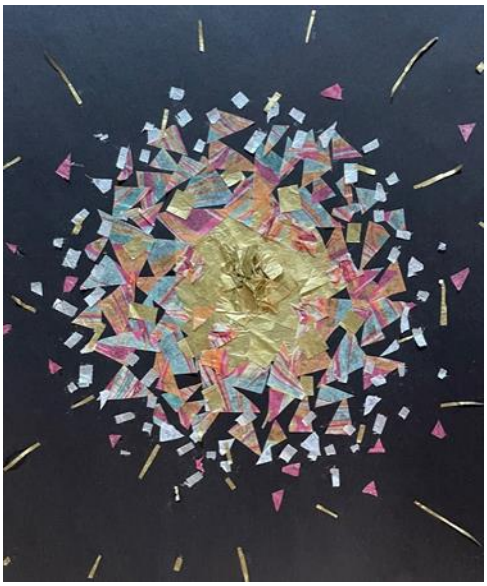
Solar Plasma Collage

Explore the Sun's plasma, variable temperature and density through art!



Materials Needed: *Mind Melting Facts About the Sun* poster*, *Mind Melting Facts* worksheet, black construction paper, tissue paper in a variety of colors and patterns, glue, scissors, pencil or white chalk. *Optional:* Compass.

*Poster is available online at: www.jpl.nasa.gov/infographics/mind-melting-facts-about-the-sun

Review the information on the *Mind Melting Facts About the Sun* poster. You can use the questions on the worksheet as a guide for classroom discussion, or assign it as an individual or group activity.

Key Concepts:

- The density of the Sun's plasma is highest in the core and progressively decreases towards the corona.
- The temperature is highest in the core, decreases towards the surface and increases again in the corona (one of the major puzzles heliophysicists are trying to solve!).
- Temperature measures how fast particles are moving, while heat measures how much energy is transferred (if there are more particles around, they will transfer more energy).

Instructions:

Step 1: Plan your materials.

Students have creative flexibility! Colors and textures are up to the students' artistic interpretation of the Sun. Adapt the activity for different ages; for example, younger children can work together to create a collaborative collage.

Showing Temperature: Choose colors to represent temperature variation inside the Sun. Decide how to represent the hottest and coolest (but still very hot!) parts within the Sun. Combine colors and include patterned or shiny paper. Choose colors that are neighbors on the color wheel to show a progressive transition.

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Showing Density: There are various ways to show density, including packed or thickly layered pieces, as well size, shape, color, and texture. Showing density is up to the artist's creative interpretation.

Showing Layers: Plasma is not solid, and therefore the layers of the Sun don't have hard transitions between them. Layers can shift and blend into each other. You can represent this by blending tissue paper colors between layers.

Show Unique Properties for the Sun's layers. For example, the photosphere is the "surface" of the Sun. We can see it with the naked eye because it creates the most light. Highlight this layer in your collage with extra bright or shiny tissue paper.

Optional: Older children can outline the layers of the Sun, from the core to the corona, on the black construction paper using a pencil, white chalk, or a compass. As an applied math activity, they can also calculate and draw a scale model, based on the distances provided on the poster.

Step 2: Cut, tear, or crumple tissue paper. Arrange your design on the black construction paper.

Step 3: When you are satisfied with your design, glue the tissue paper on the black construction paper to create a solar plasma collage!

Step 4: Discuss the intersection of science and art. How can artists and scientists work together? How can each contribute to a better understanding of our Sun?

Optional: **Create a collaborative art exhibit**. Write a short artist's statement about your interpretation of solar plasma and the methods you used to represent scientific concepts about the Sun in your collage.

Extension: Kinesthetic Activity

Materials Needed: Silk scarves.

Instructions:

In a gym or outdoor area, act out the solar plasma particles in each layer of the Sun, or pretend to "travel through" plasma together. Distribute a silk scarf to each student. Each student moves their silk scarf either faster or slower to show increasing or decreasing temperatures. Students move closer together to show higher density, and move farther apart to show lower density.

Worksheet:

Mind Melting Facts About the Sun

Image: NASA/SDO.

Directions: Read the *Mind Melting Facts About the Sun* poster, and answer the following questions.

Read each statement. Circle True or False.

- Temperature measures how fast particles are moving. *True* *False*
- The Sun's surface is solid. That is why it is visible from Earth. *True* *False*
- The Sun is hottest at the core and coolest at the photosphere. *True* *False*
- Scientists understand why the corona is hotter than the surface. *True* *False*
- The visible part of the Sun is called the photosphere. *True* *False*
- The density of the Sun is the same from the surface to the core. *True* *False*

Fill in the table.

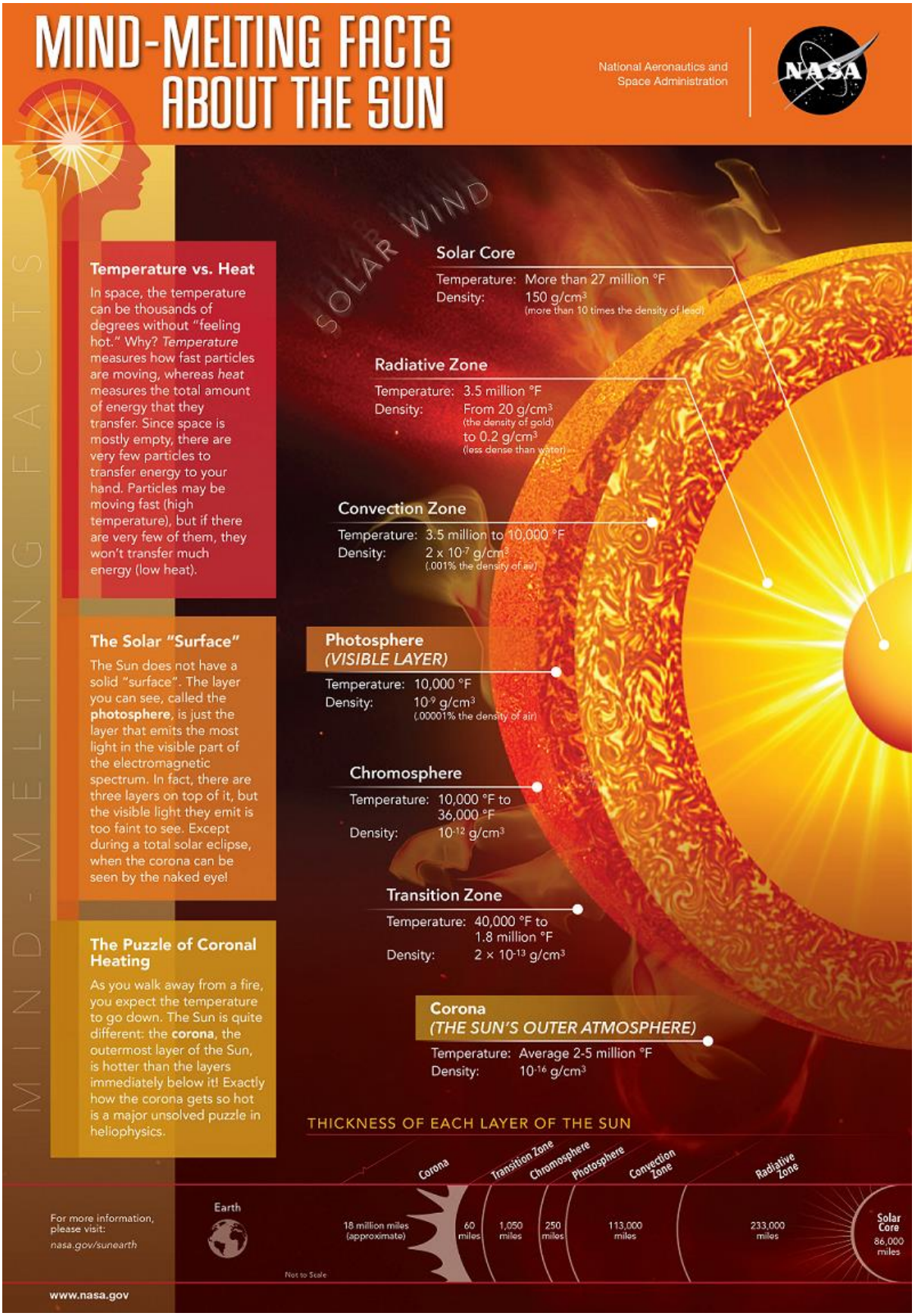
Layer of the Sun	Temperature	Density

Answer these questions.

If you were in outer space, would a thousand degrees feel hot? Why or why not?

Is the photosphere the outermost layer of the Sun? Why or why not?

Describe one major puzzle about the Sun that is not yet solved.



Larger version of this poster is available online at:
www.jpl.nasa.gov/infographics/mind-melting-facts-about-the-sun

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