Alternative Assessment—Unit 2.2

Distance from Earth to the Sun

Grade 6 Science

Overview
Given appropriate data in a table, students graph the data and use the graph to explain the cause of Earth's seasons.

Content Standards
GLE 0607.6.6 Illustrate the relationship between the seasons and the earth-sun system.
GLE 0607.Inq.2 Use appropriate tools and techniques to gather, organize, analyze, and interpret data.
GLE 0607.Inq.3 Synthesize information to determine cause and effect relationships between evidence and explanations.
GLE 0607.Inq.5 Communicate scientific understanding using descriptions, explanations, and models.
MCS Learning Outcome: Manipulate models to show how the tilt of the Earth's axis and Earth's revolution around the sun produce seasons.

Materials
Graph paper or graphing calculator or spreadsheet application

Resources
Provide the following table and questions for each student:

Month	Distance (AU)
January	0.9840
February	0.9888
March	0.9962
April	1.0050
May	1.0122
June	1.0163
July	1.0161
August	1.0116
September	1.0039
October	0.9954
November	0.9878
December	0.9837

1. What general pattern describes the Earth's distance from the sun over a year?
2. What do the data mean about the reason for the seasons?
3. What does this data show about the relative size of the Sun as seen from Earth over the year?

Assessment Rubric

Criteria	Advanced	Proficient	Below standard
Graph	Graph fits the data well and makes it easy to interpret. The X axis has a label that describes the units used for the independent variable (month). The Y axis has a label that describes the units used for the dependent variable (distance in AU). All points are plotted correctly and easy to see.	Graph is adequate and does not distort the data but interpretation is difficult. The axes have labels. The graph may not be appropriately sized for the data set.	Units and labels are not described NOR appropriately sized for the data set. Points are not plotted correctly. The graph seriously distorts the data making interpretation almost impossible.
Question 1	Generalizes that the Earth's distance from the sun is constant.	Generalizes that the Earth's distance from the sun varies OR the Earth is closest to the sun in December OR the Earth is farthest from the sun in June.	Generalizes incorrectly that the Earth is closest to the sun in June (summer) and farthest in December (winter).
Question 2	Interprets data to mean that seasons are not the result of changing distance from the sun.	Interprets data to mean that the changing distance is not the only reason for seasons but is partly the reason.	Interprets data incorrectly to mean that seasons are caused by the Earth's distance from the sun.
Question 3	Infers that constant distance means the sun's apparent brightness does not change.	Infers that the changing distance means the sun is brighter in the winter than the summer.	Infers incorrectly that the sun is brighter in the summer when Earth is closer to the sun.