

Califon Public School
Curriculum

Subject: Science	Grade: 1st	Unit #: 1	Pacing: 8 weeks
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Unit Title: Patterns of Change in the Sky**OVERVIEW OF UNIT:**

In this unit of study, students observe, describe, and predict some patterns in the movement of objects in the sky. The crosscutting concept of patterns is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Big Ideas

- Science assumes that natural events happen today as they happened in the past.
- Many events are repeated.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Patterns in the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Seasonal patterns of sunrise and sunset can be observed, described, and predicted.
- Many events are repeated.

Essential Questions

- Can we predict how the sky will change over time?
- What patterns of change can be predicted when observing the sun, moon, and stars?
- What is the relationship between the amount of daylight and the time of year?

Objectives

- Students will be able to predict how the sky will change over time.
- Students will be able to discuss and explain the relationship between the amount of daylight and the time of year.
- Students will make observations (firsthand or from media) to collect data that can be used to make comparisons.
- Students will use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.

Assessment

- Observe and use patterns in the natural world as evidence and to describe phenomena.

- Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.
- Use observations of the sun, moon, and stars to describe patterns that can be predicted. (Examples of patterns could include: The sun and moon appear to rise in one part of the sky, move across the sky, and set. Stars other than our sun are visible at night but not during the day.) (Assessment of star patterns is limited to stars being seen at night and not during the day.)
- Observe and use patterns in the natural world as evidence and to describe phenomena.
- Make observations (firsthand or from media) to collect data that can be used to make comparisons.
- Make observations at different times of the year to relate the amount of daylight to the time of year. (Note: The emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall; assessment is limited to relative amounts of daylight, not to quantifying the hours or time of daylight.)

Formative Assessment:

- Group Discussions
- Peer work

Summative Assessment:

- Projects
- Published Writing

Benchmark:

- Access Prior Knowledge

Alternative:

- Modified Projects
- Modified Work

Key Vocabulary

Sun, moon, stars, seasons, sunrise, sunset

Resources & Materials

- <https://www.nextgenscience.org/>

Technology Infusion**Teacher Technology:**

- Promethean Board
- Google Classroom
- STEMScopes

Student Technology:

- Chromebooks
- StemScopes

- Seesaw

Activities:

- The students are using the Chromebooks to reflect concepts learned using Seesaw.
- The students are using STEMscopes to explore and discover topics being taught.

Standard	Standard Description
8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
8.1.2.NI.1	Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network
8.2.2.ED.1	Communicate the function of a product or device

Interdisciplinary Integration

Activities:

- The learner will conduct close readings and apply close reading strategies to better understand the content.

Resources:

- Teacher Vision Cross-Curricular Theme Map - <https://www.teachervision.com/teaching-methods/curriculum-planning/7167.html>
- Engineering Go For It! - <http://egfi-k12.org/>
- US Department of Education STEM - <http://www.ed.gov/stem>
- Intel STEM Resource - <http://www.intel.com/content/www/us/en/education/k12/stem.html>
- NASA STEM - <http://www.nasa.gov/audience/foreducators/expeditions/stem/#.VYrO2flViko>
- PBS STEM - <http://www.pbs.org/teachers/stem/#content>
- STEM Works - <http://stem-works.com/activities>
- [What Every Educator Should Know About Using Google](#) by Shell Education
- Promoting Literacy in all Subjects by Glencoe - http://www.glencoe.com/sec/teachingtoday/subject/promoting_literacy.phtml
- International Literacy Association Read Write Think - <http://www.readwritethink.org/>

Standard	Standard Description
NJSLS-ELA L.RF.1.4	Read with sufficient accuracy and fluency to support comprehension.
NJSLS-ELA RI.MF.1.6	With prompting and support, use text features (e.g., diagrams, tables, animations) to key ideas.

21st Century Life Skills Standards

Activities:

- The learner will participate in an exploration of jobs pertaining to space.

Standard	Student Learning Objectives
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).

Careers	
Activities: The learner will participate in STEAM building activities that address the science content and apply critical thinking skills while persevering in solving the task at hand.	
Practice	Description
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.
Demonstrate creativity and innovation.	Students regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

Standards			
Standard #	Standard Description	Student Learning Objective	Clarification Statement
K-ESS3-3	Earth and Human Activity	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.	Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.
1-ESS1-1	Earth's Place in the Universe	Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.] [Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.]

1-ESS1-2	Earth's Place in the Universe	Make observations at different times of year to relate the amount of daylight to the time of year	Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.]
K-2-ETS1-1	Engineering Design	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-ETS1-2	Engineering Design	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	
K-2-ETS1-3	Engineering Design	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	

Differentiation

Students with 504 plans

- Preferential seating
- Guided notes
- Extra time
- Teacher check-ins
- Use graphic organizers
- Redirect attention
- Prioritize tasks
- Small group testing
- Provide modifications & accommodations per individual student's 504 plan

Special Education

- Provide modifications & accommodations as listed in the student's IEP
- Position the student near a helping peer or have quick access to the teacher
- Modify or reduce assignments/tasks
- Reduce the length of the assignment for different modes of delivery

- Increase one-to-one time
- Prioritize tasks
- Use graphic organizers
- Use online resources for skill-building
- Provide teacher notes
- Use collaborative grouping strategies, such as small groups
- NJDOE resources - <http://www.state.nj.us/education/specialed/>

Response to Intervention (RTI)

- Tiered interventions following the RTI framework
- Effective RTI strategies for teachers - <http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/>
- Intervention Central - <http://www.interventioncentral.org/>

English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
- NJDOE resources - <http://www.state.nj.us/education/aps/cccs/ELL.htm>
- Adapt a Strategy – Adjusting strategies for ESL students - <http://www.teachersfirst.com/content/esl/adaptstrat.cfm>

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

**Califon Public School
Curriculum**



Subject: Science	Grade: 1st	Unit #: 2	Pacing: 8 weeks
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Unit Title: Characteristics of Living Things

OVERVIEW OF UNIT:

In this unit of study, students develop an understanding of how plants and animals use their external parts to help them survive, grow, and meet their needs, as well as how the behaviors of parents and offspring help offspring survive. The understanding that young plants and animals are like, but not exactly the same as, their parents is developed. The crosscutting concept of patterns is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in obtaining, evaluating, and communicating information and constructing explanations. Students are also expected to use these practices to demonstrate an understanding of the core ideas.

Big Ideas

- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Individuals of the same kind of plant or animal are recognizable as similar, but can also vary in many ways.
- Young animals are very much, but not exactly, like their parents. Plants are also very much, but not exactly, like their parents.
- Scientists look for patterns and order when making observations about the world.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Adult plants and animals can have young.
- In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring survive.

Essential Questions

- How are young plants and animals alike and different from their parents?
- What types (patterns) of behavior can be observed among parents that help offspring survive?

Objectives

- Students will be able to describe how young plants and animals are alike and different from their parents.

Assessment

- Observe and use patterns in the natural world as evidence and to describe phenomena.
- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

- Make observations to construct an evidence-based account of how young plants and animals are like, but not exactly like, their parents.
- Examples of patterns could include features that plants or animals share.
- Examples of observations could include that leaves from the same kind of plant are the same shape but can differ in size, and that a particular breed of puppy looks like its parents but is not exactly the same.
- Observe and use patterns in the natural world as evidence and to describe phenomena.
- Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world.
- Read texts and use media to determine patterns in the behavior of parents and offspring that help offspring survive. Examples of patterns of behavior could include:
 - The signals that offspring make, such as crying, cheeping, and other vocalizations.
 - The responses of the parents such as feeding, comforting, and protecting the offspring.

Formative Assessment:

- Group Discussions
- Peer work

Summative Assessment:

- Projects
- Published Writing

Benchmark:

- Access Prior Knowledge

Alternative:

- Modified Projects
- Modified Work

Key Vocabulary

external, offspring

Resources & Materials

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| <ul style="list-style-type: none"> • https://www.nextgenscience.org/ |
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Technology Infusion

Teacher Technology:

- Promethean Board
- Google Classroom
- STEMScopes

Student Technology:

- Chromebooks

- StemScopes
- Seesaw

Activities:

- The students are using the Chromebooks to reflect concepts learned using Seesaw.
- The students are using STEMscopes to explore and discover topics being taught.

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8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
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Interdisciplinary Integration

Activities:

- The learner will conduct close readings and apply close reading strategies to better understand the content.

Resources:

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- PBS STEM - <http://www.pbs.org/teachers/stem/#content>
- STEM Works - <http://stem-works.com/activities>
- [What Every Educator Should Know About Using Google](#) by Shell Education
- Promoting Literacy in all Subjects by Glencoe - http://www.glencoe.com/sec/teachingtoday/subject/promoting_literacy.phtml
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NJSLS-ELA RI.MF.1.6	With prompting and support, use text features (e.g., diagrams, tables, animations) to key ideas.

21st Century Life Skills Standards

Activities:

- The learner will participate in an exploration of jobs pertaining to life science.

Standard	Student Learning Objectives
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).
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Careers	
Activities: The learner will participate in STEAM building activities that address the science content and apply critical thinking skills while persevering in solving the task at hand.	
Practice	Description
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.
Demonstrate creativity and innovation.	Students regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

Standards			
Standard #	Standard Description	Student Learning Objective	Clarification Statement
1-LS3-1	Heredity: Inheritance and Variation of Traits	Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.] [Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.]
1-LS1-2	From Molecules to Organisms: Structures and Processes	Read texts and use media to determine patterns in behavior of parents and	Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping,

		offspring that help offspring survive.	and other vocalizations s) and the responses of the parents (such as feeding, comforting, and protecting the offspring).
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Differentiation	
Students with 504 plans	
• Preferential seating • Guided notes • Extra time • Teacher check-ins • Use graphic organizers • Redirect attention • Prioritize tasks • Small group testing • Provide modifications & accommodations per individual student's 504 plan	
Special Education	
• Provide modifications & accommodations as listed in the student's IEP • Position the student near a helping peer or have quick access to the teacher • Modify or reduce assignments/tasks • Reduce the length of the assignment for different modes of delivery • Increase one-to-one time • Prioritize tasks • Use graphic organizers • Use online resources for skill-building • Provide teacher notes • Use collaborative grouping strategies, such as small groups • NJDOE resources - http://www.state.nj.us/education/specialed/	
Response to Intervention (RTI)	
• Tiered interventions following the RTI framework • Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ • Intervention Central - http://www.interventioncentral.org/	
English Language Learners (ELL)	
• Provide text-to-speech • Use of a translation dictionary or software • Provide graphic organizers • NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm • Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm	
Enrichment	

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied

**Califon Public School
Curriculum**



Subject: Science	Grade: 1st	Unit #: 3	Pacing: 8 weeks
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Unit Title: Mimicking Organisms to Solve Problems

OVERVIEW OF UNIT:

In this unit of study, students develop an understanding of how plants and animals use their parts to help them survive, grow, and meet their needs. Students also need opportunities to develop possible solutions. As students develop possible solutions, one challenge will be to keep them from immediately implementing the first solution they think of and to instead think through the problem carefully before acting. Having students sketch their ideas or make a physical model is a good way to engage them in shaping their ideas to meet the requirements of the problem. The crosscutting concept of structure and function is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in constructing explanations and designing solutions, and in developing and using models. Students are expected to use these practices to demonstrate an understanding of the core ideas.

Big Ideas

- Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world.
- The shape and stability of structures of natural and designed objects are related to their function(s).
- All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, and fruits) that help them survive and grow.
- Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs.
- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for problem-solving to other people.
- Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence
- Scientists look for patterns and order when making observations about the world.

Essential Questions

- How can humans mimic how plants and animals use their external parts to help them survive and grow?

Objectives

- Students will be able to mimic how plants and animals use their external parts to help them survive and grow.
- Students will make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

Assessment

- Observe and describe how the shape and stability of structures of natural and designed objects are related to their functions.
- Use materials to design a device that solves a specific problem or [design] a solution to a specific problem.
- Use materials to design a solution to a human problem that mimics how plants and/or animals use their external parts to help them survive, grow, and meet their needs: Examples of human problems that can be solved by mimicking plant or animal solutions could include:
- Designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales.
- Stabilizing structures by mimicking animal tails and roots on plants.
- Keeping out intruders by mimicking thorns on branches and animal quills.
- Detecting intruders by mimicking eyes and ears.
- Develop a simple model based on evidence to represent a proposed object or tool.
- Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Formative Assessment:

- Group Discussions
- Peer work

Summative Assessment:

- Projects
- Published Writing

Benchmark:

- Access Prior Knowledge

Alternative:

- Modified Projects
- Modified Work

Key Vocabulary

External structures, survive, needs, functions, roots, stems, leaves, flowers, fruits, mimicking

Resources & Materials

- <https://www.nextgenscience.org/>

Technology Infusion	
Teacher Technology: - Promethean Board - Google Classroom - STEMScopes Student Technology: - Chromebooks - StemScopes - Seesaw Activities: - The students are using the Chromebooks to reflect concepts learned using Seesaw. - The students are using STEMscopes to explore and discover topics being taught.	
Standard	Standard Description
8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
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Interdisciplinary Integration	
Activities: - The learner will conduct close readings and apply close reading strategies to better understand the content. Resources: - Teacher Vision Cross-Curricular Theme Map - https://www.teachervision.com/teaching-methods/curriculum-planning/7167.html - Engineering Go For It! - http://egfi-k12.org/ - US Department of Education STEM - http://www.ed.gov/stem - Intel STEM Resource - http://www.intel.com/content/www/us/en/education/k12/stem.html - NASA STEM - http://www.nasa.gov/audience/foreducators/expeditions/stem/#.VYrO2flViko - PBS STEM - http://www.pbs.org/teachers/stem/#content - STEM Works - http://stem-works.com/activities What Every Educator Should Know About Using Google by Shell Education - Promoting Literacy in all Subjects by Glencoe - http://www.glencoe.com/sec/teachingtoday/subject/promoting_literacy.phtml - International Literacy Association Read Write Think - http://www.readwritethink.org/	
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21st Century Life Skills Standards

Activities:

- The learner will participate in an exploration of jobs pertaining to agriculture.

Standard	Student Learning Objectives
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).
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Careers

Activities:

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Practice	Description
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.
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Standards

Standard #	Standard Description	Student Learning Objective	Clarification Statement
1-LS1-1	From Molecules to Organisms: Structures and Processes	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.	Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking

			animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.
1-LS1-2	From Molecules to Organisms: Structures and Processes	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.	Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations s) and the responses of the parents (such as feeding, comforting, and protecting the offspring).
K-2-ETS1-1	Engineering Design	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-ETS1-2	Engineering Design	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	
K-2-ETS1-3	Engineering Design	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	

Differentiation

Students with 504 plans

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- Guided notes
- Extra time
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- Prioritize tasks
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Special Education

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- Intervention Central - <http://www.interventioncentral.org/>

English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
- NJDOE resources - <http://www.state.nj.us/education/aps/cccs/ELL.htm>
- Adapt a Strategy – Adjusting strategies for ESL students - <http://www.teachersfirst.com/content/esl/adaptstrat.cfm>

Enrichment

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**Califon Public School
Curriculum**



Subject: Science	Grade: 1st	Unit #: 4	Pacing: 8 weeks
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Unit Title: Light and Sound

OVERVIEW OF UNIT:

In this unit of study, students develop an understanding of the relationship between sound and vibrating materials as well as between the availability of light and the ability to see objects. The idea that light travels from place to place can be understood by students at this level by placing objects made with different materials in the path of a beam of light and determining the effect of the different materials. The crosscutting concept of cause and effect is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in planning and carrying out investigations, constructing explanations, and designing solutions. Students are also expected to use these practices to demonstrate an understanding of the core ideas.

Big Ideas

- Simple tests can be designed to gather evidence to support or refute student ideas about causes.
- Objects can be seen if light is available to illuminate them or if they give off their own light.
- Simple tests can be designed to gather evidence to support or refute student ideas about causes.
- Some materials allow light to pass through them, others allow only some light through, and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach.
- Mirrors can be used to redirect a light beam.
- Sound can make matter vibrate, and vibrating matter can make sound.
- Simple tests can be designed to gather evidence to support or refute student ideas about causes.

Essential Questions

- How can you prove that you can only see something when someone shines a light on it, or if the object gives off its own light?
- What happens to a beam of light when you put different kinds of things in front of it?
- How would you design an experiment to prove your thinking?
- How do instruments (band) make sound?

Objectives

- Students will be able to demonstrate what would happen if you put different kinds of things in front of a beam of light.
- Students will be able to explain how instruments make sound.

Assessment

- Design simple tests to gather evidence to support or refute ideas about cause-and-effect relationships.
- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
- Make observations (e.g., in a completely dark room, using a pinhole box, using video of a cave explorer with a flashlight) to construct an evidence-based account that objects can be seen only when illuminated (from an external light source or by an object giving off its own light).
- Design simple tests to gather evidence to support or refute ideas about cause-and-effect relationships.
- Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question.
- Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.
- Materials can be: – Transparent (clear plastic, glass) – Translucent (wax paper, thin cloth) – Opaque (cardboard, construction paper) – Reflective (a mirror, a shiny metal spoon)
- Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
- Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string.
- Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound, and holding an object near a vibrating tuning fork.

Formative Assessment:

- Group Discussions
- Peer work

Summative Assessment:

- Projects
- Published Writing

Benchmark:

- Access Prior Knowledge

Alternative:

- Modified Projects
- Modified Work

Key Vocabulary

Sound, light, energy, beam, illuminated, non-illuminated, transparent, opaque, reflective, shadow

Resources & Materials

- <https://www.nextgenscience.org/>

Technology Infusion

Teacher Technology:

- Promethean Board
- Google Classroom
- STEMScopes

Student Technology:

- Chromebooks
- StemScopes
- Seesaw

Activities:

- The students are using the Chromebooks to reflect concepts learned using Seesaw.
- The students are using STEMscopes to explore and discover topics being taught.

Standard	Standard Description
8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
8.1.2.NI.1	Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network
8.2.2.ED.1	Communicate the function of a product or device

Interdisciplinary Integration

Activities:

- The learner will conduct close readings and apply close reading strategies to better understand the content.

Resources:

- Teacher Vision Cross-Curricular Theme Map - <https://www.teachervision.com/teaching-methods/curriculum-planning/7167.html>
- Engineering Go For It! - <http://egfi-k12.org/>
- US Department of Education STEM - <http://www.ed.gov/stem>
- Intel STEM Resource - <http://www.intel.com/content/www/us/en/education/k12/stem.html>
- NASA STEM - <http://www.nasa.gov/audience/foreducators/expeditions/stem/#.VYrO2flViko>
- PBS STEM - <http://www.pbs.org/teachers/stem/#content>
- STEM Works - <http://stem-works.com/activities>
- [What Every Educator Should Know About Using Google](#) by Shell Education
- Promoting Literacy in all Subjects by Glencoe - http://www.glencoe.com/sec/teachingtoday/subject/promoting_literacy.phtml
- International Literacy Association Read Write Think - <http://www.readwritethink.org/>

Standard	Standard Description
NJSLS-ELA L.RF.1.4	Read with sufficient accuracy and fluency to support comprehension.

NJSLS-ELA RI.MF.1.6	With prompting and support, use text features (e.g., diagrams, tables, animations) to key ideas.
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21st Century Life Skills Standards

Activities:

- The learner will participate in an exploration of jobs pertaining to communication.

Standard	Student Learning Objectives
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).

Careers

Activities:

- The learner will participate in STEAM building activities that address the science content and apply critical thinking skills while persevering in solving the task at hand.

Practice	Description
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.
Demonstrate creativity and innovation.	Students regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

Standards

Standard #	Standard Description	Student Learning Objective	Clarification Statement
1-PS4-1	Waves and Their Applications in Technologies for Information Transfer	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.	Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and

			holding an object near a vibrating tuning fork.
1-PS4-2	Waves and Their Applications in Technologies for Information Transfer	Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.	Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light.]
1-PS4-3	Waves and Their Applications in Technologies for Information Transfer	Plan and conduct investigations 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.] [Assessment Boundary: Assessment does not include the speed of light.
K-2-ETS1-1	Engineering Design	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-ETS1-2	Engineering Design	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	
K-2-ETS1-3	Engineering Design	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	

Differentiation
Students with 504 plans
• Preferential seating • Guided notes • Extra time • Teacher check-ins • Use graphic organizers • Redirect attention • Prioritize tasks • Small group testing • Provide modifications & accommodations per individual student's 504 plan
Special Education
• Provide modifications & accommodations as listed in the student's IEP • Position the student near a helping peer or have quick access to the teacher • Modify or reduce assignments/tasks • Reduce the length of the assignment for different modes of delivery • Increase one-to-one time • Prioritize tasks • Use graphic organizers • Use online resources for skill-building • Provide teacher notes • Use collaborative grouping strategies, such as small groups • NJDOE resources - http://www.state.nj.us/education/specialed/
Response to Intervention (RTI)
• Tiered interventions following the RTI framework • Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ • Intervention Central - http://www.interventioncentral.org/
English Language Learners (ELL)
• Provide text-to-speech • Use of a translation dictionary or software • Provide graphic organizers • NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm • Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm
Enrichment
• Process should be modified: higher order thinking skills, open-ended thinking, discovery • Utilize project-based learning for greater depth of knowledge • Utilize exploratory connections to higher-grade concepts • Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations

- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

**Califon Public School
Curriculum**



Subject: Science	Grade: 1st	Unit #: 5	Pacing: 8 weeks
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Unit Title: Communicating With Light and Sound

OVERVIEW OF UNIT:

In this unit of study, students continue to develop their understanding of the relationship between sound and vibrating materials as well as between the availability of light and the ability to see objects. Students apply their knowledge of light and sound to engage in engineering design to solve a simple problem involving communication with light and sound. The crosscutting concepts of structure and function and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in constructing explanations and designing solutions, asking questions and defining problems, and developing and using models. Students are also expected to use these practices to demonstrate an understanding of the core ideas.

Big Ideas

- The shape and stability of structures of natural and designed objects are related to their function(s).
- People depend on various technologies in their lives; human life would be very different without technology.
- People also use a variety of devices to communicate (send and receive information) over long distances.
- A situation that people want to change or create can be approached as a problem to be solved through engineering.
- Asking questions, making observations, and gathering information are helpful in thinking about problems.
- Before beginning to design a solution, it is important to clearly understand the problem.
- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.

Essential Questions

- How would we communicate over a distance without the use of any of the devices that people currently use?
- How can light or sound be used to communicate over a distance?

Objectives

- Students will be able to demonstrate and explain how light or sound be used to communicate over a distance.

Assessment

- Describe how the shape and stability of structures are related to their function.
- Ask questions based on observations to find more information about the natural and/or designed world.
- Define a simple problem that can be solved through the development of a new or improved object or tool.
- Ask questions, make observations, and gather information about a situation people want to change in order to define a simple problem that can be solved through the development of a new or improved object or tool.
- Develop a simple model based on evidence to represent a proposed object or tool.
- Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- Use tools and materials provided to design a device that solves a specific problem.
- Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.
- Examples of devices could include: - A light source to send signals -Paper cup and string telephones -A pattern of drum beats

Formative Assessment:

- Group Discussions
- Peer work

Summative Assessment:

- Projects
- Published Writing

Benchmark:

- Access Prior Knowledge

Alternative:

- Modified Projects
- Modified Work

Key Vocabulary

Light, sound, vibration, communicate, distance, device

Resources & Materials

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Technology Infusion**Teacher Technology:**

- Promethean Board
- Google Classroom

- STEMScopes

Student Technology:

- Chromebooks
- StemScopes
- Seesaw

Activities:

- The students are using the Chromebooks to reflect concepts learned using Seesaw.
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Activities:

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- NASA STEM - <http://www.nasa.gov/audience/foreducators/expeditions/stem/#.VYrO2flViko>
- PBS STEM - <http://www.pbs.org/teachers/stem/#content>
- STEM Works - <http://stem-works.com/activities>
- What Every Educator Should Know About Using Google by Shell Education
- Promoting Literacy in all Subjects by Glencoe - http://www.glencoe.com/sec/teachingtoday/subject/promoting_literacy.phtml
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- The learner will participate in an exploration of jobs pertaining to life communication.

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Activities:

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Standards

Standard #	Standard Description	Student Learning Objective	Clarification Statement
1-PS4-4	Waves and Their Applications in Technologies for Information Transfer	Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	Examples of devices could include a light source to send signals, paper cup and string “telephones,” and a pattern of drum beats.] [Assessment Boundary: Assessment does not include technological details for how communication devices work.]
K-2-ETS1-1	Engineering Design	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-ETS1-2	Engineering Design	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	
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Differentiation

Students with 504 plans

- Preferential seating
- Guided notes
- Extra time
- Teacher check-ins
- Use graphic organizers
- Redirect attention
- Prioritize tasks
- Small group testing
- Provide modifications & accommodations per individual student's 504 plan

Special Education

- Provide modifications & accommodations as listed in the student's IEP
- Position the student near a helping peer or have quick access to the teacher
- Modify or reduce assignments/tasks
- Reduce the length of the assignment for different modes of delivery
- Increase one-to-one time
- Prioritize tasks
- Use graphic organizers
- Use online resources for skill-building
- Provide teacher notes
- Use collaborative grouping strategies, such as small groups
- NJDOE resources - <http://www.state.nj.us/education/specialed/>

Response to Intervention (RTI)

- Tiered interventions following the RTI framework
- Effective RTI strategies for teachers - <http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/>

- Intervention Central - <http://www.interventioncentral.org/>

English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
- NJDOE resources - <http://www.state.nj.us/education/aps/cccs/ELL.htm>
- Adapt a Strategy – Adjusting strategies for ESL students - <http://www.teachersfirst.com/content/esl/adaptstrat.cfm>

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
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