

Assignment Summary

For this assignment, you will develop and use a model of the Earth-Moon-Sun system to describe the cyclic patterns of lunar phases and eclipses of the Sun and moon. You also will model and illustrate how the tilted Earth rotates on its axis, causing day and night. You will then create a multimedia presentation featuring your models.

Background Information

Earth rotates on its axis, which causes day and night. Earth also revolves around the Sun. The path Earth follows is called its orbit. It is shaped like an oval. The moon orbits Earth in the same way. It revolves around Earth and rotates on its axis in 27.3 days. Because it rotates and revolves around Earth in the same time frame, a “day” and a “year” on the moon are the same, and the same side of the moon always faces Earth.

As Earth revolves around the Sun, the seasons change. Earth is actually closest to the Sun when the Northern Hemisphere experiences winter. The cause of the seasons is actually Earth’s tilt. Summer in the Northern Hemisphere occurs when the north is tilted toward the Sun. The Sun’s rays hit Earth more directly, which heats the surface. During the Northern Hemisphere’s winter months, the north is tilted away from the Sun. So, the Sun’s rays hit Earth less directly. When the Northern Hemisphere experiences summer, the Southern Hemisphere experiences winter. When the Southern Hemisphere experiences summer, the Northern Hemisphere experiences winter.

The moon has different shapes at different times of the month that are caused by the relative positions of the moon, Earth, and the Sun. Half of the moon is almost always lit by the Sun, but since the moon revolves around Earth, we see it from different angles. The phase of the moon you see depends on how much of the sunlit side of the moon faces Earth.

Earth’s axis tilts at 23.5 degrees. The moon’s axis tilts at about 5 degrees. Because of the tilt of both the moon and Earth, the moon does not often get in Earth’s shadow, and the moon’s shadow does not often cover Earth. A solar eclipse happens when a new moon blocks our view of the Sun. A lunar eclipse occurs at a full moon when Earth is directly between the moon and the Sun.

Materials

- Earth-Moon-Sun template file (Appendix)
- Heavyweight paper or cardstock
- Scissors
- Glue stick
- Digital camera
- Brads or paper fasteners

Assignment Instructions

For this project, you are expected to submit two items:

1. A model of the Earth-Moon-Sun system
2. A multimedia presentation

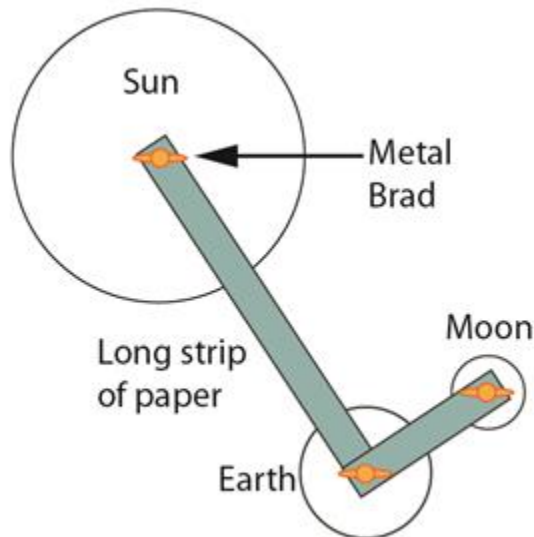
Step 1: Prepare for the project.

- a) Read through the guide before you begin so you know the expectations for this project.
- b) If anything is not clear to you, be sure to ask your teacher.

Step 2: Gather materials for the model.

Step 3: Create your model.

- a) Glue the templates to cardstock and cut out.
- b) Use brads or paper fasteners to connect Earth to the Sun and the moon to Earth as shown:



- c) Write your name on your model.

Step 4: Create a multimedia presentation.

- a) Using your model, create the following scenarios.
 - i. Night time, the Americas
 - ii. First quarter moon
 - iii. Lunar eclipse
 - iv. Solar eclipse
- b) Take a digital photograph or a video of each of the above scenarios. Label each photo or video, using the descriptions above.
- c) Set the images and videos in a multimedia presentation, and write a brief description in the presentation of what is happening in each picture.

Student Guide (continued)

- d) Make sure your multimedia presentation includes correct sentence structure, punctuation, grammar, and spelling.
- e) Ask your teacher where you should save your work. Your teacher also may have specific guidelines about the file name you should use.

Step 5: Evaluate your project using this checklist.

If you can check each box that follows, you are ready to submit your project.

Earth-Moon-Sun model

- Did you color your models correctly?
- Did you draw the axis with the correct tilt for both Earth and the moon?
- Did you assemble the Earth-Moon-Sun model according to the instructions?
- Did you create the four scenarios using your model?
- Does your model have your name on it?

Multimedia presentation

- Did you take pictures of the four scenarios?
- Did you include each scenario, plus a written description, in a multimedia presentation?
- Is the text in your presentation grammatically correct?
- Does the text in your presentation use proper punctuation and properly spelled words?
- Did you name the file as indicated by your teacher?

Step 6: Revise and submit your project.

- a) If you were unable to check off all the requirements on the checklist, go back and make sure that your project is complete. Save your project before submitting it.
- b) Turn in your model to your teacher. Be sure that your name is on it.
- c) Submit your multimedia presentation through the virtual classroom.
- d) Congratulations! You have completed your project.

Appendix

