

Comparing Distances in Space

Summary

Students will be creating measurement systems to measure objects in their environment and comparing them to the measurement systems used in space.

Additional Core Ties

Mathematics Grade 6

[Strand: RATIOS AND PROPORTIONAL RELATIONSHIPS \(6.RP\) Standard 6.RP.3](#)

Time Frame

1 class periods of 45 minutes each

Group Size

Small Groups

Materials

Measuring Distance PowerPoint Presentation (posted below)
Student Data Sheet (posted below)
Student PowerPoint Organizer (posted below)
Sentence strips
Tape
Scissors

Background for Teachers

How do we measure distances in space?

- [NASA - Ask an Astrophysicist](#)
- [Scientific American](#)

What is an Astronomical Unit (AU)?

- [Wikipedia](#)
- [NASA](#)

What is a light year?

- [StarChild Question of the Month](#)
- [EarthSky](#)

How are the Solar System and the Milky Way Galaxy related?

- [Learning Astronomy](#)
- [NASA's Space Place](#)

Student Prior Knowledge

Our solar system consists of the eight planets (and small bodies) that revolve around the sun. There is more than one solar system in our galaxy (the Milky Way). Our galaxy is made up of millions of stars.

Intended Learning Outcomes

4. Communicate Effectively Using Science Language and Reasoning
- e. Use mathematical reasoning to communicate information.

Intended Learning Outcome - Linked to Standard

Students will be able to explain why there are different systems of measurement used to measure distances in space.

Instructional Procedures

(The purpose of measuring long objects as in #2 with small objects is to lead students to the "ah ha" that not everything is easily measured with the same unit. If a larger unit is available, it will be much easier.)

Ask what measurement is? Discuss. Explain that students will be measuring objects using their own made up units of measurement. Hand out student data sheets. Divide students into groups of 3-4. Have groups measure their desk using an object of their choice to represent a unit of measurement. Have them record that information on #1 on their data sheet.

Using the same object from #1, have them measure the length of the wall. Record data for #2. You will probably hear complaining about how difficult that was. Ask the class if that would have been easier using a larger unit of measurement.

Let the groups select a larger object to use to measure the same wall for #3. Make a representation of the object using sentence strips (may be taped together) if the large object is not mobile. Record data for #3.

For #4 groups will measure the length of the hallway using the same unit used in #3. Measure and record on #4. You will likely hear complaining about wishing they had a bigger unit to measure with. Ask what would have been easier to measure with.

For #5 tell the students you would like to measure the distance between your school and a building across the street. You won't really measure this but let them choose a unit of measurement and write it down.

For #6 have them choose a unit of measurement to measure between your school and another town. You won't measure this; just write the town and the selected unit.

Have students fill out the ratio section using their data.

Present the PowerPoint. As you read and discuss, have students fill out the organizer.

Strategies for Diverse Learners

Diversity within groups.

Assessment Plan

Student data sheet and PowerPoint organizer.

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