



## DAWN ACTIVITY LEADER GUIDE

### FOOD DIFFERENTIATION

#### Goal:

Model the separation of light and heavy materials within a planetary body.

#### Estimated time:

45-60 minutes

#### Who to do it with:

Ages: 10-Adult

Numbers: 1 or more!

#### What you need:

- Heating source for water ( for example microwave, tea kettle)
- 1 hard-boiled egg

#### Per group

- 1 box of yellow gelatin dessert
- Metric cup for measuring liquids
- Bowl and Mixing Spoon
- 270 mL (9 oz.) Plastic cup
- 470 mL (2 cups) boiling water
- Food items that sink (such as, raisins, grapes, orange slices, canned peaches.)
- Food items that float (such as, marshmallows, peanuts, apples, bananas)
- Student Sheet: Page 11.5—of the NASA Educator Guide:  
<http://ares.jsc.nasa.gov/ares/education/program/ExpMetMys/LESSON11.PDF>

#### Advanced preparation:

1. Assemble materials for each group. Be sure to include several items that float and some that sink.
2. Identify source for hot water.

#### How to do it:

1. Ask participants what they know about the interior layers of the Earth. Solicit responses. Listen for explanations including core, mantle, and crust. Cut the hard-boiled egg (with the shell on) in half as an example of this for Earth (shell = crust, white = mantle, yolk = core).
2. Explain that in this activity we will model how layers form in a planetary body.

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3. Have participants observe the foods and predict which will sink and which will float in gelatin. Participants can record their predictions on the student sheet.
4. Have each place a spoonful or less of each food item in the plastic cup
5. Mix gelatin and 2 cups of boiling water in a bowl. Stir gelatin until the powder dissolves.
6. Carefully pour gelatin into each groups' cup, filling about 2/3 full. DO NOT STIR!
7. Have participants observe and record the movement of the food in the gelatin. Have them sketch and label their results.
8. Involve participants in the following questions:
  - a. How did the results compare with your predictions?
  - b. How do you think the different layers formed?
  - c. Could the same layers occur in a different order? Why or why not?
  - d. Were there some foods used by your group not consistent in their floating behavior? Why do you think this happened?
  - e. Compare what happened in the gelatin experiment with the core mantle and crust of the Earth? (think about the hard-boiled egg)
  - f. How do you think this relates to the internal structure of Vesta?

### Optional:

Background information is found on page 11.1 and optional delivery methods are found on page 11.3 of the NASA Educator Guide:

<http://ares.jsc.nasa.gov/ares/education/program/ExpMetMys/LESSON11.PDF>

### Why do it:

Vesta is a dry, internally layered (differentiated) body whose surface has been resurfaced by basaltic lava flows. One possibility is that it possessed an early magma ocean like the Moon. Most importantly Vesta has experienced significant excavating events, most notably indicated by the huge crater near its southern pole. When Dawn orbits Vesta we may be able to see below the crust to the mantle of Vesta by studying this crater, much like you did when you cut the egg in half!