

GRANDMA'S CHINA

Transparent, Translucent, and Opaque



Materials:

Instructions and Pencil/Pen

Flashlight (or other light source)

Access to Ceramics (Dishes, Vases/Pots, Decor.)

Definitions:

Transparent-allows light to pass through

Translucent-allows some light to pass through

Opaque-allows no light to pass through

Reflection-when light hits a surface and bounces back

Refraction-when light passes through an object and changes direction because of the object.

LESSON:

Did you know that your grandmother's dishes can affect light behavior? When a source of light, like a flashlight, shines on an object, the amount of and direction of the light can change. This lesson is an introduction to light behavior and can be used to understand the physical properties of ceramics.

Whether dishes have been handed down from your grandmother, are used for regular meals or are saved for special events, light behavior can help identify the types of dishes in your house. Before beginning the experiment, we need to understand the three types of ceramics.



EARTHENWARE:

Objects are fired in the oven or kiln at a low temperature. Earthenware ceramics have small holes in the clay that water and air can pass through making it porous. Objects weigh very little and can easily break when dropped.

Earthenware is not translucent, which means?



STONEWARE:

Objects are fired in the oven or kiln at a medium temperature. Stoneware is different from earthenware because water, air **and light** cannot pass through it. If light cannot pass through, **is the object transparent,**

translucent or opaque?



PORCELAIN:

Objects are fired in the oven or kiln at the highest temperature. Porcelain objects are strong and are harder to break. Porcelain objects are smooth to touch. **These objects are translucent.**

LET'S GET STARTED!

Now that you know about the three types of ceramics, let's begin. Grab your flashlight or source of light. With help from an adult, gather all the ceramic objects from your home into one place. Ceramics can be dishes, house decorations, gardening pots, and flower vases.



INSTRUCTIONS

Use the chart on the next page to answer the questions below.

1. With your flashlight, determine if the object is transparent, translucent, or opaque.
 2. Using the flashlight, does the object reflect light?
 3. Using the flashlight, does the object refract light?
-

Before you start your tests, how do you think light will behave with these objects?

An example has been done for you using a ceramic teapot from the Museums at Washington and Lee University.





This porcelain teapot was made in China around 1700. That's old! The teapot's shape looks like bamboo, a plant found in China.

Object	Is the object transparent, translucent, or opaque?	Does the object cause reflection?	Does the object cause refraction?
A teapot with black spots	Translucent	Yes	No
1.			
2.			
3.			
4.			
5.			

REFLECTION

Now that you have collected your data, talk about these questions with an adult or partner.



What were you asked to do with the ceramics?



What were the final results?



Were any of the objects transparent?



Do you think glass objects (bottles, cups, windows, etc.) would produce different results if you did the same experiment on them?



What new ideas or questions do you have after doing this activity?



How are your final thoughts different from what you thought at the beginning?