

# FAMILY ACTIVITY DISCUSSION POINTS

Introduction of Home Project: Model a fresh made column and an old column. Possible questions to explore.

- Are there living organisms in water? Mud?
- Do the bottles look like they contain the same material?
- If they contain the same materials, why do they look different?
- What do you think the different colors in the bottles represent?
- What is the difference between the two bottles?
- What is the same?
- How would you test the hypothesis that light is essential for photosynthetic microorganisms?

## Possible Experiments Results after 6 weeks

**Why are there different colors in the bottle? What causes the red, orange, green, white and black colors?**

Red and orange patches are purple photosynthetic bacteria. Green patches at or near the surface of the mud are bacteria and algae. Olive-green patches in the middle or lower part of the jar are green sulfur bacteria. The black patches are iron sulfide, a chemical formed by certain bacteria.

**Why do some colors appear in one part of a bottle and not another?**

The patchiness you see is the result of the formation of microenvironments--that is, different communities of bacteria that live in different specific conditions.

**What would happen if you kept the bottle in a dark closet?**

A jar or bottle kept in the dark will not show any growth of bacteria because light energy is critical to the development of photosynthetic creatures. That does not mean there are no living microbes in the jar, however. Not all microbes need light to grow.

**What would happen if you kept your bottle in direct Sunlight? Extreme heat?**

A bottle kept in direct Sunlight may not show any growth because the high light intensity retards photosynthesis and the extreme heat can stifle growth.

A jar or bottle kept in intense heat will not show growth, unless the soil you collected came from a hot spring. That's because most living things can't survive temperatures hotter than 120 degrees Fahrenheit (50 degrees Celsius). For comparison, your body temperature is 98.6 degrees Fahrenheit.

**What would happen if you covered you bottle with different colored plastic wrap?**

If the bottles or jars are covered with colored cellophane, different microbes will grow because different ones need different colors of light to thrive. For example, purple sulfur bacteria need red to near infrared light, while green sulfur bacteria need green to red light. And bacteria need blue to green light.

Adapted from Keepers of the Biosphere.