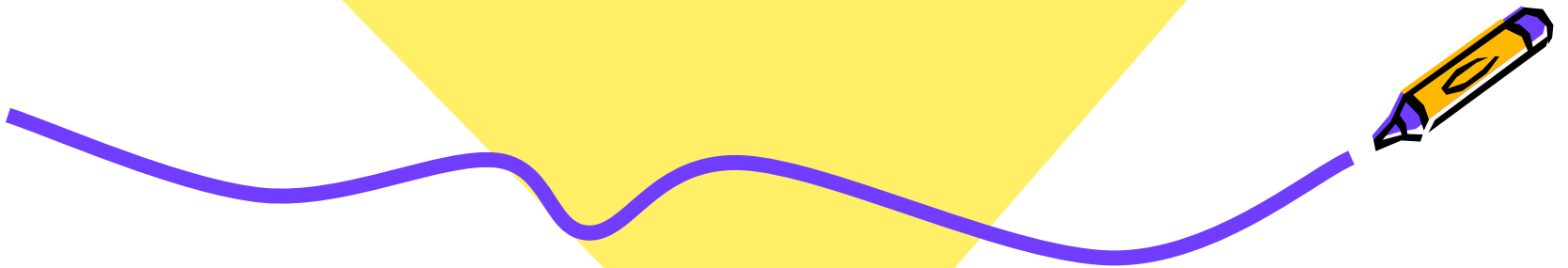


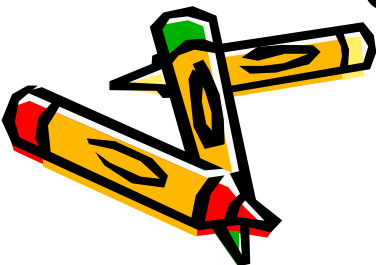
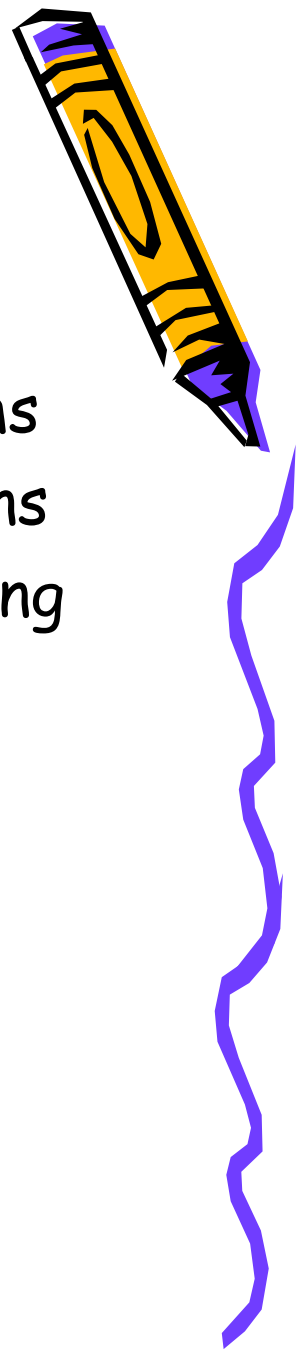
Crayons

PP STEM Lessons K-2



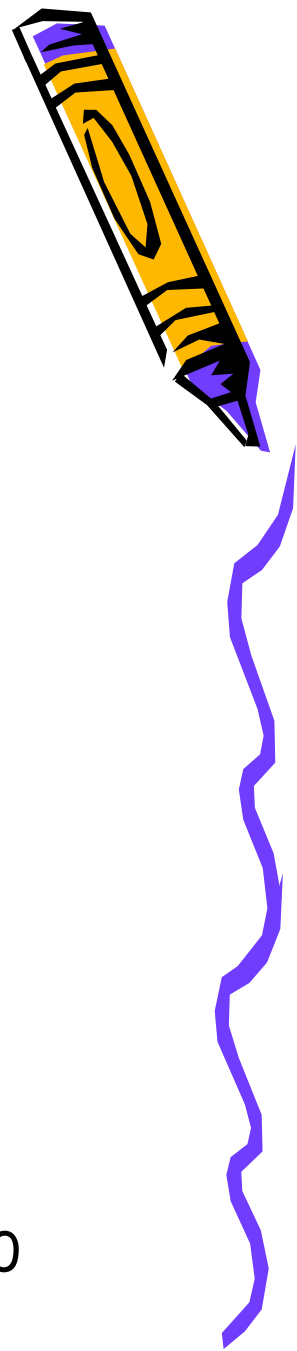
Lesson Objectives

- **Science and Engineering Practices**
 - Asking Questions and Defining Problems
 - Planning and Carrying Out Investigations
 - Obtaining, Evaluating, and Communicating Information
- **Disciplinary Core Ideas**
 - PS1.B Chemical Reactions
 - ETS1.A Defining and Delimiting Engineering Problems
- **Crosscutting Concepts**
 - Energy and Matter
 - Cause and Effect



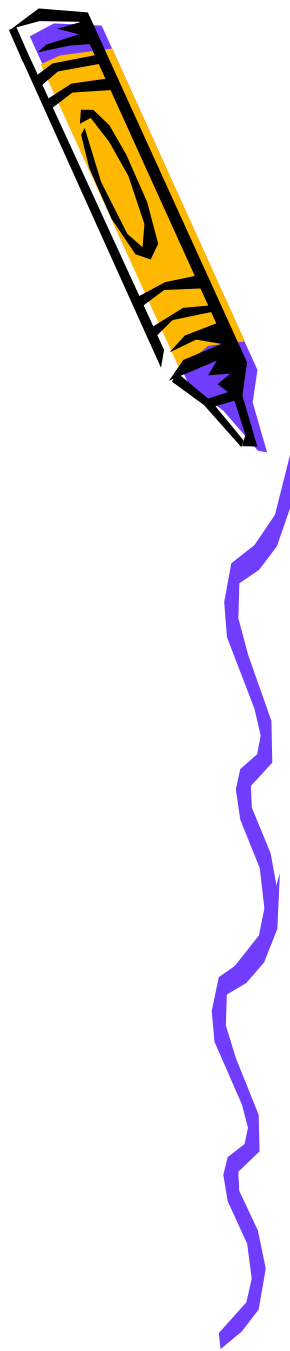
CCSS Connections

- Reading: Literature
 - Key Ideas and Details K-2.1
 - Craft and Structure K-2.6
- Reading: Informational Text
 - Key Ideas and Details K-2.1
 - Craft and Structure K-2.5
 - Integration of Knowledge and Ideas K-2.9
- Writing
 - Text Types and Purposes: K-2.3
- Mathematics
 - Measurement and Data 2.MD.1 and 1.MD.10

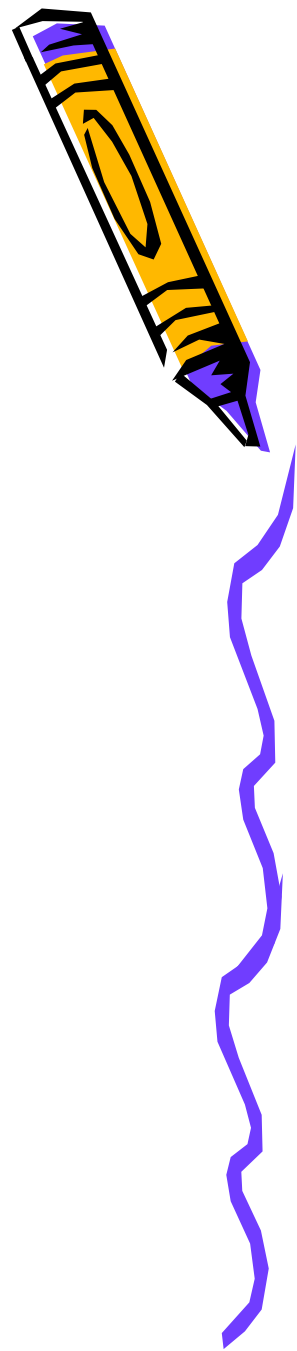


Engage

Mystery Bag Inferences

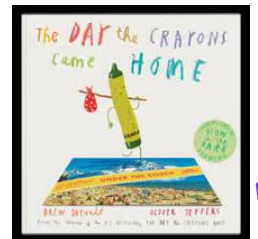


Engage



Engage

- Is this book fiction or non-fiction? How do you know?
- Who's telling the story?
- How does the text show the crayons' points of view?
- Why do you think the author, Drew Daywalt, wrote the book this way?
- How does the illustrator, Oliver Jeffers, help tell the story?
- What were some of the ways the crayons were changed?



Engage

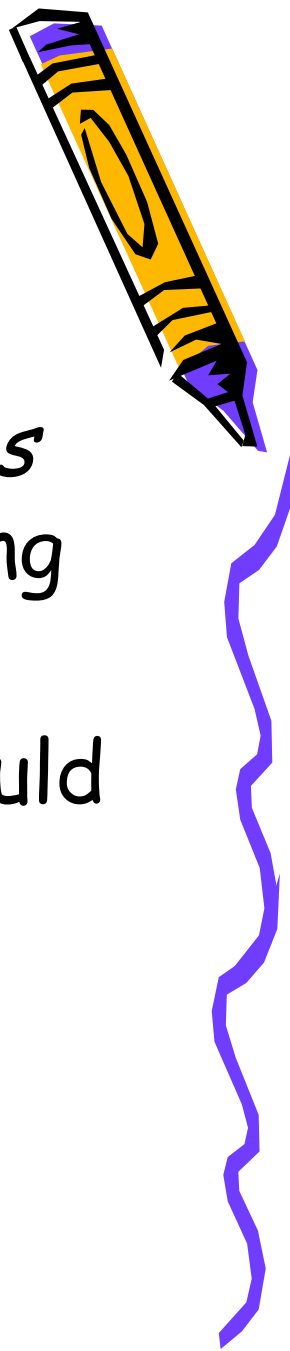
Today we're going to learn both science and engineering concepts by

- observing crayon properties,
- exploring how crayons can be changed, and
- learning how crayons are made.



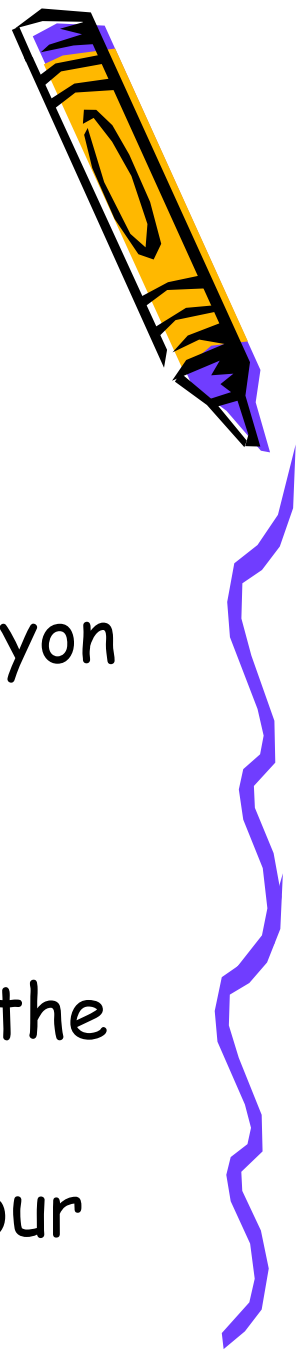
Explore

- After reading *The Day the Crayons Came Home*, what are you wondering about crayons?
- What properties of this crayon could we observe?



Explore: Crayon Observations

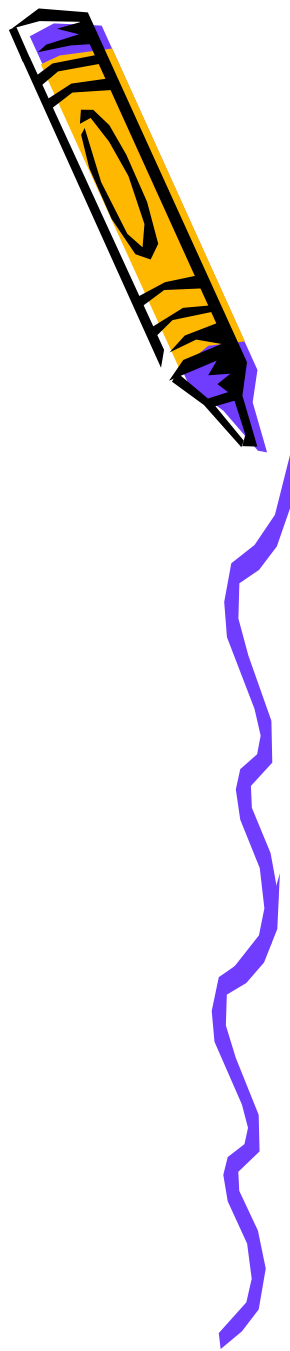
- Using your crayon, draw a detailed picture of the crayon.
- Remove the wrapper from your crayon and use all your senses (EXCEPT taste) to make and record observations of the crayon.
- Measure and record the length of the crayon.



List some ways you could change your crayon.

Explore: Crayon Observations

- Do you think your crayon is a solid, a liquid, or a gas? Why?
- What are some ways you could change your crayon?

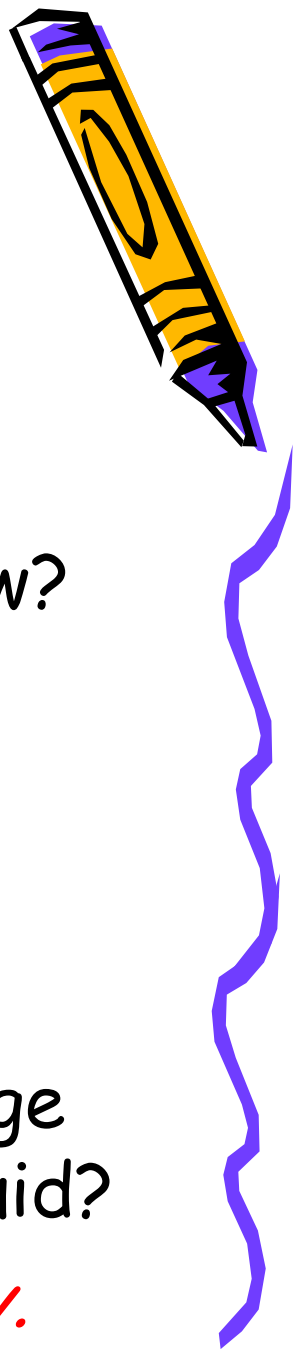


Explore: Crayon Observations

Break your crayon into 3 or 4 smaller pieces.

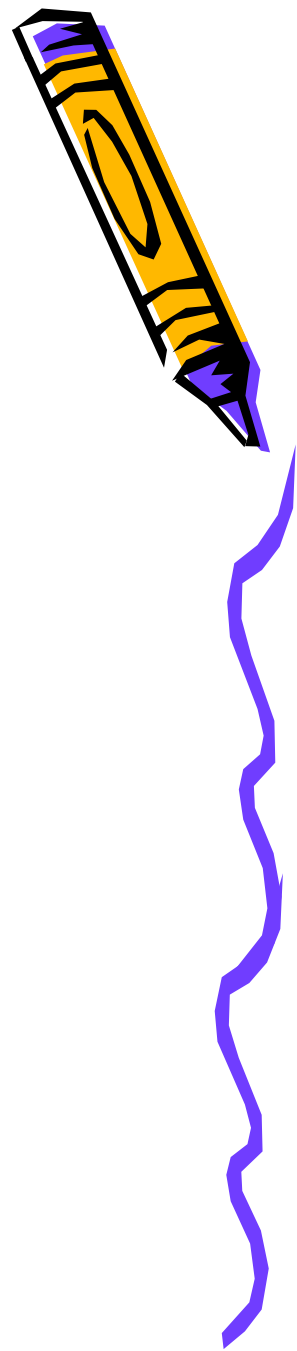
- How is your crayon different now?
- How is it the same?
- Is your crayon still a solid?
- Is it possible to change a crayon from a solid to a liquid?
- How do you think you could change your crayon from a solid to a liquid?

Keep your pieces for another activity.

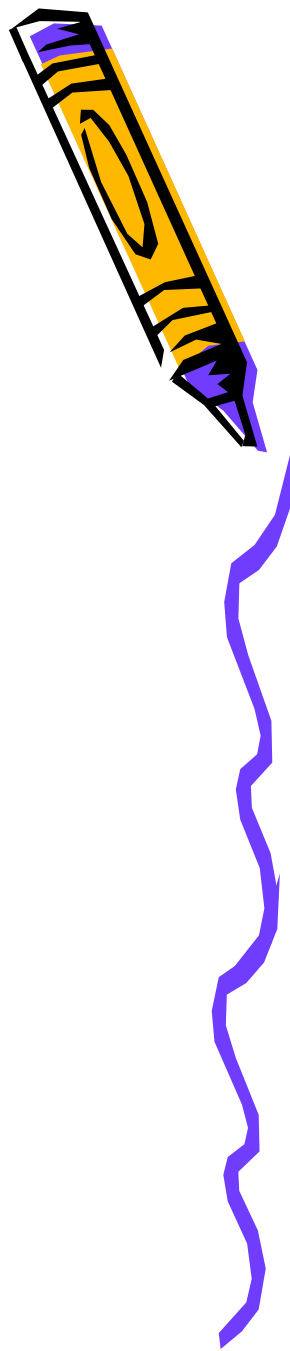


Explore

Now what are you wondering about crayons?

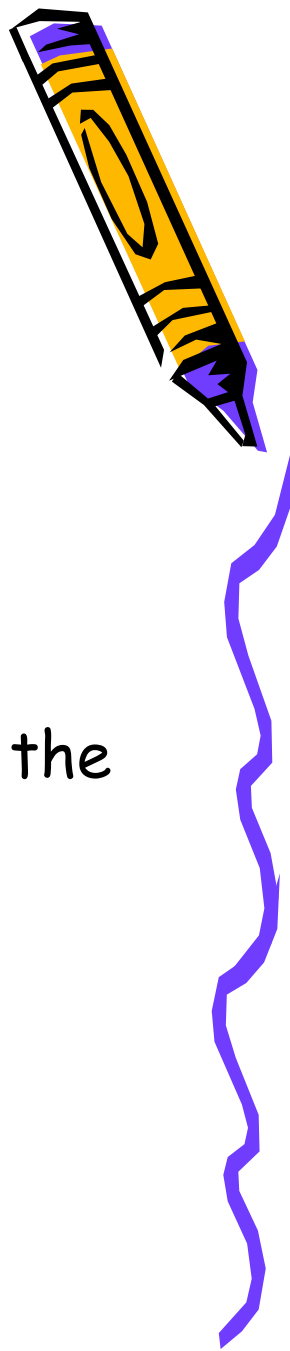


Crayon Questions

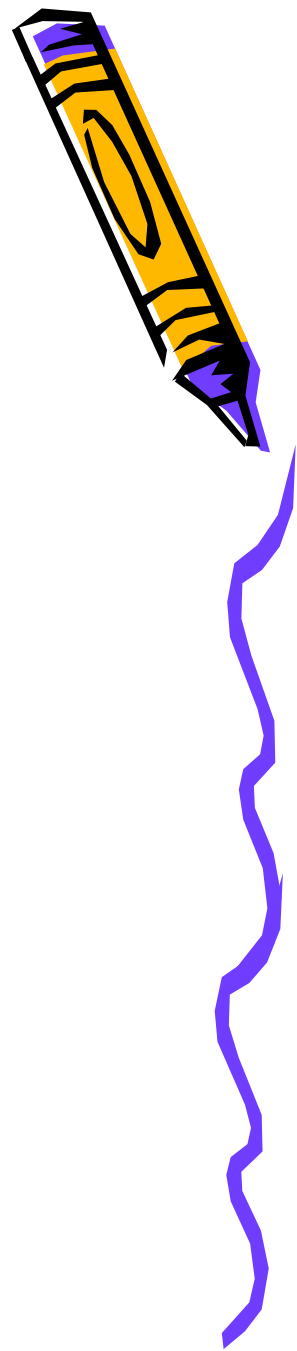
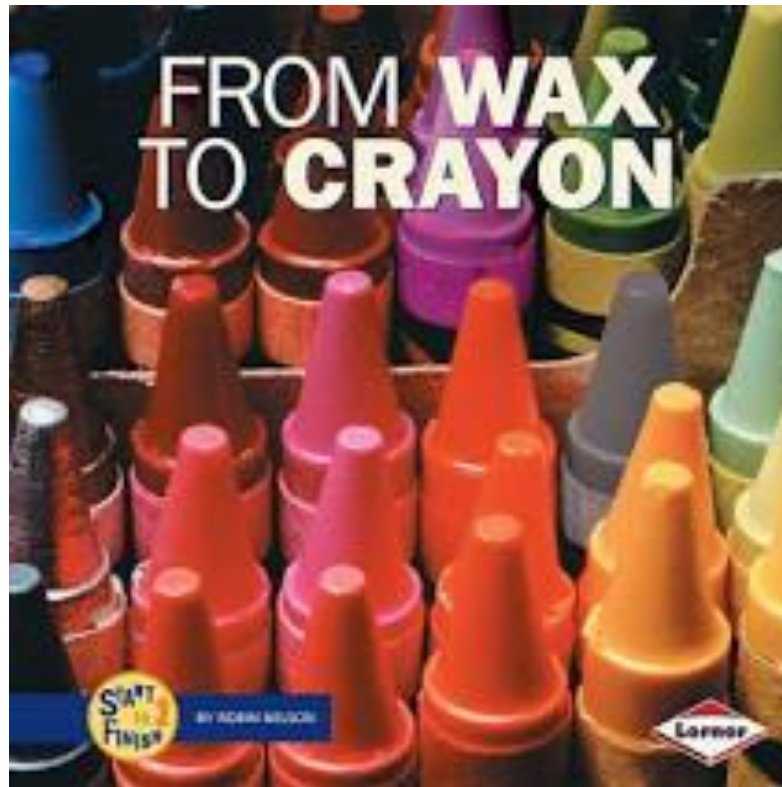


Explain

- Use your *How Crayons Are Made* cards to show how crayons are manufactured in a factory.
 - You will have the opportunity to reorder the cards as you listen to a book about the crayon-making process.

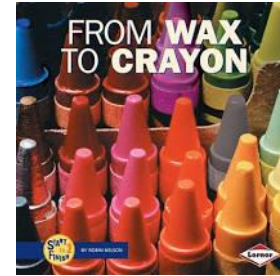


Explain

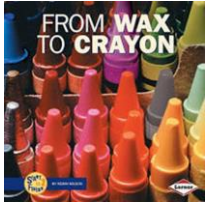


Explain: How Crayons Are Made Cards

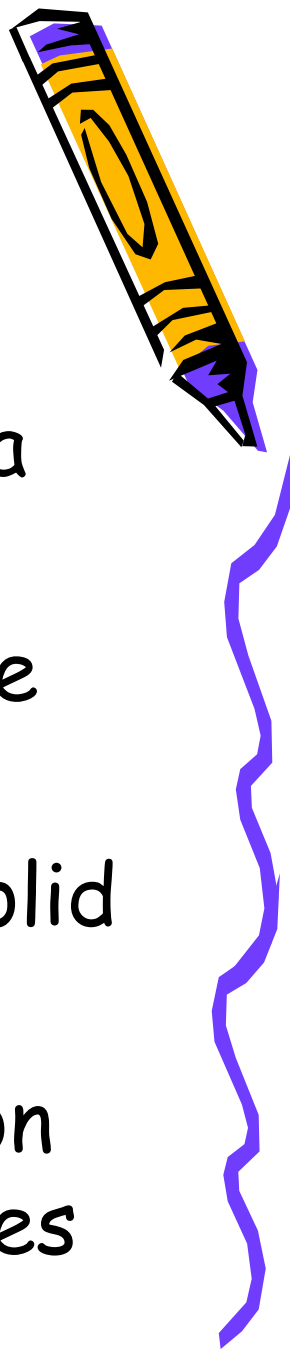
1. Wax melts.
2. A worker adds color.
3. The wax is shaped.
4. The wax gets hard.
5. A worker checks the crayons for chips or dents.
6. A machine wraps the crayons,
7. A machine sorts the crayons.
8. The crayons are boxed.
9. The crayons are sent to stores.
10. I draw pictures with many colors.



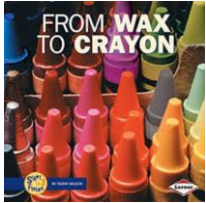
Crayon Questions



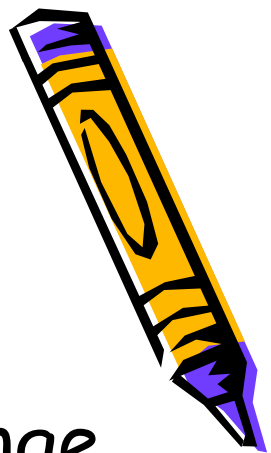
- How does the wax turn into a gooey liquid?
- How is the wax made into the shape of a crayon?
- How does the wax become solid again?
- When a worker finds a crayon with chips or dents, what does he/she do with it?



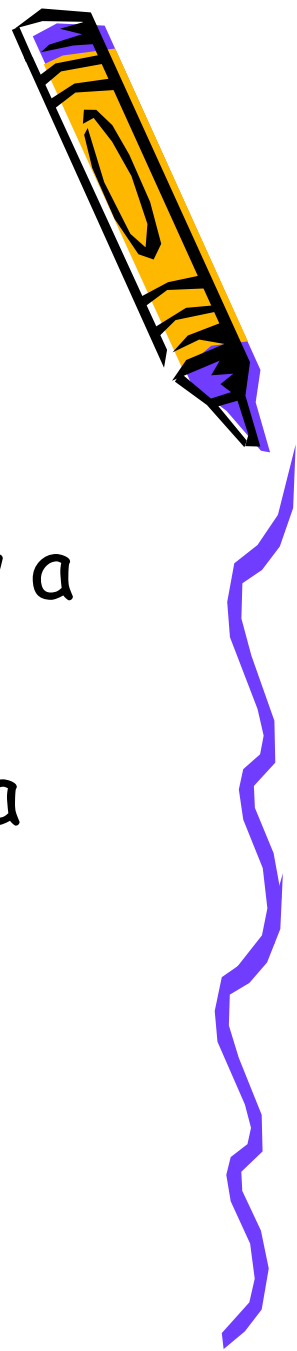
Reversible Change



- What can you do to ice to change it into a liquid?
- How can you reverse the change and make water become solid again?
- What can you do to solid wax to change it to a liquid?
- How can you reverse the change and make the wax become solid again?



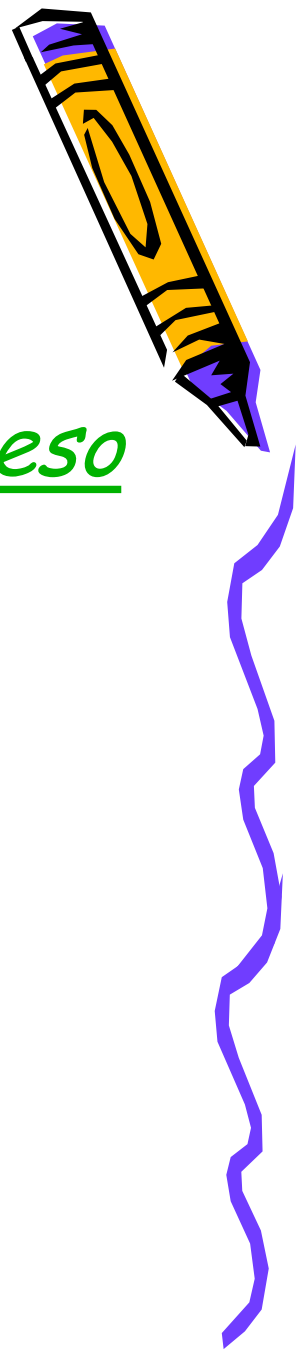
Explain: Melting Crayons Demonstration



- What changes did you observe?
- How does this demonstration show a reversible change?
- Work with a partner and think of a change that is **NOT** reversible.



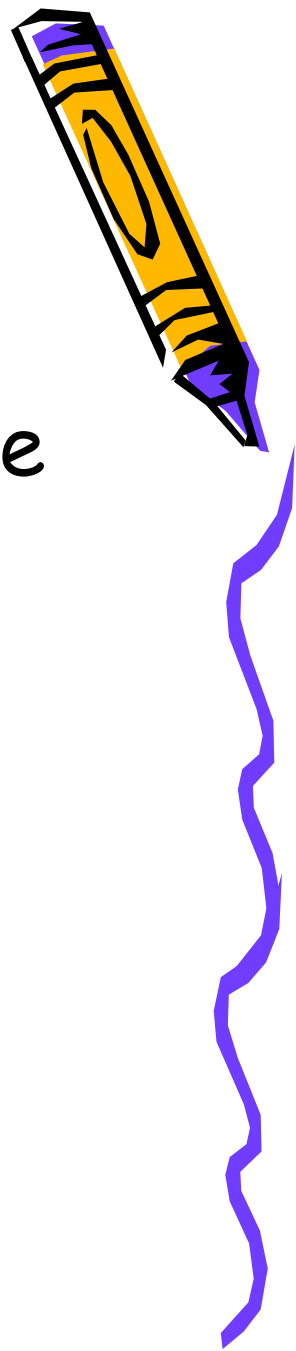
Explain: *How People Make Crayons*



- <http://cet.pbslearningmedia.org/resource/959d7d86-78fa-44e1-91a1-dcfa163ce7a0/how-people-makecrayons>



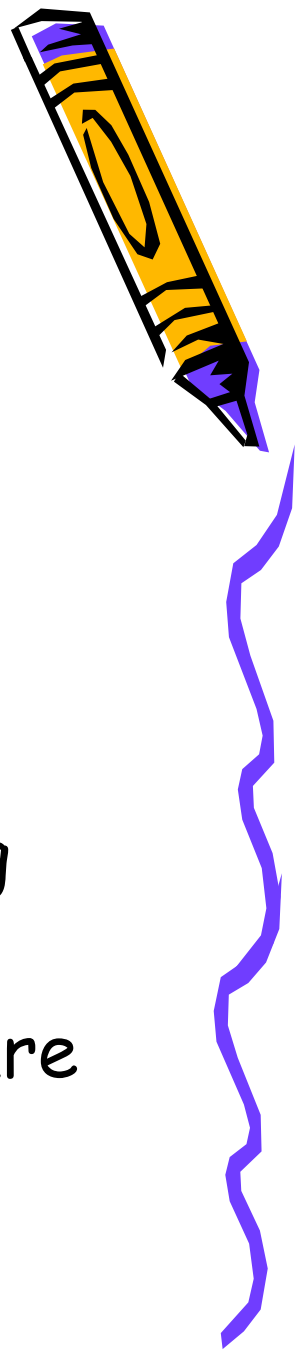
Explain: *How People Make Crayons*



1. How does the book compare to the video?
 - What is the same?
 - What is different?
2. Does the video provide any new information?



Explain: *How People Make Crayons*

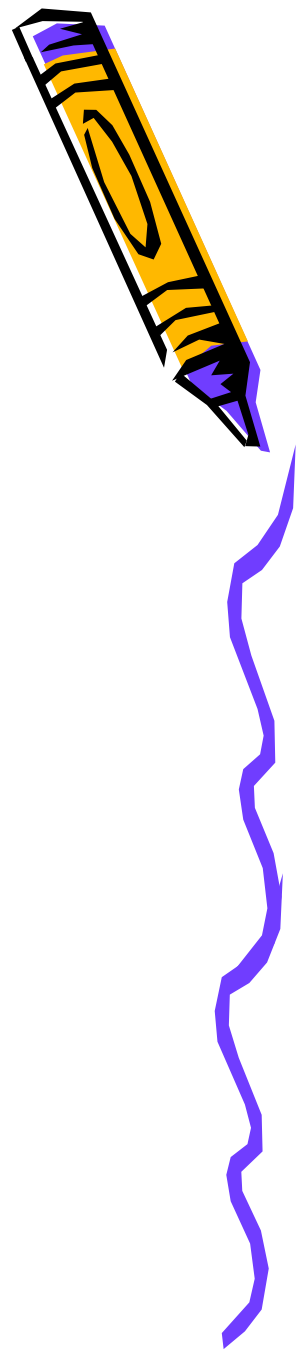


Think about all the science and engineering involved in making an ordinary crayon!

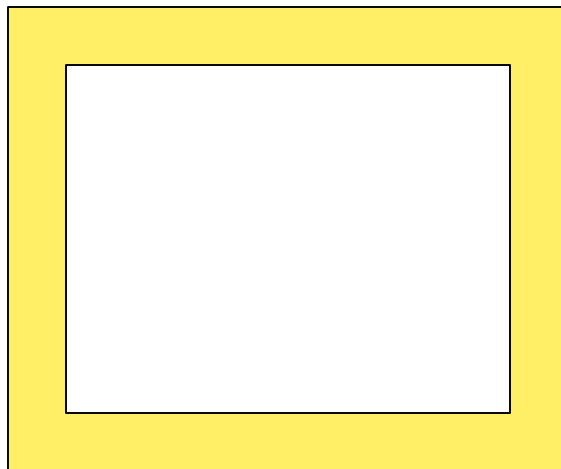
- How do you think scientists and engineers might be involved in making crayons?
- How do you think new crayon colors are invented?



Favorite Crayon Colors Graph



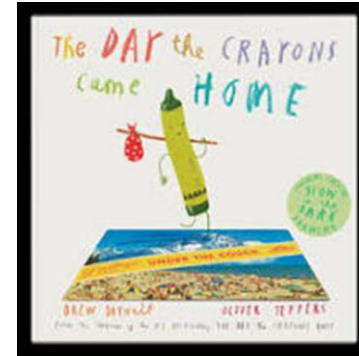
Number of Votes



Favorite Colors



Elaborate



- Reread pages 27-28.
 - Why would a crayon melt in the dryer?
 - How did the turquoise crayon get in the dryer?
 - Why is it a bad thing if a crayon gets in the dryer?
- Reread pages 13-14.
 - Why did the red and orange crayons melt?



Elaborate: Crayon Recycling Design Challenge

- Take out the broken crayons from our Explore phase.
 - Turn and talk to brainstorm a simple and safe way to recycle the crayons into new crayons.
 - Turn and talk how you might design a step-by-step process for recycling the crayons with new shapes and colors.
- Share and combine to create a class process to try together.



Elaborate: Crayon Recycling Design Challenge

- How are the crayons the same as they were before being recycled?
- How are they different after being recycled?
- Do you think this change could be reversed?
- How well did our recycling process work?

What would you change to make the process better?



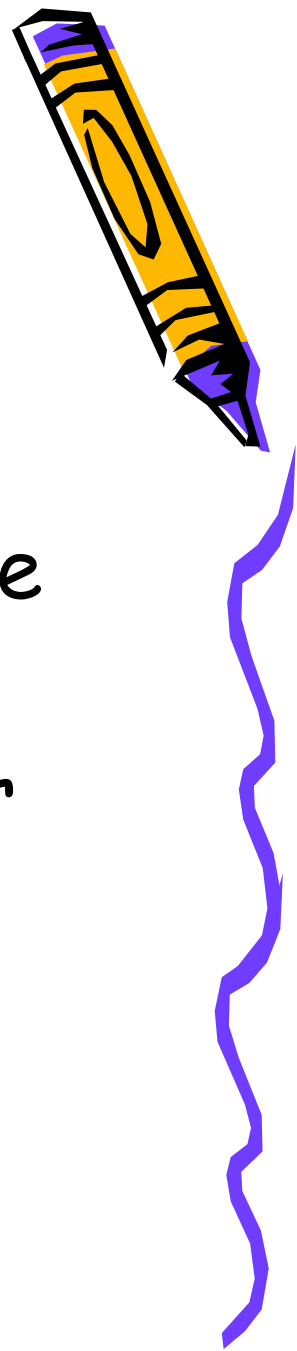
Evaluate: Postcard from a Crayon



- Write a friendly letter from the point of view of the crayon you observed at the beginning of the lesson.
 - Use first person (I, me, my, we)
 - Describe all the things that happened to the crayon during the recycling process.
 - *First, then, next, last*
 - *Solid, liquid, heated, cooled*
 - Beginning: Think of a creative way your crayon could have been broken.
 - Ending: How your crayon was recycled into a new crayon with a new color and shape, describing all the steps in the recycling process in between.



Crayons



- What did you learn today?
- What was your favorite part of the lesson?
- See your STEM at Home sheet for another experiment you can do at home.



Source

Picture Perfect STEM Lessons, K-2.
(2017.) National Science Teachers
Association.

