Jan. Gr. 1 Unit 3: Light

Content Area: **Science**
Course(s):
Time Period: **January**
Length: **6-8 Weeks**
Status: **Published**

Unit Overview

In this unit, students will:

- provide evidence, based on observations, of the relationship between the amount of light and how an object is seen;
- explain, using evidence based on observations, why objects that give off their own light can be seen in the dark;
- explain and demonstrate how different materials can allow different amounts of light to pass through;
- explain how shadows are made;
- observe that light shines in a straight line until it hits an object;
- explore how reflection can be used to redirect light;
- explore how technology is used to send and receive information using light.

Enduring Understandings

Light helps us to see and can change how we see things.

Light travels in a straight line.

Reflection causes light to redirect.

Technology uses light to send and recieve information.

Essential Questions

What is light?

How does light help us see things?

How does technology use light to communicate?

Instructional Strategies & Learning Activities

- Unit 3: Light

  Teacher eBook

  Light: Unit Project: Make a Rainbow

  During the unit project "Make a Rainbow," children will:
    - Plan and conduct an investigation to explain how a rainbow forms.
    - Use tools and materials to carry out an investigation.
    - Make observations and draw conclusions.

  Launch

- Unit 3: Light

  Student Edition

  Light: Unit Opener

  The Unit Opener for "Light" introduces the unit project, Make a Rainbow. During this unit project, children will:
    - Plan and conduct an investigation to explain how a rainbow forms.
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    - Make observations and draw conclusions.

  Launch

- Unit 3: Light

  Online Assessment

  Light: Unit Pretest

  The interactive Unit Pretest for "Light" focuses on prerequisite knowledge. The test is composed primarily of DOK 1 items that evaluate student preparedness for the upcoming content.

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- Unit 3: Light

  Teacher Edition

  Light: 3D Unit Planning

  Planning resources are available for each lesson and hands-on activity in the unit "Light."

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- Unit 3: Light

  Assessment Guide

  Light: Unit Pretest (Editable)

The Unit Pretest for "Light" focuses on prerequisite knowledge. The test is composed primarily of DOK 1 items that evaluate student preparedness for the upcoming content.
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- Unit 3: Light

  Teacher Edition

  Light: Unit At a Glance

  Unit at a Glance for "Light" includes the unit table of contents, unit vocabulary words, and the vocabulary game, Guess the Word. In this unit, children will:
  - provide evidence, based on observations, of the relationship between the amount of light and how an object is seen;
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- Unit 3: Light

  Teacher Edition

  Light: Connecting with NGSS

  These opportunities for informal science learning provide local context and extend and enhance concepts from the unit "Light."
  Launch

- Unit 3: Light

  Online Assessment

  Light: Unit Test

  The interactive Unit Test for "Light" assesses students' ability to apply knowledge to solve problems and explain phenomena in relation to the Performance Expectations associated with the unit. In this unit, children:
  - provide evidence, based on observations, of the relationship between the amount of light and how an object is seen;
  - explain, using evidence based on observations, why objects that give off their own light can be seen in the dark;
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- Unit 3: Light

  Assessment Guide

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- Unit 3: Light

  Teacher eBook

  Light: Unit Opener

  The Unit Opener introduces the unit "Light" and the unit project, Make a Rainbow.

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  Student Edition

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- Unit 3: Light

  Home Letter

  Light: Home Letter

  This is the home letter for the unit "Light."
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- Unit 3: Light

  Student eBook

  Light: Unit Opener

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- Unit 3: Light

  Teacher Edition

  Light: Integrating the NGSS* Three Dimensions of Learning

  This section details the Performance Expectations covered in the unit "Light."
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- Unit 3: Light

  Assessment Guide

  Light: Unit Pretest

  The Unit Pretest for "Light" focuses on prerequisite knowledge. The test is composed primarily of DOK 1 items that evaluate student preparedness for the upcoming content.
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  - Unit 3: Light

    Teacher Edition

Light: Unit Opener

The Unit Opener introduces the unit "Light" and the unit project, Make a Rainbow.
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Unit 3: Light

Teacher Edition

Light: Differentiate Instruction

This page provides differentiated support for this unit's Science & Engineering Leveled Readers, "What Are Forces and Energy?" and "Soccer Moves!"
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Unit 3: Light

Teacher Edition

Light: Unit Project: Make a Rainbow

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Assessment Guide

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Unit 3: Light

You Solve It

Message Projector (Teacher)

Teacher support materials are available for "Message Projector." During this activity, students will first construct messages that they want to project onto a screen. Then, they test out different materials for the lens of their projector and evaluate which one will best allow light to shine through. Students will test their design to see if their message is projected on the screen.
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Unit 3: Light

Unit Project Worksheet

Light: Unit Project: Make a Rainbow

This is the Unit Project worksheet for "Make a Rainbow." During this project, children will:

- Plan and conduct an investigation to explain how a rainbow forms.
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Unit 3: Light

Student eBook

Light: Unit Performance Task: Observe Reflections

During the Performance Task "Observe Reflections," children will observe reflections in a mirror and use their observations to predict where their partner should stand in order to be visible in the mirror. They will observe the cause-and-effect relationship between where they stand and whether they are visible in the mirror.
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Unit 3: Light

Unit Performance Task Worksheet

Light: Unit Performance Task: Observe Reflections

This is the Unit Performance Task worksheet for "Observe Reflections." During this task, children will observe reflections in a mirror and use their observations to predict where their partner should stand in order to be visible in the mirror. They will observe the cause-and-effect relationship between where they stand and whether they are visible in the mirror.
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Unit 3: Light

You Solve It

Message Projector

In Message Projector, students first construct messages that they want to project onto a screen. Then, they test out different materials for the lens of their projector and evaluate which one will best allow light to shine through. Students will test their design to see if their message is projected on the screen.
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Unit 3: Light

Teacher eBook

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Unit 3: Light

Teacher Edition

Light: Unit Review

The Unit Review assesses student understanding of key ideas and concepts from the unit "Light."
Launch

Unit 3: Light

Leveled Readers - Green

Enrichment: Soccer Moves!

The leveled reader "Soccer Moves!" is designed for above-level readers and can be used to extend key concepts from the unit "Light."
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Unit 3: Light

Unit Project Worksheet

Light: Unit Project: Make a Rainbow (Editable)

This is the editable Unit Project worksheet for "Make a Rainbow." During this project, children will:

- Plan and conduct an investigation to explain how a rainbow forms.
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Launch

- Unit 3: Light

  Student Edition

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- Unit 3: Light

  Unit Performance Task Worksheet

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- Unit 3: Light

  Leveled Readers Teacher's Guide

  Topic 4: Forces and Energy

  The Leveled Readers Teachers Guide provides teaching strategies and support (as well as reproducible English and Spanish worksheets) for the Unit 3 readers "What Are

Forces and Energy?" and "Soccer Moves!" On-Level and Extra-Support worksheets focus on vocabulary development, while Enrichment worksheets reinforce and enrich content.
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- Unit 3: Light

  Teacher Edition

  Light: Unit Performance Task: Observe Reflections

  During the Performance Task "Observe Reflections," children will observe reflections in a mirror and use their observations to predict where their partner should stand in order to be visible in the mirror. They will observe the cause-and-effect relationship between where they stand and whether they are visible in the mirror.
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- Unit 3: Light

  Leveled Readers - Blue

  On-Level: What Are Forces and Energy?

  The leveled reader "What Are Forces and Energy?" is designed for on-level readers and can be used to enrich key concepts from the unit "Light."
  Launch

- Unit 3: Light

  Teacher eBook

  Light: Unit Review

  The Unit Review assesses student understanding of key ideas and concepts from the unit "Light."
  Launch

- Unit 3: Light

  Leveled Readers - Red

  Extra-Support: What Are Forces and Energy?

  The leveled reader "What Are Forces and Energy?" is designed for below-level readers and can be used to reinforce key concepts from the unit "Light."
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- Unit 3: Light

Student Edition

Light: Unit Performance Task: Observe Reflections

During the Performance Task "Observe Reflections," children will observe reflections in a mirror and use their observations to predict where their partner should stand in order to be visible in the mirror. They will observe the cause-and-effect relationship between where they stand and whether they are visible in the mirror.
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Integration of Career Exploration, Life Literacies and Key Skills

Students will establish and follow rules, routines, and responsibilities throughout the year

	Different types of jobs require different knowledge and skills.
9.1.2.CAP.1	Make a list of different types of jobs and describe the skills associated with each job.
9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
9.4.2.CI.2	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).
	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology and Design Integration

Students will use the design process to create a message they can project using light. Students will use the interactive textbook on the Smartboard.

TECH.8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
TECH.8.2.2.C.2	Create a drawing of a product or device that communicates its function to peers and discuss.
TECH.8.2.2.D.1	Collaborate and apply a design process to solve a simple problem from everyday

	experiences.
TECH.8.2.2.D.5	Identify how using a tool (such as a bucket or wagon) aids in reducing work.
TECH.8.2.2.D.CS1	Apply the design process.

Interdisciplinary Connections

Students go to the STEM lab bi-monthly to create hands-on projects that align with the unit.

Students will listen to and read non-fiction texts about light.

LA.RI.1.1	Ask and answer questions about key details in a text.
LA.RI.1.2	Identify the main topic and retell key details of a text.
LA.RI.1.3	Describe the connection between two individuals, events, ideas, or pieces of information in a text.
LA.RI.1.4	Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
LA.RI.1.5	Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
LA.RI.1.6	Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
LA.RI.1.8	Identify the reasons an author gives to support points in a text and explain the application of this information with prompting as needed.
LA.RI.1.9	Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).
LA.RI.1.10	With prompting and support, read informational texts at grade level text complexity or above.

Differentiation

- Understand that gifted students, just like all students, come to school to learn and be challenged.
- Pre-assess your students. Find out their areas of strength as well as those areas you may need to address before students move on.
- Consider grouping gifted students together for at least part of the school day.
- Plan for differentiation. Consider pre-assessments, extension activities, and compacting the curriculum.
- Use phrases like "You've shown you don't need more practice" or "You need more practice" instead of words like "qualify" or "eligible" when referring to extension work.
- Encourage high-ability students to take on challenges. Because they're often used to getting good grades, gifted students may be risk averse.

- **Definitions of Differentiation Components**:

    - Content – the specific information that is to be taught in the lesson/unit/course of instruction.
    - Process – how the student will acquire the content information.
    - Product – how the student will demonstrate understanding of the content.
    - Learning Environment – the environment where learning is taking place including physical location and/or student grouping

Differentiation occurring in this unit:

See suggestions in the teacher manual for differentiation for struggling and advanced learners.

Modifications & Accommodations

Refer to QSAC EXCEL SMALL SPED ACCOMMOCATIONS spreadsheet in this discipline.

Modifications and Accommodations used in this unit:

IEP and 504 accommodations will be utilized.

Benchmark Assessments

Benchmark Assessments are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

Schoolwide Benchmark assessments:

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

DRA

Additional Benchmarks used in this unit:

Teacher will use the assessments located in the series to compare growth over time.

Formative Assessments

Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for

helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

Formative Assessments used in this unit:

Self-Check and Unit Reviews

Summative Assessments

Summative assessments evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

Summative assessments for this unit:

Self-Check and Unit Reviews

Instructional Materials

HMH Science Dimensions prgram materials

Materials listed for hands on exploration.

Standards

1-PS4	Waves and their Applications in Technologies for Information Transfer
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. Examples of materials could include those that are transparent (such as clear plastic),

translucent (such as wax paper), opaque (such as cardboard), and reflective (such as a mirror). The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.

Cause and Effect

Simple tests can be designed to gather evidence to support or refute student ideas about causes.