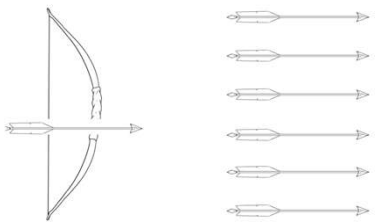


Trends exist in
every industry and
content domain.

Look for causes of the trend &
factors influencing the trend.






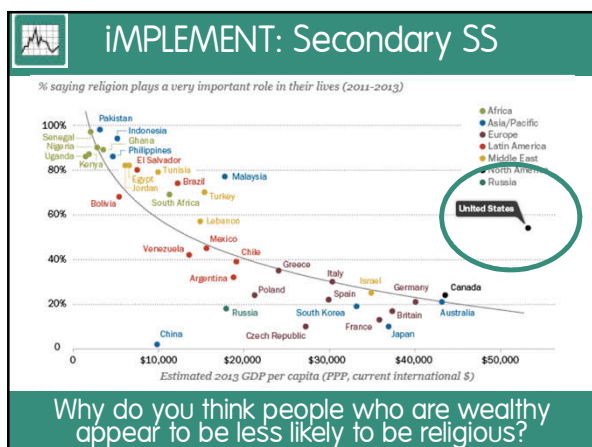
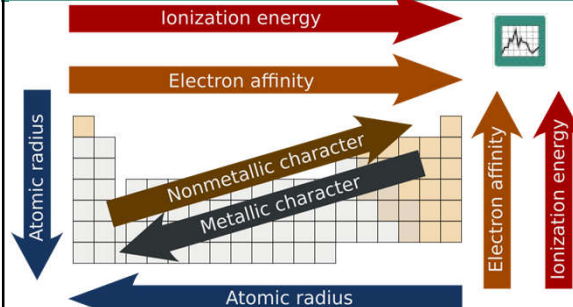
Some events have multiple consequences. On the bow, identify a cause. On the arrows, list consequences of that cause/action.

IMPLEMENT: ELA



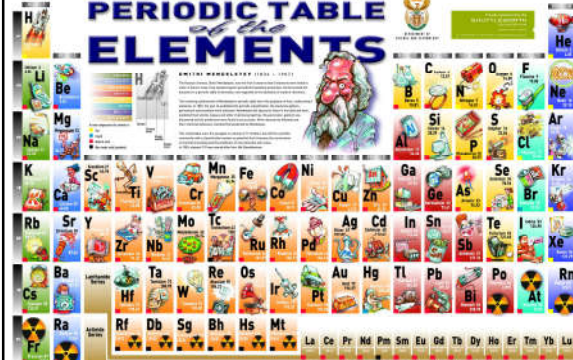
IMPLEMENT: ELA

Evaluate the political, social, and economic factors that influenced Esperanza's journey. Which had the greatest impact on her and her family? Which had the least? Which affect you?

IMPLEMENT: Middle School Science

Questions? Activities? Products?

PERIODIC TABLE of the ELEMENTS

Can you find a correlation between those trends and uses?

iMPLEMENT: Social Studies

Analyze the way the trends in British rule of the Colonies led to the American Revolution.



iMPLEMENT: Science

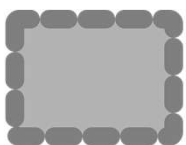
Predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways.



OVER TIME

iMPLEMENT: Math

Describe the trend toward larger or smaller denominators when you divide fractions.



THINK OF AN
OBSOLETE PROBLEM.

THINK OF A NEW
PROBLEM.

SHAKESPEARE

OVER TIME



JEFFERSON

GALILEO

Viceroy
FILTER
the Smoke!

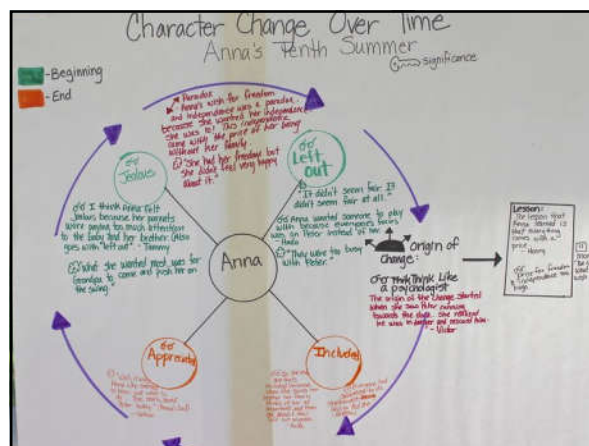
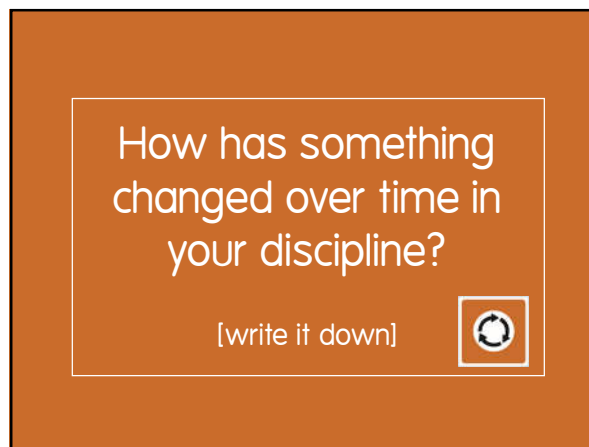
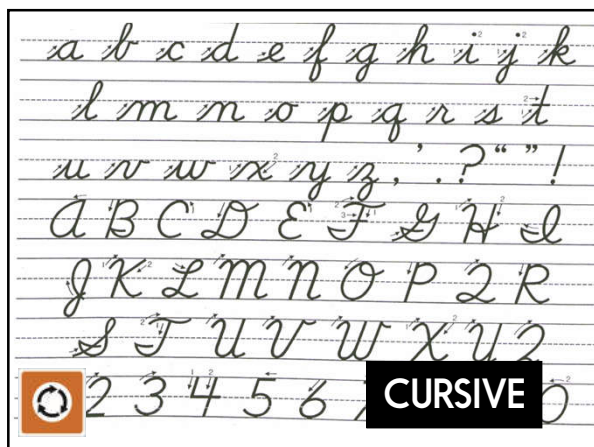
As your Dentist,
I would recommend

SMOKING



$$\begin{array}{r} 36 \\ \times 24 \\ \hline 144 \\ + 720 \\ \hline 864 \end{array}$$

MULTIPLICATION





How would your teacher last year have explained this?



Do you think this will become more or less important to you over time?



How different do you think this is from when your parents learned it?



When do you think you'll use this again in your future?

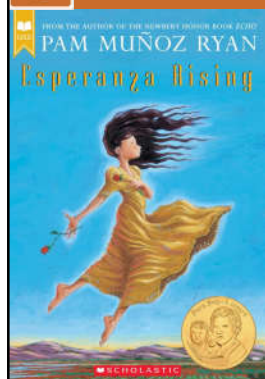


IMPLEMENT: Social Studies

Identify and explain how changes resulting from the Industrial Revolution led to conflict among sections of the United States.



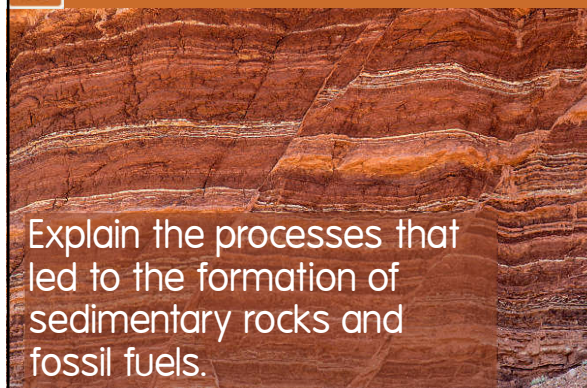
IMPLEMENT: ELA



How would Esperanza's story have been different had it happened during World War II or the current day versus during the Great Depression?



IMPLEMENT: Science

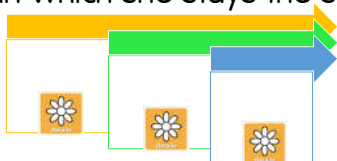


Explain the processes that led to the formation of sedimentary rocks and fossil fuels.



IMPLEMENT: ELA

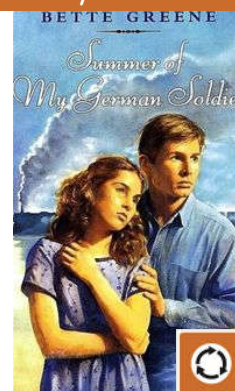
Trace the changes in Esperanza's character over the course of the novel. Identify ways in which she changes and ways in which she stays the same.



Support your claim that she is either a static or dynamic character.

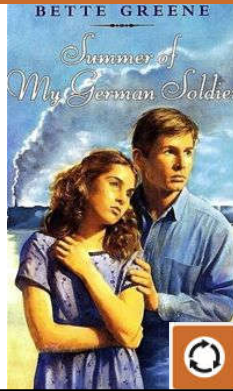
IMPLEMENT: Secondary ELA

Use the Thinking Map of your choice to compare and contrast a character as he/she changes from the beginning of the novel to the end.



IMPLEMENT: Secondary ELA

Imagine that there were a sequel written. What conflict might exist at the beginning of the sequel? Design a movie poster that uses a one-line slogan highlighting that conflict.



What is similar between this slide and the next one?

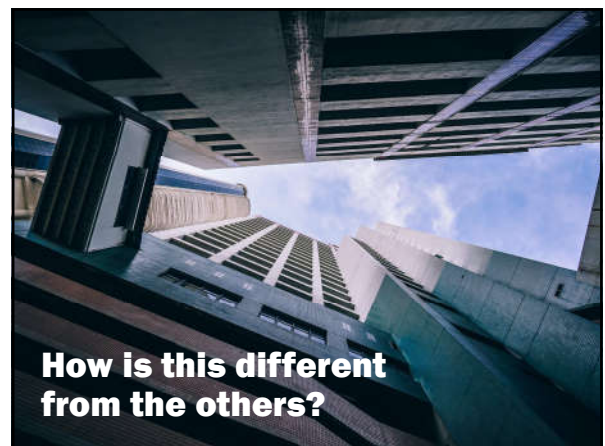


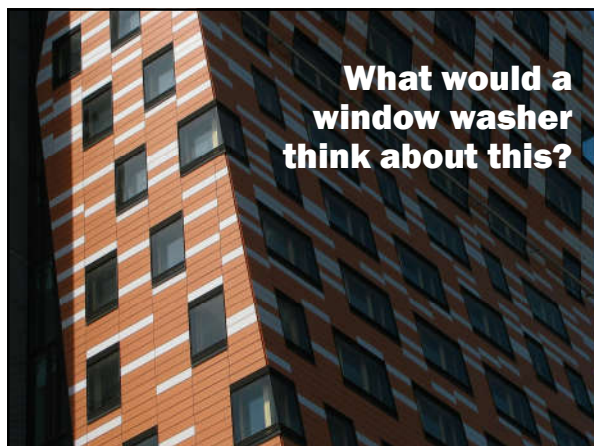
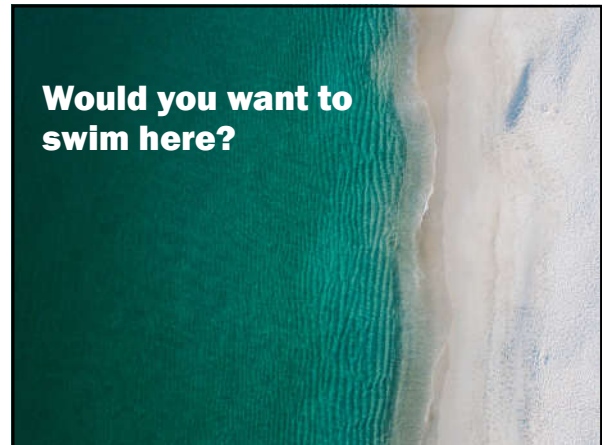
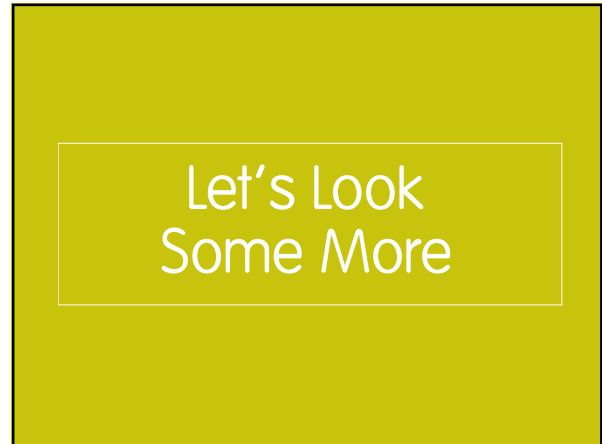
Similarities?

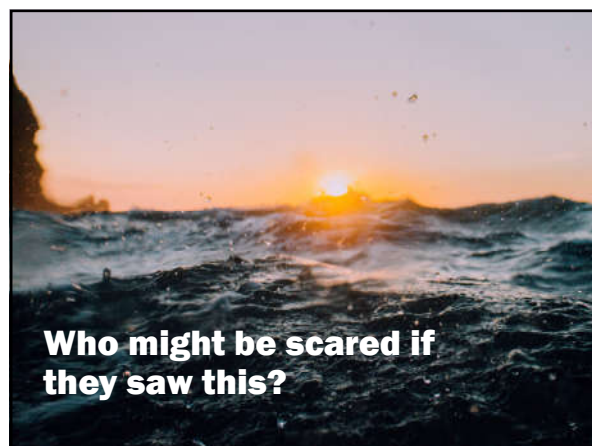


Let's Look

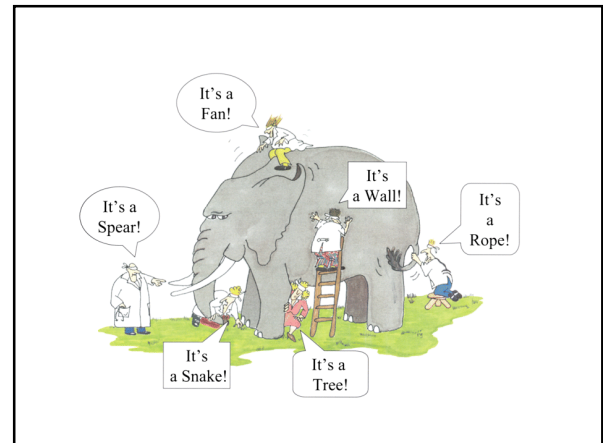
How is this different from the others?





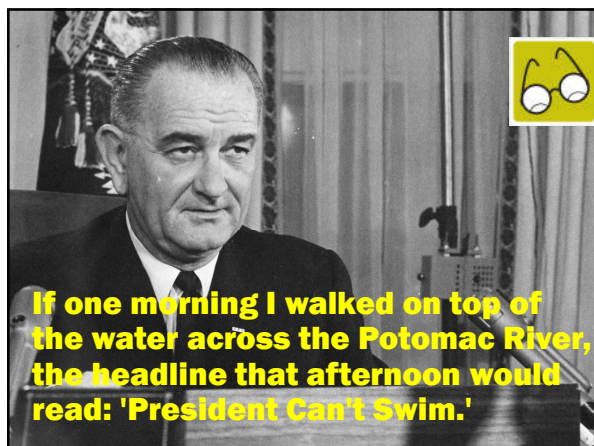
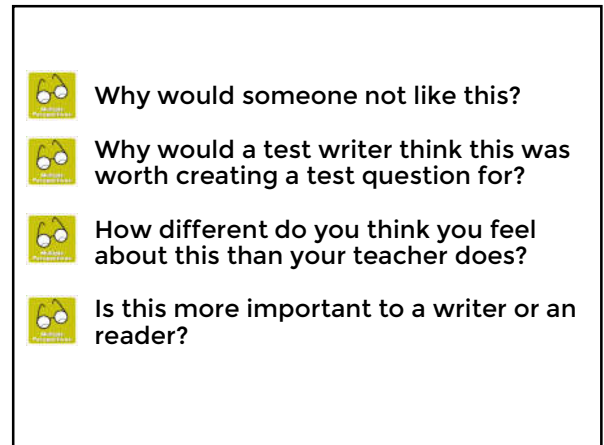
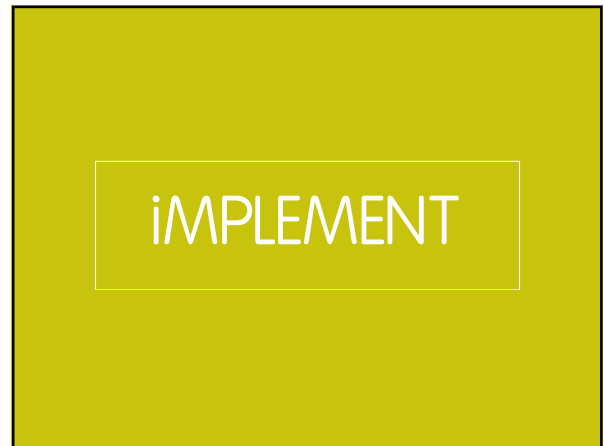


Perspective is an art technique for creating an **illusion of three dimensions (depth and space) on a two-dimensional (flat) surface.**



<https://www.mrwordpress.com/tag/3d-street-art/>

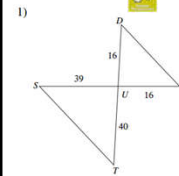




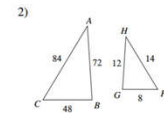
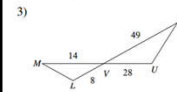
Debate: Because of gravity, planets with large masses are bossier than planets with a smaller mass.



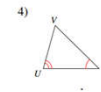
State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.



$\triangle UTS \sim$ _____



$\triangle CBA \sim$ _____



How would a landscape architect use this?

IMPLEMENT: Secondary Math

The concepts of congruence, similarity, and symmetry can be understood from the perspective of geometric transformation. Fundamental are the rigid motions: translations, rotations, reflections, and combinations of these, all of which are here assumed to preserve distance and angles (and therefore shapes generally). Reflections and rotations each explain a particular type of symmetry, and the symmetries of an object offer insight into its attributes—as when the reflective symmetry of an isosceles triangle assures that its base angles are congruent.

Perspective is a central tenet of geometry.

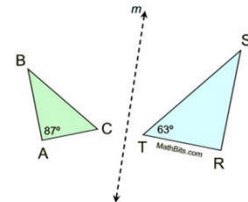


7. $\triangle RST$ was dilated and then reflected over line m to create image $\triangle ABC$.

a) Which angle in the image is 63° ?

Choose:

- ☐ $\angle C$ ☐ $\angle S$
☐ $\angle B$ ☐ $\angle R$



What words would a five-year-old use to describe this?

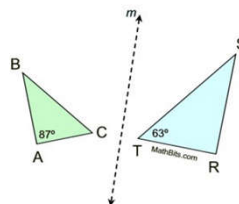


7. $\triangle RST$ was dilated and then reflected over line m to create image $\triangle ABC$.

a) Which angle in the image is 63° ?

Choose:

- ☐ $\angle C$ ☐ $\angle S$
☐ $\angle B$ ☐ $\angle R$



You can be very simplistic, but please don't stop there.

Things can be very different from each other, and yet be similar in very important ways.



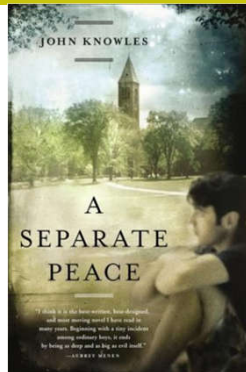
+



IMPLEMENT: Secondary ELA



Analyze two conflicts in the story from the perspectives of Finny and Gene.



IMPLEMENT: Physical Education



Describe the rules of baseball from the perspective of the ball.



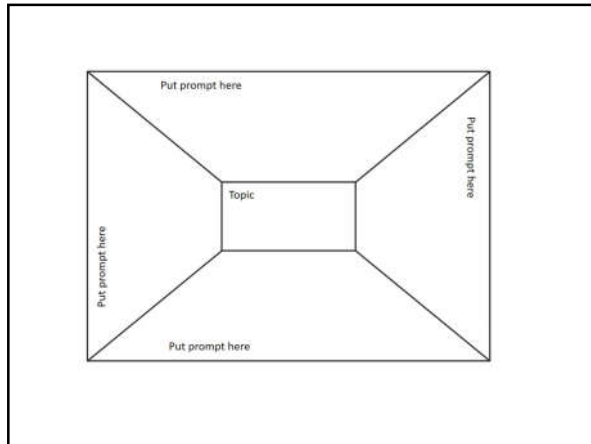
	<p>FOREST FIRE animals & vegetation</p>	

	Who is most hoping the batter will swing on a 3-2 count?
	Is an 0-2 count desirable?

	<p>FOREST FIRE vegetation & Forest Service</p>	

What rules have been enacted because of the Forest Service's perspective with regards to forest fires?

Activity Break:
Let's Learn about
FRAMES!



Close Reading with Icons of Depth and Complexity

The Gettysburg Address

Four years and seven months ago, on this spot, we gathered to consecrate a portion of this land as a national cemetery for those who died here in the great battle of Gettysburg. It is a fitting thing to do, and it is a fitting thing to say.

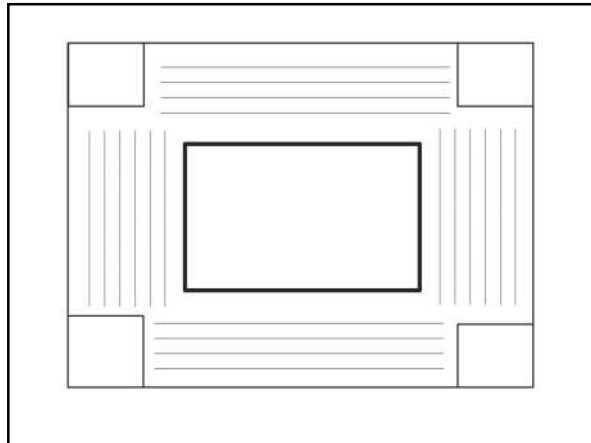
Handwritten notes: "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was".

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- Read through entire and record unknown words.
- Determine the unknown words using resources.
- Read through again and record unanswered questions.
- Determine answers to unanswered questions using resources.
- Read through a 3rd time and generate a Big Idea for the passage.



affective domain

A collage of photos showing students' work on the "We've Been Framed!" project, including a large display board and individual student photos.

content in the center

The Gettysburg Address

Four years and seven months ago, on this spot, we gathered to consecrate a portion of this land as a national cemetery for those who died here in the great battle of Gettysburg. It is a fitting thing to do, and it is a fitting thing to say.

Handwritten notes: "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was".

The Preamble

We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

Handwritten notes: "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was".

give one as an example

Distributive Property

In what way is the Distributive Property different in Prepositional Logic?

Handwritten notes: "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was".

Who deserves credit for "inventing" the Distributive Property?

Handwritten notes: "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was", "I wonder if it is worth the day", "I wonder how it was".

Multiplication of ordinal numbers is only right distributive, not left distributive.

give one as an example

It means basically "it works for."
"Over" is an appropriate preposition because it demonstrates a hierarchy almost like the Order of Operations.

In Propositional Logic, it refers to two specific laws of replacement. In math, it applies to all real numbers.

Distributive Property

Fix this rule.

Multiplication of ordinal numbers is only LEFT distributive, not RIGHT distributive.

Since it's always existed, no one really invented it, but you could give credit for exploration/description to mathematicians in the early to mid 1850s.

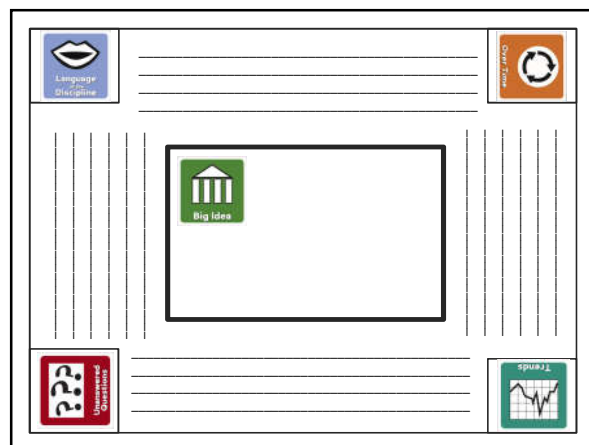
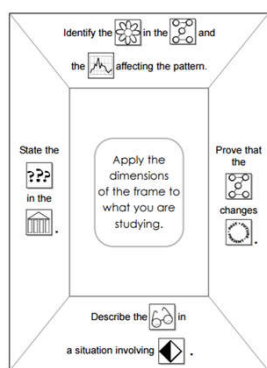
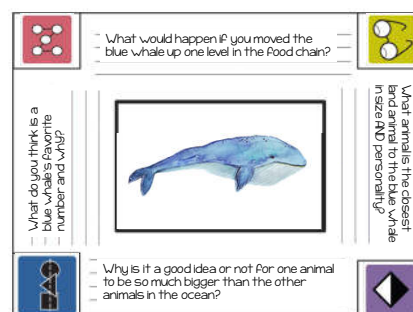
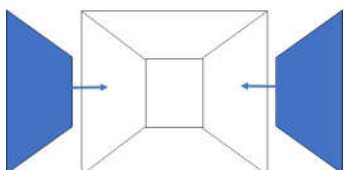
what not to do: only taking it halfway

<http://teach2learncoach.blogspot.com/2016/07/using-depth-and-complexity-frames-in.html>

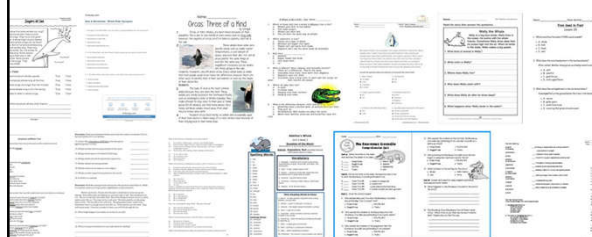
are we using elements...or not????

<http://teach2learncoach.blogspot.com/2016/07/using-depth-and-complexity-frames-in.html>

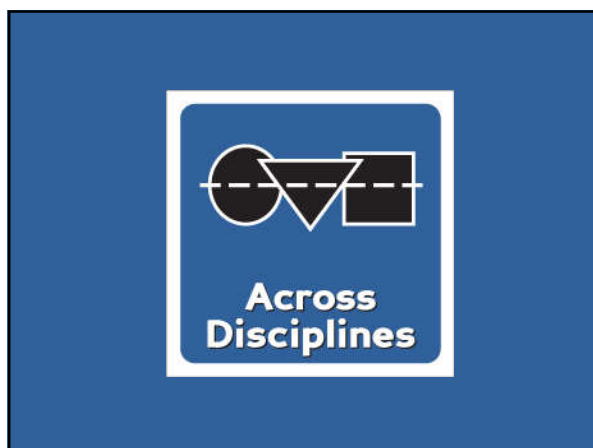
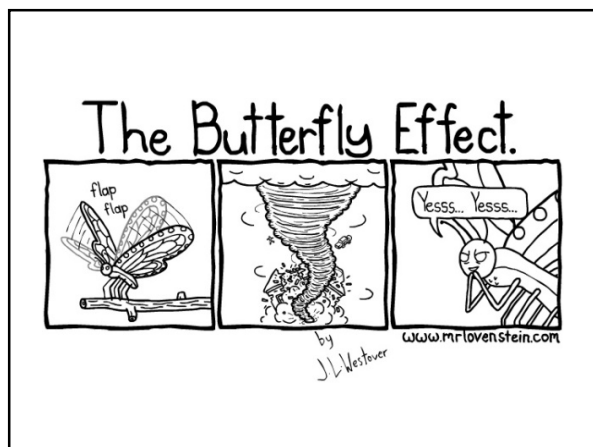
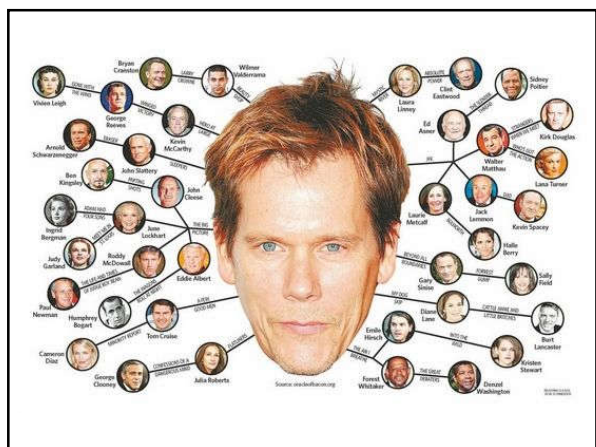
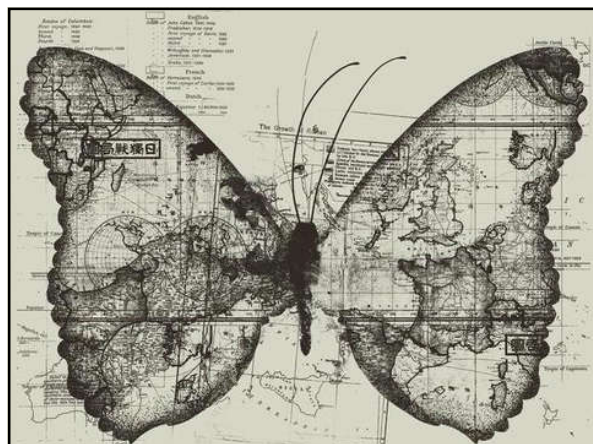
Break Apart Strategy- Give each group 2 copies of the frame. Have them cut one into the different sections and keep one for the final product.



Instead of this, how about...



- Which academic vocabulary words are your students most likely to confuse or misunderstand?
- What is the most important change that needs to occur in your students over the course of the year?
- Identify a positive trend in your teaching skill or style.
- What is something that other teachers misunderstand about your content or grade level?



This is more than just
language arts + history.



Which topic most relates to the
concept of standard deviation?

- Intelligence?
- Baseball?
- Height?
- Elections?

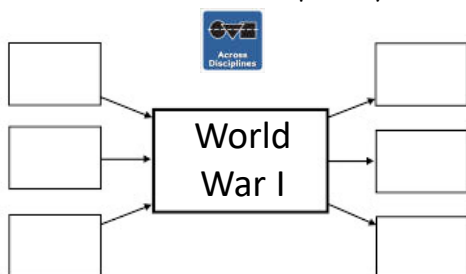


iMPLEMENT

Take the one you
selected and gather
two credible sources to
prepare to defend it in
a Socratic Seminar.

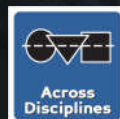


Create a multi-flow map, showing
the way that World War 1 connects
with science, math, and poetry.



iMPLEMENT: Secondary PE

Across the Disciplines of Math,
Photography, Art, Speech, Social
Studies, and Physics



iMPLEMENT: Secondary PE



Photography students will videotape PE students throwing the discus.

iMPLEMENT: Secondary PE



PE students will attempt to adjust the angle of throw to improve distance.

iMPLEMENT: Secondary PE



Math students will analyze the data of the angle of the throws and correlate angle to distance.

iMPLEMENT: Secondary PE



Art students will draw the throwing of the discus, focusing on the muscles and tendons identified by the biology students.

iMPLEMENT: Secondary PE

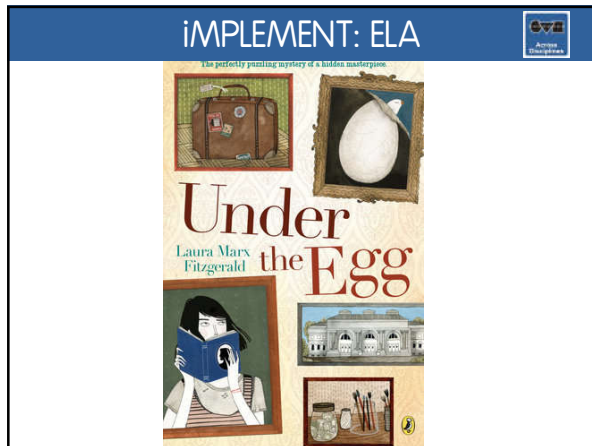


Biology students will analyze the video to identify muscles and tendons that bear the greatest burden in the throwing.


iMPLEMENT: Secondary PE



DIFFERENTIATE IT:
Advanced students in all disciplines will create a display that will be in the library called "Discus: The Art & Science of the Throw"



iMPLEMENT: ELA




Turn the "School of Athens" into flap art citing

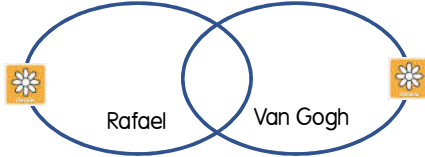
- FOUR references from the novel
- THREE artistic techniques





iMPLEMENT: ELA



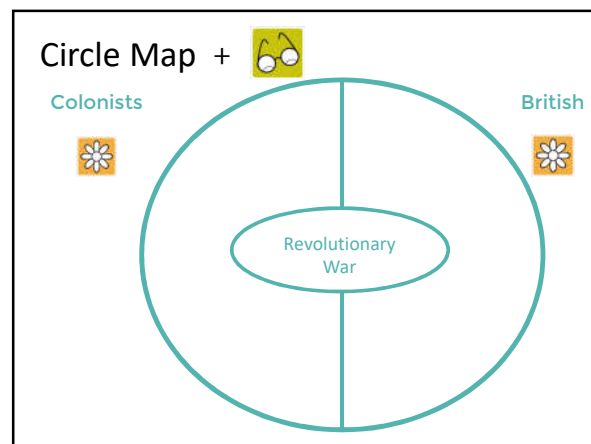
Compare the self-portrait of Rafael to the one of Van Gogh using what you've learned about art from the novel.







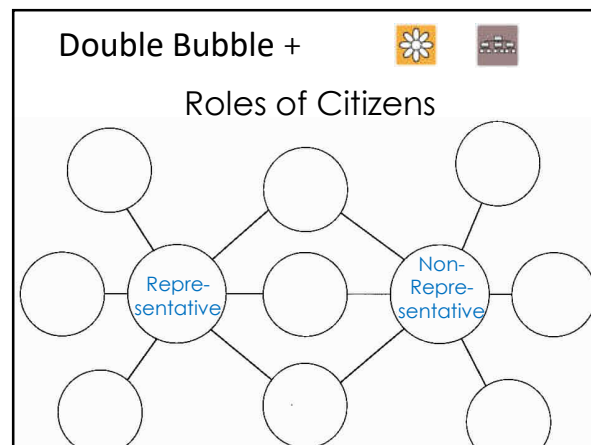
How would a Renaissance painter view Van Gogh's work?

Algorithm		Model	
 Explain		 Work it Out	
<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>		<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	

MS Bove 2015



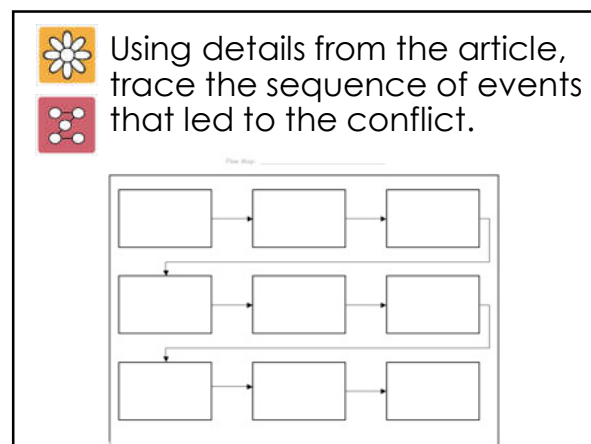
Algorithm	Model
 <pre> 45 76 134 1 - 204 ----- 130 - 81 ----- 49 </pre>	
 Explain	 Work it Out
<p>First I estimated 76 to 80. Then I figured out that 80 goes into 344 4 times. Then I put 4 in the tens place. Next I did $4 \times 76 = 304$ then I did $344 - 304 = 40$. Next I pulled down the 1 to get 401. Next I did $76 \times 5 = 380$ and I put 5 in the ones place. Finally I did $401 - 380 = 21$ to get my remainder 21.</p>	<pre> 344 - 304 ----- 40 - 38 ----- 21 </pre>



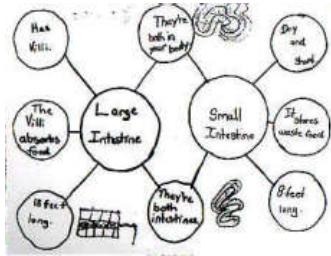
Which one does not belong?



NATO	Treaty of Versailles
Truman Doctrine	Marshall Plan

What are the similarities between this and pre-WWI US policy?




Double Bubble +

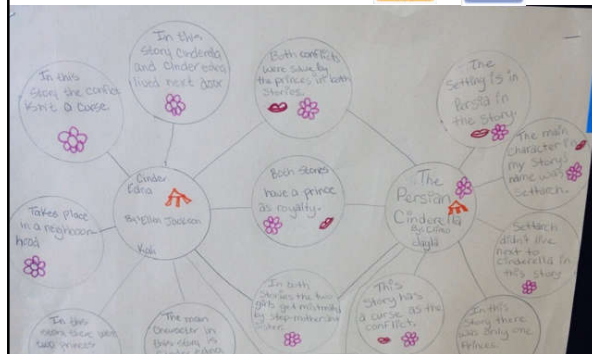


Using  details from the story, show the  patterns of the relationships between the characters.



 Analyze those patterns to determine what they say about the difference between the bonds of friendship and family.

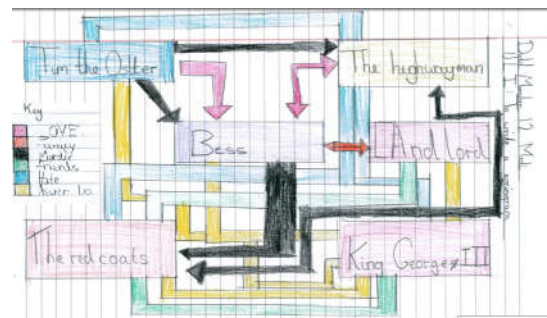
Double Bubble +



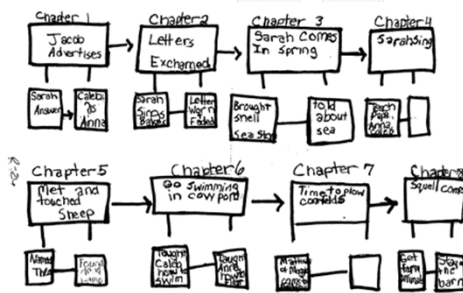
+



=



Sequence +



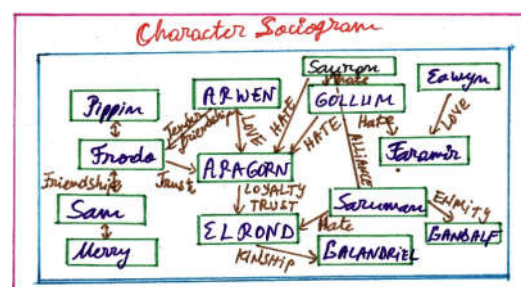
Sarah, Plain and Toll

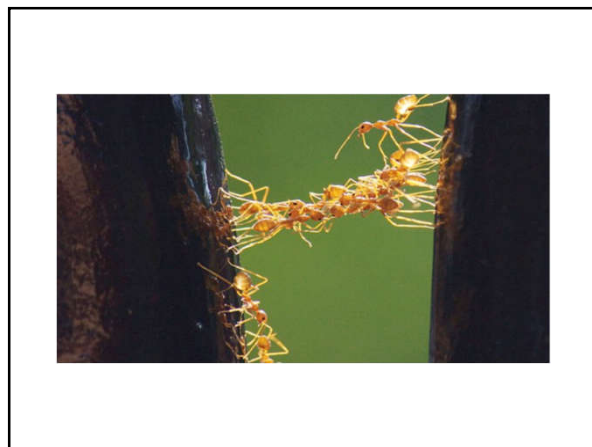
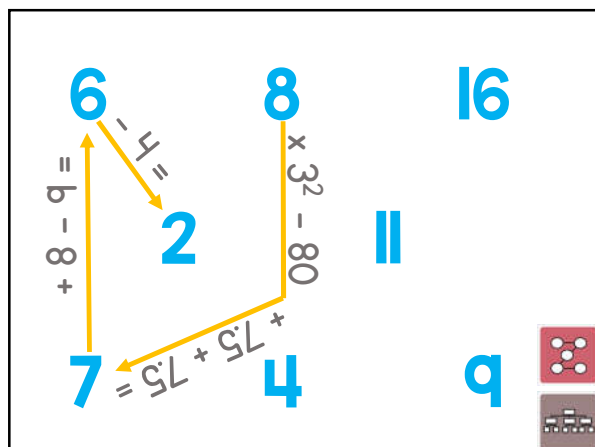
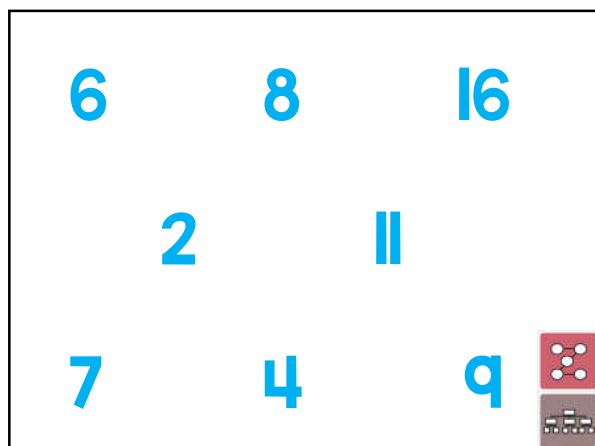


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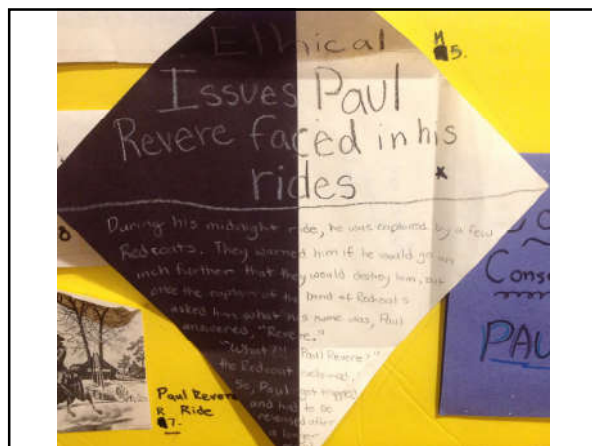
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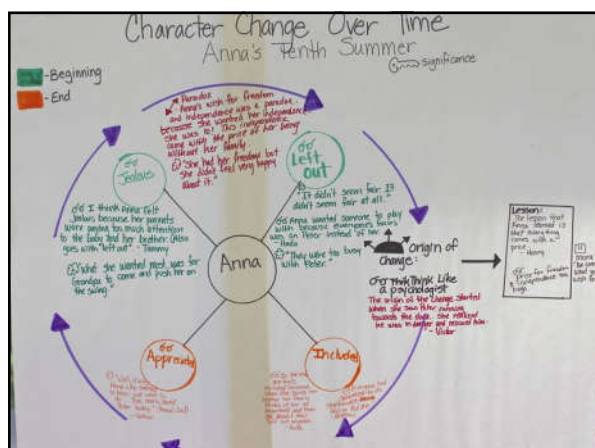





Also use with:

- 1 Math [numbers & operators, steps in problems]
- 2 Science [biological systems, planets, elements, etc.]
- 3 Social Studies [historical figures, movements, and eras]
- 4 Art [colors, line, form, etc.]


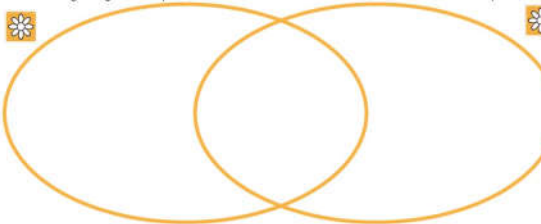






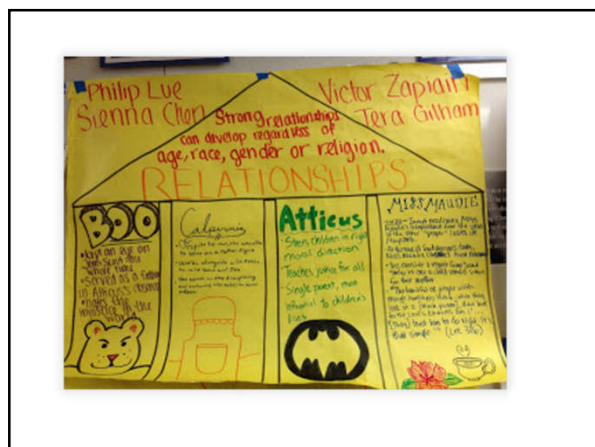
Name: _____

 **How I've Changed this Year**

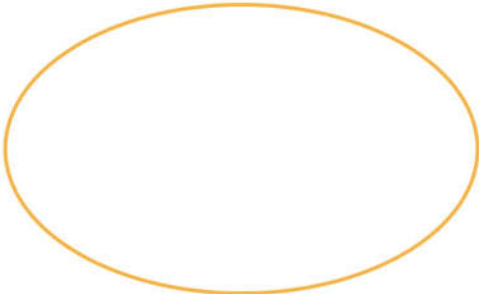
At the beginning of the year I was... Now, at the end of the year, I am...


  

 The Big idea of how I'm different now than I was as the beginning of the year is...




Name: _____





 10 Things I've Learned This Year


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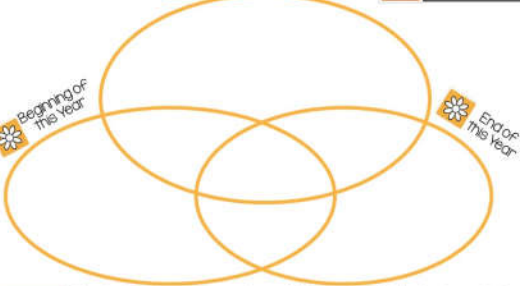
Name: _____


 How I Will Be Next Year

 Change through the Year

 Beginning of the Year

 End of the Year






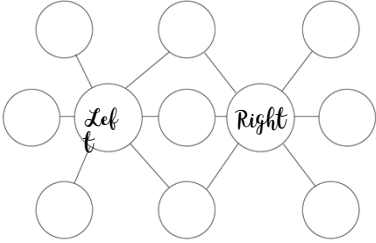
 Based on the changes I've seen in myself this year, I predict that next year, I will...

USE AS STRUCTURE

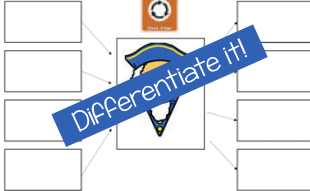
Weather				
Language of the Discipline	Details	Patterns	Change over Time	Trends
100	100	100	100	100
200	200	200	200	200
300	300	300	300	300
400	400	400	400	400
500	500	500	500	500
600	600	600	600	600
700	700	700	700	700
800	800	800	800	800
900	900	900	900	900
1000	1000	1000	1000	1000

Compare & contrast the numbers to the left and right of zero on the number line.



Think of four reasons George Washington should have been a king instead of the president. Then, on the other side of the Thinking Map, think of four future consequences that would have happened if he had become a king.














PPP Personalized Planning

Is it possible for a truly free people to have a king or queen? If not, is England really free? Would the English agree they are less free?

Student Task: Develop five questions about the growth of urban societies and changes in societies (due to social class divisions, slavery, divisions of labor between men and women) using at least four Depth & Complexity elements.

(add Blooms or DOK or constrict to specific elements for even more direction)














Earthworms Discussion

Digger the dirt


WHO THINKS WHAT?

What do different people, animals, or plants think about earthworms?




WHAT WILL HAPPEN NEXT?

As earthworms evolve, how do you think they will change over time?



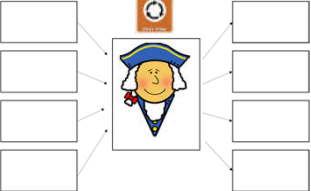
ARE THEY REALLY DIRTY?

Is it fair to call earthworms dirty? Why or why not?



OTHER THOUGHTS



Think of four reasons George Washington should have been a king instead of the president. Then, on the other side of the Thinking Map, think of four future consequences that would have happened if he had become a king.



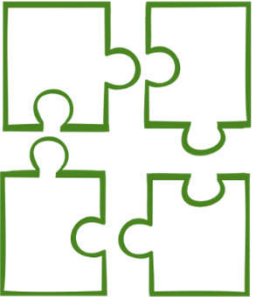
Flow

Is it fair for one person to be the king or queen for life? Why would it be better or worse to take turns?

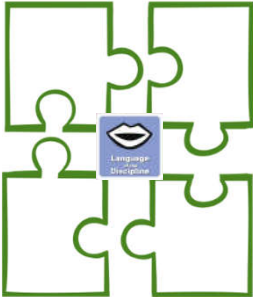
What are the three basic ways animals get food in the food chain?


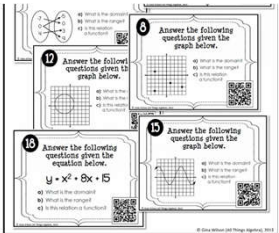
List them in a puzzle piece.



Define an apex predator on the back of a puzzle piece & draw one on the front of the puzzle piece.

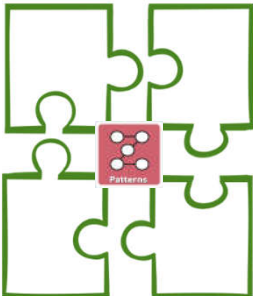


First: Task Cards


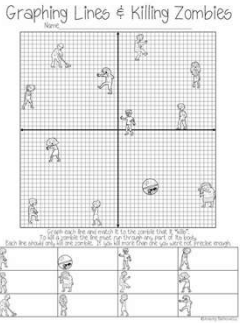



Create a food pyramid of specific animals with five tropic levels.




List the animals in order on a puzzle piece, apex predator on top.

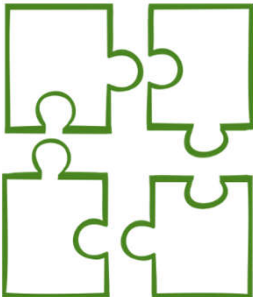


First: Graphing Lines & Killing Zombies


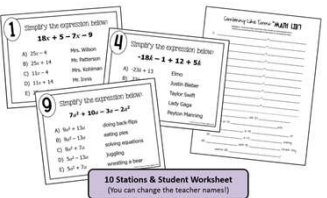



On the last puzzle piece, you may choose to do any of the following:

-  Write an epitaph for the grave of a decomposer.
-  Describe what would happen to your food chain if your apex predator became extinct.
-  Investigate & share your findings on which is more vulnerable to climate change, producers or consumers?



Next: Mad Libs

menus!

Draw a triangular prism. Label how many faces, edges, and vertices it has.	Which stop sign do you think most drivers prefer, the octagon, or the circle with an inverted triangle & why?	Create a map using a rhombus, a pentagon, a hexagon, an octagon, and a decagon.
Create a riddle involving a hexagon.	Following the naming convention, name the polygons with 65, 47, and 82 sides.	Why should/should not monogons and/or digons be recognized as polygons?
Draw three non-examples of a polygon.	Describe the connection between polygons and honeybees or lava.	Create a t-chart naming five shapes and their number of vertices.

Across 4. monetary motivation for exploration 5. the transfer of plants, animals, culture, and humans and the transfer of disease and invasive species 7. religious motivation for exploration 8. founded in 1607	Down 1. slave trade - movement of slaves, crops, and goods among European, East African, and colonial ports 2. 1620 beginning of self-governance by the colonists 3. of 1763 forbade settlement west of the Appalachians 6. fame and international recognition motivation for exploration
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Ian's Idea:

Reflecting With Depth and Complexity

Do you ask your students to look back at their work and reflect on their progress? If so, are you integrating the tools of depth and complexity into these reflections?

- Ask students to *examine the change over time* in their scores.
- Tell students to *look for patterns* in the type of questions missed.
- Encourage them to notice if the simply *misunderstood a rule*.
- Perhaps students need to notice a recent *trend* in their work.

Depth & Complexity augments and enriches **existing** projects and lessons.

Colonial Exploration

DEPTH & COMPLEXITY