**Student Worksheet: Convection Connections**

**Directions**: Answer the questions in the first section, “How a lava lamp works,” as directed by your teacher. Then, read the *Science News* article “[How a dying star is similar to a lava lamp](https://www.sciencenews.org/article/dying-star-lava-lamp-convection)” and answer the questions in the section “A lava lamp star.” For the third section, work individually or with a partner to choose an example of convection to research and answer the remaining questions.

**How a lava lamp works**

1. Watch a video of a lava lamp. Describe what it looks like and what components it has. How do you think it functions? Consider what changes are happening in the lamp when it is turned on.

2. What forms of heat transfer are occurring in the lava lamp when it is turned on, conduction, convection, and/or radiation? Explain.

3. Define convection in your own words.

4. How does convection relate to a lava lamp? Describe in detail what is happening inside a lava lamp when it’s turned on. Explain the liquid motion in terms of thermal and kinetic energy.

5. What factors might affect the rate of convection? Think about the speed at which the substances move in the lava lamp.

**A lava lamp star**

1. Read the *Science News* article “[How a dying star is similar to a lava lamp](https://www.sciencenews.org/article/dying-star-lava-lamp-convection).” Why did the article compare the star R Doradus to a lava lamp? Explain the comparison and describe the process of convection happening in the star.

2. Why are scientists intrigued by the convection happening on R Doradus? What is the speed at which the convective cells of gas rise and fall within the star? How does the size of these convective cells compare with those in the sun? What do the scientists think this could mean?

**Find a convection connection**

1. As a class, brainstorm examples of convection. Think about devices that use or force convection as well as natural processes that involve convection.

2. Choose one example of natural convection, or a device that uses convection, to research. Describe the process of convection as it relates to your example. Draw a diagram of how convection works in your example. In your diagram, be sure to indicate what the liquids or gases are, the heat source, how the substance(s) changes in kinetic energy and density, and how convective cells move within the system.

3. Could you vary anything in your example to alter the rate of convection? How could changing the rate of heat transfer by convection impact the function of the device or natural process in your example. Explain.