Unit III: STEM Unit: Designing Lighting Systems

Content Area: **Science**
Course(s): **Science 1**
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Enduring Understandings

Light travels in a straight line until it comes in contact with another object/medium.

Optical engineers design technologies that produce or utilize light in some way, they need to select materials to use in these technologies that interact with light in desirable ways.

The farther light travels from its source, the less intense the light becomes.

We can use a Light Intensity Meter to measure and record how intense the light is at a particular location.

Essential Questions

How does light interact with different materials?

Why do optical engineers need to know about the interactions between light and different materials?

How does light travel?

How can we measure the intensity of light?

Content

Literature Connection:

Omar's Time to Shine Storybook

http://optics.synopsys.com/learn/kids/optics-kids-scientists-engineers.html

http://www.optics4kids.org/home/content/what-is-optics/

Skills

investigate to determine the effect of placing objects made with different materials in the path of a beam of light.

Describe and classify different kinds of materials by their observable properties.

Investigate how light interacts with different materials, how light travels, and how to measure the intensity of light.

Design a lighting system and discuss improvement ideas.

Use the Engineering Design Process (EDP) to design a lighting system.

Connect knowledge of light to a broader understanding of how optical engineers can use this knowledge to solve problems.

Observe and analyze how light interacts with, and is affected by, different materials.

Discover the kind of work done by optical engineers.

Examine the materials and handouts needed for the activity in the classroom.

which materials have the properties that are best suited for an intended purpose.

Work in teams to design and improve lighting systems to illuminate specific hieroglyphs in a model tomb.

Apply their knowledge of light and optical engineering as they imagine, plan, create, test, and improve their own lighting systems.

Explore how light interacts with a variety of material like optical engineers.

Experiment by reflecting light using mirrors and learn about light intensity.

Imagine, plan, create, test, and improve their own lighting systems.

Standards

SCI.1	Waves: Light and Sound
SCI.1-PS4-4	Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.
SCI.1-PS4-2	Make observations to construct an evidence-based account that objects can be seen only when illuminated.
SCI.1-PS4-3	Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.