

# Why is Light Important to Our Lives?



## Science Discipline: Physical Science

### Enduring Value: Change, Consistency, and Measurement

#### Essential Question(s):

Lesson 1: How do the interactions between light and air affect life on Earth?

Lesson 2: How do the interactions between light and water affect life on Earth?

Lesson 3: How do the interactions between light and materials affect life on Earth?

Lesson 4: How do interactions among light, heat, and temperature affect life on Earth?

#### Unit Standards:

1. Specific National Resource Council Standards (NRC, 1996) for each lesson
2. Common Core State Standards Checklist
3. *Next Generation Science Standards Checklist* (May 2012 Draft: NRC, 2012)

### Big Ideas/Science Concepts: Light

- Light appears to travel in straight lines and spreads out from the source. This can be observed if students look closely.
- Light can change direction when it hits a different medium.
- Reflection happens when light bounces off of something like a mirror.
- Refraction occurs when light passes from one medium into another. The light will bend, and the angle will depend on the media.
- Heat, light, and temperature are related.
- When an electric current flows through the little wire filament in the light bulb, the moving electrons bump into the inside of the wire. When atoms bump into things and move around more, we say they are at a higher temperature.
- When a light shines on objects, color makes a difference. The lighter the color of the object the more light is reflected and, hence, the darker the color of the object, the more light is absorbed. Therefore, the darker the color the warmer the object will become.

Resource: *Ask the Van*, Department of Physics, University of Illinois at Champaign-Urbana

## Learning Lessons:

### 1. How Does Light Travel in Air?

Students explore the phenomenon of how light travels in air through guided instruction, exploration, presentations consisting of the Big Idea and Evidence to support it, and class consensus.

### 2. How Does Light Travel in Water?

Students explore the phenomenon of how light travels in water through guided instruction, exploration, presentations consisting of the Big Idea and Evidence to support it, and class consensus.

### 3. How Does Light Interact with Different Materials?

Students explore the phenomenon of how light interacts with different materials through guided instruction, exploration, presentations consisting of the Big Idea and Evidence to support it, and class consensus.

### 4. How are Light, Heat, and Temperature Related?

Students explore the relationship between light, heat, and temperature through guided instruction, exploration, presentations consisting of the Big Idea and Evidence to support it, and class consensus.

## Assessments/Supports:

1. Summative/Final Unit Assessment
2. Extension Menu
3. Scaffold/Support

