



Subject: Science

Grade Level: Middle School

DI Strategy: Tiered Scaffold

Middle School Science Tiered Assignment Lesson

Recently in my co-taught middle school Science class we were learning about the relationship between the Earth and Sun, specifically in regards to the seasons. The goal of this section was for students to not only understand the relationship between the Earth and Sun, but also to demonstrate this relationship using a model. We spent three class periods using the textbook, models, videos, and an EdPuzzle video to discuss key terms like rotation, revolution, axis, and tilt. At the end of the third day, students completed an exit ticket to check for understanding. On the ticket it had a season and a hemisphere (see picture below) listed and students were expected to draw a model of the sun and earth that demonstrated that given season of the year. Students were asked to label their diagram with as much information as they could. Exit tickets were collected and used to develop tiered activities for the next day in class.

The next day in class we also gave a bellringer activity (#1-3 from the Review and Reinforce worksheet found below). We used this activity to make sure students were placed in the appropriate "tiered" group. I moved some students from the high group to the middle group because their "bellringer" responses showed some areas of confusion. The tiered groups for the remainder of the class period were as follows:

Tier 1. This was the group that scored the lowest on the exit tickets. Their diagrams were not only inaccurate, but also missing key information that was needed to demonstrate mastery of this content. This group worked with my co-teacher to first review the key terms from this section (using Quizlet). Then, students worked independently on the "Review and Reinforce" sheet from the lesson. My co-teacher went over the answers with the group and discussed any areas of concern. Then, these students worked with me to set up a model to represent Summer in the Northern Hemisphere from the "Reasons for the Season" lab. Students contributed to the lab by suggesting what each material would represent and they also helped me set up the model. After helping me set up one model, I asked these students to set up a model for a new situation (such as Summer in the Southern Hemisphere) without my help. They were able to work together to set up the new model and ask me questions if they needed additional help.

Tier 2. The second group was the largest group and included students that had pretty accurate diagrams, but were missing some key elements. I felt that they just needed a refresher on some key points of the lesson. First, they worked independently to complete the "Review and Reinforce" sheet (which was a matching section of key vocabulary and their definitions). This also allowed me some time to get tier 3 set up. We went over the worksheet together, using examples to reinforce the key terms mentioned. Then, we worked together to start the "Reason for the Seasons" lab. We discussed what each material would be used for and did the first example together. Then, once I felt the students were able to work on their own---they divided up into three small groups to finish the rest of the lab, checking in with me as needed.



Tier 3. Finally, my last group included students who demonstrated great knowledge of this topic through their exit ticket. They had accurately labeled their diagram that included many important science terms. There were only 5 students who fell into this category, so I had them work together in one group. They spent the class period completing the "Reasons for the Seasons" lab within their small group. Besides going over the directions with them (briefly), they had very little guidance for this activity. I was able to check in every once in awhile, and was extremely impressed with how well they worked together and utilized all of their materials. They were very creative with setting up their model and really went above and beyond the task given.

All in all it was really great to see students reaching their potential given the appropriate tiered activity! The document below shows the Review and Reinforce, Reason for the Seasons lab, and sample exit tickets!

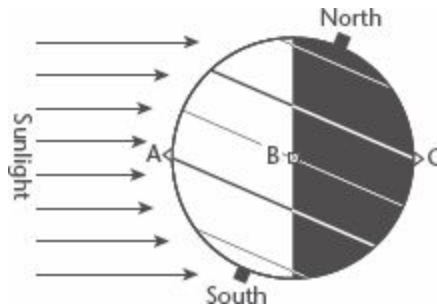


Review and Reinforce

Earth in Space

Understanding Main Ideas

Use the diagram below to answer Questions 1–3 on a separate sheet of paper.



1. In the diagram, what season is it in North America?
2. Would a person at each of the points A, B, and C see the sun? If so, where would the sun be in the sky?
3. Which is a person standing at point B seeing, sunrise or sunset? Explain.

4. axis

5. rotation

6. revolution

7. orbit

8. calendar

9. equinox

10. solstice

a. path of Earth as it revolves around the sun

b. defines the beginning, length, and divisions of a year

c. line passing through Earth's center and poles

d. when the sun is farthest north or south of the equator

e. movement of Earth around the sun

f. movement of Earth around its axis

g. when the noon sun is directly overhead at the equator



The Reason for the Seasons

Name _____

A) Materials:

- Flashlight
- Rubber band
- Styrofoam ball
- Toothpicks
- *You may use other materials from the classroom as needed*

Task: As a group, decide how you can use the listed materials to represent the seasons of the year. Describe your setup procedure below:

B) Making Models:

Once you have described your procedure, set up your model for the following situations. Sketch and label your model for each situation.



Teaching Learning Succeeding

Summer (Northern Hemisphere): **Bonus:** Place an “X” on your diagram to represent nighttime in Pennsylvania.

A large, empty rectangular box with a black border, intended for a student to draw a diagram and mark an 'X' to represent nighttime in Pennsylvania during the Northern Hemisphere summer.

Summer (Southern Hemisphere): **Bonus:** Place an “X” on your diagram to represent daytime in Pennsylvania.

A large, empty rectangular box with a black border, intended for a student to draw a diagram and mark an 'X' to represent daytime in Pennsylvania during the Southern Hemisphere summer.

Spring Equinox (Northern Hemisphere):

A large, empty rectangular box with a black border, intended for a student to draw a diagram for the Spring Equinox in the Northern Hemisphere.



C) Reflect:

1. Rate your model. On a scale of 1-5 (5 being the best), how well did it represent the “Reason for the Seasons?” Explain why or why not. What would you do to improve it?

2. **The Big Idea** ---What IS the “Reason for the Seasons?” Think like a scientist. Use as many astronomy words as you can think of! (There is **not** a 10 word limit)



Exit Ticket Examples:

