STEM

What Can You Do with a Box?

Volume in The Real World

Lisa Taylor Teaching Stars

TEACHER PAGE

#1 What can you do with a box?: Read the picture book What can you do with a box? by Jane Yolen and Chris Sheban. Have students brainstorm things they can do with a box.

#2 Making Boxes: Students plan and construct boxes using card stock. Students then find the box's volume.

#3 Finding the Volume of Different Boxes: Students will measure each box to find the volume. Measuring in centimeters in much easier. Depending on your grade level standards you may want students to use calculators.

#4 Did you know? The Economics of Boxes
The history of boxes video: https://youtu.be/8i3riKvCYkM

#5 Building the Biggest Tower: Have students work in groups and build the biggest tower possible in 1 minute. Students measure their standing tower at 1 minute. Record each tower's height.

#6 What Does it Mean to Think Outside the Box?

http://wonderopolis.org/wonder/can-you-think-outside-of-the-box

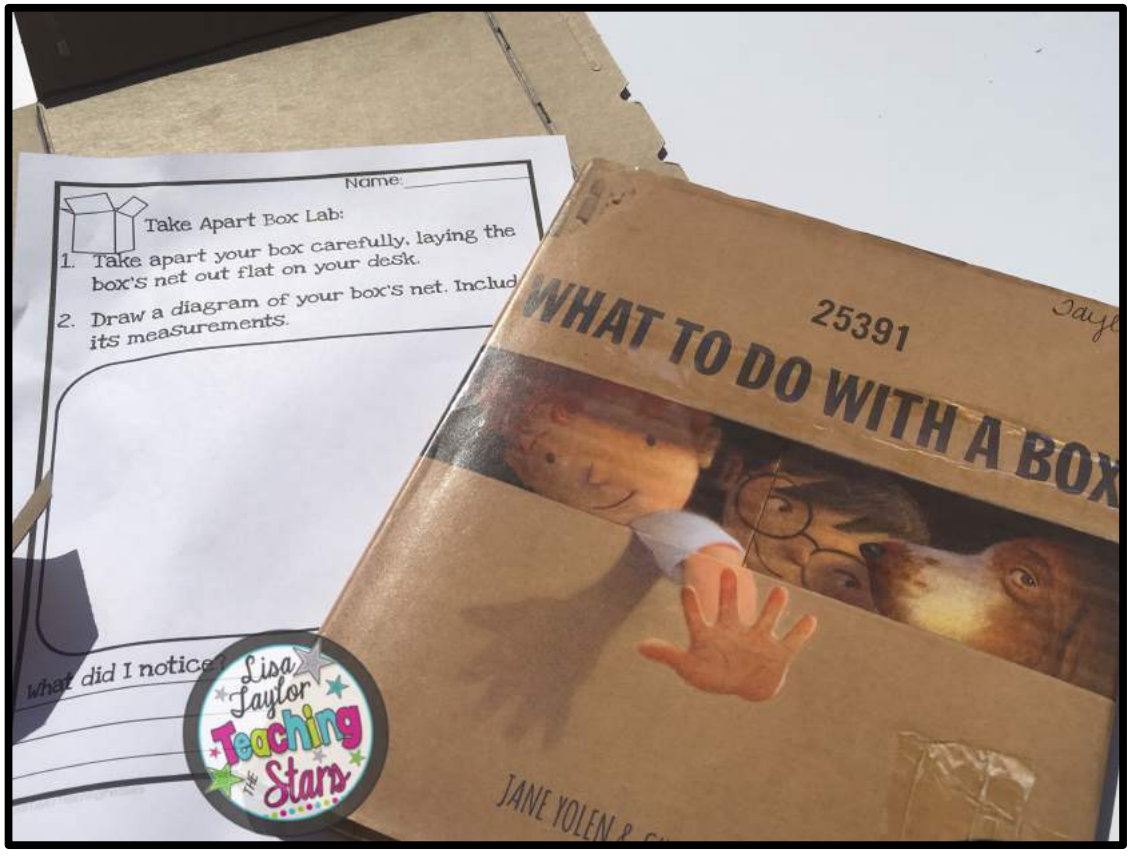
*Continue to ask students about other questions they may have. Students can then design their own experiments, based on their questions.

What Can You Do With a Box?

What can you do with a box?: Read the picture book What Can You Do With a Box? by Jane Yolen and Chris Sheban. Have students brainstorm things they can do with a box.

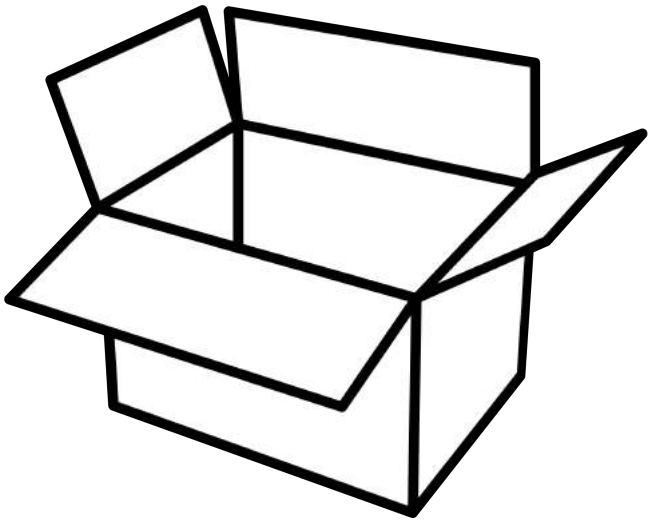
Materials:

- What can You Do With a Box? Picture Book
- Brainstorming Page



Name _____

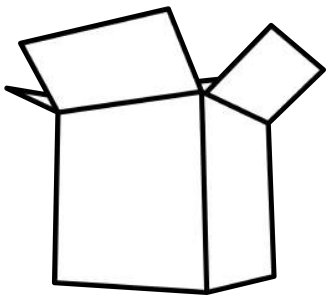
What can you do with a box?



Dear Parents,

We are starting our unit on volume. Please send in any empty cereal, cracker, or snack boxes. We will be finding the volume of each box. Please help your child see how volume is used in the real world.

Thank you for your support!



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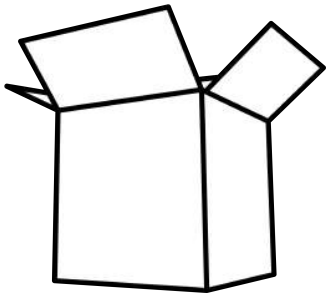


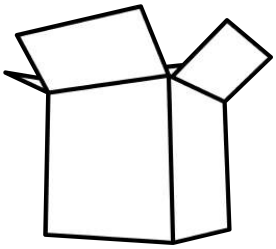
Finding the Volume

Box Activity: Collect different types of boxes. Label each box with a number. Students can work in groups or independently to find the volume of each box. It is easier if students use centimeters (less fractions).

Discussion Questions:

Does the order of how you multiple the Length X Height X Width make a difference in your answer? Why? What property supports your answer? (Communitive Property of multiplication)

Box #	Equation you used to find the Volume	Volume of box



Name: _____

Predictions & Questions

1. Which box do you predict has the greatest volume?

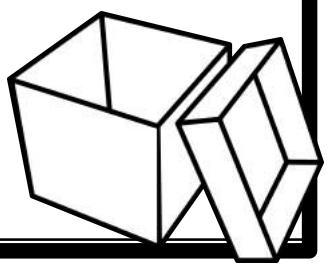
2. Which box do you predict has the least volume?

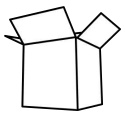
3. How do you find the volume of a box?

4. Where do you see volume in the real world?

5. Why is volume important for consumers?

6. Why is volume important for producers?





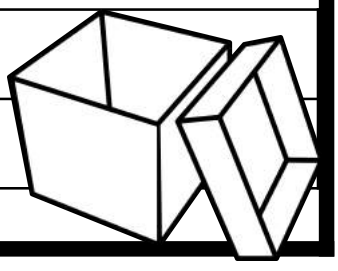
Name: _____

Comparing Two Boxes

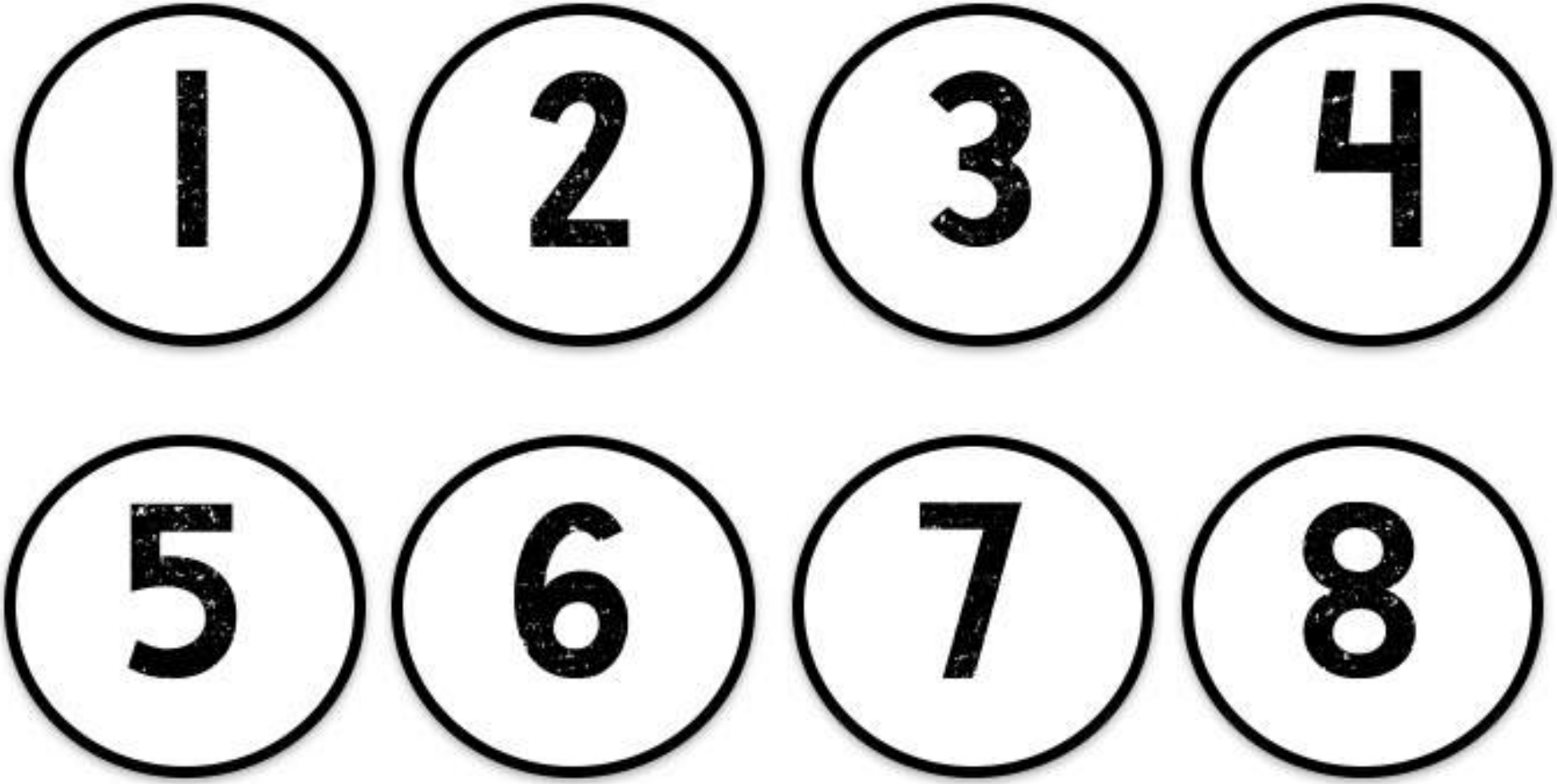
Box #_____	Box #_____
Find the volume of BOX	Find the volume of BOX

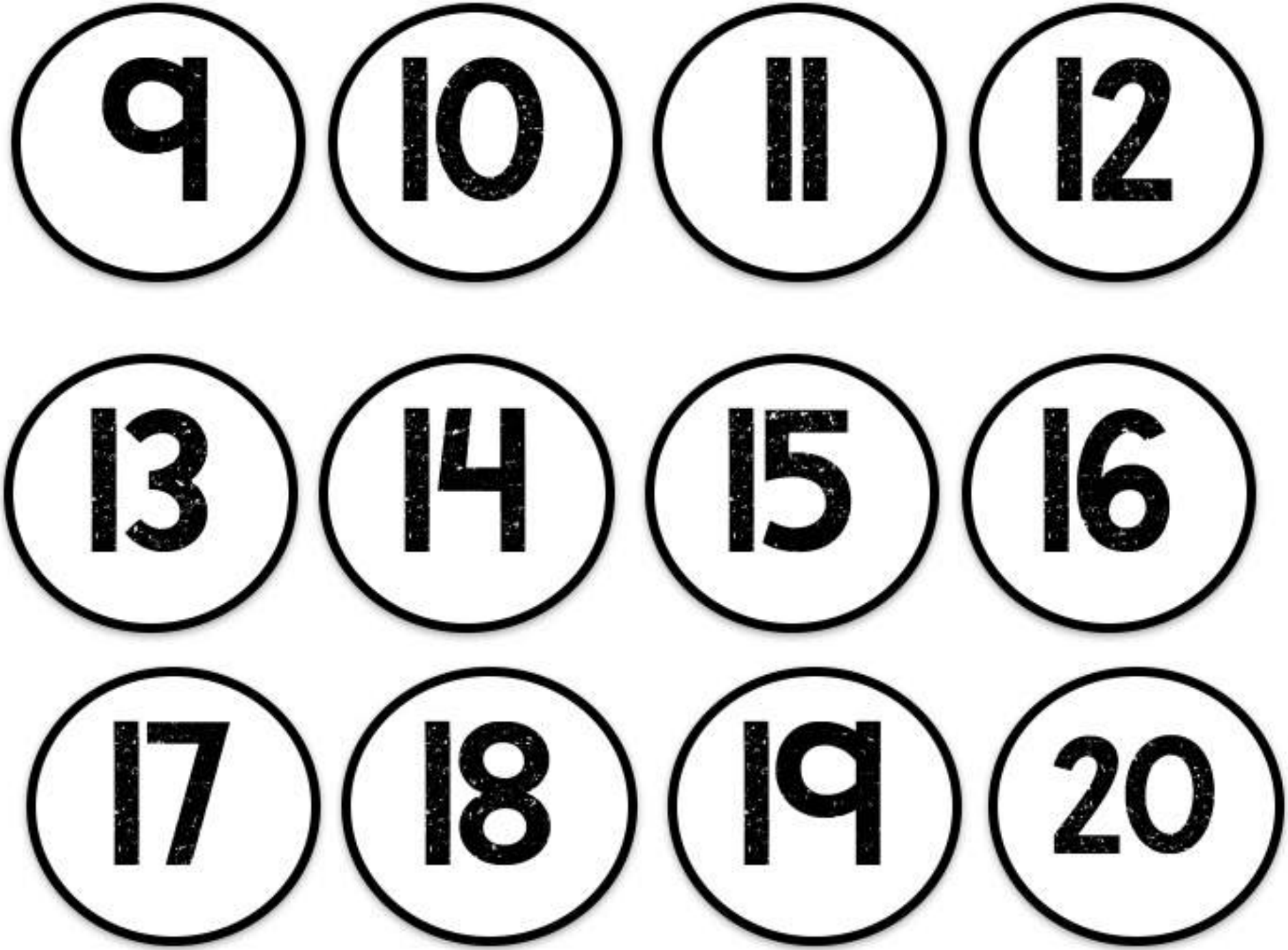
Which box has the greatest volume? How much more volume does it have?

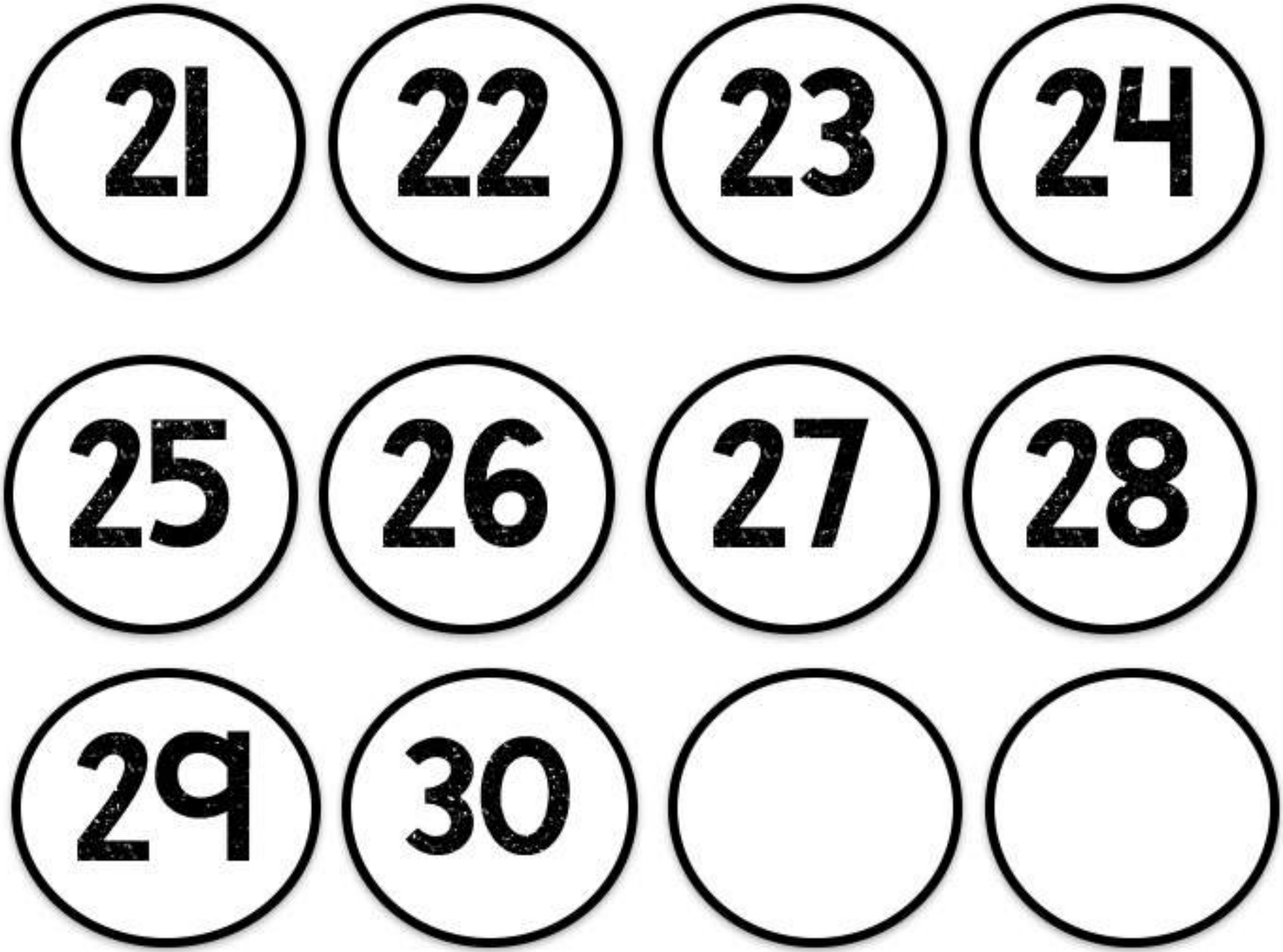
What did I notice?



Box Numbers



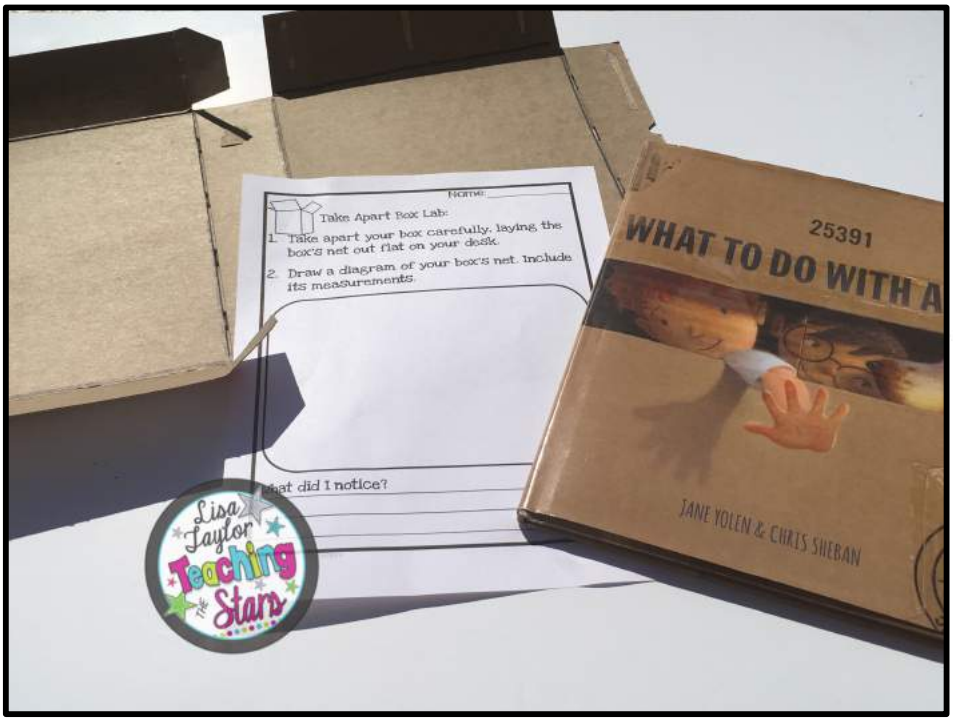


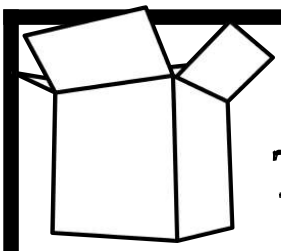


Take Apart Box Lab

Take Apart Box Lab: Students take apart a box to analyze its net. Students look how the box was designed and cut. Students record their observations and measurements of their box. Students label the front, back, top, and bottom. Students can re-design the box and put back together inside out. Students can then redesign their box.

Materials:
Boxes
Rulers
Tape
Markers





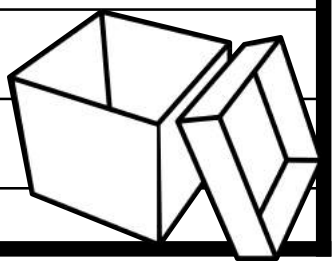
Name: _____

Take Apart Box Lab:

1. Take apart your box carefully, laying the box's net out flat on your desk.

2. Draw a diagram of your box's net. Include its measurements.

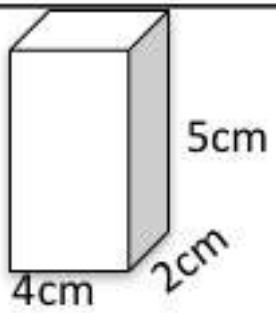
What did I notice?



Volume Assessment

Name: _____

1.



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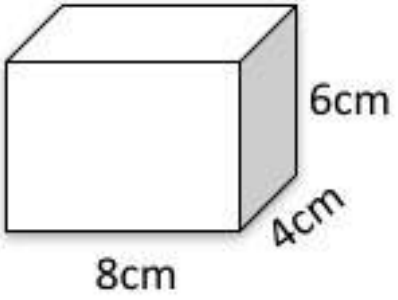

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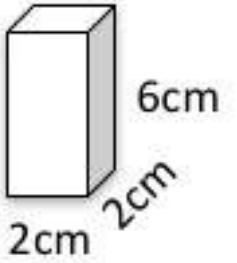

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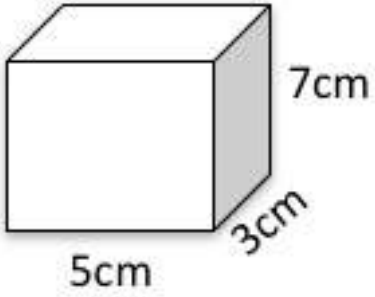

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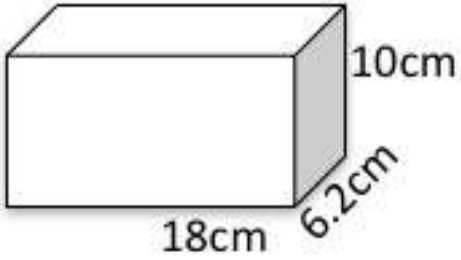

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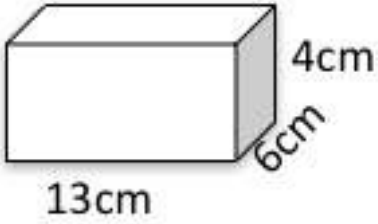

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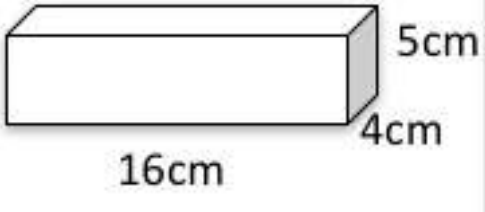

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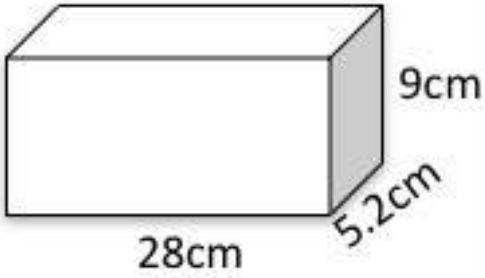

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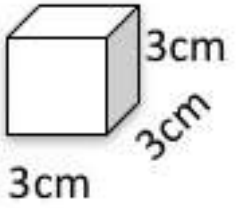

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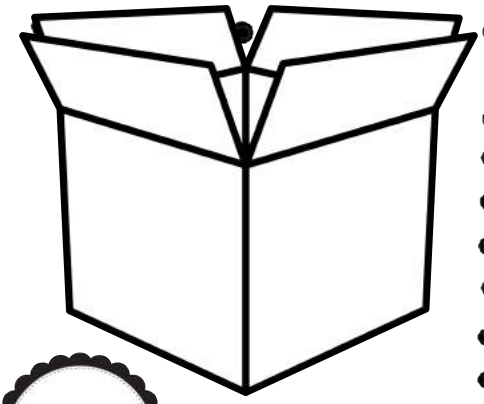
DID YOU KNOW?

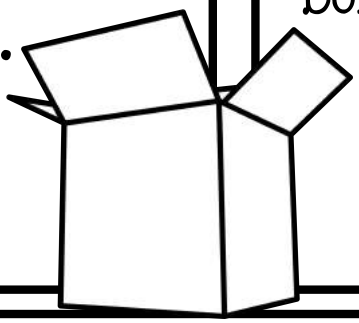


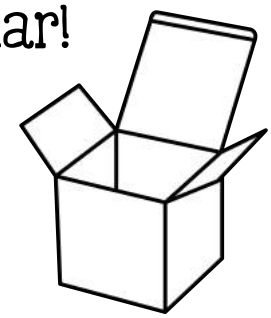
1. Cardboard boxes were added to the National Toy Hall of Fame in 2005.

2. Cardboard box was invented in 1817 in England.

3. Robert Gair, accidently invented the precut paperboard box in 1890. He was making bags and slipped and cut them instead. He realized he could make prefabricated paperboard boxes.

4. The invention of Kellogg's Corn Flakes Cereal in the mid-1800s made the box popular!



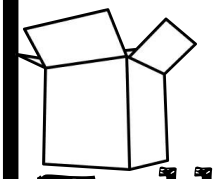


5. Cardboard boxes replaced wooden crates in the early 20th century because they were lighter and more practical.

6. Recycling 1 ton of cardboard boxes saves 46 gallons of oil.

Tallest Tower Challenge

Tallest Tower Challenge: Use all the boxes collected for the volume lesson. Students work in teams to compete for the tallest tower challenge. Each group has 1 minute to build, when time is called they must freeze and step away.



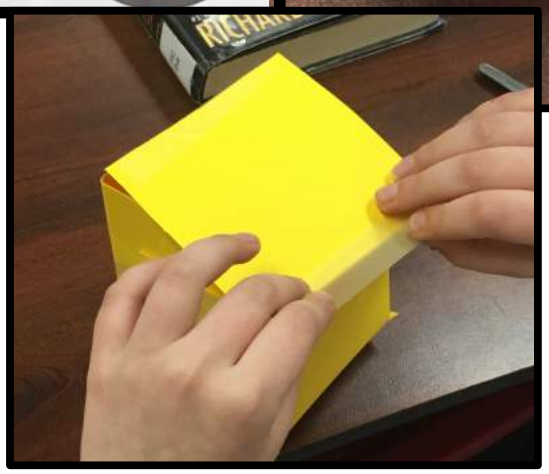
Tallest Box Tower Challenge

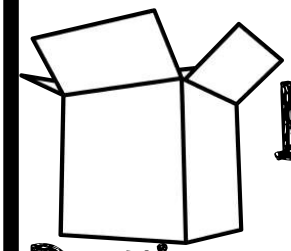
Group	Height
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	

Making Boxes

Making Boxes: Students will use cardstock or graph paper to construct boxes. At first I don't give them much instruction. I want to see what they understand about the different faces and sizes of a box.

Materials:
Cardstock or graph paper
Rulers
Tape



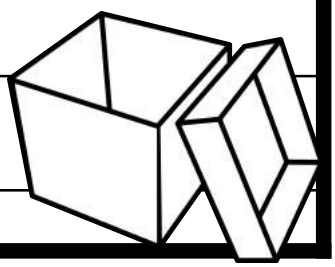


Name: _____

Making Boxes

Design and sketch a box.

After you constructed your box? What did you learn? What didn't work? What would you do different next time?



Thinking Outside the Box

Thinking Outside the Box:

What does it mean to think outside the box?
Why is it important to think outside the box?
Do you think kids or adults are better at thinking out side the box?

Resources:

http://wonderopolis.org/wonder/can-you-think-outside-of-the-box

Box Challenge

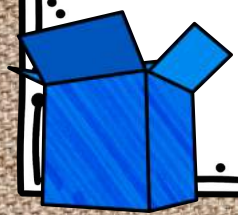
Build a fort using all your boxes.

Box Challenge

Can you balance a box on your head? How long? Can you add another box on top of it? Can you walk with it?

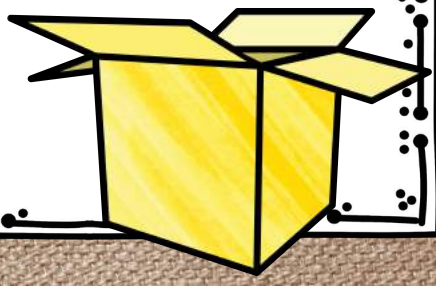
Box Challenge

Using a box create a game that others can play with it.



Box Challenge

Using all the boxes make the tallest tower possible.



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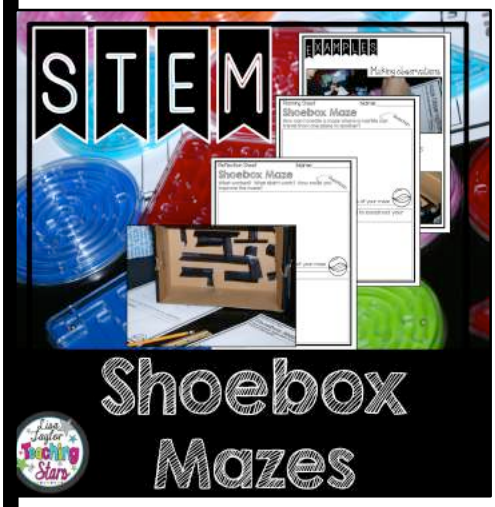

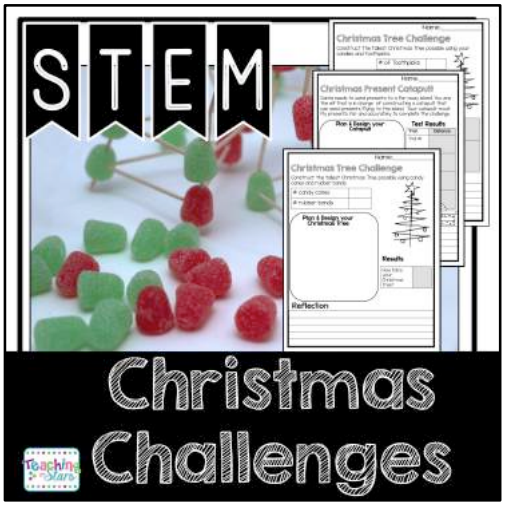

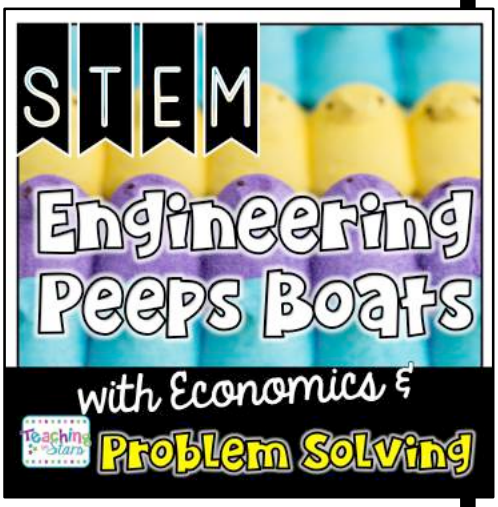

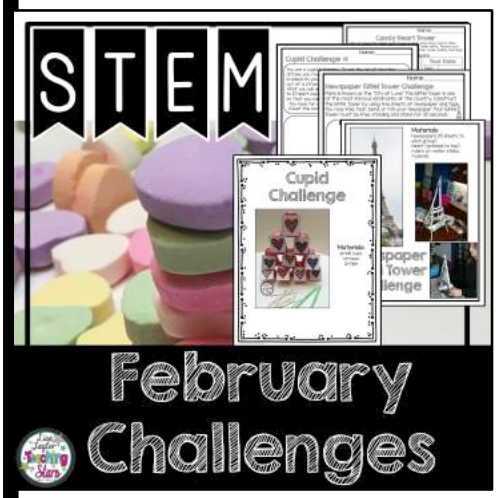

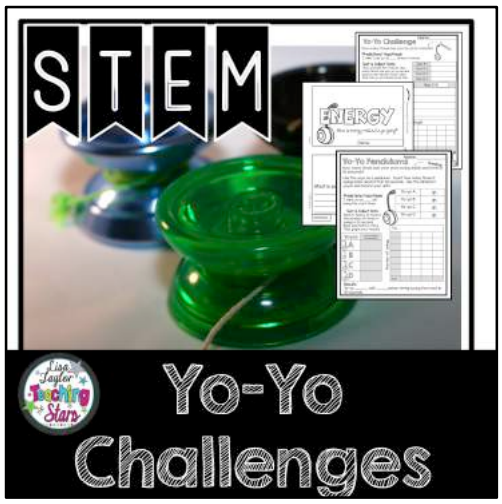

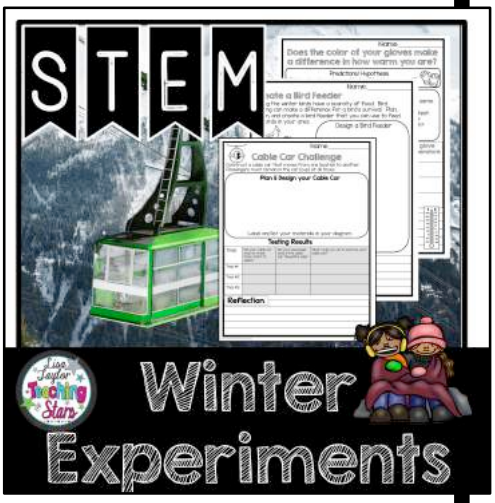

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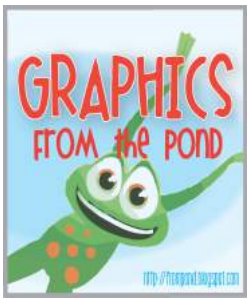

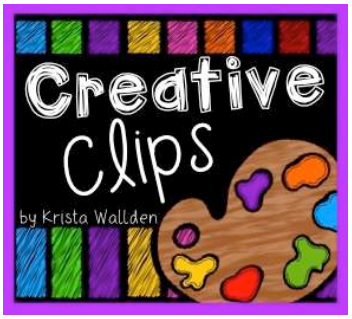

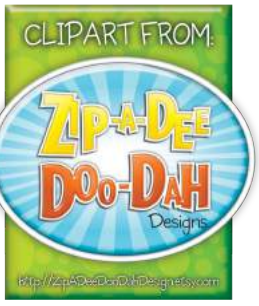

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