Big is Relative

Curriculum

Meets many states' Core Curriculum Requirements in Science and Technology

Objective:

Students will be able to distinguish the relative concept of size by comparing the size of the Earth progressively with larger objects in the universe of less comprehensible sizes in order to reconstruct the definition of big and utilize this new definition to evaluate future scientific bodies.

Warm-up Activity:

List three items, people, or places that you would consider big. Explain how you know that they are big.

Discussion Questions:

1. Prior to the presentation how would you have answered the question, "Is the earth big?" How should you answer the question, "Is the Earth big?" based on the new information gained in the presentation?
2. Explain why you can't answer question number one accurately without a basis for comparison.
3. How many Earths can fit inside the sun? If asked if the sun was big, what would you respond and how would you justify that response?
4. If you dropped the Red Giant star Betelgeuse into the middle of our solar system, what planet's orbit would it extend out to? Argue why that doesn't necessarily make Betelgeuse big.
5. Where are we located in the Milky Way Galaxy?
6. What are some of the advantages to that location in the Milky Way Galaxy?
7. Describe how the Milky Way galaxy could be considered both big and not big.

Cross Curricular and Extension Activities:

English:

1. Select an object, person or place and write a persuasive essay articulating how big it is utilizing the relative concept of size.

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Mathematics:

2. Research and categorize other solar system objects such as moons, asteroids and comets based on the relative concept of size. Graph and compare these objects based on their surface area and volume.

History:

3. Research American land expansion acquisitions such as the Louisiana Purchase or the Gadsden Purchase and relate the relative concept of size to the area of previously owned land.

Content Area: **Science**

Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence- based, model-building enterprise that continually extends, refines, and revises knowledge. The four science practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.

Strand A. Understand Scientific Explanation
Cumulative Progress Indicator:
5.1.P.A.1-Display curiosity about science objects, materials, activities, and longer-term investigation in progress.
5.1.4.A.3-Use scientific facts, measurements, observations, and patterns in nature to build and critique scientific arguments.
5.1.8.A.1-Demonstarte understanding and use of interrelationships among central scientific concepts to revise explanations and to consider alternative explanations.

Standard: 5.4 Earth Systems Science: All students will understand that earth operates as a set of complex, dynamic, and interconnected systems, and is part of the all-encompassing system of the universe.

Strand A. Objects in the universe
Cumulative Progress Indicator:
5.4.4.A.3-Analyze and evaluate evidence in the form of data tables and photographs to categorize and relate solar system objects (e.g., planets, dwarf planets, moons, asteroids, and comets).
5.4.6.A.4-Compare and contrast the major physical characteristics (including size and scale) of solar system objects using evidence in the form of data tables and photographs.

Content Area: Technology

Standard: 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.
Strand F. Critical thinking, Problem solving, Decision-making
Cumulative Progress Indicator:
8.1.4.F.1-Select and apply digital tools to collect, organize, and analyze data that support a scientific finding.