**University of Arkansas**

**College of Education**

**Lesson Plan Format**

**COE Course**

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| **Unit Title: Astronomy** | **Lesson Title: Moon Phases** |
| **Subject Area: Science** | **Grade Level:    6th** |

1. **Pre-assessment and Planning**

Previously, students modeled the phases of the moon while utilizing a ball and a light source. During this lesson they will investigate why other stars and planets appear to be wandering the night sky. They will differentiate between revolutions and rotations. They will make connections between the importance of relative positioning discovered yesterday and revolutions and rotations discussed today.

“The rotation of an object is when it spins on its axis. The revolution of an object is when it circles around another object. Earth takes about 24 hours to complete one rotation. Earth takes 365 1/4 days to make a complete revolution. It takes the moon about 27-30 days to make one revolution, and the same amount of time to make one complete rotation. Therefore, the same side of the moon is always facing Earth. The revolution of the moon around Earth is the reason we have moon phases.” (Reed, 2002).

Bell problem- What is the difference between a revolution and a rotation?

A revolution involves an object making a circuit around another object. A rotation involves an object spinning about on its axis.

* Have a student demonstrate the counter clockwise rotation of Earth.
* Have another student demonstrate the counter clockwise rotation of the moon while it revolves around Earth. The first student (Earth) should still be rotating. Make sure the moon is only rotating once for every revolution. The same side of the moon should always be facing Earth. Explain to students that the revolution of the moon around Earth is why we have moon phases.

When executing the activity, the students will operate in table based cooperative groups to ensure equal distribution of abilities.

1. **Objective(s)**

I will be able to explain how planets appear to wander the night sky.

ESS.10.6.1 Explain how planets seem to wander against the background of the stars

1. **Assessment**

 Observe groups demonstrating the activity to make sure the concepts are understood.

 Journal Activity: Have students write a paragraph comparing a revolution and a rotation. Have them explain the movement of Earth and the moon in space, in addition to the apparent change in position of the planets and stars.

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|  | **5** | **3** | **1** |
| Science Content | Accurate; Connected to big ideas in science | Mostly accurate; Connections to big ideas are not clear | Inaccurate; Not connected to big ideas in science |
| Organization & Presentation | Main ideas are clearly presented; Ideas are presented in an appropriate order; Ideas are supported by information and logic; Appropriate conclusions are based upon evidence presented; Effective use of models, diagrams, charts, and graphs | Main ideas are presented to some extent; Ideas are not presented in an order that adds clarity; Some ideas are supported by information and logic; Conclusions do not follow from ideas presented; Some appropriate use of models, diagrams, charts, and graphs | No main idea presented; Ideas are presented in an order that distracts from clear communication; Ideas are not supported by information and are illogical; Inappropriate conclusions are presented No use of models, diagrams, charts, and graphs |

1. **Engaging the Learner**

Inquiry: Why do the planets appear to wander against the background of stars at night?

1. **Methods, Activities and Resources**

**Methods**

Whole group discussion – introduction and conclusion

Teacher modeling- beginning of the activity

Table-based cooperative groups- executing the activity, modeling the movement of the celestial bodies

Independent practice- completing observations in science journals

**Activities**

1. Engaging the learner (5 min)
2. Modeling and explaining the activity (5 min)
3. Students executing the activity and recording findings (35 min)
4. Conclusion and introducing the next lesson, eclipses (5 min)

Activity:

1. Explain to the students that Earth revolves around the sun, just as the moon revolves around Earth.
2. Remind students that Earth and the moon rotate counter clockwise as they orbit the sun. The moon revolves around Earth as Earth is revolving around the sun.
3. Assign three students to represent Earth, the moon, and the sun. They should hold the right word cards.
4. Have students demonstrate the rotation and revolution of Earth and the moon around the sun for the class. Make sure they rotate as they revolve.
5. Put students into groups to repeat this activity. Have students play the different roles of the sun, the moon, and Earth.
6. Bring the students back together as a class.
7. Assign students again to be the sun, the moon, and Earth, but this time add two stars and one planet out in the distance.
8. Have Earth slowly turn from day to night. Have them pay special attention to the planet and stars. What do they appear to do? Earth should notice that the planet and stars appear to move across the sky as they are rotating. Point out that although the other planets are revolving around the sun, it is because of Earth's rotation that the planets appear to move across the sky. The same is true with the stars in the sky – they appear to move because of Earth's rotation.
9. Again, break students into groups to repeat the activity so all can understand that stars and planets appear to move across the sky based on earth's rotation. Each student should have the opportunity to play Earth.

**Resources**

* Computer/Microsoft Office/Internet/overhead camera/projector
* Resources for classroom use and to extend content knowledge and pedagogy
  + Index Cards
  + Science Notebooks
  + Science books

1. **Potential Adaptations to the Lesson {PAL}**

* Technology fails- Utilize the whiteboard to outline the instructions
* Material grasped or completed faster or slower than expected- If slower than expected, conduct whole class discussion on the mechanics of the activity. Focus upon why each celestial body appears to be moving in the manner that it does. If the lesson is faster than expected, proceed to the lesson on eclipses.

1. **Collaboration**

* This lesson was made with coordination from my mentor teacher.