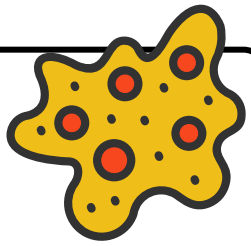
Name: _____ Date: _____

Science Friday Think Big

From "'Fire Amoeba' Likes It Hot, And A Faraway Lava Planet"
"How does a shape-shifting microbe survive extreme heat?

California's Lassen Volcanic National Park is famous for its geothermal wonders, including four volcanoes and Boiling Springs Lake, where the acidic water bubbles with energy. Nearby, in a "boring" stream, Syracuse University researchers Angela Oliverio and Beryl Rappaport made a surprising discovery: the Incendiamoeba cascadensis, or fire amoeba. Read on to learn why this "hot" organism is causing such a "heat wave" in the scientific community! (A little thermal energy humor for you.)



1. Some people live in places that seem uninhabitable, such as Las Vegas in the scorching Nevada desert. What are some ways people have adapted to live in such climates?

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2. The discovery of the fire amoeba is an example of life living in unexpected conditions. What forms might life take in other extreme environments?

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3. If you could shape-shift, what form would you take to escape extreme heat? How about extreme cold? Why did you choose those shapes?

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The original audio for this story and the transcript can be found at:
https://www.sciencefriday.com/segments/fire-amoebas-lava-exoplanet-atmosphere/
It is about 18 minutes long.

This story aligns with the following NGSS standards:

- LS1.A: Structure and Function - All living things are made up of cells, which are the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).
- LS1.D: Information Processing - Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain.
- LS4.C: Adaptation - Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions.

Expected answers:

1. In hot places like Las Vegas, people use air conditioning, stay inside during the day, and build houses that block the sun. In cold places like northern Canada, people wear heavy coats, heat their homes, and eat foods that give them lots of energy to stay warm.
2. Life might have thick shells or special skin to protect it from radiation in space, or antifreeze in its body so it doesn't freeze in Antarctica. Near hydrothermal vents, organisms might get their energy from chemicals instead of sunlight since it's too dark down there.
3. To escape heat, I would turn into something flat and skinny so I could squeeze into cool cracks and move fast to find shade, kind of like the fire amoeba's worm shape. To survive extreme cold, I would turn into a round, fluffy ball to trap my body heat and keep my insides warm.