INSPIRE GK12 Lesson Plan

Lesson Title	Lunar and Solar Eclipses
Length of Lesson	One (50 minute) class period
Created By	Charlotte Buehler
Subject	General Science
Grade Level	7th grade
State Standards	7th: Inquiry (1b), Earth and Space Science (4f)
DOK Level	DOK 3
DOK Application	Predict, Model, Compare and Contrast
National Standards	5-8: Inquiry (A), Earth and Space Science (D)
Graduate Research Element	The sun is a major source of energy for the phenomena on the earth's surface. The sun plays a vital role in photosynthesis, which is an essential process to most plants. The noxious Australian pine use photosynthesis to grow and other environmental factors like wind which carry the seeds to help it propagate to new locations. Photosynthesis and wind are both products of interactions between the sun and earth.

Student Learning Goal:
MS 7th Grade:
Inquiry- (e) Communicate results of scientific procedures and explanation through a variety of written and graphic methods
Earth and Space Science- (e) Distinguish the structure and movement of objects in the solar system

National Science Education Standards of Content 5-8:
Inquiry (A)- Think critically and logically to make the relationships between evidence and explanations
Earth and Space Science (D)- Earth in the solar system.

Materials Needed (supplies, hand-outs, resources):
18 inflatable balls total (6 Sun - 36 inch diameter, 6 Earth - 12 inch diameter, 6 Moon - 8 inch diameter), 6 Flashlight, dark room to better see the flashlight, Utube links (http://www.youtube.com/watch?v=wuhNZejHeBg, http://www.youtube.com/watch?v=VGMotGL875M&feature=related)

Lesson Performance Task/Assessment:
This lesson will introduce what an eclipse is, how one form, what types exist, and what an eclipse looks like from Earth. The instructor will begin the demonstration by breaking the class into groups of four students. Each student will have a job: one to hold the flashlight, one to hold to moon, the sun, and the earth. Before the activity starts, the students should predict and write down what they think will happen when they conduct the activity. Next, the students with the flashlight will stand next to the sun ball and point the light in the direction of the earth ball. The students with the moon ball to begin revolving around the earth ball. The student should watch the shadow effect as the moon moves between the earth and the sun. The instructor should ask what type of eclipse was demonstrated (a lunar eclipse). They students should write down what they observed once they have successfully demonstrated one lunar eclipse. Next, they switch places and take a task they have not done. The group should demonstrate a solar eclipse in much the same fashion, except the moon will be in between the earth and the sun (instead of the earth being in between the sun and the moon).

Lesson Relevance to Performance Task and Students:
Understanding the earth's position in the solar system aids in student understanding of how certain general phenomena occur: like the day length, the year, phases of the moon, and eclipses. The basic concept of earth rotation and orbiting is also essential for learning about ocean currents, tides, and the seasons.

Anticipatory Set/Capture Interest:
Find out what the students know about the sun, earth and moon. Have they ever seen an eclipse? The last lunar eclipse was June 15, 2011. The last solar eclipse was July 11, 2010. The activity balls (sun, earth, moon) can be used to engage the students by tossing the balls to different students and having them respond with questions or comments about eclipses or the sun, moon, and earth.

Guided Practice:
The instructor will play the videos (see links) of the lunar and solar eclipse and then segue to the basic terminology discussing the orbit and rotations of the moon and earth and the stationary position of the sun. The students will also see the instructor explain the use of the flashlight, and the balls for the earth, moon, and sun to create the eclipse.

Independent Practice:
The students will demonstrate with the materials (flashlight and earth, moon, and sun balls) how an eclipse forms. The will act out both a lunar eclipse and a solar eclipse and should take turns with the objects so each student can experience different roles.
As a challenge, once the students successfully demonstrate the lunar eclipse, they should try to demonstrate the solar eclipse without any instruction.

Remediation and/or Enrichment:
Remediation: Individual IEP, have the students work in groups.
Enrichment: Could you see an Earth eclipse from the Moon? Research other aspects of the eclipses they find interesting.

Check(s) for Understanding:
1.) Ask the students why a real to-scale model of the sun, earth, and moon can't be used.
2.) How does a lunar eclipse form? A solar eclipse?

Closure:
Gather the material and regroup. Ask one student group to explain how a lunar eclipse forms and another student group how a solar eclipse forms. Were they correct in their predictions of how they might form?

Possible Alternate Subject Integrations:
Mathematics

Teacher Notes:
Access to internet to watch the Utube links for lunar and solar eclipse videos.