

Grade 1 ∴ Quarter 3 ∴ Physical Science ∴ Light

What Your Child Will Learn in First Grade Science Quarter 3

During third quarter, students will participate in investigations and make observations to gather evidence proving that objects can only be seen when they are illuminated/lit up. They will have the opportunity to plan and conduct an investigation to determine what happens when objects are placed in the path of a beam of light. They will learn to describe objects as reflective, transparent, translucent, or opaque, depending on how the beam of the light travels through/not through the object. Lastly, students will use the Engineering Design Process to develop a communication device with a light source, using what they have learned about light throughout the investigations.

Target Statements:

- Compare and contrast observations of objects with and without light.
- Identify natural and human-made sources of light.
- Explain how light travels and draw a diagram/model of light traveling (*not to include the speed of light*)
- Plan an investigation that helps determine what happens when different objects are placed in front of a beam light.
- Justify whether an object is transparent, translucent, or opaque.
- Use the Engineering Design Process to design a device that can communicate using light.

Vocabulary:

- | | | | |
|----------------|--------------|---------------|---------------|
| • illuminate | • source | • natural | • human-made |
| • beam | • reflective | • translucent | • transparent |
| • opaque | • device | • imagine | • prototype |
| • observations | • evidence | • conclusion | |

Resources for Home (optional):

- Allow your child to create shadows at home, identify light sources throughout your home, and investigate how light travels “through” materials.
- Encourage your child to discuss the investigations they have done in class, and explain what conclusions they have reached based on the evidence they gathered.
- NSTA “Science Resources for Parents”: <http://www.nsta.org/parents/>
- NSTA “Tips for Busy Parents”: <http://www.nsta.org/sciencematters/tips.aspx>
- NSTA “Help Your Child Explore Science”: <http://www.nsta.org/parents/explore.aspx>

Materials to be collected:

Everyday items will often be used to support students’ scientific investigations.

In this unit, we will require a large number of:

- flashlights

If possible, please send one in with your child during the start of the quarter. Please be sure it is labeled with your child’s name, so it may be returned at the end of the unit.

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The eight *Scientific and Engineering Practices* describe the behaviors and habits of mind that are necessary to make students' knowledge of content more meaningful. The term "practices," instead of a term such as "skills," is used to stress that engaging in scientific inquiry requires coordination both of knowledge and skill simultaneously. Acquiring skills in these practices supports a better understanding of how scientific knowledge is produced and how engineering solutions are developed. Such understanding will help students become more critical consumers of scientific information.

Practice	What This "Looks Like" for a First Grade Student
Asking Questions (Scientist) and Defining Problems (Engineer)	- Ask questions based on observations to find more information about the natural and/or designed world(s). - Ask and/or identify questions that can be answered by an investigation.
Developing and using Models	- Develop and/or use a model to represent relationships, relative scales (bigger, smaller) and/or patterns in the natural and designed world(s). - Develop a simple model based on evidence to represent a proposed object or tool.
Planning and Carrying Out Investigations	- Evaluate different ways of observing and/or measuring a phenomenon to determine which way can answer a question. - Make observations and/or measurements to collect data that can be used to make comparisons.
Analyze and Interpret Data	- Record information (observations, thoughts, and ideas). - Use and share pictures, drawings, and/or writings of observations. - Use observations to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems.
Use Mathematics and Computational Thinking	- Decide when to use qualitative (observations) versus quantitative (numerical) data. - Use data to compare alternative solutions to a problem.
Constructing Explanations (Scientist) and Designing Solutions (Engineer)	- Make observations to construct an evidence-based account for natural phenomenon. - Use tools and/or materials to design and/or build a device that solves a specific problem. - Generate and/or compare multiple solutions to a problem.
Engaging in Argument from Evidence	- Distinguish between opinions and evidence in one's own explanations. - Listen actively to arguments to indicate agreement or disagreement based on evidence, and/or to retell the main points of an argument. - Construct an argument with evidence to support a claim.
Obtaining, Evaluating, and Communicating Information	- Obtain information using various texts and other media that will be useful in answering a scientific question and/or supporting a scientific idea. - Communicate information or design ideas and/or solutions with others in oral and/or written forms: using models, drawings, writing, or numbers that provide detail about scientific ideas, practices, and/or design ideas.

Source: *NGSS Appendix F (2013) – Science and Engineering Practices in the NGSS*