Science 3-5: Can We Live on Mars?

Intended Audience: Students with significant cognitive disabilities

# **Standards:**

SC.3.E.5.3 Recognize that the Sun appears large and bright because it is the closest star to Earth.

SC.4.E.5.3 Recognize that Earth revolves around the Sun in a year and rotates on its axis in a 24-hour day.

SC.4.E.6.2 Identify the properties of common earth-forming minerals, including hardness, color, luster, cleavage, and streak color, and recognize the role of minerals in the formation of rocks.

SC.5.E.5.2 Recognize the major common characteristics of all planets and compare/contrast the properties of inner and outer planets.

SC.5.E.5.3 Distinguish among the following objects of the Solar System- Sun, planet, moons, asteroids, comets- and identify Earth’s position in it.

# **Learning Objectives:**

 1. Students will identify the similarities between Earth and Mars.

 2. Students will identify the differences between Earth and Mars.

 3. Students will identify that Earth, Mars, and the Sun are parts of our Solar System.

# **Vocabulary:**

1. Earth: the planet on which we live

2. Mars: the planet that is 4th in order from the Sun

3. carbon dioxide, argon, oxygen and nitrogen: chemical elements found on Earth and/or Mars

4. polar ice cap: a large, thick sheet of ice

5. volcano: a mountain with a hole in the top that sometimes sends out rocks, lava, and ash

6. canyon: a deep valley with steep rock sides with a river or stream flowing through it

7. terrestrial: relating to or occurring on the Earth

8. atmosphere: the mass of air that surrounds a planet

9. telescope: a device shaped like a long tube that you look through in order to see things that are far away

10. ancient: having existed for a very long time

11. meteoroid/meteorite: a piece of rock or metal that has fallen to the ground from outer space

12. satellites: a machine that is sent into space and moves around the earth, Sun, moon, or other planets taking photos and images

# Materials:

* Article: [All About Mars](https://www.readworks.org/article/All-About-Mars/e36539db-1346-4689-acac-8620aeb7cf6e#!vocabularySection:ancient/articleTab:content/)
* Article: [All About Earth](https://www.readworks.org/article/All-About-Earth/41827ad4-6d66-4472-ba7e-7dbe3d138f04#!articleTab:content/)
* Images: [Mars](https://www.google.com/search?q=mars+images&oq=mars+images&aqs=chrome..69i57j0l5.2144j0j8&sourceid=chrome&ie=UTF-8)
* Images: [Earth](https://www.google.com/search?safe=active&ei=t6VPW_GxKfGqggehwIGQAw&q=earth+images&oq=earth+images&gs_l=psy-ab.3..0i67k1j0i7i30k1l8j0.41076.41954.0.42361.5.5.0.0.0.0.96.358.4.4.0....0...1.1.64.psy-ab..1.4.356....0.TZXDQEwELLw)
* Video: [Mars 101: National Geographic](https://www.youtube.com/watch?v=D8pnmwOXhoY)
* Video: [The Planet Earth: Astronomy and Space for Kids](https://www.youtube.com/watch?v=IDhapt7nw4A)
* Prepare prior to instruction: graphic organizer to compare and contrast
* Science journals

# **Essential/Guiding Questions:**

 1. How do Earth and Mars compare to one another?

 2. What would be needed for humans to live on Mars?

 3. What is the purpose of the Sun to Earth and Mars?

# Lesson Presentation:

**Activating Prior Knowledge:**

1. Ask students “If you could choose to live on Earth or Mars, which would you choose?” Have students draw a picture of what they think their chosen scenario might look like.

2. Determine prior knowledge of planet Earth, the Sun and Solar system.

3. Tell students that they are going to learn about two planets, Earth and Mars, and see how they are the same and different.

4. Ask students “Do you think we can live on Mars?” Let’s find out!

**Modeled instruction:**

**Text/multi-media 1- Mars**

1. Show the video [Mars 101: National Geographic](https://www.youtube.com/watch?v=D8pnmwOXhoY) and Mars images.

2. Define vocabulary found in the video with visual supports and images.

3. Read article: [All About Mars](https://www.readworks.org/article/All-About-Mars/e36539db-1346-4689-acac-8620aeb7cf6e#!vocabularySection:ancient/articleTab:content/) .

4. Use [Mars](https://www.google.com/search?q=mars+images&oq=mars+images&aqs=chrome..69i57j0l5.2144j0j8&sourceid=chrome&ie=UTF-8) images to support the main idea of the text and to visually support key details.

**Text/multi-media 2- Earth**

1. Show the video [The Planet Earth: Astronomy and Space for Kids](https://www.youtube.com/watch?v=IDhapt7nw4A) and Earth images.

2. Define vocabulary found in the video with visual supports and images.

3. Read the article: [All About Earth](https://www.readworks.org/article/All-About-Earth/41827ad4-6d66-4472-ba7e-7dbe3d138f04#!articleTab:content/).

4. Use [Earth](https://www.google.com/search?safe=active&ei=t6VPW_GxKfGqggehwIGQAw&q=earth+images&oq=earth+images&gs_l=psy-ab.3..0i67k1j0i7i30k1l8j0.41076.41954.0.42361.5.5.0.0.0.0.96.358.4.4.0....0...1.1.64.psy-ab..1.4.356....0.TZXDQEwELLw) images to support the main idea of the text and to visually support key details.

**Supported/Guided instruction:**

**Text/multi-media 1- Mars**

1. Replay the video [Mars 101: National Geographic](https://www.youtube.com/watch?v=D8pnmwOXhoY). Review vocabulary prior to watching.

2. Engage students in discussion (i.e. “What do you see?”, “How is this different from the planet on which we live?”)

3. Reread the article: [All About Mars](https://www.readworks.org/article/All-About-Mars/e36539db-1346-4689-acac-8620aeb7cf6e#!vocabularySection:ancient/articleTab:content/). If appropriate, provide students with a copy of the article. On the Smartboard or a doc camera, underline the main idea and circle the key details in the text.

4. Use [Mars](https://www.google.com/search?q=mars+images&oq=mars+images&aqs=chrome..69i57j0l5.2144j0j8&sourceid=chrome&ie=UTF-8) images to support the main idea of the text and to visually support key details.

**Text/multi-media 2- Earth**

1. Replay the video [The Planet Earth: Astronomy and Space for Kids](https://www.youtube.com/watch?v=IDhapt7nw4A) and show Earth images. Review vocabulary as it related to Earth images.

2. Engage students in discussion (i.e. “What do you see that supports our ability to live on Earth?”, “Are there things we cannot live with out on Earth?”, “How does the Sun help us to live on Earth?”, “What is the Earth made from?”)

3. Reread the article: [All About Earth](https://www.readworks.org/article/All-About-Earth/41827ad4-6d66-4472-ba7e-7dbe3d138f04#!articleTab:content/). If appropriate, provide students with a copy of the article. On the Smartboard or a doc camera, underline the main idea and circle the key details in the text.

4. Use [Earth](https://www.google.com/search?safe=active&ei=t6VPW_GxKfGqggehwIGQAw&q=earth+images&oq=earth+images&gs_l=psy-ab.3..0i67k1j0i7i30k1l8j0.41076.41954.0.42361.5.5.0.0.0.0.96.358.4.4.0....0...1.1.64.psy-ab..1.4.356....0.TZXDQEwELLw) images to support the main idea of the text and to visually support key details.

**Independent Work:**

1. Students complete/create a graphic organizer that looks at the similarities and differences between Earth and Mars.

2. Students answer the question: “Can we live on Mars?” using information from the texts and videos as evidence. Answers can be shared in Science journals, orally with a partner, with visual supports, etc.

**Small group suggestions:**

1. Students can investigate other planets and compare them to Earth or Mars.

2. Students can list or categorize features of each of the planets.

3. Students can read additional articles or view additional videos and images to deepn knowledge.

# Assessment:

1. Students will explain the similarities and differences between Earth and Mars and answer the question: “Can we live on Mars?” using information from the texts and videos as evidence.

2. Teachers should utilize district created rubrics to score student work.

# UDL:

**Multiple means of representation:**

1. Students can use a graphic organizer to compare and contrast Earth and Mars.

2. Students can draw a Venn diagram and show similarities and differences between Earth and Mars.

3. Students can create a PowerPoint to show compare and contrast the differences between Earth and Mars.

4. Students can write a compare and contrast narrative in their Science journal.

5. Students can draw pictures to show the similarities and differences between Earth and Mars.

6. Students can work individually, in pairs, or in a small group.

7. Students can work independently with adult supports.

**Multiple means of expression:**

1. Students can use an iPad or other touch device to show similarities and differences.

2. Text to speech options are available for computers, iPads and other hand held devices. Google Chrome offers free extensions, such as Selection Reader and Select and Speak-Text to Speech, and apps, such as Text to Speech, Text to Speech with Google Drive, and TTS Reader- Unlimited Text-to-Speech.

3. Speech to text options are also available from Google. Extensions include Voice Note II-Speech to Text, Online speech recognition, and Co: Writer Universal. Voice Note II is also available as an app; Speech notes-Speech to Text Notepad is available as well.

4. Additional information about text to speech and speech to text options are available through your district Assistive Technology Department.

5. Expression may come in the form of verbal responses, signed responses, pointing/gestures, eye gaze, or through the use of a low or high tech device.

6. All students should have access to expressive language/technology that is appropriate for their specific need.

**Multiple means of engagement:**

1. Provide students with choices of how to interact with materials.

2. Provide students or small groups with various places in the classroom in which to work, i.e. floor, desks, at the board.

3. Limit distractions in the work areas.

4. Encourage collaboration with peers in partners or small groups.

5. Allow students to work independently.

6. Allow students to be positioned for maximum learning engagement.

7. Provide students with additional materials, if necessary.

8. Provide supervision to students who need assistance when handling hard, and potentially dangerous, objects.

# Assistive Technology Recommendations:

1. All students should have a means of expressive communication and a way to be actively engaged in learning.

2. Response modes may include, but are not limited to: eye gaze, gesturing or pointing to pictures/words/phrases, signing, low tech devices (Go Talks, etc.), or dynamic devices (iPad, etc.)

3. Lesson vocabulary, photos/pictures and graphic representations should be created and/or printed prior to the lesson to provide all students with an opportunity to be engaged in discussion.

# Technology Needed:

* Smartboard, iPad

# Additional Resources:

* Article: [The Planets Closest to the Sun](https://www.readworks.org/article/The-Planets-Closest-to-the-Sun/5bcb9753-8625-4680-b9c2-21328aa05bd5#!articleTab:content/)
* Article: [How Long is One Day on Other Planets?](https://www.readworks.org/article/How-Long-Is-One-Day-on-Other-Planets/7304dfdf-b8ca-4536-b3fc-c9a1baf8e2e4#!articleTab:content/)
* Book: You are the First Kid on Mars, by Patrick O’Brien
* Book: Life on Mars, Jon Agee
* Song/rap: [The Planet Mars Song for Kids](https://www.youtube.com/watch?v=ZfBpbRULkOA)
* Song/rap: [The Earth Song for Kids](https://www.youtube.com/watch?v=gKdxPw9HDUs)
* National Geographic video/images: [Earth is Our Home- Let's Protect It](https://www.youtube.com/watch?v=ymarrXoi0ZM)

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