

***How is a Crayon Made?*** by Oz Charles. New York: Scholastic, Inc., 1988.  
ISBN 0-590-45997-X

**Literature Annotation:** This easy to read book contains lots of colored pictures showing different workers in the factory and the resources that are used to produce crayons.

**Grade Level:** 1

**Duration:** One 45-minute period

**Economic Concepts:** Production; Scarcity, Decision-making

### **Maryland State Curriculum**

***Economics Standard:*** Students will develop economic reasoning to understand the historical development and current status of economic principles, institutions, and processes needed to be effective citizens, consumers, and workers participating in local communities, the nation, and the world.

4.A.2 Describe the production process (Grade 1)

4.A.2.a Give examples of natural and human resources used in production (Grade 1)

4.A.1 Describe economic choices people make about goods and services (Grade 1)

***Reading Standard:*** Students will use a variety of strategies to understand what they read (construct meaning).

1.E.4 Use strategies to demonstrate understanding of the text (after reading)

2.A.3.c Recognize sequential order (Grade 1)

2.A.4.e Retell important facts from the text (Grade 1)

**Objectives:** Students will...

- identify the natural, capital, and human resources used in the production of crayons.
- describe several sequential steps in the process of producing crayons.
- explain how limited natural, capital, and human resources require people to make choices.

### **Vocabulary**

**economic resources:** the natural, human, and capital resources that are used to produce goods and services: also call factors of production.

**natural resources:** the renewable, and nonrenewable gifts of nature that can be used to produce goods and services, including but not limited to land, water, animals, minerals, tress, climate, soil, fire, seeds, grain and fruits.

**human resources:** the health, strength, talents, education and skills that humans can use to produce goods and services.

**capital resources:** the goods that are manufactured and constructed by people and used to produce other goods and services, including but not limited to factories, warehouses, roads, bridges, machinery, ports, dams, and tools. (Money is not a capital resource.)

**production:** the act of creating goods and services by combining economic resources.

**product:** a good or service

**decision-making process:** a process used to solve a problem in social studies including; identify a problem, explain the pros and cons of alternate choices, make a decision based on the choices available, and identify the opportunity cost of the choice made

### **Additional Vocabulary**

paraffin wax                      choices

### **Teacher Materials**

- Crayon in a brown paper bag, prepared before the lesson
- Paraffin wax (found in the canning section of the grocery store or candle-making section of a craft store)
- Transparency or chart of Resource Sheet 1: *Economic Resources Chart*

### **Student Materials**

- One copy of Resource Sheet 2: *Economic Resources for Making Crayons*
- Optional: Resource Sheet 3: *Steps to Produce a Crayon*
- Optional: Fold-out Book, six 8x6 rectangles taped together and accordion folded into a fold-out book (teacher may want to have prepared ahead of class time)
- Optional: Resource Sheet 4: *Steps to Make Crayons*
- Optional: one of the covers from Resource Sheet 5: *Fold-Out Book Cover*
- Optional: production sequence pictures downloaded from Crayola website [http://www.crayola.com/factory/preview/factory\\_floor/crayon\\_mfg.htm](http://www.crayola.com/factory/preview/factory_floor/crayon_mfg.htm)

### **Teacher Background**

Crayons are now made from paraffin wax and soybean oil. Additional information about soybean crayons may be found at <http://www.indianasoybeanboard.com/crayons.shtml> and at the Prang Crayon website. Students can view the five basic steps in making paraffin wax crayons at the Crayola website.

### **Motivation**

Show the paper bag to the students. Have students play the Twenty Question game in which they ask a question about the object in the bag. Their question must be answered with a yes or no. For example, students may ask “Is the object something to wear?” or “Is the object blue?” etc. If the students need additional hints, tell them that it is something in their school box.

### **Development**

1. Show students the crayon. Ask: *Who makes crayons?* Ask students: *What do you think is used to make the crayon?*
2. Show students some paraffin wax that can be found at craft stores in the candle making section and in some grocery stores with the food canning supplies. Tell students that paraffin wax is one of the main ingredients for making crayons. Explain to students that paraffin wax comes from oil. This is the same oil that is used to make gasoline for cars and heating oil for our buildings. Ask students: *How might the increase in oil prices affect the cost of wax crayons?*

3. Show students the book *How is a Crayon Made?* by Oz Charles. Have them look at the back cover with all the different colored crayons going down the chutes into a box. Then look at the opening page with all the boxes of crayons.
4. Read the first page with the class. Ask students to recall what type of tanks are used at the color mill, and why the type of tank is important.
5. Conduct a Read-Aloud of the rest of the book. Have students notice the different machines and equipment that are used by the workers in the factory.
6. Have students recall some of the machines and equipment that were in the factory (i.e., filter press, plastic trays, kiln, blending machines, pulverizer, liquid paraffin wax pipes, vat, stirring rod, rotary mold tables like a giant muffin tin, square metal frame, dual labeling machines, quality control lab, transverse breaking machine or crayon eater, packing machines, and boxing machines).
7. Explain to students that these machines are called **capital resources** used to produce crayons. These machines and equipment are tools that workers use to produce crayons. Display Resource Sheet 1: *Economic Resources Chart* and write 'machines and equipment' under Capital Resources.
8. Have students refer back to the text to locate some of the workers and the jobs they are doing, e.g. breaking the cakes of color, weighing bags of color powder, putting plastic trays into a kiln to dry, pouring powdery pigment into the vat of clear wax, picking up the labeled crayons and checking for broken tips, testing crayons, and packing boxes.
9. Explain to students that these workers are **human resources** used to produce crayons. On Resource Sheet 1, write 'workers' under the heading Human Resources.
10. Then ask students what other resources were needed to make the crayons. Students may mention water, color pigment, paraffin wax or liquid paraffin wax, and cardboard boxes. Remind students that paraffin is made from oil, and that cardboard is made from wood (trees).
11. Tell students that water, oil, and trees or wood are all **natural resources**. On Resource Sheet 1 write 'found in nature' under the heading Natural Resources.

### **Assessment**

Distribute copies of Resource Sheet 2: *Economic Resources for Making Crayons*. Have students write or draw two examples of each resource in the appropriate column. On the back of the sheet have students write a sentence about how crayons are made.

## Additional Activities and Resources

- Explain to students that some crayons are now made with soybean oil. Have students compare the two types of crayons, Crayola made with paraffin wax and Prang made with soybean oil. Have students decide what criteria to use in evaluating each crayon. They want to use similar tests like the quality control lab, such as intensity of color, consistency, smoothness on the paper, how quickly it breaks, etc.
- Ask students to explain how producers might decide which natural resource to use for their crayons. Have students discuss the positive and negative points for using soybean oil or paraffin wax from oil. Some points may be that soybeans can be grown and are a renewable resource, price of soybean oil and paraffin wax or oil, differences in quality of crayon, availability of oil or soybean oil, etc.
- Have students create a sequence chain that illustrates several key steps in the production of crayons. Students may use Resource Sheet 3: *Steps to Produce a Crayon*. Students may view the five basic steps in making paraffin wax crayons at the Crayola website.
- Have students create a fold-out of the sequence for making crayons. Use six 8x6 rectangles, taped together and folded into a fold-out. Give students one copy of the book cover. Have students cut apart the strips on Resource Sheet 4: *Steps for making Crayons* and arrange them in order on their desk. Give students copies of the pictures for the five basic steps downloaded from the Crayola website [http://www.crayola.com/factory/preview/factory\\_floor/crayon\\_mfg.htm](http://www.crayola.com/factory/preview/factory_floor/crayon_mfg.htm). Have students match the pictures with the strips on their desk. Students should glue the pictures and strips in the correct sequence in their fold-out book.

Resource Sheet #1  
Economic Resources Chart

Natural Resources (nature's gifts)	Human Resources (workers)	Capital Resources (machines and equipment)



Resource Sheet #2

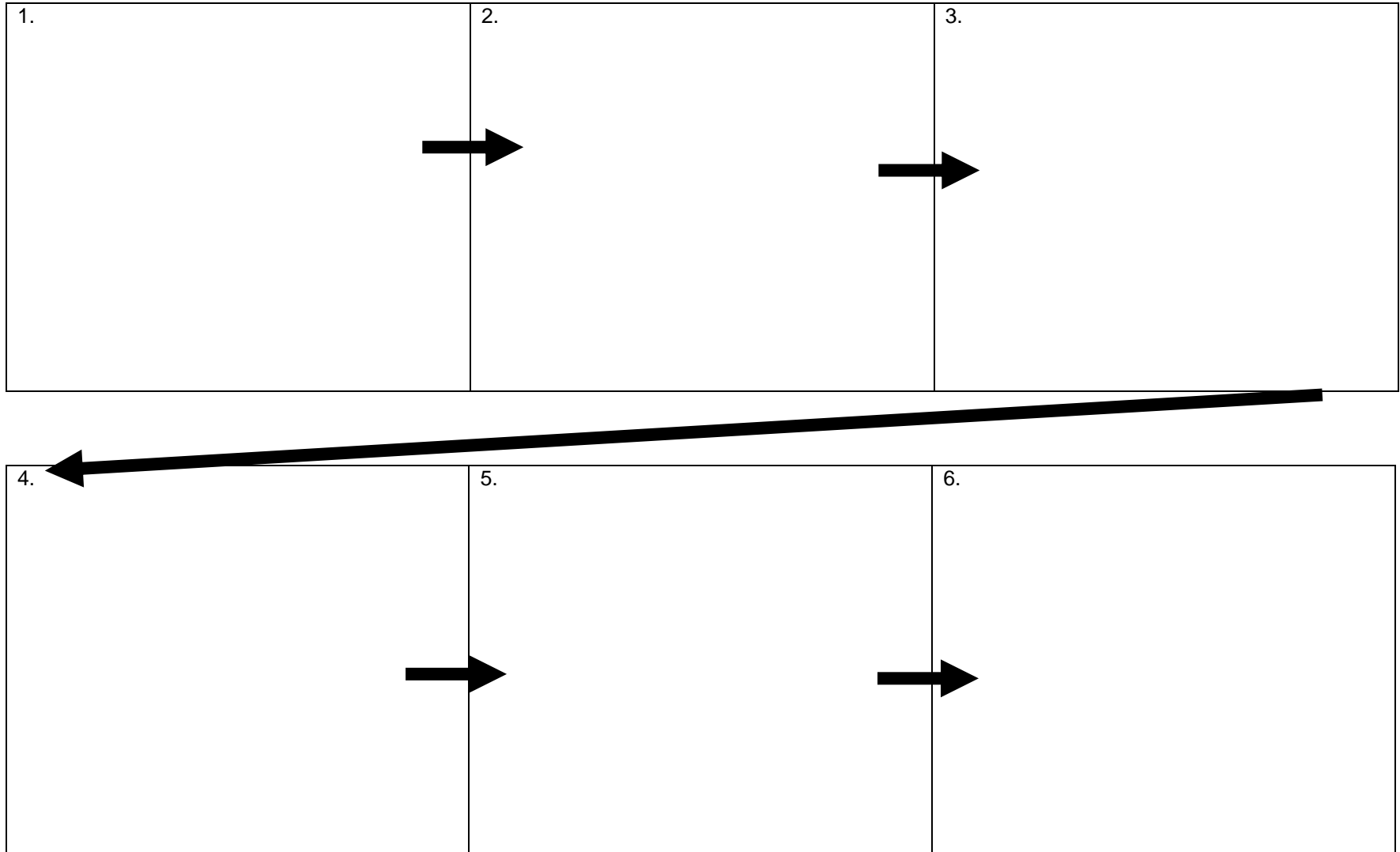
## Economic Resources for Making Crayons



Natural Resources	Human Resources	Capital Resources

Name \_\_\_\_\_

### Steps to Produce a Crayon



## Steps to Make Crayons

Liquid paraffin is pumped through pipes to vats.

Colored pigment is poured into each vat of wax.

The colored wax is piped to mold tables with lots of little holes.

The wax flows into the holes which are molds for the crayons.

Some crayons are taken to the quality control lab to be tested.

Crayons are tested for strength and intensity of color.

Labeling machines wrap and glue a label around each crayon.

The crayons are put into packing machines with different slots.

Crayons are put into cardboard boxes called sleeves.

Finished boxes are then packed and sent to stores.

Fold-Out Book Cover

How is a  
Crayon  
Made?



How is a  
Crayon  
Made?

