

FACILITATOR GUIDE

Imagining Life

Learning objectives

This activity explores the following ideas:

- 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.
- Astrobiologists use our knowledge about life on Earth to make predictions about what life might be like elsewhere in the universe.

Materials

- Drawing sheets
- Drawing sheet photocopy master
- Extremophile cards
- Markers
- Astrobiology information sheet
- Searching for Life information sheet
- Activity and facilitator guides

The Explore Science toolkit comes complete with all necessary materials for this activity. Materials are also readily available to create or restock activity kits. Graphic files (including the drawing sheet) can be downloaded from www.nisenet.org. All other materials are available at discount stores.

Notes to the presenter

This activity is designed as an open-ended, conversational experience. Some participants, particularly children, may enjoy imagining, drawing, and talking about alien landscapes and life forms. Older participants may prefer to review the extremophile cards and just talk about their ideas rather than drawing. Either way is fine—the most important thing is to encourage participants to think about what the environment might be like on other planets, and what kind of life forms might be able to survive there.

Conversational prompts

As visitors imagine, talk about, and/or draw, you can engage them in conversation about what they are drawing (or just imagining) and ask them to expand on their ideas. Here are some example prompts, but you'll also want to follow the lead of your guests:

- How big is your creature? Where does it live? What does it eat? How does it sense its environment?
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- What makes your creature so well adapted to its environment? If it's dry, how does it find water? If it's cold, how does it keep from freezing?
- How important is it to find life in the rest of the universe?
- What is our responsibility to alien environments and life forms? Could we contaminate other worlds with microbes from Earth? How could we prevent that from happening?
- If we do find extraterrestrial life, should we bring it back to Earth? Could it live here? Would you want it for a pet? What if it got out into the wild and disrupted the ecosystem by destroying species native to Earth?
- Wow, these are some big societal, environmental, and ethical questions! Who should get to decide about issues like these?

Are you surprised by what guests draw and describe? Remember, there's no right or wrong answer since we haven't actually discovered any alien life! Researchers at NASA are studying some of these same questions right now. For example, on the recent Juno mission to Jupiter, scientists made the decision to deorbit—or crash—the space craft into Jupiter to prevent it from contaminating any of Jupiter's moons that might harbor life with microbes from Earth.

For larger groups, such as camp groups or student classrooms, participants might break up into smaller groups to share their ideas or work together. You might try having the whole group think of a similar landscape and then imagine different creatures who would live there. Encourage participants to think about how all those different aliens would interact.

Extension

Participants can write a story about life on their planet. The story's central conflict could result from an explorer from Earth, or a trip to the faraway planet Earth!

Difficult concepts

With this activity, it is important to remind participants that we haven't found life or signs of life anywhere else in the whole universe. Some people have had experiences, heard about events, or seen popular media that suggest extraterrestrial creatures exist and have even visited Earth. Scientists have not validated any of these accounts, so the current scientific opinion is that no "aliens" have been found or have been in contact with people or planet Earth.

However, scientists do expect that life exists beyond Earth, and that one day we may encounter it. There are many research programs looking for evidence of life in other parts of the universe. If we find them, living organisms on other planets are likely to look very different from people, or the little green creatures of popular culture.

If participants bring up things they've experienced or have heard of, you might say something like, "Yes, we hear lots of stories and see movies about aliens, and that makes them seem real to us. But right now scientists haven't been able to verify any alien encounters, so we're still looking for good evidence of life beyond Earth." Or, "Yes, sometimes we experience things we can't explain, and we wonder if extraterrestrials could be involved. But right now scientists haven't been able to verify any alien encounters, so we're still looking for good evidence of life beyond Earth."

Staff training resources

Refer to the *Tips for Leading Hands-on Activities* sheet in your activity materials.

- An activity training video is available at vimeo.com/191168174.
- A content training video is available at vimeo.com/191171866.

The NISE Network has a curated list of programs, media, and professional development resources in the NASA Wavelength Digital Library that directly relate to the toolkit. These resources can be viewed and downloaded from nasawavelength.org/users/nisenet.

Credits and rights

Versions of this activity exist in many forms. This activity was inspired by *Creatures from Omicrom*, developed by Lawrence Hall of Science, UC Berkeley.

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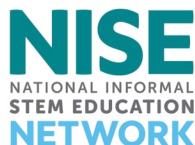
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