

Format: Virtual Science Academy (VSA)

Grades: 1-8; Adult

Length: 45 minutes

General Description

Blast off to new discoveries with this Virtual Science Academy that merges space science and scientific illustration! Students and teachers will learn how to capture their own investigations of Saturn's largest moon using scientifically accurate illustrations, just as other great scientist have done throughout history. Materials will be provided.

Big Ideas:

- Explore the geology of Titan, Saturn's largest moon and compare/contrast it with our own planet/moon.
- Make observations and practice scientific illustration through creating a landscape illustration of Titan.

Key Concepts

- Titan's unique landscape and atmosphere hosts features that are both similar, yet different to our own on Earth and moon. Mountains, weather, and rivers can be seen on this moon.
- Specific chemical compounds, such as methane, are found on Titan that contribute to its unique atmosphere and geosphere.
- Scientific illustration is unique in that it only documents/illustrates what exists through empirical evidence; it functions as a visual way to communicate scientific principals & findings.

GRADES 1-5

Next Generation Science Standards:

- **1-ESS1-1** Use observations of the sun, moon, and stars to describe patterns that can be predicted. [*Clarification Statement:* Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night, but not during the day.]
- **1-ESS2-2** Students who demonstrate understanding can: Develop a model to represent the shapes and kinds of land and bodies of water in an area.
 - **1-ESS2-A: Earth Materials and Systems** - Wind and water can change the shape of the land.
- **2-ESS2-3** Students who demonstrate understanding can: obtain information to identify where water is found on Earth* and that it can be solid or liquid.
- **4-ESS2-1** Students who demonstrate understanding can: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [*Clarification Statement:* Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.]

- **4-ESS2-A: Earth Materials and Systems** - Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.
- **MS-ESS1-A: The Universe and Its Stars** - Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (MS-ESS1-1)
 - Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (MS-ESS1-2)
 - **Patterns:** Patterns can be used to identify cause-and-effect relationships. (MS-ESS1-1)
 - **Scale, Proportion, and Quantity** - Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-ESS1-3)
 - **Systems and System Models:** Models can be used to represent systems and their interactions. (MS-ESS1-2)

Colorado Academic Standards:

- **2-3-ESS1 GLE1** Some events on Earth* occur quickly; others can occur very slowly.
 - Use information from several sources that Earth* events can occur quickly or slowly. [*Boundary Statement:* Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly, and **erosion of rocks**, which occurs slowly.]
 - **GLE2** Wind and water can change the shape of the land; models can show the shape and these changes to the land.
- **2-3-ESS2** Develop a model to represent the shapes and kinds of land and bodies of water in an area.
- **2-3-ESS3** Obtain information to identify where water is found on Earth* and that it can be solid or liquid.
 - **GLE2** Water cycles among land, ocean, and atmosphere, and is propelled by sunlight and gravity. Density variations of sea water drive interconnected ocean currents. Water movement causes weathering and erosion, changing landscape features.
- **MS-3-ESS2-2** Construct an explanation based on evidence for how geoscience processes have changed Earth's* surface at varying time and spatial scales. [*Clarification Statement:* Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.]

Colorado Academic Standards – Visual Arts

- **3-VA3 Invent and Discover to Create** - **GLE** Plan and create works of visual art and design recognizing various purposes and intentions
- **5-VA3-2 Invent and Discover to Create** – **GLE** Apply an understanding of art processes and studio skills to create works of art and design.
- **7-VA3-2 Invent and Discover to Create** – **GLE** Demonstrate technical skills and processes to achieve desired results.
- **8-VA3-2 Invent and Discover to Create** – **GLE** Demonstrate technical proficiency and craftsmanship in the creative process.

**Earth in the context of “Art Station Titan” is Saturn’s moon Titan; environmental factors such as weathering and erosion and physical factors such as gravity and states of matter will transfer regardless of celestial location*