

Lesson Plan template- Internship II 2015

Student Teacher Name: Nikkee Johnson

Subject/Grade Level: 3rd grade Science

Daily Lesson Plan Day/Title: How Light Energy Moves

Learning Goals/Objectives	<p><u>Learning Goal:</u> Students will be able to understand that light travels in a straight line but can change paths via reflection or refraction. Students will become familiar with transparent, translucent, and opaque terms and objects.</p> <p><u>Learning Objectives:</u></p> <ol style="list-style-type: none">1. The student will be able to explain how light can be reflected off a mirror or a rough object through the law of reflection.2. The student will be able to recognize that light changes direction when crossing the boundary between two different transparent materials in a process called "refraction".3. Students will be able to identify which objects are translucent, transparent, or opaque.
Common Core State Standards	<p>Common Core State Standard:</p> <ul style="list-style-type: none">• SC.3.P.10.4: Demonstrate that light can be reflected, refracted, and absorbed.• SC.3.P.10.In.3: Identify that light may come from different sources, such as the Sun or electric lamp. <p>NSTA Next Generation Science Standards:</p> <ul style="list-style-type: none">• B.3.1: Light travels in a straight line until it strikes an object. Light can be reflected by a mirror, refracted by a lens, or absorbed by the object.
Assessment	<p><u>Formative:</u> Questions will be asked at the beginning and throughout the lesson to check for understanding of the standards. The teacher should also check for correct responses on flipbook. If students are not on the right track in their exploration, guide them in the right direction to meet learning objectives. Teacher will also give continuous feedback to students during the lesson based on questions and responses.</p> <p><u>Summative:</u> Teacher will collect students' "Light Energy" Booklets to take for a grade. Teacher will also review booklet before the next lesson to check for understanding of the material.</p>
Design for Instruction	<p>Student Activities & Procedures:</p> <ol style="list-style-type: none">1. Begin with a review of edmodo poll to see where student understanding lies.2. Tell students that they have been learning about all types of energy all week but today they are going to learn more about light energy.<ol style="list-style-type: none">a. Pose the question: Who can tell me what light energy is? (Students can look back at their MELTS resource if needed.)3. Bring up the Science Fusion lesson to complete a couple pages on light energy. Introduce new vocabulary as it comes up.4. Pass out lab booklets and explain to the class that they will be completing the information on each page as it relates to lab they will complete.5. The students will rotate through three different exploration labs based on

today's lesson. This will give them a chance to delve deeper into the material and gain a better understanding of light energy.

- a. Opaque, Translucent, Transparent Lab
 - b. Reflection Mirror Lab
 - c. Refraction Water Lab
6. Then break groups into labs. Lowest group will do the reading in their fusion books first, skipping the opacity lab. They may do it later in the day if there is time.
 7. Keep students on track, and keep with a good pace, by setting a timer on the smart board to time each rotation.
 8. Teacher will walk around to facilitate labs and answer any misconceptions.
 9. At the end, bring students back together to share results and conclusions.

Lab Setups:

Opaque, Translucent, Transparent Lab:

1. Students work in pairs or small groups to explore the properties of objects. Start by filling out the chart in their workbook about manmade and natural light.
2. Then have students hold up a flashlight through a tube and onto an object.
3. Test the objects opacity and write down results on the chart provided.

Reflection Lab:

1. Students work in pairs or small groups to explore the properties of a mirror. Students should begin by placing their mirror in the middle of the lab table on top of a piece of white paper. One student can be in charge of holding the mirror to the table. Then they should place their flashlight on the table so that it shines directly at the mirror.
2. Ask students to observe and trace with a pencil the ray of light from the flashlight to the mirror, as well as its reflection. They should put arrows on their lines showing the direction in which the light is traveling.
3. Ask students what they think would happen if they turn the mirror. Then have students turn the mirror and trace the path of the light and its reflection using a different colored pencil, again adding arrows to show the direction in which the light is traveling. Does the reflection move with the mirror? Finally, have students turn the mirror one more time and trace the lines in a third color.
4. Ask students to answer the questions in their workbook:
 - a. Turn off the flashlight, aim it at the mirror, and draw the incoming light line and your predicted path of reflected light. How do you think the light reflects when entering the mirror and leaving the mirror? Write a general rule.
 - b. Were you able to measure the angle of reflection compared to the angle of light coming in? Remember, you are measuring the angle between the flashlight beam and the mirror on one side, and the angle between the reflection of the flashlight beam and the mirror on the other side.
 - c. If you trace the path of the light on the paper and on the edge of the mirror, how do the two angles compare? (Students who need more visualization can color in the wedges and see that they are the same shape and area)
5. Ask students to place an index card in front of the mirror. Then have them point the light at the index card and observe the ray of light across the table. They should notice how the ray continues beyond the card as it did with the mirror. Ask students whether or not they think the index card is reflecting light.

	<p>Refraction Lab: Part 1:</p> <ol style="list-style-type: none"> 1. Students will work in small groups. Draw two arrows on each piece of paper. On one piece, draw the arrows pointing in the same direction. On the other piece, draw one arrow pointing to the left and the other pointing to the right. 2. Tape the pieces of paper to a wall or poster board. Then place the bottle/glass in front of each piece and watch what happens. Students will write the results on their workbook. These arrows point to the left originally. When you look at them through the water bottle, they point to the right! The alternating arrows point to the left and the right but they change directions and point to the right and left when examined through the water bottle. 3. Students should be able to recognize that refraction is at work here, because light bends when it passes through substances, such as water and plastic. As the light travels through a substance, it becomes concentrated into a focal point, usually near the center. After light passes through the focal point, the rays cross over each other and cause images to appear reversed. <p>Part 2:</p> <ol style="list-style-type: none"> 1. Students will now work on the Spear Fishing Challenge. Set up the equipment by putting the penny in the container of water. 2. Then, have each group stand beside the container and look at an angle through the water to the penny. Hold the straw to your eye like a telescope so that you can just see the penny. 3. Without moving the straw, insert the pencil and release. What happened? Did you spear the penny fish? If you were not successful, rethink your strategy and try again. Where do you need to position the straw to be able to hit the penny with the pencil? Try hitting the penny from directly above the water. 4. Construct a diagram of what you think is happening with light that makes it difficult to spear the penny. Include arrows to indicate direction. <p>Exceptionalities: I will use a mixture of whole group learning and cooperative learning for ESE kids. As well as incorporating extra visuals and technology into the lesson. Extra one on one help will be provided to ESE and Read 180 kids during independent practice. Leveled readers on the subject will be available to those who need them.</p>
<p>Resources/Materials</p>	<p><u>For teacher led lesson and reading:</u> Computer with internet connection, Interactive Whiteboard, work book from TpT, "Science Fusion" textbook/online lesson, "Light" fusion leveled reader, and part of lesson modified from (http://www.pbslearningmedia.org/resource/lsp07.sci.phys.energy.lplightmoves/how-light-moves/)</p> <p><u>For independent labs:</u> Mirror, Paper, Colored pencils, Felt, Aluminum foil, Plastic/Paper Bag, Paper tubes, Flashlights, Index cards, Containers of water (best with transparent sides), Penny, Straws, strands of dry spaghetti, Scissors</p>

