

Creating Crayons

How does each fit into the design process for crayons?

| Science | Engineering | Creativity |
|---------|-------------|------------|
| | | |

Using the different writing instruments,
draw a triangle and square.

| Slate Pencil | Black Wax Pencil | Chalk |
|--------------|------------------|-------|
| | | |

What are observations you can make about how each writes?

| Slate Pencil | Black Wax Pencil | Chalk |
|--------------|------------------|-------|
| | | |



What is a pigment? What were used to make the colors in the crayons when they were invented?

Physical Change: When a substance is changed in shape or state without changing the composition. It can be reversed.

Chemical Change: When substances are combined and produce a new substance. It is not reversible.

When pigments and wax were combined to make crayons, do you think it was a physical or chemical change? Explain your answer.

Station #1 Chromatography: Observing marker ink pigments.

Follow the directions to set up this station:

- a. Cut strips of coffee filters so that they are 1 inch wide and 7-8 inches long.
- b. Tape the top of each strip to a popsicle stick or straw. Check to see that the filter strip will almost reach the bottom of the plastic container when the straw sits across the top.
- c. Using one marker of the same color from different brands of markers, draw a single line across the filter strip about one inch from the bottom.
- d. Fill the container with one inch of water.
- e. Place the straws/popsicle sticks across the top so that the coffee filter hangs down into the water. Do not let the water touch the ink line.
- f. Make observations about what happens to the ink as the water is absorbed and moves up the coffee filter.

Write your observations below:

| Strip #1 | Strip #2 | Strip #3 | Strip #4 | Strip #5 |
|----------|----------|----------|----------|----------|
| | | | | |

Paste the strips in the space below after they dry.

| Strip #1 | Strip #2 | Strip #3 | Strip #4 | Strip #5 |
|----------|----------|----------|----------|----------|
| | | | | |

What do you notice about the different pigments in the ink?

Station #2 Melting Crayons:

Safety Note: Follow all teacher directions. Be careful around the hot trays and melted wax. Do not touch either.

Make observations about the colored crayons and how much they have melted at each time.

| | 5 minutes | 10 minutes | 15 minutes |
|----------------|-----------|------------|------------|
| Red Crayons | | | |
| Yellow Crayons | | | |
| Black Crayons | | | |

Safety Note: Follow all teacher directions. Be careful around the hot trays and melted wax. Do not touch either.

Closely look at the different colored crayons at each point and make observations. Do the colors seem to have melted at the same rate?

| | 15 minutes | 30 minutes |
|-------------------------|------------|------------|
| While melting at | | |
| After cooling | | |

What kind of change do you think melting crayons represents? Why?