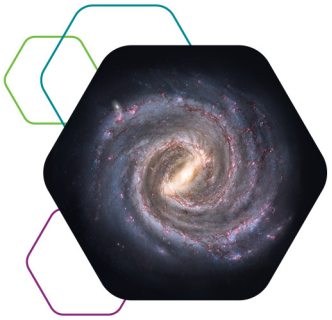
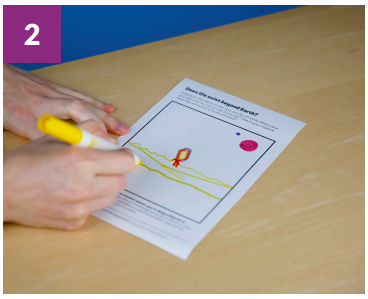


## EXPLORING THE UNIVERSE

# Imagining Life

## Try this!


Take a look at the cards. They show living things that thrive in extreme environments—places where humans cannot live.




Imagine a planet or moon with an environment too harsh for people. Is it too hot? Too cold? Too acidic? Color in your landscape and make it look like the environment you imagine.


Now draw a life form that could survive in your imaginary environment. It can be one you see on the cards or one you invent!

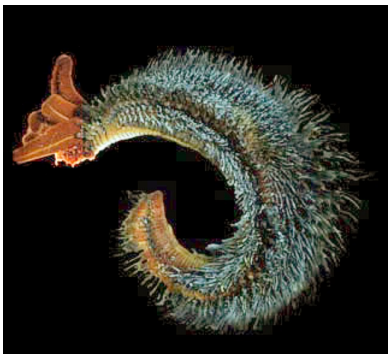
*If life exists elsewhere in the universe, it could look very different from life on Earth.*

**Life on Earth comes in an amazing variety of forms.** Some living organisms, called *extremophiles*, thrive in environments far too harsh for humans. Some extremophiles are relatively familiar animals and plants that are well suited to their extreme environments. Others are as strange as bacteria that thrive inside rocks, or microbes that can withstand tremendous heat, cold, and radiation.

**Penguins have adapted to live in extremely cold temperatures.**

All living things on Earth reached their present form through *evolution,* the process by which organisms develop from earlier forms. Every once in a while, a random genetic variation makes an organism better adapted to its environment. Through *natural selection,* favorable variations are passed down to the next generations.

**Astrobiologists use what we know about life on Earth to make predictions about what life might be like elsewhere in the universe.** Some NASA scientists study extremophiles to better understand the environmental conditions that sustain life and to predict what kind of life they might find on different planets.



**Pompeii worms live in extremely hot deep-sea vents.**

Astrobiologists expect that alien life forms—if they're out there—will be specially adapted to their environment. Most of the alien worlds we've explored so far are very different from Earth, so any living things we find beyond Earth will probably be very different, too.

When you imagine life on another planet, you're doing a little bit of astrobiology! Scientific breakthroughs involve creativity as well as data collection and experimentation. When we use our imagination, it helps us understand what a habitable extraterrestrial planet might be like, and what kind of life might survive there.