



Grade 1 STEAM Unit 3 - Investigating Light, Sound, and the Sky

Unit Focus

In this hands-on science unit, students are introduced to physical and life science concepts while exploring the fascinating ways light, sound, and natural patterns affect our world. Using LEGO Education Spike and Lego Education Science, students build and test models, design solutions to real-world problems, and investigate patterns of the sun, moon, and stars.

Students will discover that objects can only be seen when illuminated and that sounds are produced by vibrating materials. They will explore how different materials affect the transmission of light and sound and use this understanding to design tools that communicate over a distance. Students will also program light and sound sensors, integrating technology into their investigations.

Throughout the unit, students develop self-regulation, perseverance, and a growth mindset as they engage in collaborative problem-solving. They consider ideas from others, work toward shared goals, and clearly articulate their design choices and reasoning. The MakerSpace allows students to combine their artistic creativity with scientific understanding by creating a mobile that represents the sun, moon, and stars.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
Common Core English Language Arts: 1 - Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly. (CCSS.ELA-LITERATURE.SL. 1.4) Mathematics: 1 - Relate counting to addition and subtraction (e.g., by counting on 2 to add 2). (CCSS.MATH.CONTENT.1.OA.C.5) Next Generation Science Standards Performance Expectations: 1 - Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. (1-PS4-1) - Make observations to construct an evidence-based account that objects can be seen only when illuminated. (1-PS4-2) - Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. (1-PS4-3) - Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. (1-PS4-4) - Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. (1-LS1-1)	<i>Students will be able to independently use their learning to...</i> T1 Ask questions to gain understanding, communicate their ideas, explain their thinking process, and evaluate efficiency or connectedness to a concept. T2 Use the engineering design process to invent or innovate solutions. T3 Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems. T4 Leverage technology to demonstrate learning competencies.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> U1 Scientific concepts and patterns can be used to inspire technological designs and solutions to problems. U2 Engineers utilize the engineering design process to solve problems and develop new ideas. U3 Persevering through challenges builds one's growth mindset and builds resilience. U4 Technological methods can be used to develop and test solutions.	<i>Students will keep considering...</i> Q1 How can I better understand a problem and use what I know to design and test a solution? Q2 How do I communicate my ideas and collaborate effectively to reach a shared goal? Q3 How do science and technology help us solve problems in creative ways?

Stage 1: Desired Results - Key Understandings

- Use observations of the sun, moon, and stars to describe patterns that can be predicted. (1-ESS1-1)
- Make observations at different times of the year to relate the amount of daylight to the time of year. (1-ESS1-2)
- Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)

CSTA: Computer Science Standards (2017)

K-2

- Develop programs with sequences and simple loops, to express ideas or address a problem. (1A-AP-10)

ISTE Standards (2024)

ISTE Standards (2024): K-12

- Develop, test and refine prototypes as part of a cyclical design process. (1.4.c.)

Madison Public Schools Profile of a Graduate

- Design: Engaging in a process to refine a product for an intended audience and purpose. (POG.2.2)
- Collective Intelligence: Working respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective. (POG.3.1)

Acquisition of Knowledge and Skill

Knowledge

Students will know...

K1 The sun, moon, and stars move in patterns we can observe and predict.

K2 Good solutions come from multiple attempts and revisions.

K3 Design is a process that can be continually revisited for improvements.

K4 Vibrations produce sound.

K5 Light comes from sources and travels until it hits something.

K6 Different materials reflect, absorb, or transmit light.

K7 Light and sound waves can be used to send messages over a distance.

Skill(s)

Students will be skilled at...

S1 Using observations of the sun, moon, and stars to describe patterns that can be predicted.

S2 Developing , testing and refining prototypes as part of a cyclical design process.

S3 Making observations and gathering information to define a simple problem that can be solved by making a new or improved object or tool.

S4 Expressing ideas and feelings about the design process clearly.

S5 Using materials and motion to create vibrations that produce sound.

S6 Using observations to explain that objects are seen only when light reaches them or reflects off them.

S7 Planning and conducting an investigation to compare how different materials affect a beam of light.

S8 Designing and building devices to communicate over a distance, one using light and one using sound.

S9 Designing a solution to a human problem that mimics an external animal structure.

S10 Describing the design, including its materials and how it works to solve a human problem.