Research-Based Interventions to Improve Comprehension for Students with Reading Difficulties in the Inclusive Classroom

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Statement of the Problem

- Students with reading difficulties often have difficulty meeting the *curriculum demands* in content area classes (Boon et al., 2020).
- Commonly exhibit difficulties with *reading* (Boon & Spencer, 2010, 2013).
- Perform below their typically achieving peers in all areas on national achievement tests (National Assessment of Educational Progress, 2019).
- Lack the adequate academic skills to *read on grade level* and have not developed sufficient skills to compensate for such deficits (Mastropieri et al., 2003).
- *Difficulty with reading comprehension*, especially with identifying the main ideas and supporting details from the textbook (Jitendra et al., 2000).
- Finally, students with mild disabilities often have insufficient prior knowledge skills and *lack specific strategy instruction* abilities to for academic success (Antoniou & Souvignier, 2007).

National Assessment of Educational Progress (NAEP, 2019)

- The National Assessment of Educational Progress (NAEP) is "a continuing and nationally representative measure of trends in academic achievement of U.S. elementary and secondary students in various subjects. It is the largest continuing and nationally representative assessment of what our nation's students know and can do in select subjects. It was first administered in 1969 to measure student achievement nationally. Teachers, principals, parents, policymakers, and researchers all use NAEP results to assess progress and develop ways to improve education in the United States." (https://www.nationsreportcard.gov/focus_on_naep/)

Reading (*At or Above Proficient Level*)

- Grade 4 **39%**; 8 **37%**; 12 **40%** (Typically Achieving)
- Grade 4 **12%**; 8 **9%**; 12 **13%** (Disabilities)

Before Reading

- Teach students how to activate their background knowledge in connection with the topic to be read.

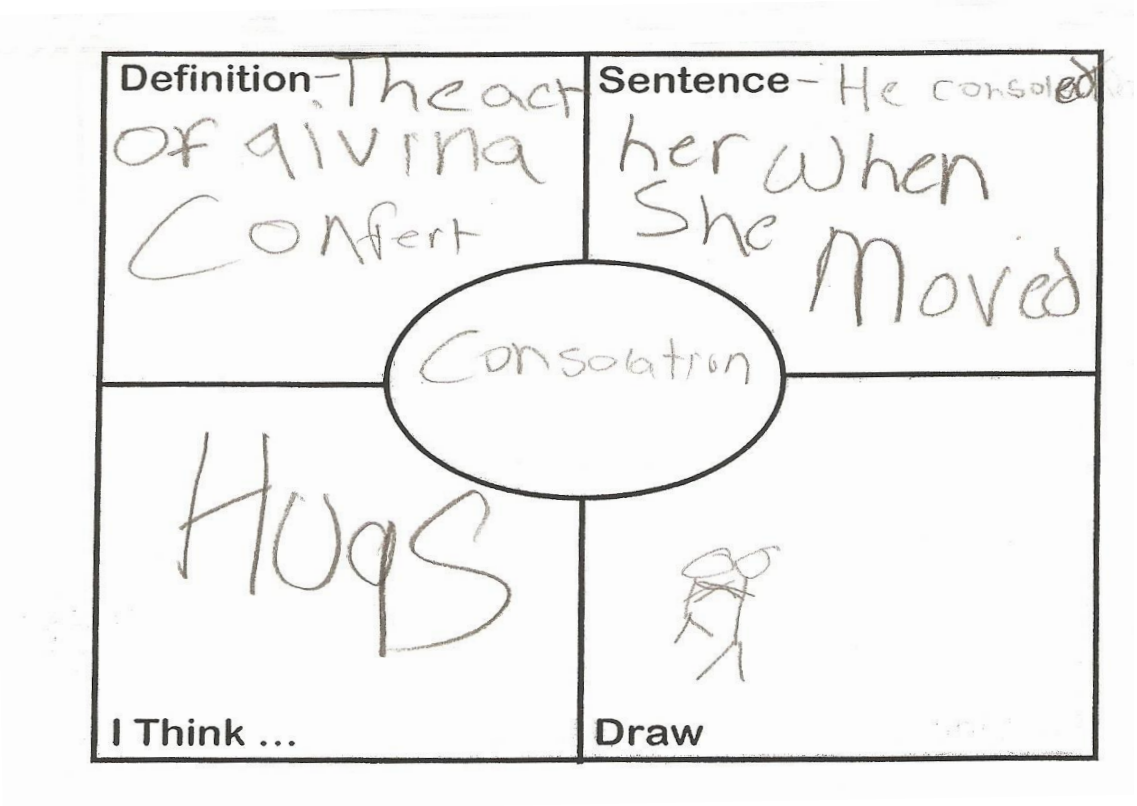
- Students better understand, think about, and retain new information when they are familiar with or taught background knowledge of a topic before reading.
- Activate prior knowledge by previewing text before reading:

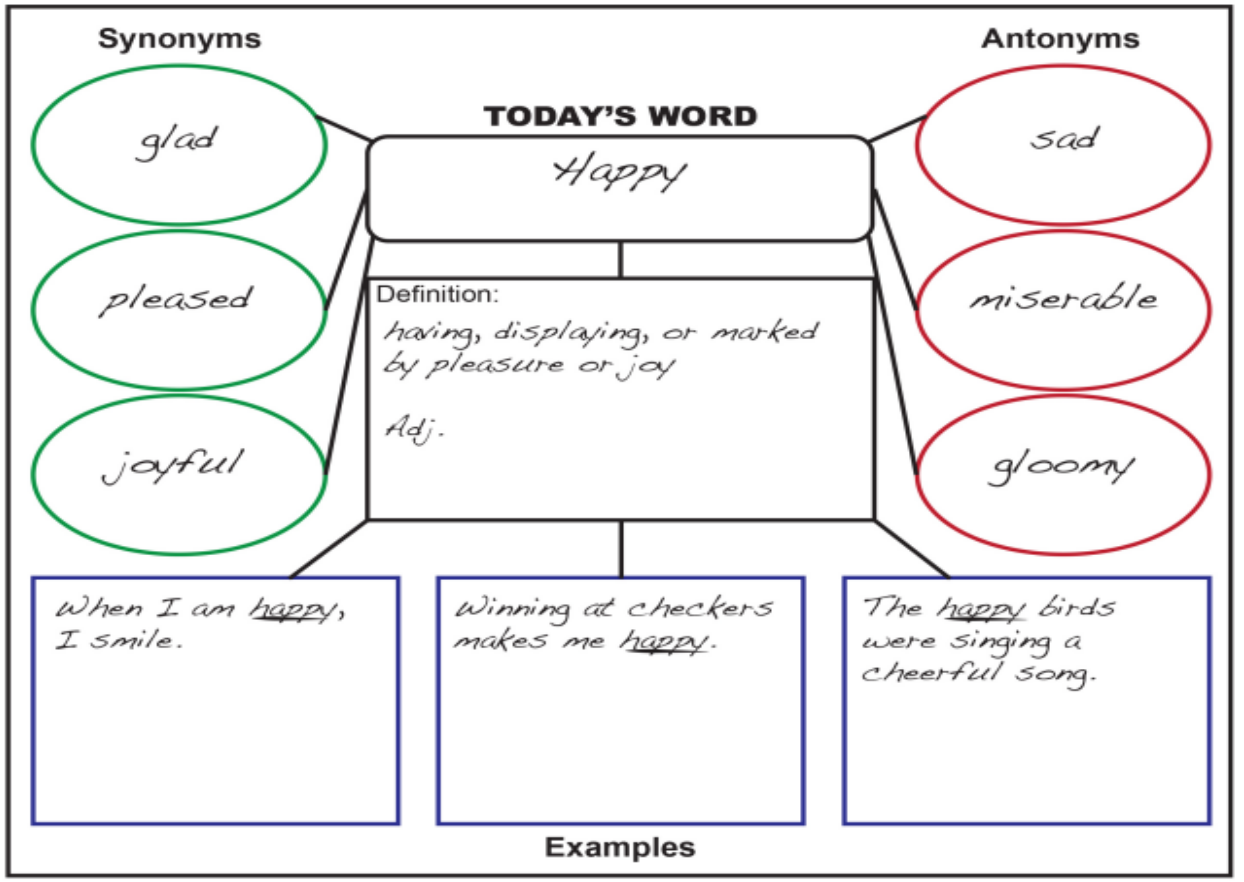
  - Use specific strategies to activate prior knowledge, such as previewing headings or key concepts, or making a prediction and confirmation chart.
  - Prepare and guide previewing activities to support and focus the connections students make.
  - Use graphic organizers to introduce important information, solicit prior knowledge from students, and make predictions.

Previewing & Skimming (Scanning) Strategy

1) Read the title.
2) Read the introduction.
3) Read each boldface heading (subheadings) and underline or highlight the first sentence under each heading (This first sentence often provides the main idea for the section.)
4) Look at all of the pictures, including graphs and charts, and read their captions.
5) Read the conclusion.
6) Read the comprehension questions at the end of the chapter to find out what the authors consider most important in the chapter.
7) Now that you have a good idea of your purposes and learning goals for the chapter, you should write down what you learned about the purposes and goals of this chapter before you start actively reading it.

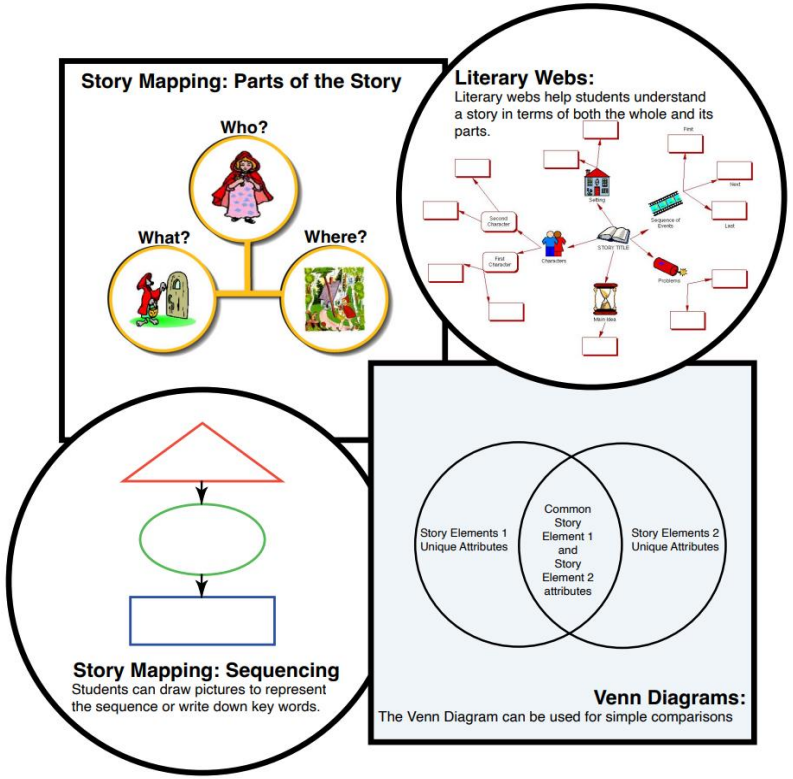
Explicitly Teach Key Specialized Vocabulary (*Frayer Diagram Model*)

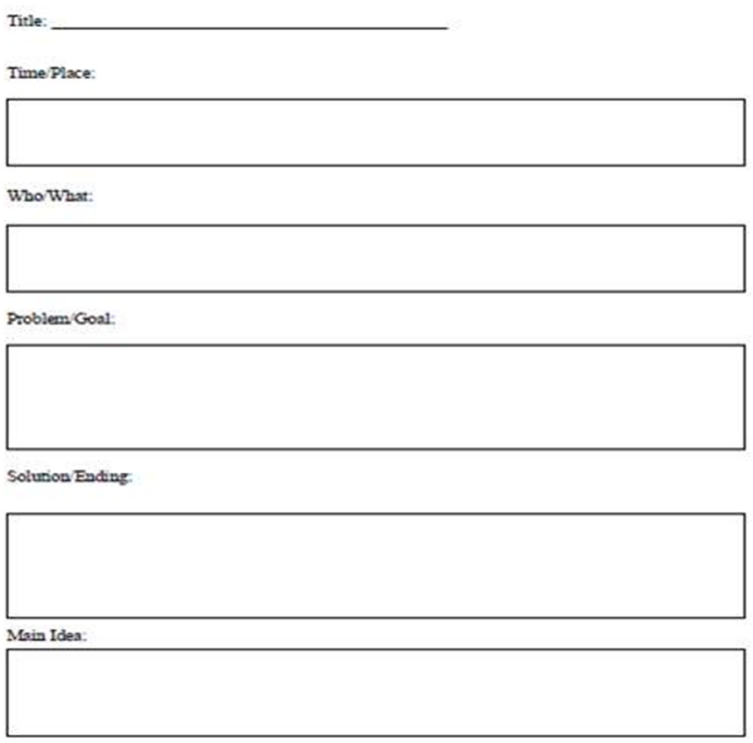




During Reading

- Use graphic organizers which are visual representations that help students identify, organize, and remember important ideas from what they read.
- Adapt graphic organizers to text type (e.g., story grammar map for literary text; Venn diagram for compare/contrast informational text).





After Reading

- Teach students how to use self-questioning strategies to reflect on what they have read.

- Explicitly teach students to summarize the main ideas of what they read.

Example (from PALS – Peer Assisted Learning Strategies Peer Tutoring program):

- Who or what is the passage about?
- What is happening to the who or what?
- In 10 words or less, provide a summary of the passage.

- Teach students to summarize small amounts of text such as a short paragraph before summarizing longer sections (Kosanovich, 2013).

What is a Meta-Analysis?

- Review of many studies on a particular strategy (Berkeley et al., 2009; Forness, 2001; Forness et al., 1997; Kavole, 2001)

- Indicates **effectiveness or ineffectiveness** of a teaching strategy
- Derives a numerical indicator of effectiveness
- Averaged across studies
- Indicator known as an **Effect Size** (ES)
- Allows for comparison of approaches
- Effective intervention is greater than **($d = 0.25$)**

Basic Skills Training and Reinforcement (Mean ES $d = 0.62$)

Lowest of 3 interventions. Lower teacher time & effort!

- Vocabulary Instruction $d = 0.60$
- Corrective feedback $d = 0.33$
- Repeated readings $d = 0.81$
- Direct instruction $d = 0.81$

Text Enhancements (Mean ES $d = 0.92$)

Increased teacher time, but learn more than skill training & reinforcement!

• Illustrations (*overall*)	$d = 0.74$
• Representational Illustrations	$d = -0.01$
• Imagery	$d = 0.30$
• Spatial organizations	$d = 1.00$
• Mnemonic illustrations	$d = 1.28$
• Adjunct aids	$d = 1.09$
highlighting	$d = 1.34$
semantic feature charts	$d = 0.73$
computers	$d = 1.22$

Self-Questioning Strategies (Mean ES $d = 1.33$)

Increased teacher time, but greatest results!

• Peer-tutoring/Cooperative learning	$d = 0.58$
• Activating prior knowledge	$d = 0.84$
• Summarization & main idea	$d = 1.19$
• Summarization training plus self-monitoring attribution, training packages	$d = 1.48$
• Text-structure based strategies	$d = 2.92$

Self-questioning comprehension monitoring and questioning, activating prior knowledge, attribution questioning, summarization, and prediction.

Basic Skills Instruction (Mean ES $d = 0.62$)

Text Enhancement (Mean ES $d = 0.92$)

Self-Questioning (Mean ES $d = 1.33$)

Direct Instruction

- Explicit, skill-based, teacher-directed (Carnine et al., 1990)
- Scripted teacher presentations

- Corrective reading (Lloyd et al., 1980)
    - Secondary/HS
    - High interest materials
    - Controlled vocabulary
    - Extremely structured & well-scripted
- Reading Mastery (Polloway et al., 1986)
    - Elementary students
    - Level I, II, & III
    - Controlled vocabulary
    - Well-structured & scripted
- DISTAR (Stein & Goldman, 1980)

*Components: structure, clarity, redundancy, task sequencing, feedback!

Repeated Reading

- Re-read passages or stories

- Increase fluency, accuracy, comprehension, & story retelling
- Theory of Automaticity (greater fluency) (LaBerge & Samuels, 1974; Samuels, 1979)
- Effects of repeated reading on new material
- Positive effects with shared words from previous passages (Rashotte & Torgesen, 1985)
- Monitor motivation!

Illustrations

Pictures that represent characters, events, places and action in texts

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Four categories:

1. Representational illustrations (pictures in text)

2. Imagery (mental image of events)

3. Spatial organizers (graphic organizers)

4. Mnemonics (memory & key vocabulary)

Representational Illustrations

- Pictures in accompanying text

- May be distractive (T.L. Rose, 1986)
- Attention difficulties (Hallahan & Reeve, 1980)
- Yielded less than optimal results (Harber, 1983)
- Lowest effect size (-.01) (Mastropieri et al., 1996)

Imagery

Construct pictures in your mind about material (Clark et al., 1984; Coop, 1982; Flaro, 1987; Rose et al., 1983; Warner & Alley, 1981)

Illustrations are unavailable

1. Read: Read the first sentence
2. Image: Make a picture in your mind
3. Describe: Describe mental picture or image
4. Evaluate: Completeness/Comprehensiveness
5. Repeat: Read next sentence & repeat steps

Provide feedback on quality of image

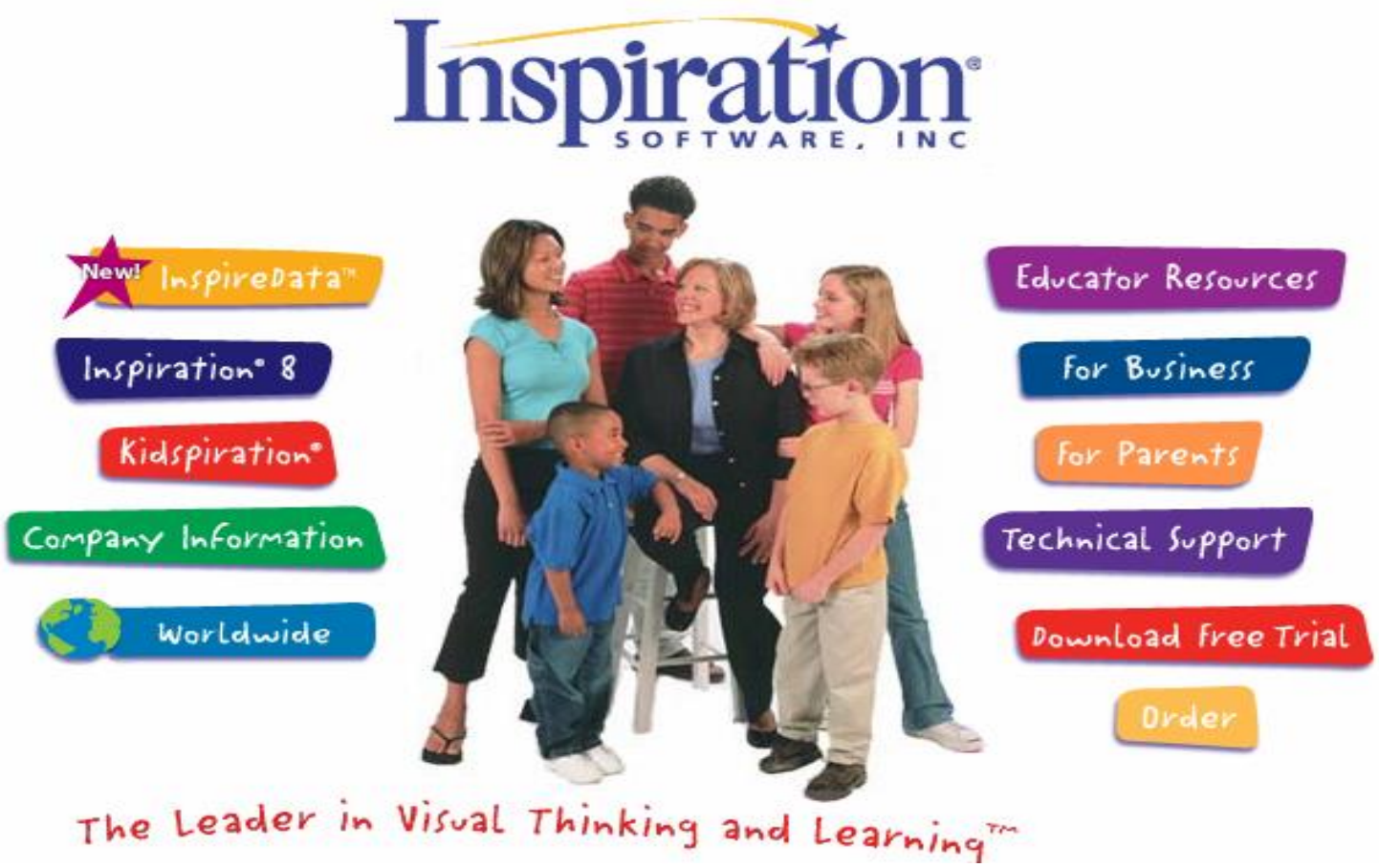
Results: *Greater comprehension from baseline to posttest & after training!*

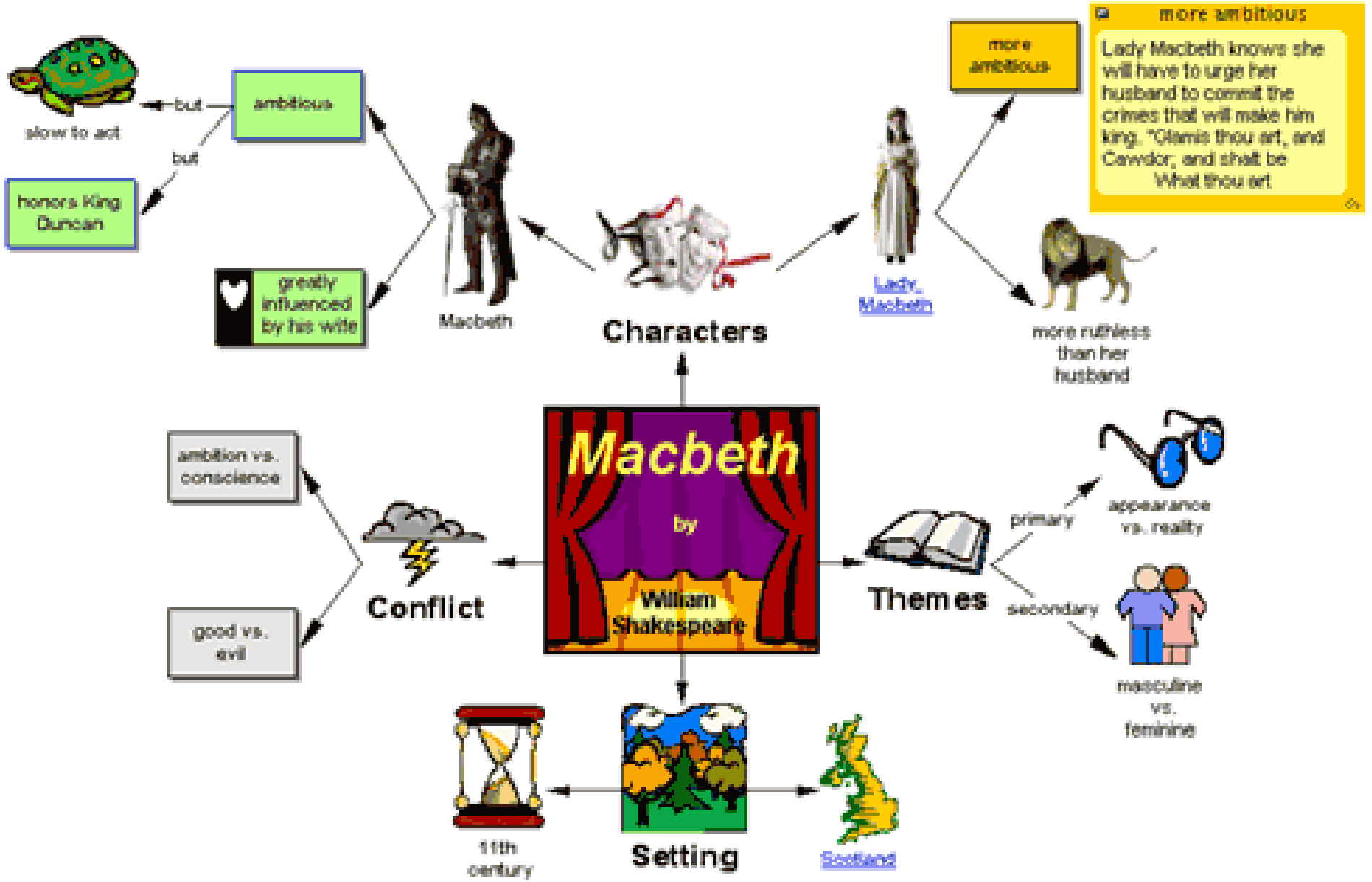
Spatial Organization – [Graphic Organizers]

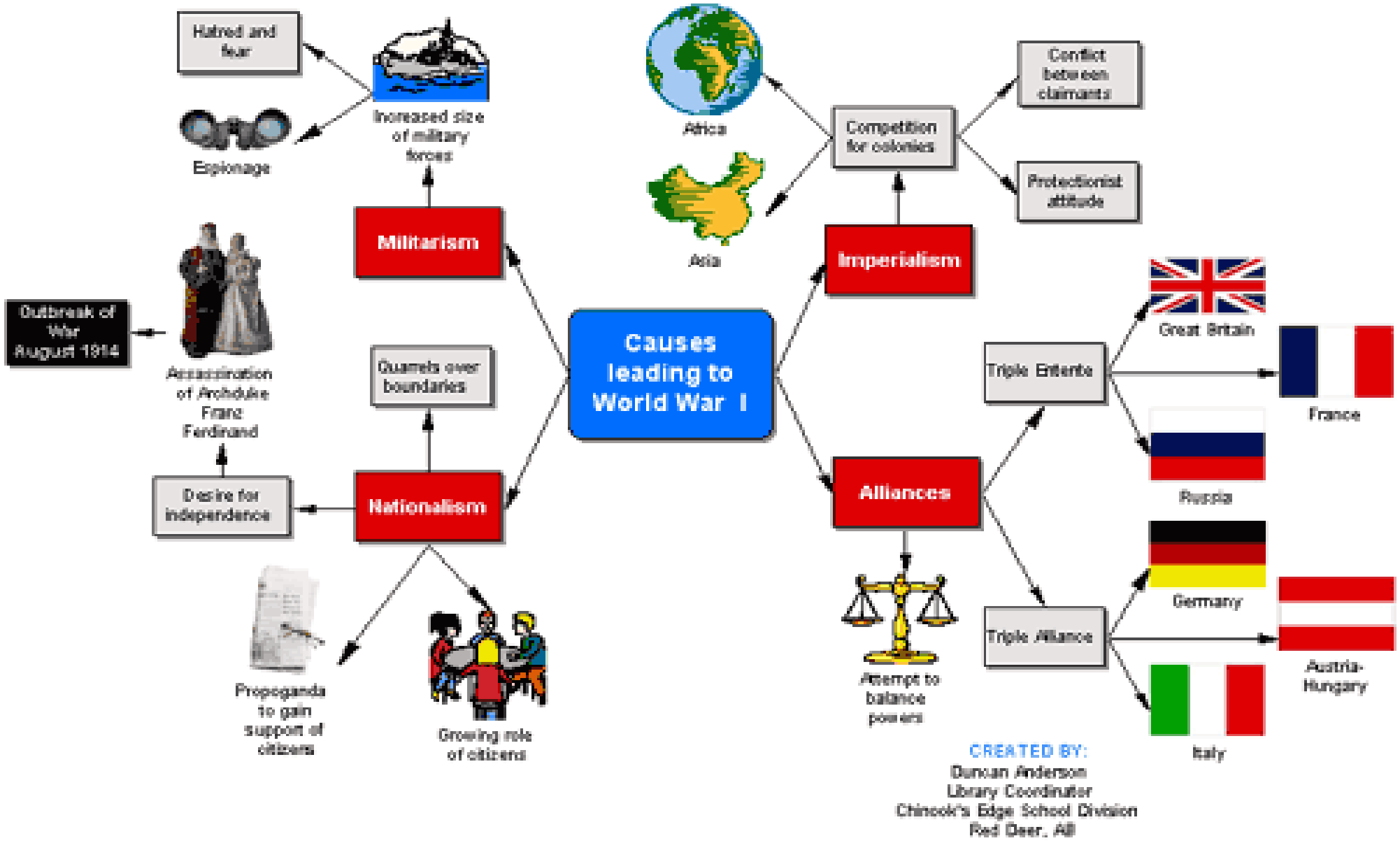
- Organization of content from text (Boon et al., 2005; Boon et al., 2006a, 2006b; Stagliano & Boon, 2010)

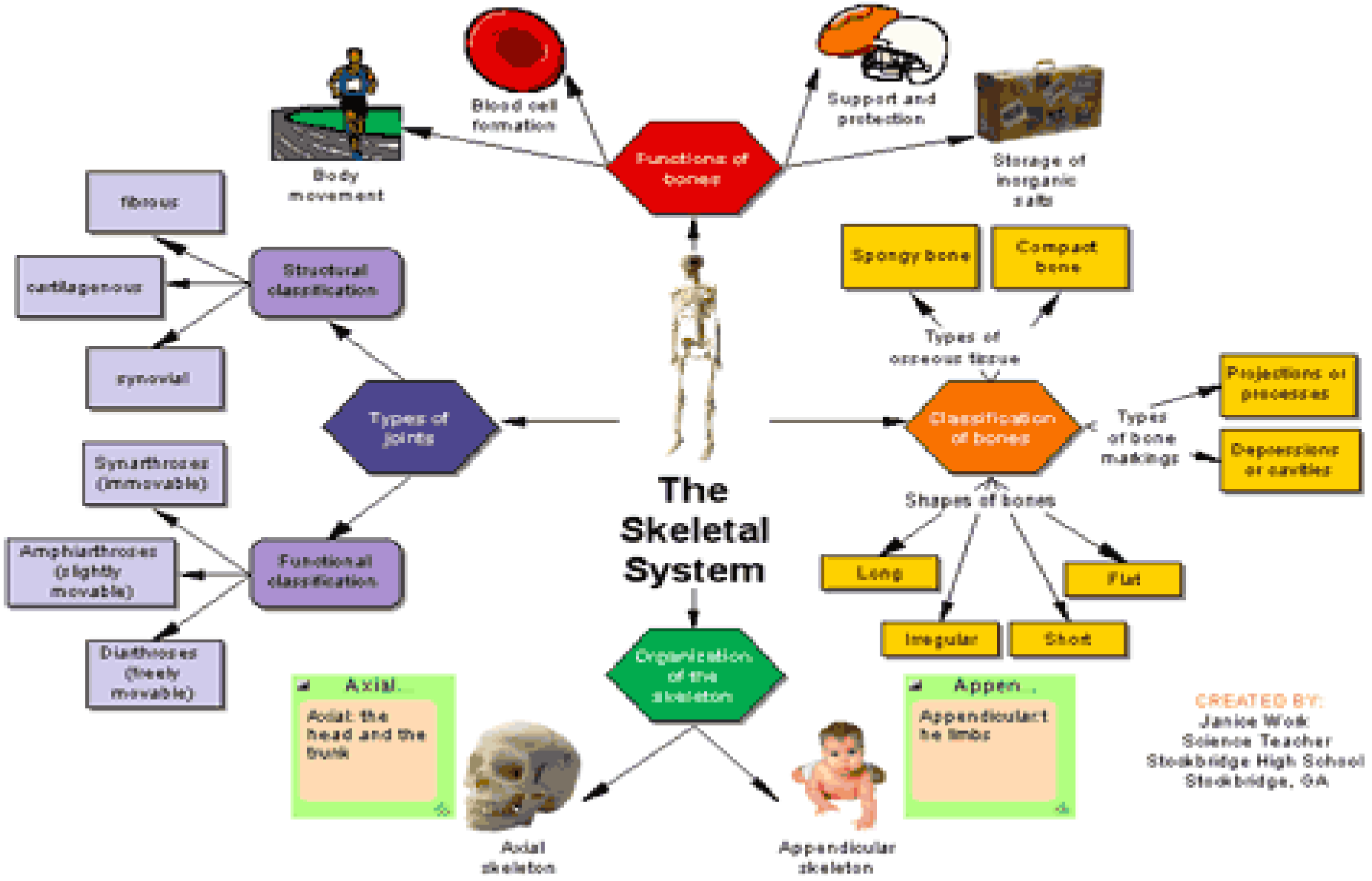
- Charts & diagrams
- Explain information visually (Winn, 1987)
- Visual-spatial displays depicted content & interrelationships (Carnine, 1986)
- Outperformed students without displays
- Spatial organized features related to reading/listening passage facilitated oral retelling over presentation of list of features (Mastropieri & Peters, 1987)

http://www.inspiration.com/




Macbeth
by
William Shakespeare
Characters
Macbeth
slow to act
but
ambitious
but
honors King Duncan
greatly influenced by his wife
Lady Macbeth
more ambitious
more ambitious
Lady Macbeth knows she will have to urge her husband to commit the crimes that will make him king. "Glamis thou art, and Cawdor; and shalt be What thou art
more ruthless than her husband
Themes
primary
appearance vs. reality
secondary
masculine vs. feminine
Conflict
ambition vs. conscience
good vs. evil
Setting
11th century
Scotland


Causes leading to World War I
Militarism
Hatred and fear
Espionage
Increased size of military forces
Nationalism
Desire for independence
Quarrels over boundaries
Outbreak of War August 1914
Assassination of Archduke Franz Ferdinand
Propoganda to gain support of citizens
Growing role of citizens
Imperialism
Africa
Asia
Competition for colonies
Conflict between claimants
Protectionist attitude
Alliances
Attempt to balance powers
Triple Entente
Great Britain
France
Russia
Triple Alliance
Germany
Austria-Hungary
Italy
CREATED BY:
Duncan Anderson
Library Coordinator
Chinook's Edge School Division
Red Deer, AB


The Skeletal System
Functions of bones
Blood cell formation
Body movement
Support and protection
Storage of inorganic salts
Organization of the skeleton
Axial skeleton
Appendicular skeleton
Axial
Axial: the head and the trunk
Appen
Appendicular: the limbs
Types of joints
Structural classification
fibrous
cartilagenous
synovial
Functional classification
Synarthroses (immovable)
Amphiarthroses (slightly movable)
Diarthroses (freely movable)
Classification of bones
Types of osseous tissue
Spongy bone
Compact bone
Shapes of bones
Long
Flat
Irregular
Short
Types of bone markings
Projections or processes
Depressions or cavities
CREATED BY:
Janice Wolk
Science Teacher
Stockbridge High School
Stockbridge, GA

Luna moth speech

Luna moth speech

I. What's my topic?

- A. Life of the Luna moth
- B. Purpose
  1. Educate
  2. Inform
- C. Research
  1. Internet
     http://pooh.unl.edu/~scotth/samantha/moths-butterflies.html?page=luna
     http://www3.islandtelecom.com/~oehlkew/zlunmoth.htm
  2. Observation

II. Who's my audience?

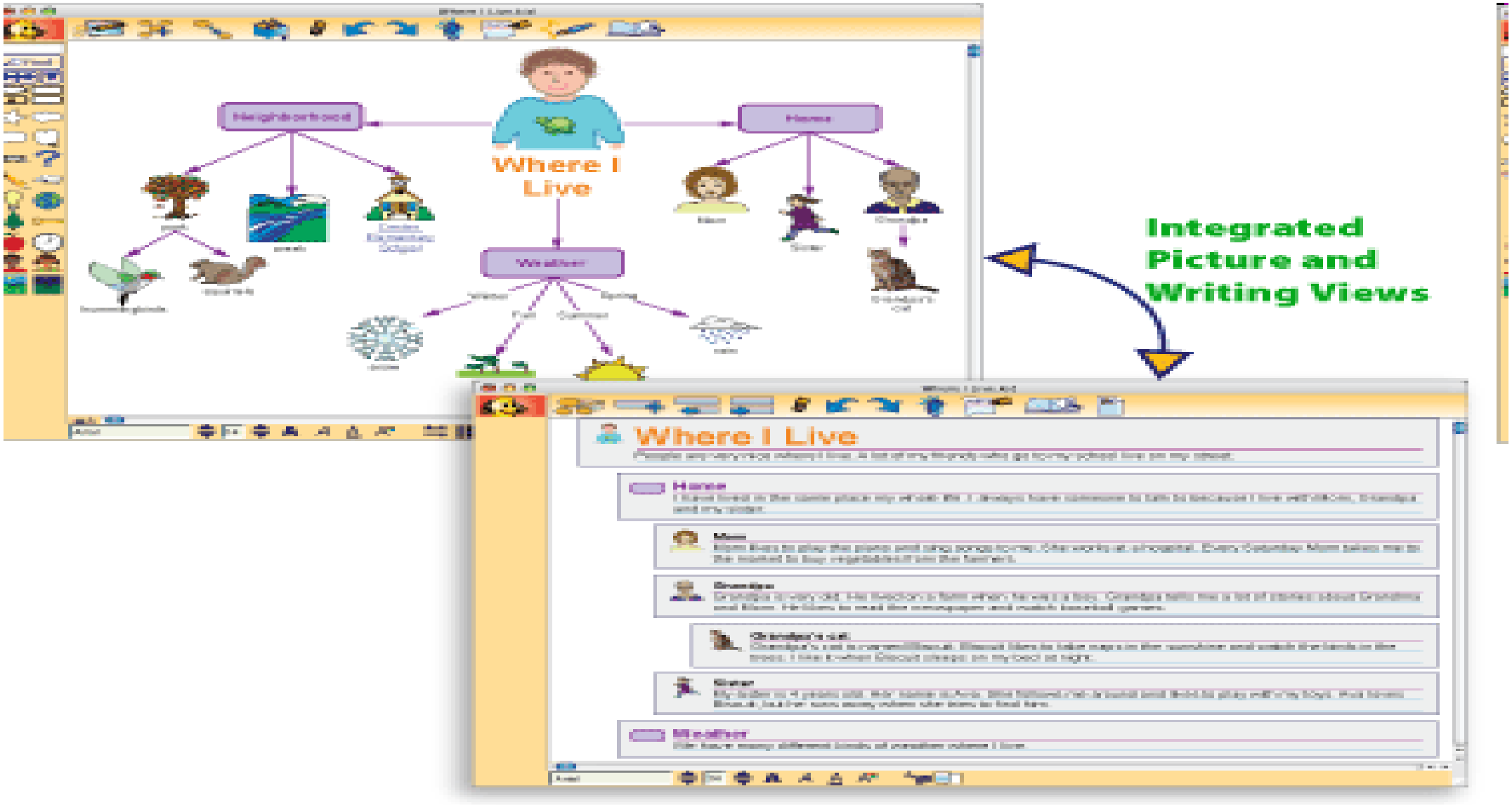
- A. Sixth grade class
- B. Teacher

III. Design a catchy opening

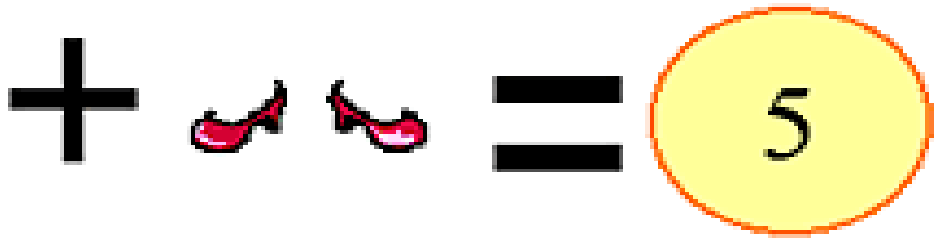
- A. Open with a story about how the "moon moth" got its name
  Tell a story that will help the audience imagine they are walking through the woods at night and see the moonlight glittering through the trees just ahead
  ... or is it moonlight?
- B. Give overview of main points
  Central idea: Luna moths are beautiful insects that have a unique life and interesting habitat.

IV. Build the body

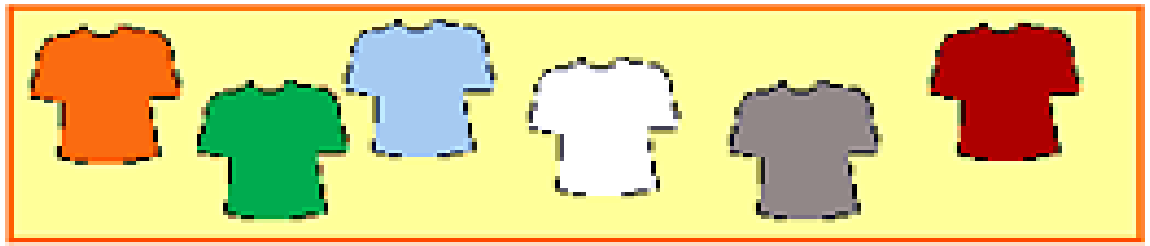
- A. Main points
  1. Characteristics

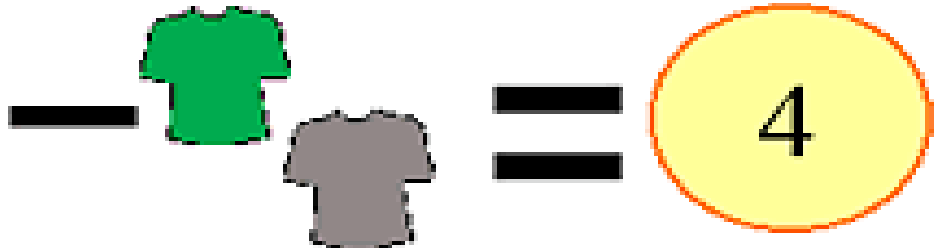

Where I Live
Neighborhood
Home
Weather
Integrated
Picture and
Writing Views
Where I Live
Home
Mom
Grandpa
Sister
Mother

Shanae has 4 pairs of shoes. If she gets one more pair of shoes, how many pairs of shoes will she have?

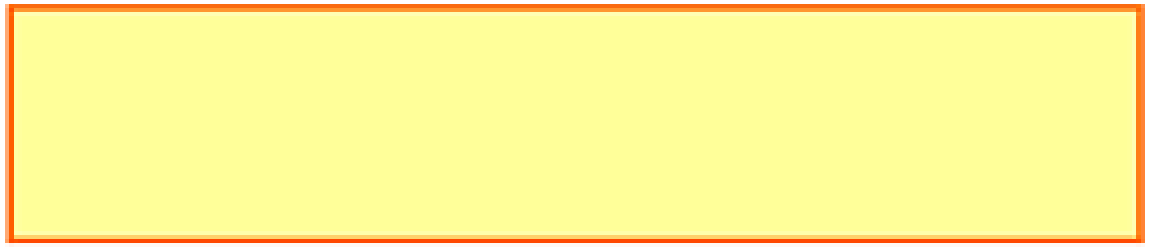


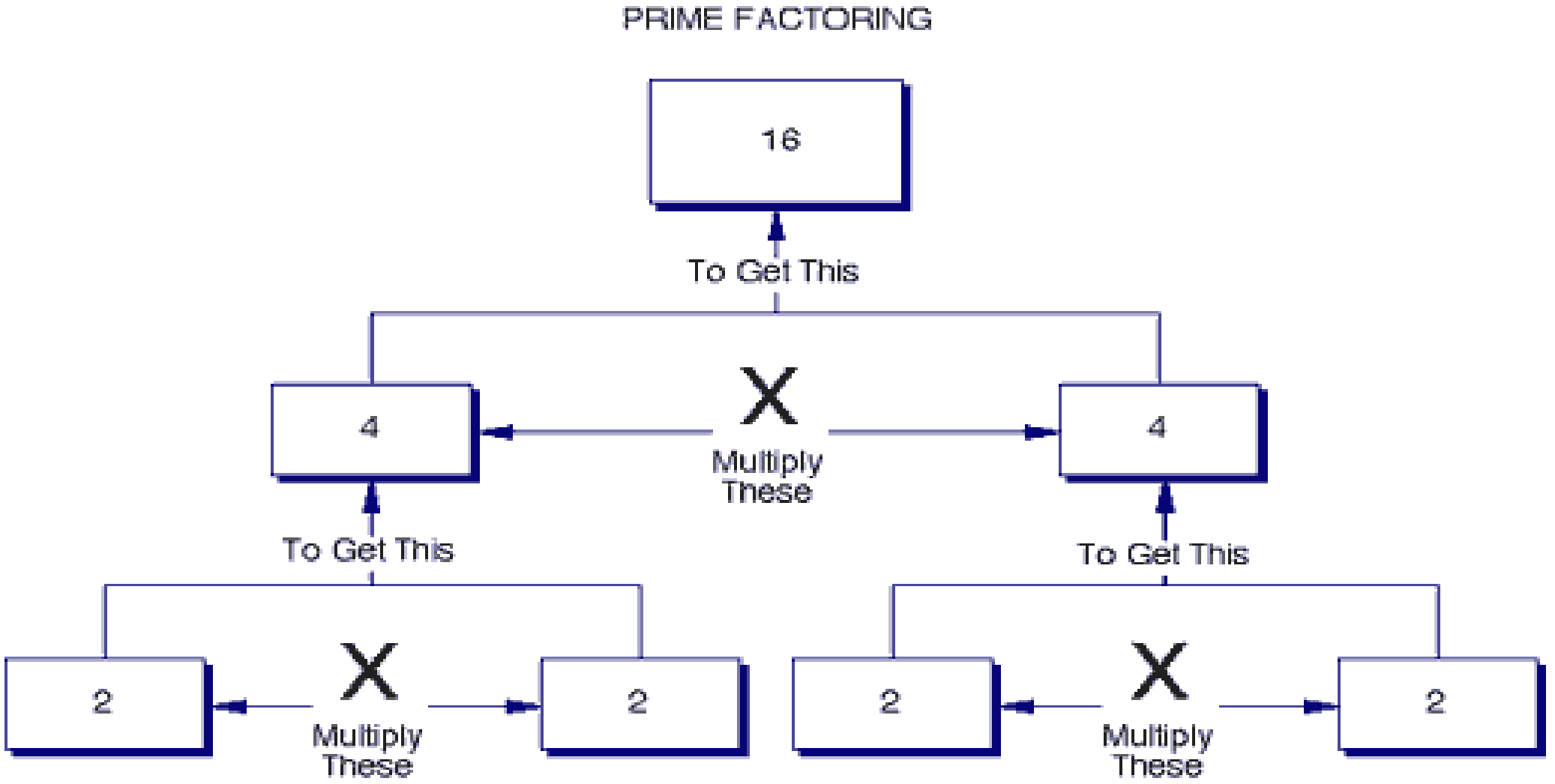
Jerry has 6 shirts. If he gives 2 shirts to his brother, how many shirts will he have?





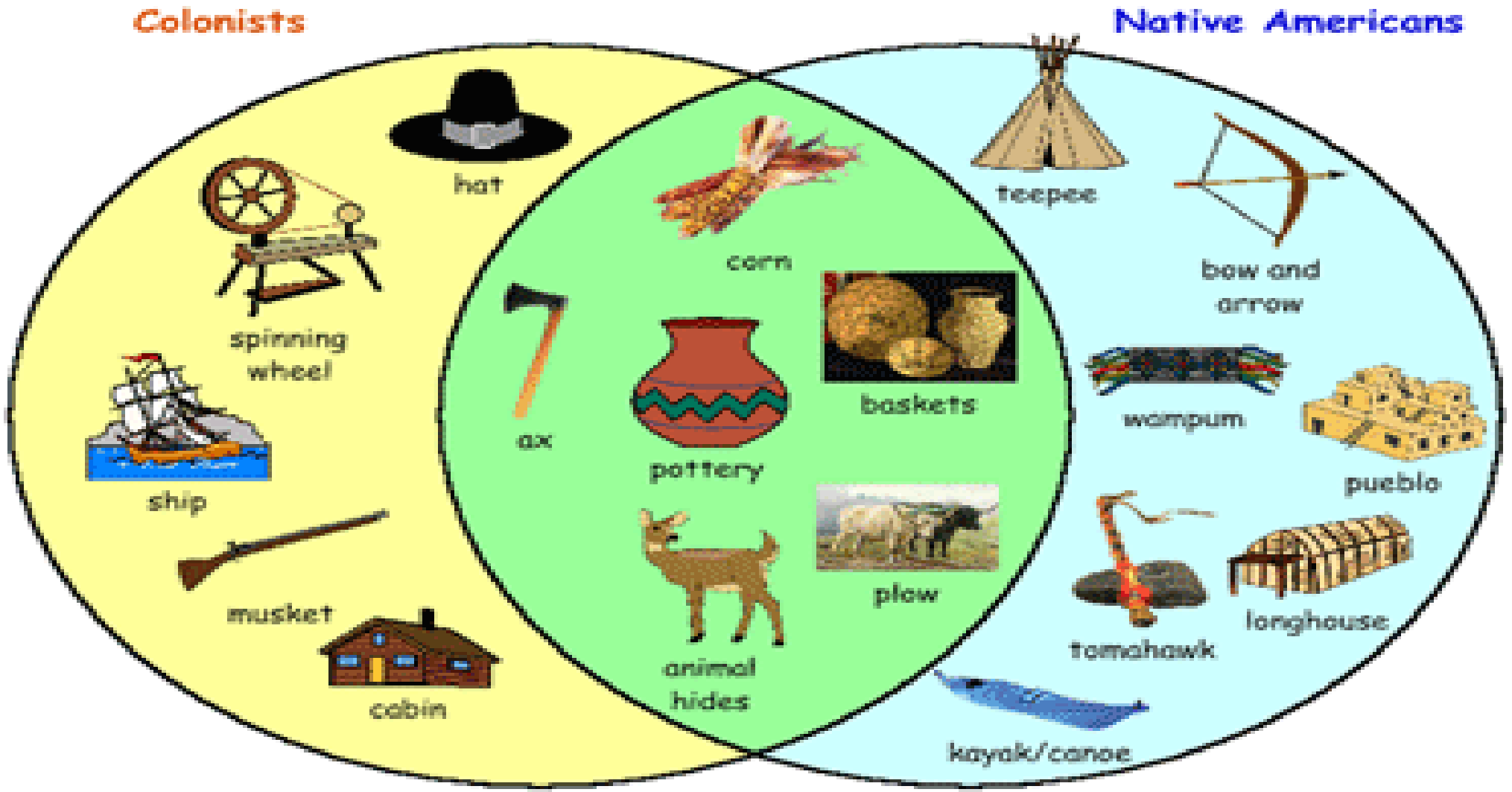
Create and solve your own story problem.

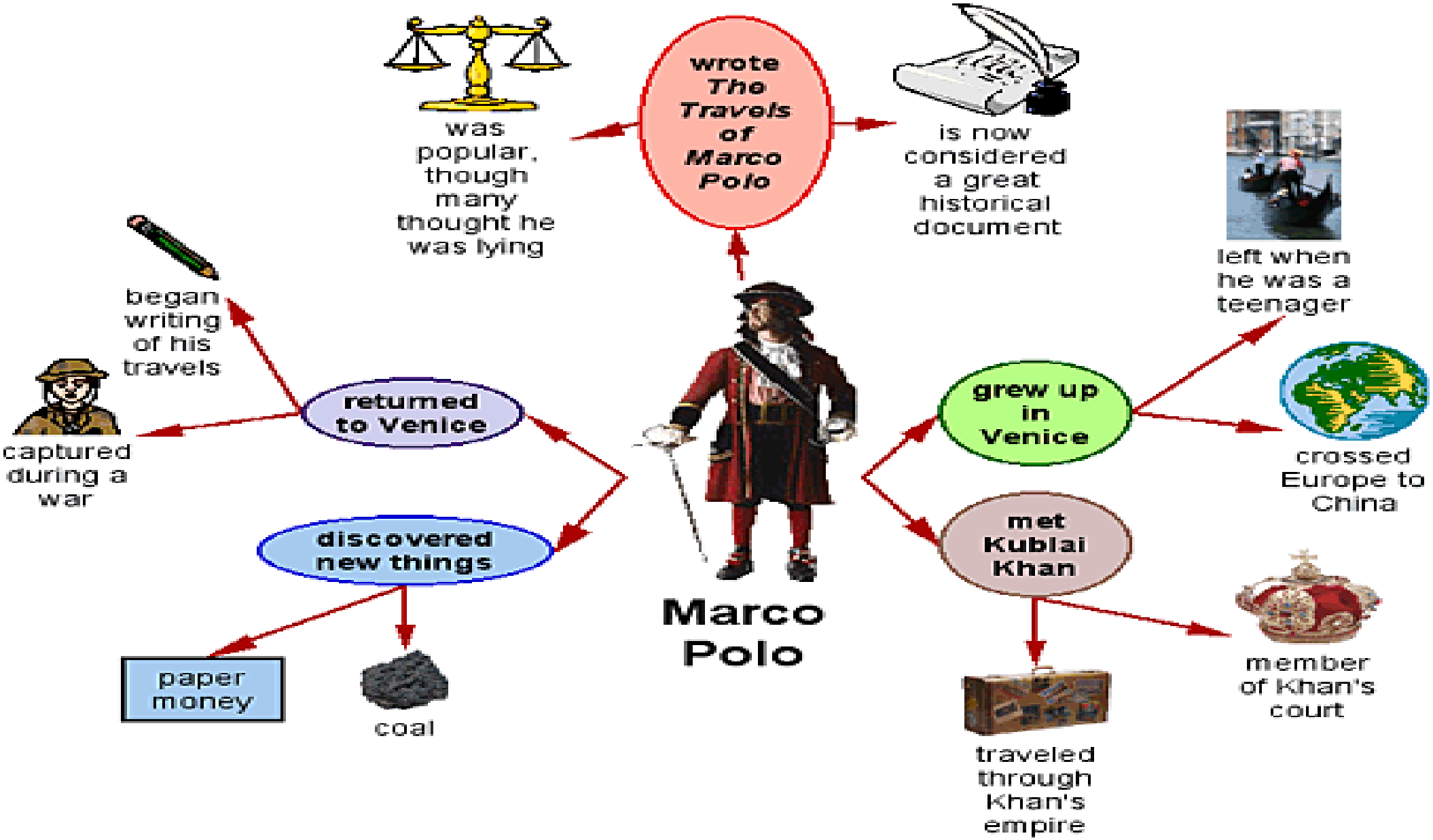



PRIME FACTORING
16
To Get This
4
X
Multiply
These
4
To Get This
To Get This
2
X
Multiply
These
2
2
X
Multiply
These
2

Colonist or Native American

Were these artifacts used by the colonists, Native Americans or both?




wrote The Travels of Marco Polo
was popular, though many thought he was lying
is now considered a great historical document
left when he was a teenager
began writing of his travels
returned to Venice
captured during a war
grew up in Venice
crossed Europe to China
discovered new things
met Kublai Khan
paper money
coal
traveled through Khan's empire
member of Khan's court
Marco Polo

FREE – Graphic Organizers (I can afford that!)

Bubbl.us

Cacoo

Cmap Tool

Gliffy

Diagramly

Grapholite

Lovely Charts

MindMeister

Popplet

Text 2 MindMap

Mnemonic Illustrations

- Memory strategy

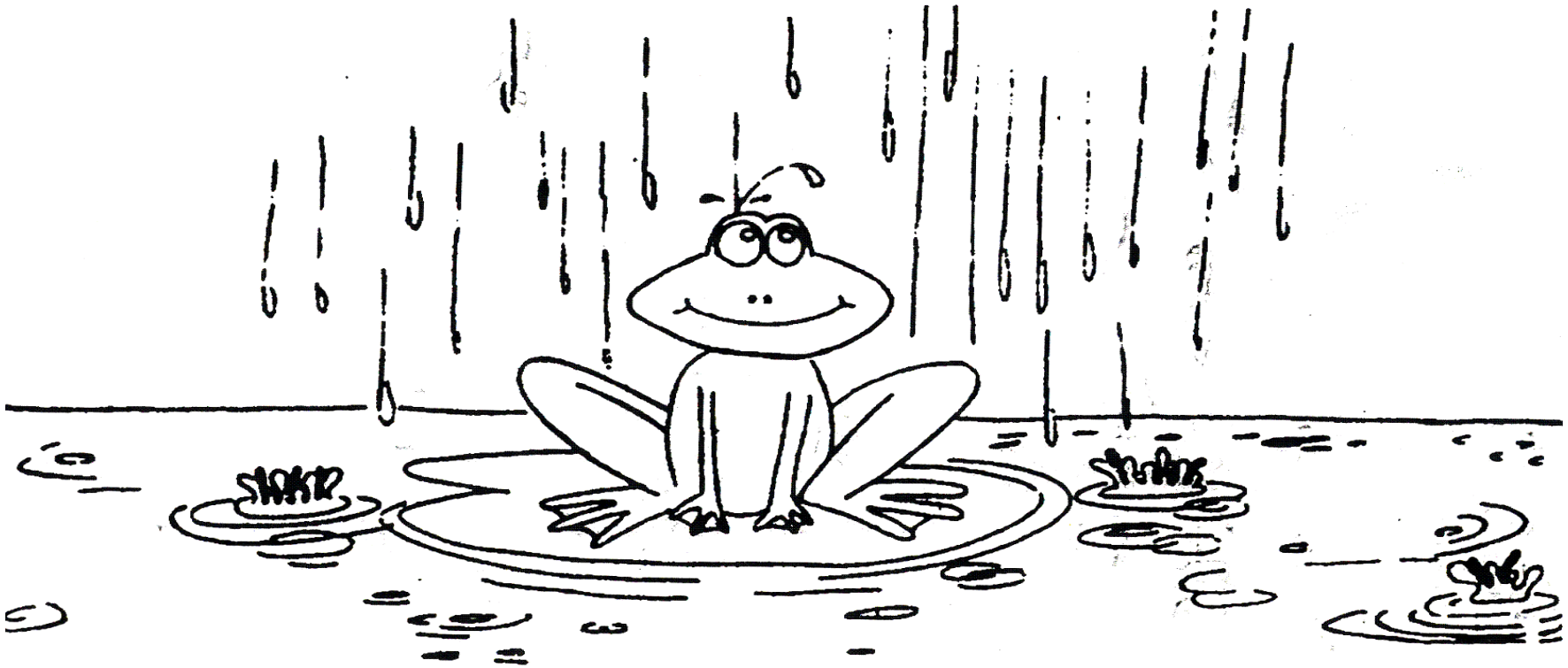
- Rehearse before, during, & after
- Substantially outperformed control students in learning new facts or vocabulary (Mastropieri & Scruggs, 1989)
- Promote recall by enhancing concreteness & meaningfulness (Mastropieri, Scruggs, & Levin, 1985)
- Students could be trained to generate keyword strategies enhance science text (Scruggs & Mastropieri, 1992; King-Sears et al., 1992)
- Absent from commercial textbooks (Levin et al., 1987)

First-Letter Strategies

› **M**y **V**ery **E**asy **M**ethod **J**ust **S**peeds **U**p **N**aming **P**lanets	The planets in order: **M**ercury, **V**enus, **E**arth, **M**ars, **J**upiter, **S**aturn, **U**ranus, **N**eptune, **P**luto
› **M**y **V**ery **E**ager **M**other **J**ust **S**erved **U**s **N**ine **P**izzas	The planets in order: **M**ercury, **V**enus, **E**arth, **M**ars, **J**upiter, **S**aturn, **U**ranus, **N**eptune, **P**luto
› **Ar**at **i**n **t**he **h**ouse **m**ight **e**at **t**he **i**ce **c**ream	The spelling of the word **arithmetic**
› **D**ear **M**iss **S**ally **B**rown	The main steps in long division: **d**ivide, **m**ultiply, **s**ubtract, **b**ring down
› **D**oes **M**cDonald's **S**ell **C**heese **B**urgers	The main steps in long division: **d**ivide, **m**ultiply, **s**ubtract, **c**ompare, **b**ring down
› **R**oy **G**. **B**iv	The colors of the rainbow in order: **r**ed, **o**range, **y**ellow, **g**reen, **b**lue, **i**ndigo, **v**iolet
› **N**ever **E**at **S**hredded **W**heat	The sequence of directions, going clockwise: **N**orth, **E**ast, **S**outh, **W**est

Keyword Method

Ranid (rain) **Frog**



Central Powers

(Central Park)

Turkey
Austria-Hungary
Germany

Self-Questioning Strategies

- Activating prior knowledge (Sachs, 1984)
- Summarizing information (Jenkins et al., 1987)
- Redirect attributions (Borkowski et al., 1988)
- Monitor performance (Graves, 1986)
- Peer-tutoring (Fuchs & Fuchs, 2001)
- Use elaborative interrogation (Scruggs et al., 1994)
- Text-structure based strategies (Bakken, 1995)
- Multi-component training packages (Schumaker et al., 1982)

Activate Prior Knowledge

- Teacher asks questions relevant to forthcoming readings

Example: **What do you think this story is going to be about?**

- Teacher teaches relevant vocabulary (e.g., Frayer Diagram Model)
- Teacher teaches using graphic organizers containing main ideas of topic (e.g., Concept Map)
- Students are taught to ask questions related to forthcoming topics
- Students complete activities containing relevant questions before reading

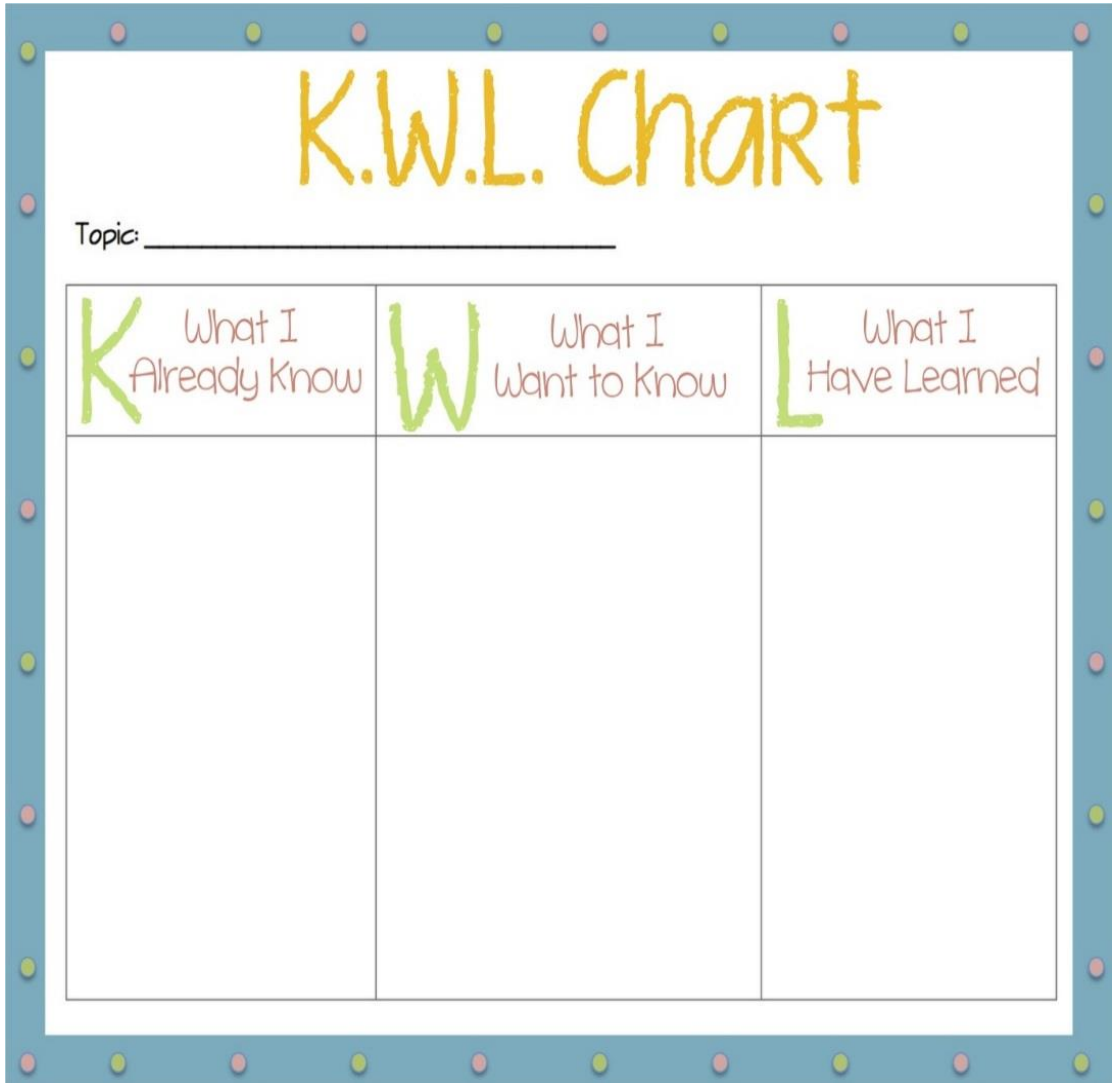
Brainstorming

- Another strategy for <u>activating prior knowledge</u>
- Prior to a lesson, present students with a major topic that will be introduced
- Ask students to generate as many ideas as possible that are related or similar to that topic

<u>K-W-L</u>

Another strategy used to activate prior knowledge before reading

- "What do I **K**now about this topic?"
- "What do I **W**ant to know?"
- "What did I **L**earn?"



Meta-Cognitive Strategies - IT FITS Strategy

Helps students remember important information from science textbooks

- **I**dentify the term
- **T**ell the definition of the term
- **F**ind a keyword
- **I**magine the definition doing something with the keyword
- **T**hink about the definition doing something with the keyword
- **S**tudy what you imagined until you know the definition

TRAVEL Strategy

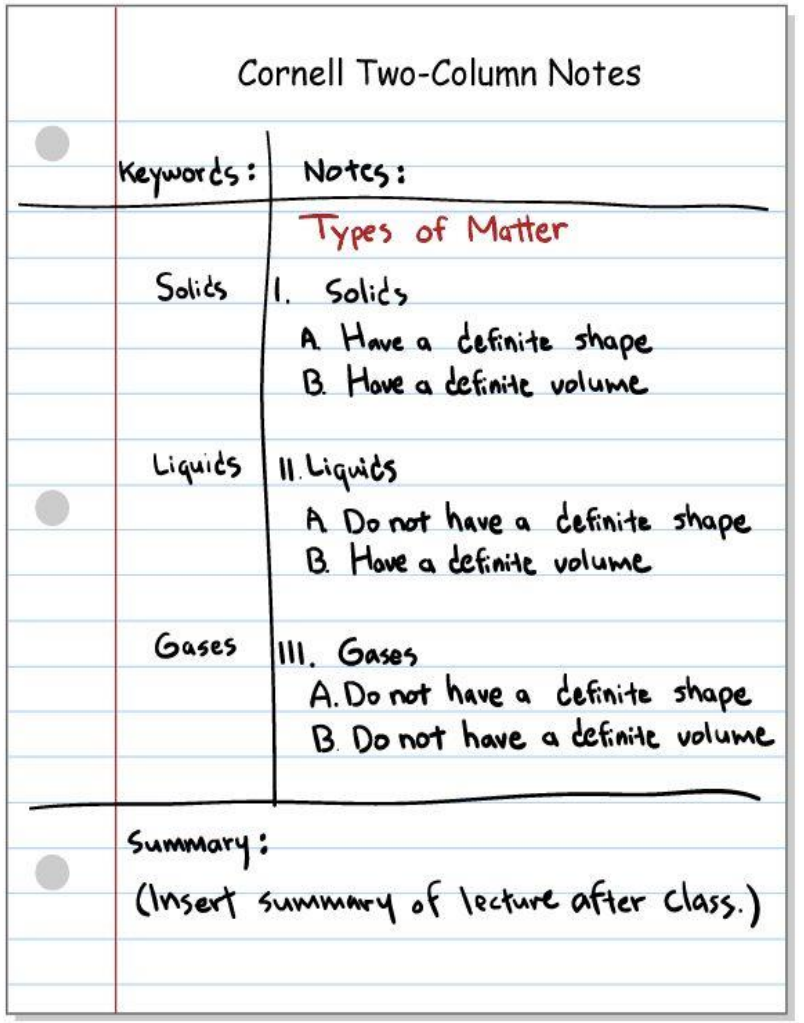
Taught to students to develop cognitive organizers to improve comprehension and recall

- **T**opic: Write down the topic and circle it
- **R**ead: Read a paragraph
- **A**sk: Ask what the main idea and three details are and write them down
- **V**erify: Verify the main idea by circling it and linking its details
- **E**xamine: Examine the next paragraph and Ask and Verify again
- **L**ink: When finished with the story, link all circles (Boyle & Weishaar, 1997)

LINKS Strategy

Listen, **I**dentify verbal cues, **N**ote **K**ey words, and **S**tack information into outline format

- Teaches students to use a <u>two-column format for taking notes</u>
- Main ideas on the left (e.g., names of important people, places)
- Supporting details on the right column (e.g., important attributes or characteristics)



Peer-Tutoring

- Highly recommended strategies to promoting achievement among diverse learners (Delquadri et al., 1986)

- Entire class divided into pairs of students

- Alternate tutor/tutee roles to master basic academic skills

- Increase time-on-task (Hall et al., 1982)

- Successful programs have been established in reading (Mathes et al., 1994), mathematics (Fuchs et al., 1995a, 1995b), & spelling (Maheady & Harper, 1987)

Types of Peer-Tutoring Programs

Same-Age Tutoring:

- Students more skilled in content-areas tutor less skilled students
- Pairs of students can alternate tutor/tutee roles (drill one another on flash cards)

Cross-Age Tutoring: older students tutor younger, lower functioning students

- For example, high school students tutoring elementary students

General Education & Special Education Tutoring

Special Education & Special Education Tutoring

Cooperative Learning

- Students work in small group to collaboratively complete group activities (4-6)

- Promotes inclusive education of diverse learners (Johnson & Johnson, 1986)

- Increased achievement (Johnson et al., 1981)

- Improved attitude toward subject matter (Slavin & Karweit, 1985)

JIGSAW Strategy

- Students contribute to a component of a larger task
- Compiled and presented to the class

Example:

Presentation of Dr. Martin Luther King

Early life (Latanya)

Civil Rights Movement (Melissa)

Material from King's speeches (Susan)

Information about King's assassination (Gary)

Group meets to cooperatively compile information learned!

Cooperative Learning: The FOSS Model (A Model for Activities-Oriented Approaches)

Four students work together and take turns with different roles to complete particular science activities.

- One student is the **Reader**. The **Reader** reads all print instructions, ensures that all students in the group understand the task, and summarizes the activity for the group.

- On student is the **Recorder**. The **Recorder** is responsible for recording all the data, including observations, predictions, and estimations. This would involve using pens, pencils, and the appropriate chart and graph paper.

- One student is the **Getter**. The **Getter** is responsible for getting all of the necessary materials and for retuning all of the materials at the conclusion of the activity. This would involve walking and carrying equipment, such as trays, microscopes, water, slides, pans, and eye droppers.

- One student is the **Starter**. The **Starter** begins the manipulations of the materials, supervises the assembly of materials, and ensures that all group members have equal opportunity at using the hands-on materials.

Teacher Roles & Responsibilities

- Moving around the room & monitoring activities
- Monitor on-task student behaviors
- Intervene to demonstrate appropriate behavior
- Assist with tasks or demonstrate procedures
- Teach collaborative skills to successfully complete task
- Provide closure to the lesson
- Restate objectives
- Summarize major points
- Have students provide examples & answer final questions
- Systematically evaluate student performance

Elaborative Interrogation

- Coached students through reasoning processes (Anteaters!) (Scruggs et al., 1994; Scruggs et al., 1993; Sullivan et al., 1996)

- Facilitate recall of text-based information by promoting active reasoning

- Less effective performed independently facilitating recall & comprehension (Mastropieri et al., 1996)

- Higher in ability to explain recalled information

Experimenter: Anteaters have long claws on their front feet. Why does this make sense:

Students: I don't know.

E: Well, let's think. What do you know about anteaters? For example, what do they eat?

S: Anteaters eat ants.

E: Good. And where do ants live?

S: They live in holes in the ground.

E: Now, if anteaters eat ants, and ants live in holes in the ground, why do you think that anteaters have long claws on their feet?

S: To dig for ants.

E: Good. To dig for ants (translated from Mastropieri, 1995, p. 122-123).

Promote Self-Generated Questions

- Reading comprehension strategies that require students to self-question before, during, and after reading!
- Promote **meta-cognition** – the awareness of one's own cognitive processes and how they can be enhanced
- Asking questions about reading material helps to promote thinking about the information, thus facilitating comprehension

Summarize and paraphrase

- Teach students to delete irrelevant and redundant information
- Teach students to use their own words

The **RAP** strategy

- **R**ead a paragraph
- **A**sk yourself what the paragraph was about
- **P**ut the main idea and two details in your own words

SQ3R

Survey
- Use skimming technique.
- Look at headings, sub-headings, first and last paragraphs and first sentences.
- Look at any photos, illustrations or diagrams.

Question
- Read through the text.
- Ask: What? When? Why? Where? Who? How?

Read
- Read all the text for understanding.
- Highlight key words or facts.
- Make notes.

Recite
- Recite the information out loud.
- Repeat a few times.

Review
- Revisit the information after:
  - 1 day
  - 1 week
  - 1 month

Common Features Across Instructional Strategies

1. Use clear objectives
2. Specific sequence for teaching
   - **Objective of the Lesson**
   - **Presentation of Information**
   - **Guided practice**
   - **Independent Practice**
   - **Formative Evaluation**
3. Inform the importance the strategy
4. Monitor performance
5. Encourage questions that require students to think about strategies & text
6. Encourage appropriate attributions
7. Teach for generalized use of the strategy

8. I Do, We Do, You Do - YouTube

Questions?