

Tour of the Universe

Overview:

In this lesson, students learn about features of our own galaxy, the Milky Way, as well as other galaxies in the Universe. Students will travel on an imaginary journey through the Universe, recording their observations in a travel journal. Students will describe the features they would look for if searching for volcanoes elsewhere in the Universe.

Objectives:

The student will:

- navigate through websites to learn about different galaxies and galaxy components;
- create a fictitious “travel journal” detailing features of the Milky Way and other galaxies; and
- think critically about where volcanoes might be located in the Universe.

Materials:

- Sheets of paper to create a travel journal
- Transparency: “The Milky Way”
- Student Worksheet: “Tour of the Universe”

Activity Procedure:

1. Ask students what they see when they look up at the night sky. Has anyone seen the Milky Way? Ask students to describe the Milky Way (a spiral galaxy composed of 100 billion stars).
2. Show the Transparency: “The Milky Way,” first from Earth then from space. Point out the stars and the spiral arms of the galaxy.
3. Ask students if they think there might be planets outside our solar system in the Milky Way. Explain that scientists have found many extrasolar planets—it is estimated that there might be as many as 6 billion Jupiter-sized planets in the Milky Way alone.
4. Explain that there are many billions of galaxies in the Universe. Ask students if they think there might be planets around stars in other galaxies.
5. Ask students to go on an imaginary tour of the Universe to look for new volcanoes. They will use information from Internet research to accurately document what they see until they reach another galaxy.
6. Once they reach this new galaxy, imagination can take over. Students will use critical thinking skills to describe which of five “newly discovered planets” might or might not have volcanoes (Students should recall from previous lessons that to have volcanoes, planets need a solid surface and an internal heat source. Remind them of this information if necessary).
7. Distribute the Student Worksheet: “Tour of the Universe” and ask students to complete it.

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Background Information:

The Universe is composed of billions of galaxies, which contain many planets. However, little is known about planets beyond those in our solar system, including whether volcanoes are present or absent.

Materials:

- 8x10 sheets of paper
- Stapler

Procedure:

1. Imagine that you are going on a journey through the Universe. You have been hired by NASA to look for new volcanoes. You will record your data in a travel journal.
2. Fold five 8x10 pieces of paper in half and staple them together along the crease. This will serve as a travel journal.
3. Navigate through one or both of the websites listed below:
NASA's Cosmic Distance Scale of Earth:
<http://heasarc.gsfc.nasa.gov/docs/cosmic/earth.html>
NOVA Online Zoom-Out Map of the Local Universe:
http://www.pbs.org/wgbh/nova/universe/tour_map.html
4. Use information from the Internet to accurately describe which planets and other features you see as you leave Earth and travel outside our solar system. Record what you see in your journal. Make sketches of these observations.
5. Based on your Internet research, choose which galaxy you will visit next. Sketch the galaxy in the journal.
6. Not much is known about planets in other galaxies. This is a chance to get creative! Imagine that you have discovered 5 planets in your chosen galaxy. Describe the interior and exterior of each fictitious planet. Which ones are likely to have volcanoes, based on these features? Record your thoughts in your journal.
7. If necessary, more pages can be added to the end of the journal.