Science 3-5: Earth-Forming Minerals

Intended Audience: Students with significant cognitive disabilities

# **Standards:**

SC.3.E.6.1 Demonstrate that radiant heat from the Sun can heat objects and when the Sun is not present, heat may be lost.

SC.4.E.6.2 Identify the physical 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.

# **Learning Objectives:**

1. Students will identify the characteristics of Earth.
2. Students will identify the characteristics of Venus.
3. Students can compare the similarities and differences between Earth and Venus.
4. Students will recognize the effect of the Sun/heat on both planets.

# **Vocabulary:**

1. Earth: the planet that we live on with sea and land
2. Venus: the planet second from the Sun
3. terrestrial: having to do with land
4. atmosphere: the mass of air or gas that surrounds a planet
5. telescope: used by scientists to view objects very far away
6. spacecraft/space probe: a device that is designed to travel outside of the Earth’s atmosphere

**Materials:**

* Article about Earth from Readworks.org: [Planets: Article-a-Day set](https://www.readworks.org/article/Planets/adfa1cb6-ce8c-4863-a87a-f9ffeccc8080#!articleTab:content/contentSection:633d73a4-ad07-4172-992a-168426fbba18/)
* Article about Venus from Readworks.org: [Planets: Article-a-Day set](https://www.readworks.org/article/Planets/adfa1cb6-ce8c-4863-a87a-f9ffeccc8080#!articleTab:content/contentSection:633d73a4-ad07-4172-992a-168426fbba18/)
* Video: [National Geographic: Venus](https://video.nationalgeographic.com/video/science/101-videos/00000166-8411-da07-abef-f777edcf0000) 00:06-1:48
* Video: [Planet Earth for Kids](https://www.youtube.com/watch?v=IDhapt7nw4A)
* Graphic organizer for Compare and Contrast
* Prepare prior to instruction: visual supports for academic content
* Prepare prior to instruction: images of Earth and Venus

# **Essential/Guiding Questions:**

1. What similarities do Earth and Venus share?
2. What characteristics make Earth and Venus very different?
3. How does the Sun contribute to human life on Earth?
4. How does the Sun contribute to lack of human life on Venus?

**Lesson Presentation:**

**Activating Prior Knowledge:**

1. Show students images of other planets. Ask students if any of them have things in common with Earth. Jot student ideas on chart paper or on board.

2. Determine any other prior knowledge of the Earth and Venus.

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

4. Tell students that the Sun plays a role in each of the planets’ characteristics.

**Modeled instruction:**

**Text/multi-media 1- Earth**

1. Show the video [Planet Earth 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 about Earth from Readworks.org: [Planets: Article-a-Day set](https://www.readworks.org/article/Planets/adfa1cb6-ce8c-4863-a87a-f9ffeccc8080#!articleTab:content/contentSection:633d73a4-ad07-4172-992a-168426fbba18/)

4. Use images of the Earth to support the main idea of the text and to visually support key details.

**Text/multi-media 2- Venus**

1. Show the video [National Geographic: Venus](https://video.nationalgeographic.com/video/science/101-videos/00000166-8411-da07-abef-f777edcf0000) (00:06-1:48 only) and Venus images.

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

3. Read the article about Venus from Readworks.org: [Planets: Article-a-Day set](https://www.readworks.org/article/Planets/adfa1cb6-ce8c-4863-a87a-f9ffeccc8080#!articleTab:content/contentSection:633d73a4-ad07-4172-992a-168426fbba18/)

4. Use images of Venus to support the main idea of the text and to visually support key details.

**Supported/Guided instruction:**

**Text/multi-media 1- Earth**

1. Replay the video [Planet Earth for Kids](https://www.youtube.com/watch?v=IDhapt7nw4A). Review vocabulary prior to watching.

2. Engage students in discussion about life on Earth, purpose of the Sun, the land (i.e. “What do you see that supports our ability to live on Earth?”, “How does the Sun help us to live on Earth?”, “What is the Earth made from?”)

3. Review content vocabulary prior to reading the passage. Reread the article about Earth from Readworks.org: [Planets: Article-a-Day set](https://www.readworks.org/article/Planets/adfa1cb6-ce8c-4863-a87a-f9ffeccc8080#!articleTab:content/contentSection:633d73a4-ad07-4172-992a-168426fbba18/) . 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 images of the Earth to continue to support the main idea of the text and to visually support key details.

**Text/multi-media 2- Venus**

1. Replay the video [National Geographic: Venus](https://video.nationalgeographic.com/video/science/101-videos/00000166-8411-da07-abef-f777edcf0000) (00:06-1:48 only) and show images of Venus. Review vocabulary as it related to the images shown.

2. Engage students in discussion (i.e. “What do you see?”, “How is this different from the planet on which we live?”, “How does the Sun affect Venus?”) Pause at images in the video for student response.

3. Reread the article: about Venus from Readworks.org: [Planets: Article-a-Day set](https://www.readworks.org/article/Planets/adfa1cb6-ce8c-4863-a87a-f9ffeccc8080#!articleTab:content/contentSection:633d73a4-ad07-4172-992a-168426fbba18/) . 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 images of Venus to continue 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 Venus.

2. Students show what they know by using information from the images, 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 categorize features of each of the planets by using images.

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

4. Students can match images with support from an adult.

**Assessment:**

1. Students will show that they understand the similarities and differences between Earth and Venus.

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

**UDL:**

**Multiple means of representation:**

1. Students can use images of Earth and Venus in a graphic organizer to show similarities and differences.

2. Students can create replicas of Earth, Venus and the Sun and show how the Sun affects both planets.

3. Students can draw a picture of the inner planets in relation to the Sun and explain similarities and differences.

4. Students can make a list of traits/sets of images for both Earth and Venus.

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

6. Students can work independently with peer or adult supports.

**Multiple means of expression:**

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

2. 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.

3. Text to speech options are available for computers on the Word app, 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.

4. 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. Microsoft Word also has speech to text options.

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

**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 when working with plants.

9. Provide physical prompts when necessary.

**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 (GoTalks, 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.

4. When possible, provide students with text to speech options. Articles and passages from Readworks.org have this option.

5. If students are writing in response to text or writing as a means of sharing information, provide students with alternates to pencils. Speech to text and alternative pencils should be considered. Find more information about alternative pencils here: [Weebly site for Alternative Pencils](file:///C:\Users\nicholsond\Desktop\Summer%20contract%202019\3-5%20Science%20Plans%202019\alternativepencils.weebly.com)

**Technology Needed:**

* Smartboard, doc camera (for projecting text if there is no access to a Smartboard

**Additional Resources:**

* Video: [The Universe: Our Solar System: Planet Earth](https://www.youtube.com/watch?v=GoQ0tO-olos)
* Website: [NASA Space Place](https://spaceplace.nasa.gov/all-about-venus/en/)
* Book: The Magic School Bus Lost in the Solar System by J. Cole and B. Degen, authors and illustrators
* Book: Explore My World Planets by B. Baines
* District-adopted Science curriculum