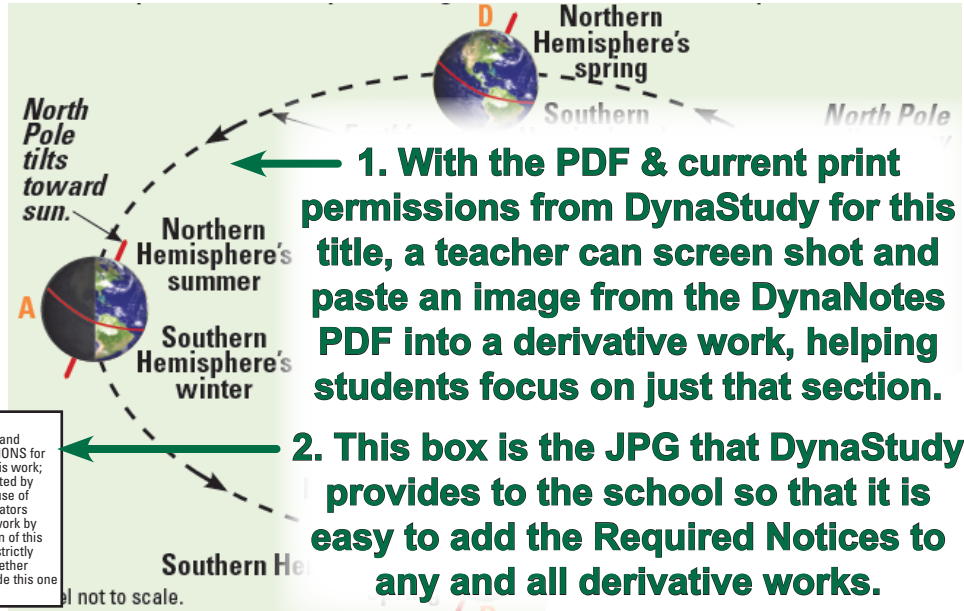


DynaNotes Grade 5 Science Streamlined Derivative Work Example:
 “Activity: Create and Manipulate a Single Season Model of Sun and Earth”

Follow the instructions to create and manipulate a seasonal model of the sun and Earth.

1. Review the diagram.

Notice Earth’s axis remains at the same angle in all seasons from your viewpoint. You will see this is not the case from the sun’s viewpoint.



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2. Choose a season: It is _____ in the _____ hemisphere.
 (season) (northern/southern)

3. Create a simple model using available supplies. It should include the sun, the Earth, Earth’s equator, and Earth’s imaginary axis. Identify the northern and southern hemispheres with different colors or by repeatedly writing “S” below the equator. *No moving parts are needed.*

4. Put your head near the sun and look at the Earth. Draw the appearance of the equator in the correct circle of the table (for the season you chose). Shade the southern hemisphere. *Note: It is easier to draw the equator if you draw the axis, too.*

5. What season comes next in the hemisphere you chose? _____ Adjust your model to represent that season and draw the appearance of the equator from the sun’s point of view in that circle of the table (and shade the southern hemisphere). Adjust your model and continue the process two more times to complete the table.

Northern Hemisphere	Southern Hemisphere	View of Earth’s Equator from Sun
winter	summer	
spring	fall	
summer	winter	
fall	spring	

6. Explain how different areas on Earth receive more or less sunlight during different seasons.

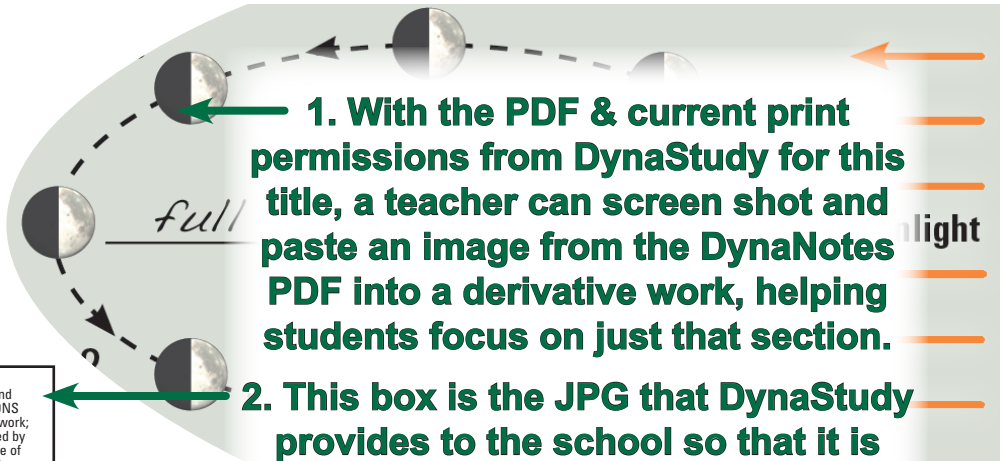
DynaNotes Grade 8 Science Streamlined Derivative Work Example:

“Activity: Create and Manipulate a Single Moon Phase Model of Moon and Earth”

Follow the instructions to create and manipulate a single moon phase model.

1. Review the diagram.

Notice the dark half of the moon (opposite the sun) is always in the same position from your viewpoint (in this diagram, on the left). You will see this is not the case from Earth’s viewpoint.



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2. Choose a moon phase: It is a _____ moon.
(moon phase)

3. Create a simple model using available supplies. It should include Earth, Earth’s moon, and something to show the direction sunlight is coming from (as a giant “wall” of light: remember, the sun is massive compared to Earth). Identify the dark and lit sides of the moon by blackening half of it.* *No moving parts are needed.*

4. Put your head near the Earth and look at the moon. Shade the area of the moon that appears dark from Earth’s viewpoint in the correct circle of the table (for the moon phase you chose).

5. Which moon phase comes next? _____
Adjust your model to represent that moon phase. Be sure to keep the Earth and sun in the same position, and only move the moon. Take care to always have the dark side of the moon opposite the direction of sunlight. Draw the moon’s appearance in that circle of the table. Continue to adjust your model until the table is complete.

Moon Phase & View from Earth	
 new moon	 full moon
 waxing crescent	 waning gibbous
 first quarter	 last quarter
 waxing gibbous	 waning crescent

6. How would you explain the moon phases to someone who does not understand them?

7. What are some limitations of your model?

**In reality, the moon slowly rotates as it revolves, keeping the same side facing Earth, which means the part of the moon that is light or dark is always changing. BONUS: To make your model even more accurate, draw a “face” on half the moon – the side that will always face Earth – and use play-dough or removable tape as a movable “shadow,” so you can shift the shadow’s position on the moon (still keeping the shadow opposite the sun in all cases).*