

# Astrobiology Shuffle with Digital Resources

## Background Information

Every living thing is fine-tuned to live in a certain place, or **environment**. A trait that makes a living thing a good fit with its environment is an **adaptation**.

Some environments are so harsh that most things can't live there. These places may be very hot or cold, or filled with burning acid. But living things called **extremophiles** (ek-STREEM-uh-fylz) can live in places like this. The name combines "extreme" with the Greek word for love (phile).

The Aterra4 deep-space probe has entered GSL383, a distant galaxy with several stars much like our sun. Aterra4 has found 6 planets that may support life. The Environment cards describe what each planet is like. The Organism cards describe extremophiles and the places where they live on Earth.

## Astrobiology Shuffle

In a digital whiteboard (Jamboard, Google Slides, Padlet, etc.) students match organisms to the environments they might live in. They may work in small groups or complete on their own.

### Instructions

1. Insert 6 Environment JPGs into a digital whiteboard.
2. Insert 12 Extremophile JPGs. Resize them to fit on the screen.  
  
NOTE: You may wish to do fewer environments and extremophile cards so that they fit better.
3. Insert a text box with whatever background information (above) and instructions you would like your students to have.
4. Include the website in the Learn More (below) if you want your students to go explore.

## ATerra4 Explorer

Students choose an extreme environment and design a creature that could live there.

### Instructions

1. Insert the 6 Environments JPGs into a digital whiteboard (Jamboard, Google Slides, Padlet, etc.). Resize as needed to fit the page.
2. On a separate slide, insert the ATerra4 Student Sheet JPG.
3. Add text box with instructions on how to draw the creature and insert text or write in their answers using the tools of the whiteboard you are using.

4. Include the website in the Learn More (below) if you want your students to go explore.

## *Environment Match*

Students will match extremophiles to the real-life extreme environments on Learn.genetics. They may work in small groups or alone.

### **Instructions**

1. Insert the 12 Extremophile JPGs into a digital whiteboard. Resize them to fit on the screen.
2. Insert a text box with whatever background information (above) you would like your students to have.
3. Insert a text box with the following instructions.
  - Go to <https://learn.genetics.utah.edu/content/astrobiology/environments/> and explore the Life in Extreme Environments interactive map.
  - Create a text box for each of the 13 environments on the map.
  - Decide which extremophiles on the cards could live in each place. Match the Extremophile card to the environment.

## *Colonization Match*

Students will match extremophiles to extreme environments on the planets and moons in our solar system. They may work in small groups or alone.

### **Instructions**

1. Insert the 12 Extremophile JPGs into a digital whiteboard. Resize them to fit on the screen.
2. Insert a text box with whatever background information (above) you would like your students to have.
3. Insert a separate text box for each of the rocky planets (except Earth!) and large moons in our solar system. Or you may want to assign your students to do this.
4. Insert a text box with instructions for your students. "For each planet or moon, match any Extremophile cards that you think could colonize that place"
5. Include the website in the Learn More (below) if you want your students to go explore.

## *Learn More*

Go to <https://learn.genetics.utah.edu/content/astrobiology/> to learn more about how life survives in extreme environments on Earth and could survive on other worlds!