Washington Township School District

The mission of the Washington Township Public Schools *is to provide a safe educational environment for all students to attain the skills and knowledge specified in the New Jersey Student Learning Standards at all grade levels so as to ensure their full participation in our global society as responsible, self-directed, and civic-minded citizens.*

Course Title:	**Science**
Grade Level(s):	**1st**

Duration:	*Full Year:*	**X**	*Semester:*		*Marking Period:*	
Course Description:	The Washington Township School District first grade curriculum uses an integrated approach to general science that focuses on units in physical, life, and earth science. By using this approach, teachers are able to meet the needs of all students while aligning with the New Jersey Model Curriculum, the Next Generation Science Standards, and the New Jersey Student Learning Standards. Hands-on activities are stressed and include student discovery experiments, problem solving, model building, cooperative learning, technology integration, classroom discussion, teacher demonstrations, and writing opportunities for research and self-expression. Interdisciplinary subject areas are incorporated whenever possible. Students are introduced to the use of scientific tools and methods used for investigations. The course is designed to be implemented using the 5E Model of Instruction: Engage, Explore, Explain, Extend/Elaborate, and Evaluate. The major topics of study for first grade are taken specifically from the Next Generation Science Standards: ☐ Waves: Light and Sound ☐ Structure, Function, and Information Processes ☐ Space Systems: Patterns and Cycles					
Grading Procedures:	Unit tests will be administered at the end of each marking period. Refer to individual unit tests for percentages that equate for Secure, Developing and Beginning grades. Benchmarks will be administered twice a school year and equate to a grade of Secure, Developing or Beginning Skills.					
Primary Resources:	National Geographic Learning: Exploring Science & Mystery Science					

Washington Township Principles for Effective Teaching and Learning

- Implementing a standards-based curriculum
- Facilitating a learner-centered environment
- Using academic target language and providing comprehensible instruction
- Adapting and using age-appropriate authentic materials
- Providing performance-based assessment experiences
- Infusing 21st century skills for College and Career Readiness in a global society

Designed by:	Jeanne York
Under the Direction of:	Linda Thomas, Elementary Supervisor and Gretchen Gerber, Director

Written: August 2017

Revised: July 2024 by Jeanne York

BOE Approval:

Unit Title: Waves: Light and Sound (Physical Science)

Unit Description: Students will investigate light and sound. First students will explore the relationship between vibrations and sound. Then light will be defined as the source of making objects visible (example: the sun). Different materials will be identified by the degree to which they allow light to pass. The concept of a shadow and reflective light will be studied. Next, light and sound will be explored as a means to help people communicate. The unit will culminate first with students designing a communication device using light or sound. Then students will makes connections to the real world through the career of a science photographer.

Unit Duration: Marking Period 1

Desired Results

New Jersey Student Learning Standards:

1-PS4-1- Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. [Clarification Statement: 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- Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated. [Clarification Statement: 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- Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. [Clarification Statement: 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).] [*Assessment Boundary: Assessment does not include the speed of light.*]

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.[Clarification Statement: 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.*]

Indicators:

PS4.A: Wave Properties

- Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)

PS4.B: Electromagnetic Radiation

- Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2)
- Some materials allow light to pass through them, others only allow some light through and others block 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. (Boundary: 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.) (1-PS4-3)

PS4.C: Information Technologies and Instrumentation

- People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)

Understandings: *Students will understand that…* ● vibrating matter can make sound. ● sound can make matter vibrate. ● light makes it possible to see objects. ● the sun is an object that gives off its own light. ● objects that give off light can be used to help us see. ● objects can be seen only where there is light. ● clear is defined as the ability of a material to allow light to pass through it. Some materials can be classified as clear. ● some materials allow only some light to pass through them. Some materials block all light. ● a shadow is a dark shape made when something blocks the light. ● some materials redirect a beam of light. (reflect) ● people communicate in many ways. ● certain devices enable people to communicate over long distances.	**Essential Questions:** ● How is vibrating related to sound? ● What makes it possible to see? ● What are the different degrees to which light can pass through materials? ● What devices can help people communicate over long distances? ● What does a science photographer do?

Assessment Evidence

Performance Tasks:

Investigate Lessons – Students will practice performance tasks in cooperative groups engaging in scientific steps of an investigation.

- Lesson 2((TG pages 6-7) Investigate Sound – Demonstrate that vibrating matter can make sound.
- Lesson 5 (TG pages 12-13) Investigate Vibration – Demonstrate that sound can make matter vibrate.
- Lesson 9 (TG pages 20-21b) Investigate Light and Dark – Observe evidence that objects can be seen only where there is light.
- Lesson 16 (TG pages 34-35) Investigate Communicating with Sound – Observe and record evidence that information can be communicated using devices.

Think Like A Scientist: Plan and Investigate Lessons – Students will engage in performance tasks in cooperative groups to plan and conduct an investigation, provide evidence and use that evidence to explain results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric.

- Lesson 3 (TG pages 8-9b) – Show how vibrating materials make sound.
- Lesson 6 (TG pages 14-15b) – Show how sound makes materials vibrate.
- Lesson 14 (TG pages 30-31b)– Show what happens to light when it shines on different objects.

Think Like An Engineer Lesson: - Students will engage in performance tasks in cooperative groups to design, build and test a prototype device and analyze and improve results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric.

- Lesson 17 (TG pages 36-37b)– Design and build a device to communicate through sound or light.

Other Evidence:

Students will demonstrate their understandings through:

- Science Notebook Entries
- Science in a Snap (Additional Investigations) in Lessons 1, 12, 13, 15)
- Goals and Scales Analysis
- Unit Test

Benchmarks:

Benchmarks will be administered twice during the school year (at the end of Marking Period 2 and 4). The benchmark at the end of Marking Period 2 will include concepts from Physical and Earth Science. The benchmark at the end of Marking Period 4 will include concepts from Life Science. Results will be graded on the scale of Secure, Developing and Beginning Skills.

Physical Science Unit Test Percentages (Based on 20 questions):

Secure = 80% - 100%

Developing = 60% - 79%

Beginning = Below 60%

Learning Plan

Resources: National Geographic Learning: Exploring Science Teacher's Guide, Student Book, Interactive eBook and Website, Student Science Notebook. Schoolwide Mentor Text The Listening Walk can be used to start the unit before sound lessons and Light is All Around Us can be used to start the unit before light lessons.
Learning Activities:

Lesson and Duration	Activities	Materials / Suggested Resources
Lesson 1 (Pages Text 4-5, Online 138-139, 142-143) Vibrate and Make Sound NJSLS PS4.A Sound can make matter vibrate and vibrating matter can make sound. (1-PS4-1) Objective: Explain that vibrating matter can make sound. 1 Day	**Unit Introduction:** Read online page 138-139 to introduce the physical science unit. **Engage:** Show Interactive E-Book video, the "Guitar String."Students share ideas . Ask: Have you ever seen someone play a stringed instrument? How was the instrument played? **Explore:** Preview the lesson photo and describe what you see. Focus Question: How can vibrating matter make sound? Read the lesson. **Explain:** Vibration and Sound - Refer to the guitarron. Investigate "Science in a Snap." Teach the Dimensions: Light and Sound Video (see resources). Discuss. **Elaborate**: Define the terms pitch and volume. Using youtube link in suggested resources, listen to a variety of sounds to describe in terms of pitch and volume. Conduct listening sessions in the classroom. **Evaluate:** Explain the meaning of vibrate and name things that vibrate in Science Notebook and/or Class Chart.	• Online Source for listening to different sounds: • In Student Resources Online Book - Video - "Stephon Alexander on Light and Sound" • Different instruments and their sounds: http://www.findsounds.com/types.html https://www.youtube.com/watch?v=17V-bP1XEao • Science Notebook • Chart Paper • Schoolwide Mentor Texts Loud, Soft, High, and Low Sound and Sounds All Around • Optional Mystery Science Activity: Where Do Sounds Come From? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/light/mystery-2/sounds-vibrations/144?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 2 (Pages Text 6-7, Online 144-145) Investigate Sound NJSLS 1-PS4.A Sound can make matter vibrate and vibrating matter can make sound. (1-PS4-1) Objective: Demonstrate that vibrating matter can make sound. 1 Day	**Engage:** Students recall how a guitar string makes a sound and ask questions. Show video from lesson 1 of guitar strings vibrating and discuss. **Explore**: Students add Predictions and Observations tables into their Science Notebook or class chart. Preview then read and conduct investigation on pages 6- 7 / 144-145). **Explain:** Students share Observations and Conclusions. Ask Teach the dimensions questions. **Elaborate:** Investigate further with additional rubber bands and discuss findings. **Evaluate:** "Wrap It Up" - Describe and Explain investigation in Science Notebook and/or Class Chart.	• Box (with opening at top) • 2 rubber bands of different sizes and thickness • Hand lens • Safety goggles • Science Notebook • Chart Paper

Lesson 3 (Pages: Text 8-9b/ Online 146-147) Think Like a Scientist (Vibration) NJSLS (Performance Standard) 1-PS4- 1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. Objective: Work with a partner to plan and conduct an investigation to provide evidence that vibrating materials make sound. Use evidence from their investigation to explain results to others. 1 Day	**Engage**: Review: Can we see vibrations? Show tuning fork video and discuss. Review concepts from previous lessons and discuss how drums make a sound from page 9 / 146. Review the investigation structure on pages 6-7 / 146-147 Read the task. Students develop a plan to complete the investigation. **Explore**: Students add Predictions and Observations tables into their Science Notebook or class chart. Students conduct their planned investigation and record findings in their Science Notebook / Class Chart. **Explain**: Students analyze results, revisit questions and share their results. Ask Teach the Dimensions questions. **Elaborate:** Compare and contrast findings between the two objects investigated. **Evaluate**: Ask Compare and Evaluate Questions.	• Materials that demonstrate vibration and making a sound (tuning forks, 2-L Bottles, plastic cups, etc – see TG page 8) • Science Notebook • Chart Paper • Tuning Fork Video : https://nj.pbslearningmedia.org/resource/phy03.sci.phys.mfe.ztunefork/sound-and- solids-visualizing-vibrations/#.WU1aj2grLcc https://www.youtube.com/watch?v=f99MnB7vfIQ • Schoolwide Mentor Text Sounds All Around (See Sound Activities page 30)
Lesson 4 (Pages Text 10-11 Online 150-151) Sound Makes Things Vibrate NJSLS 1-PS4.A Sound can make matter vibrate and vibrating matter can make sound. (1-PS4-1) Objective: Explain that sound can make matter vibrate. 1 Day	**Engage:** Recall what was learned from the tuning fork video and the previous investigation. **Explore:** Preview and ask about drum sounds and possible effects. Read page 10 / 150-151. **Explain:** Discuss and ask about causes of sound related to vibrations and drums. Recall and discuss further “Science in a Snap” and relate to the drums and walls. Ask Teach the dimensions questions. **Elaborate:** View internet videos of water and sound experiments and discuss how water vibrates when exposed to sound? **Evaluate:** “Wrap It Up” - Describe and Identify understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet Videos for tuning fork and water: https://nj.pbslearningmedia.org/resource/phy03.sci.phys.mfe.ztunefork/sound-and- solids-visualizing-vibrations/#.WU1aj2grLcc • Schoolwide Mentor Texts Loud, Soft, High, and Low Sound and Sounds All Around
Lesson 5 (Pages Text 12-13 Online 152-153) Investigate Vibration NJSLS 1-PS4.A Sound can make matter vibrate and vibrating matter can make sound. (1-PS4-1) Objective: Demonstrate that sound can make matter vibrate. 1 Day	**Engage:** Review sound / vibration relationship. Conduct ruler vibration tests and discuss. Discuss feeling vibrations. **Explore:** Students add Predictions and Observations tables into their Science Notebook and/or Class Chart. Preview then read and conduct investigation on pages 12-13 / 152-153 **Explain:** Students share Observations and Conclusions. Ask Teach the	• Ruler • Inflated balloons • Paper towel tubes • Science Notebook • Chart Paper • Schoolwide Mentor Texts Loud, Soft, High, and Low Sound and Sounds All Around • Optional Mystery Science Activity: How Do They Make Silly Sounds in Cartoons. See prep work, materials, and handouts in this link as well: https://mysteryscience.com/light/myste

	Dimensions questions. **Elaborate:** Investigate further and conclude how voices affect other substances. Add 321 ideas in Student Notebook / Class Chart (online pages 153a-153d) **Evaluate:** "Wrap It Up" - Describe and Predict understandings in Science Notebook and/or Class Chart.	ry-1/sounds-vibrations/105?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 6 (Pages Text 14-15b Online 154-155) Think Like a Scientist (Sound Can Make Materials Vibrate) NJSLS (Performance Standard) 1-PS4- 1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. Objective: Work with a partner to plan and conduct an investigation to provide evidence that vibrating materials make sound can make materials vibrate. Use evidence from their investigation to explain results to others. 1 Day	**Engage:** Recall from previous lessons how sound can make matter vibrate. Quick Hands-on test (Teacher's edition online 155a). Examine the xylophone picture on page 14-15 / 154/-155. Review the investigation structure. Read the task. Students develop a plan to complete the investigation. **Explore:** Students add Predictions and Observations tables into their Science Notebook / Class Chart. Students conduct their planned investigation and record findings in their Science Notebook. **Explain:** Students analyze results, revisit beginning questions. Share results. Ask Teach the Dimensions questions. **Elaborate:** Students research to find out about how animals that use vibrations communicate and compare findings with this investigation. **Evaluate**: Ask Identify and Evaluate Questions. Teacher and students complete rubrics in Science Notebook and/or Class Chart.	• Materials that can make sound in order to make another object vibrate (radio, thick sheet of plastic, tin cans, etc) • Hand lens • Safety Goggles • Science Notebook • Chart Paper

Stem Engineering Project (Pages Online 149) Design A Drum NJSLS (Performance Standard) 1-PS4- 1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. Objective: Identify engineering problems. Design, build and test a prototype. Use results to improve the prototype.	**Engage:** Introduce the Phenomenon: Teacher Led Demo. Tap Prior Knowledge by viewing and discussing drummers and drum pictures. Ask the 5 Whys.Step 1: Define the Problem. Ask Teach the Dimensions Questions. **Explore:** Carry out the investigation Step 2: Design A Solution. Step 3: Test Your Solution. Step 4 REfine or Change your Solution. **Explain:** Share and Explain Findings: Ask Questions. **Elaborate:** Students turn and talk to compare designs. **Evaluate:** "Wrap it Up" – Define, Explain and Infer understandings in Science Notebook and/or Class Chart.	• Ruler • Science Notebook • Chart Paper

Lesson 7 (Pages Text 16-17 Online 156-157) Light NJSLS PS4.B: Objects can be seen only when light is available to illuminate them. Some objects give off their own light. (1-PS4-2) Objective: Identify that light makes it possible to see objects. Classify the sun as an object that gives off its own light. 1 Day	**Engage:** Quick Hands-On test with student's eyes in partnerships. Discuss why someone turns on a light when they first enter a room. **Explore:** Preview and read pages 16-17 / 156-157. **Explain:** Reread the first paragraph on page 16, analyze the pictures and identify that light makes it possible to see. Reread the second paragraph on page 16 / 156 and classify the sun as an object that gives off light. Ask Teach the Dimensions questions. **Elaborate:** Students conduct their own investigations to study the effect of light on their ability to see objects. **Evaluate:** "Wrap it Up" – Explain and predict understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Schoolwide Extra Texts All About Light, Sources of Light(pages 10-13) • Optional Mystery Science Activity: Can You See In The Dark? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/light/mystery-4/light-illumination/137?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 8 (Pages Text 18-19 Online 158-159) Light to See NJSLS PS4.B: Objects can be seen only when light is available to illuminate them. Some objects give off their own light. (1-PS4-2) Objective: Recognize that objects that give off light can be used to help us see. 1 Day	**Engage:** Show a campfire photo and discuss light on camper's faces. Tap prior knowledge of students' experiences around a campfire. **Explore:** Preview and read pages 18-19 / 158-159. **Explain:** Compare photos on page 18-19 / 158-159 to the ones on page 16-17 / 156-157. Study what objects can be seen on pages 18-19 / 158-159 and what would be seen if the diver swam deeper. Ask Teach the Dimensions questions. **Elaborate:** Brainstorm other sources of light. **Evaluate:** "Wrap it Up" – Explain and predict understandings in Science Notebook and/or Class Chart.	• Use video portion to show people around a campfire https://www.youtube.com/watch?v=eHiR_mgH5Ek • Science Notebook • Chart Paper
Lesson 9 (Pages Text 20-21b Online 160-161) Investigate – Light and Dark NJSLS 1-PS4-2: Make observations to construct an evidence-based account that objects can be seen only when illuminated. Objective: Observe evidence that objects can be seen only where there is light. Use their observations to construct an evidence-based account that objects can be seen only when illuminated. 1 Day	**Engage:** Quick Hands-On Test - repeat about eye dilation and add concepts of effects in darkness. Discuss darkening the room. **Explore:** Students add "Object in the Box" table to their Science Notebook / Class Chart. Preview and read pages 20-21 / 160-161. Complete investigation steps. **Explain:** Share observations and explain results. Ask Teach the Dimensions questions. **Elaborate:** Students suggest and try other ways to see objects more clearly. **Evaluate:** "Wrap it Up" – Recall, Contrast and Generalize understandings in Science Notebook and/or Class Chart	• Collect in Advance: Shoeboxes with lids (see TG page 20 / 160 for directions) *flashlights • Science Notebook • Chart Paper

Lesson 10 (Pages Text 22-23 Online 162-163) Shining Through NJSLS PS4.B: 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. (1-PS4-3) Objective: Define clear as the ability of a material to allow light to pass through it. 1 Day	**Engage:** Use shaft of light video to discuss how light streams through windows. . **Explore:** Preview and read pages 22-23 / 162-163. **Explain:** Reread page 22 / 162, define the term clear and classify some materials as clear. Ask Teach the Dimensions questions. **Elaborate:** Students imagine designing a new, strong plastic for safety goggles. Discuss the importance of it being clear and how it can be tested. **Evaluate:** "Wrap it Up" – Recall and Identify understandings in Science Notebook and/or Class Chart.	• Shaft of light video https://www.youtube.com/watch?v=O_IgT-IU52w • Science Notebook • Chart Paper • Optional Mystery Science Activity: What If There Were No Windows? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/light/mystery-3/light-materials-transparent-opaque/106?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 11 (Pages Text 24-25 Online 164-165) Blocking Some Light NJSLS PS4.B 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. (1-PS4-3) Objective: Describe materials that allow only some light to pass through them. 1 Day	**Engage:** Use video to show transparent animals and discuss what you see. Recall what it means for an object to be clear. **Explore:** Preview and read pages 24-25 / 164-165. **Explain:** Reread the paragraph on page 24 / 164 and determine the main topic. Discuss light passing through flower petals and a foggy window. Ask Teach the Dimensions Questions. **Elaborate:** Students consider other examples of materials that block some light. Research how sunglasses work. **Evaluate:** "Wrap it Up" Recall and Identify understandings in Science Notebook and/or Class Chart.	• Internet video - Transparent Animals https://www.youtube.com/watch?v=eHqt_4dmfEc • Science Notebook • Chart Paper
Lesson 12 (Pages Text 26-27 Online 166-167) Blocking All Light NJSLS PS4.B 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. (1-PS4-3) Objective: Describe materials that block all light. Define a shadow. 1 Day	**Engage:** In the student online library in the physical science gallery, view photo of stained glass and discuss how light comes in from different panes. Describe a shadow and what causes shadows. **Explore:** Preview and read the title and first sentence of page 26 / 166 to determine the main topic. Students read pages 26-27 / 166-167 to find out about materials that block all light. **Explain:** Observe the image of the dragonfly and describe how its body blocks light. Define a shadow and what causes it. Investigate shadows in "Science in a Snap." **Elaborate:** Students draw a picture in their Science Notebook and use three different types of tape to cover it and then label how the tape blocks the light. Provide vocabulary to challenge advanced students: transparent, translucent, opaque. **Evaluate:** "Wrap it Up" – Define, Explain and Infer understandings in Science Notebook and/or Class Chart.	• Physical Science Gallery • flashlight • three types of tape: clear, matte and masking • Schoolwide supplemental text Shadow, All About Light (pages 26-29) • Science Notebook • Chart Paper • Optional Mystery Science Activity: Could A Statue's Shadow Move: See prep work, materials, and handouts in this link as well: https://mysteryscience.com/sun-shadows/mystery-1/sun-shadows-daily-patterns/82?code=Mjc0MTM1OTc0&t=student&chapter=all • Optional Mystery Science Activity: What Does A Shadow Do When You Are Not Looking? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/sun-shadows/mystery-2/sun-shadows-daily-patterns/138?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 13 (Pages Text 28-29 Online 168-169) Reflecting Light NJSLS PS4.B 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. (1-PS4-3) Objective: Describe how some materials redirect a beam of light. 1 Day	**Engage:** In the student online library in the physical science gallery, view the photo "Window Reflections" and discuss. Describe three things that can happen when light shines on an object. **Explore:** Preview the images on pages 28-29 / 168-169 and determine what the lesson is about. Read pages 28-29 / 168-169. **Explain:** Reread the first two sentences on page 28 and define reflect. Read the rest of page 28 and discuss light on smooth and shiny surfaces. Investigate how light reflects off a mirror in "Science in a Snap." **Elaborate:** Students write how they can use a mirror to see around a corner. **Evaluate:** "Wrap it Up" – Explain and Relate understandings in Science Notebook and/or Class Chart.	• Physical Science Gallery in student online library photo "Window Reflections" • Flashlights • mirror • Science Notebook • Chart Paper
Lesson 14 (Pages Text 30-31b Online 170-171) Think Like a Scientist (The Effect of Placing Objects Made With Different Materials in the Path of a Beam of Light) NJSLS (Performance Standard) 1-PS4-3 Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. Objective: Work with a group to plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. Explain their results and conclusions to others. 1 Day	**Engage:** Review how light reflects? Quick Hands-On activity with flashlight and a cd and discuss. Read the introduction on page 30 / 170 and determine the task. **Explore:** Read step 1 and have students refer back to lessons about what light can do when it shines through different objects. Students add Objects and Light table to their Science Notebook and/or Class Chart. Students conduct their planned investigation and record findings in their Science Notebook and/or Class Chart. **Explain:** Students analyze results and share their results. Students ask how they thought like a scientist. Ask Teach the Dimensions Questions. **Elaborate:** Students extend the investigation to test the ability of each object to make a shadow. Ask questions using the 321 plan in the teacher's guide. **Evaluate**: Students Describe and Explain their findings in Science Notebook and/or Class Chart. Teacher and students complete rubrics.	• Flashlight • Variety of transparent, translucent and opaque materials (see TG page 30) • mirrors • Science Notebook • Chart Paper

Lesson 15 (Pages Text 32-33 Online 172-173) People Communicate NJSLS PS4.C People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4) Objective: Describe how people communicate. Identify devices that enable people to communicate over long distances. 1 Day	**Engage:** View morse code youtube video and discuss. Discuss why people send emails and texts and how a message is written. **Explore:** Preview the images on pages 32-33 / 172-173 and determine what the boys are doing. Ask: How do people communicate? Read pages. **Explain:** Reread the first sentence on page 32 / 172 and define communication and information. Reread the rest and determine all the ways the boy can communicate to his grandmother. Determine methods that use sound, use electronic devices and send information over long distances. Investigate a way to communicate using light in "Science in a Snap." Ask Teach the Dimensions questions. **Elaborate:** Students use the pretense of having a party to describe different ways to communicate and which ways would be best. **Evaluate:** "Wrap it Up" – Describe and Identify understandings in Science Notebook and/or Class Chart.	• Online video morse code used by ships (just light but words letters communicated indicated) https://www.youtube.com/watch?v=knAQXAFvQik • Another Online video morse code used by ships (includes light and sound) https://www.youtube.com/watch?v=GnHv7h_5P9M • flashlights • Science Notebook • Chart Paper • Optional Mystery Science Activity: How Could You Send A Secret Message To Someone Far Away? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/light/mystery-5/light-communication-engineering/131?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 16 (Pages Online Only 174-175) Stories in Science- Using Cell Phones in New Ways NJSLS PS4.C People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4) Objective: Describe Aydogan Ozcan's invention. Explain how Ozcan's invention can help people. 1 Day	**Engage:** View online video of slow motion and discuss how technology can help us observe things more closely. Tap prior knowledge with technology doctors use. **Explore:** Read the photo captions 174-175 about Aydogan Ozcan. Read pages 174-175. **Explain:** Describe Ozcan's invention. Ask Teaching Dimensions questions. **Elaborate:** Discuss other ways to use his invention and how to use a cell phone to show others. **Evaluate:** "Wrap it Up" – Summarize and Compare understandings - see online questions and record in Science Notebook and/or Class Chart.	• Online video - slow motion lightning strike https://www.shutterstock.com/video/clip-1036509782-super-slow-motion-lightning-strike-compositing-elements?cr=c&gad_source=2&gclid=EAIaIQobChMIkbuVqr6uhwMViyKzAB1lgw5HEAAYASABEgLd0vD_BwE&gclsrc=aw.ds&kw=&pl=PPC_GOO_US_FT_PM- • Online video - slow motion lightning strike https://www.youtube.com/watch?v=-KheqfpUpr0 • Science Notebook • Chart Paper

Lesson 17 (Pages Text 34-35 Online 176-177) Investigate – Communicating with Sound NJSLS PS4.C People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4) Objective: Observe and record evidence that information can be communicated using devices. 1 Day	**Engage:** Quick hands-On: Create musical coat hanger and conduct activity. Discuss results. Discuss how students hear sound through something other than the air. Preview the introduction by reading page 34 / 176. **Explore:** Read through steps. Students create, test and record the results of their prototype in Science Notebook and/or Class Chart. **Explain:** Share observations and explain results. Ask Teach the Dimensions questions. **Elaborate:** Students determine how the device would work differently using other types of string. Ask 321 questions in the Teacher's Guide. **Evaluate:** "Wrap it Up" – Summarize and Compare understandings and record in Science Notebook and/or Class Chart	• Disposable cups • String for investigation (plus different types for the Elaborate section) • Paper clips • Science Notebook • Chart Paper • Optional Mystery Science Activity: How Do Boats Find Their Way In The Fog? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/light/mystery-6/lights-sounds-communication/155?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 18(Pages Text 36-37b Online 176-177) Think Like an Engineer (Design a Device) NJSLS 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. Objective: Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. Test and revise the prototype device based on results and feedback. Use the device to explain how people can use sound or light to communicate. 1-2 Days	**Engage:**. View video in Interactive EBook "Humpback Whales" and discuss. Discuss different ways people communicate using light and sound. Read the introduction and task steps. **Explore:** Reread through steps 1 and 2. Students create, test and record the results of their prototype in Science Notebook and/or Class Chart. **Explain:** In steps 3 and 4 students review their results and determine if their prototype solved the problem. Students, like an Engineer, determine how to improve their prototype and proceed with the changes (create, test and record). Students share their results. Discuss how Science and Engineering have made changes to human society like new communication devices. Ask Teach the Dimensions questions. **Elaborate:** Students devise a way to extend the distance over which their device can communicate. Ask 321 questions in the Teacher's Guide. Use the internet site about Humpback Whales to learn more information about these whales. **Evaluate:** Students describe and explain how they solved the problem and notes to Science Notebook and/or Class Chart.	• String • Flashlights • Light sticks • Drums, spoons, cups etc (see TG page 36) • mirrors • Science Notebook • Chart Paper • Internet site about Humpback Whales https://www.montereybayaquarium.org/animals/animals-a-to-z/humpback-whale

Science Career - (Pages Text 38-39 Online 181) Photographer NJSLS / Connections to the Nature of Science: Scientific Investigations Uses a Variety of Methods (Science uses different ways to study the world.) Objective: Relate a photographer's job to the science of light. 1 Day	**Engage:** View photos, read captions and ask questions about photos from Student's Physical Science Gallery Online: "Joel Sartore, Photographer" "Leopard" "Lorikeet" "mandril" and "Spiny Turtle." Tap prior knowledge about what can happen when light shines on an object. **Explore:** Preview the images on pages 38-39 / 181 and determine why there is a photo of Gabby Salazar and how this relates to the photos on the page and this lesson. Read pages 38-39 / 181. **Explain:** Reread the first paragraph and discuss why it is important for photographers to know about light. Observe and discuss the photos of the trees on page 39 / 181. Reread the second paragraph on page 38 181 and relate photography to conservation. Discuss photography as a possible career. **Elaborate:** Students research other careers about light and the importance for people who have these jobs to know about light. **Evaluate:** "Wrap it Up" – Describe and Identify understandings.Students record the Identify, Describe and Explain questions in Science Notebook and/or Class Chart..	• Science Notebook • Chart Paper

Unit Learning Goal and Scale **(Level 2.0 reflects a minimal level of proficiency)**	
Standard(s): **1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. [Clarification Statement: 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.]**	
4.0	Students will be able to: **In addition to planning and conducting investigations at 3.0, students can** ● **Define pitch and volume and describe sound in terms of different pitches and volumes** ● **Explain how animals use vibrations to communicate through further research.**
3.0	Students will be able to: ● **Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. [Clarification Statement: 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.]**
2.0	Students will be able to: ● **Define vibration.** ● **Name items that vibrate.** ● **Understand that sound can cause vibrations.**
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): **1-PS4-2. Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated. [Clarification Statement: 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.]**	
4.0	**Students will be able to:** **In addition to planning and conducting investigations at 3.0, students can** ● **Make observations and construct an evidence-based account about visibility with different degrees of light.** ● **Identify various sources of light beyond the sun and a flashlight.**
3.0	Students will be able to: ● **Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated. [Clarification Statement: 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.]**
2.0	Students will be able to: ● **Define light.** ● **Identify the sun as a source of light.**
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): **1-PS4-3. Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. [Clarification Statement: 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).] [Assessment Boundary: Assessment does not include the speed of light.]**	
4.0	Students will be able to: **In addition to planning and conducting investigations at 3.0, students can** ● **Imagine designing a new, strong plastic to be used for safety goggles. Explain the importance of the googles being clear and develop a plan to test its clarity.** ● **Plan and conduct investigations to determine how sunglasses work.** ● **Define the terms transparent, translucent and opaque.**
3.0	Students will be able to: ● **Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. [Clarification Statement: 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).] [Assessment Boundary:** **Assessment does not include the speed of light.]**
2.0	Students will be able to: ● **Define clear, shadow and reflect.** ● **Identify examples of items that are clear, items that can make a shadow and items that can reflect light.**
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): **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.* [Clarification Statement: 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.]**	
4.0	Students will be able to: **In addition to planning and conducting investigations at 3.0, students can** ● **Extend the investigation by increasing the distance of communicating and redesigning and building the device if needed.**
3.0	Students will be able to: ● **Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.* [Clarification Statement: 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.]**
2.0	Students will be able to: ● **Define communicate, devices, long distances.** ● **Name ways people communicate over long distances.**
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Unit Modifications for Special Population Students

Advanced Learners	● **Allow students to complete Investigations, Think Like a Scientist, Think Like an Engineer independently.** ● **Use "Elaborate" sections of the lessons to extend student thinking.** ● **Introduce advanced vocabulary (transparent, translucent, opaque)**
Struggling Learners	● **Refer to Learning Assessment Masters for pre-made charts to use in science notebook. (Investigations, Think Like a Scientist, Think Like an Engineer)** ● **Pair with higher ability students when completing Investigations, Think Like a Scientist and Think Like an Engineer Lessons.** ● **Assign different roles for group members in the investigations so all members contribute to the group.**
English Language Learners	● **Vocabulary: vibrate, sound, light, clear, shadow, reflect, communicate (provide visual, verbal and written examples together) (pair related words to these vocabulary words – example light – bright, dim, shine, glow, ray)** ● **Help students understand the correct structure of questions and statements (jumble words and have students place in correct structure order depending on whether it is a question or statement).**
Special Needs Learners	● **Refer to Learning Assessment Masters for pre-made charts to use in science notebook. (Investigations, Think Like a Scientist, Think Like an Engineer)** ● **Conduct Investigations, Think Like a Scientist, and Think Like an Engineer by dividing into parts or modeling side by side to monitor student understanding.** ● **Modify steps in the investigations or questions asked in the "Wrap it Up" section.**

Interdisciplinary Connections

Indicators:

Reading:

RL.CR.1.1. Ask and answer questions about key details in a **literary** text (e.g., who, what, where, when, why, how).

RI.CR.1.2. Determine main topic and retell a series of key details in informational texts (e.g., who, what, where, when, why, how).

RI.IT.1.3 Describe relationships among pieces of information (e.g., sequence of events, steps in a process, cause-effect and compare-contrast relationships) within a text.

L.VL.1.2 Ask and answer questions to determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1 reading and content.

RI.MF.1.6 With prompting and support, use text features (e.g., diagrams, tables, animations) to describe key ideas.

Writing:

W.IW.1.2 With prompts and support, write informative/explanatory texts to examine a topic and convey ideas and information.

W.WR.1.5 With prompting and support, generate questions through shared research about a topic and determine possible sources to obtain information on that topic.

W.SE.1.6 With guidance and support from adults, gather and select information from multiple sources to answer a question or write about a topic.

Mathematics:

1.DL.A.1 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Integration of 21st Century Skills

Indicators:
8.2.2.A.4 Choose a product to make and plan the tools and materials needed.
8.2.2.B.1 Identify how technology impacts or improves life.
8.2.2.B.3 Identify products or systems that are designed to meet human needs.
8.2.2.B.4 Identify how the ways people live and work has changed because of technology.
8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product.
8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss.
8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
8.2.2.D.1 Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.2.2.D.3 Identify the strengths and weaknesses in a product or system.
9.2.4.A.1 Identify different types of work and how work can help people achieve personal and professional goals
9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

Unit Title: Structure, Function, and Information Processing (Life Science) and K-2-ETS1 Engineering Design

Unit Description: Students will investigate plants and animals. First, students will learn that plants and animals are living things that have parts to help them survive. Then students will explore the idea that plants respond to external inputs such as light, water, and gravity. A life cycle will be studied to demonstrate how life continues with future generations. Next, adults and young plants and animals will be studied for similarities and differences. Students will identify how animals use their senses to interact with and survive in their habitat. Throughout the unit, students will engage in activities to think like a scientist and engineer. The concept of patterns in animals will be explored. The unit will conclude with a study of the science career of a conservationist.

Unit Duration: **Marking Period 3 (Animals) (Lessons 12-33)**
Marking Period 4 (Plants) (Lessons 1-11)

Desired Results

New Jersey Student Learning Standards:

1-LS1-1- 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.* [Clarification Statement: 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- Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.[Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).]

1-LS3-1- Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like,their parents. [Clarification Statement: 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.]

K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.

Indicators:

LS1.A: Structure and Function

- **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, fruits) that help them survive, grow. (1-LS1-1)**

LS1.B: Growth and Development of Organisms

- **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. (1-LS1-2)**

LS1.D: Information Processing

- **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. (1-LS1-1)**

LS3.A: Inheritance of Traits

- **Young animals are very much, but not exactly, like their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1)**

LS3.B: Variation of Traits

- **Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)**

Understandings:
Students will understand that…

- plants are living things that have different parts to survive and grow (roots, stems, leaves).
- flowers and fruits are parts of many plants that help plants survive and grow.
- plants respond to light.
- roots respond to gravity.
- adult plants make young plants like itself in some ways.
- plants grow in a life cycle.
- different animals use their body parts in different ways to help them survive and grow.
- animals use their body parts in different ways to: see, hear, grasp objects, protect themselves, move from place to place, seek and find food, take in water, food and air.
- animals capture and convey different kinds of information needed for survival and growth.
- human problems can be solved by mimicking animal survival skills.
- adult and young animals engage in behaviors to survive. Young animals make noises to let their parents know they need something. Adult animals keep their young warm, move them from place to place and protect them from danger.
- patterns in behavior help offspring survive.
- young animals are very much, but not exactly, like their parents.
- individuals of the same type of animal are similar but can also vary in many ways.
- Conservationists help animals survive.

Essential Questions:

- What parts of plants/animals help them survive and grow?
- How do plants/animals respond to their environment?
- How are adult and young plants alike and different?
- What is the life cycle of a plant?
- How do adults and their offspring interact together to survive?
- What does a conservationist do?

Assessment Evidence	
Performance Tasks: Investigate Lessons – Students will practice performance tasks in cooperative groups engaging in scientific steps of an investigation. ● Lesson 4 (TG pages 48-49) – Observe and describe how a plant responds to light. ● Lesson 5 (TG pages 50-51) – Observe and describe how the roots of a plant respond to gravity. Think Like A Scientist: Plan and Investigate Lessons – Students will engage in performance tasks in cooperative groups to plan and conduct an investigation, provide evidence and use that evidence to explain results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric. ● Lesson 10 (TG pages 60-63) – Show and use evidence that young plants are like, but not exactly like, their parents. ● Lesson 26 (TG pages 96-97)– Determine patterns in the behavior of parents and offspring that help offspring survive. ● Lesson 30 (TG pages 104-105b)– Show that young animals are like, but not exactly like, their parents. Think Like An Engineer Lesson: - Students will engage in performance tasks in cooperative groups to design, build and test a prototype device and analyze and improve results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric. ● Lesson 19 (TG pages 80-83)– Describe how engineers design solutions to human problems by mimicking how animals use their external parts to help them survive, grow, and meet their needs. ● Lesson 20 (TG pages 84-85d)– Design a solution to a human problem by mimicking how animals use their external parts to help them survive.	**Other Evidence:** **Students will demonstrate their understandings through:** • Science Notebook Entries • Goals and Scales Analysis • Unit Tests

Benchmarks:

Benchmarks will be administered twice during the school year (at the end of Marking Period 2 and 4). The benchmark at the end of Marking Period 2 will include concepts from Physical and Earth Science. The benchmark at the end of Marking Period 4 will include concepts from Life Science. Results will be graded on the scale of Secure, Developing and Beginning Skills.

Plants - Unit Test Percentages (Based on 13 questions): Secure = 77% - 100%

Developing = 54% - 76%

Beginning = Below 54%

Animals – Unit Test Percentages (Based on 23 questions): Secure = 78% - 100%

Developing = 52% - 77%

Beginning = Below 52%

Learning Plan

Resources: National Geographic Learning: Exploring Science Teacher's Guide, Student Book, Interactive eBook, Website, and Student Science Notebook. Become an Expert "Water Lilies and Bullfrogs" is a supplemental student leveled book that can be used throughout the unit in either a whole group, small group or individual setting. Other texts to related to unit them: Literacy By Design mentor text City Green and Guided Reading Books Planting and Growing Level D, City Dog, Country Dog Level G, Flying Jewels Level H, Dictionary of Animals Level H, A Dictionary of Snake Facts Level I. Schoolwide Short Shared Text Collection articles can be used for lessons about adult animals caring for their young: "Bringing Up Baby" (page 38), "First Dinner Out" (page 39-40), "Panda Baby" (page 41), "Zebra Babies" (page 42)

Learning Activities:

Lesson and Duration	Activities	Materials / Suggested Resources
Lesson 1 (Pages Text 42-43 Online 18-19, 22-23) Plants NJSLS LS1.A: Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1) Objective: Identify plants as living things. Know that plants have different parts that help them survive. 1 Day	**Unit Introduction:** Read online pages 18-19 to introduce the Life Science Unit. **Engage:** Quick Hands-On - Students observe their leaf and make a leaf rubbing. Share findings. Discuss what students know about different plants and what they have seen. **Explore:** Students look at page 42-43 / 22-23 and observe different plants. Ask probing questions about this exploration. Read pages. **Explain:** Discuss living and nonliving things. Discuss plants as living things. Define survival. Ask Teach the Dimensions questions. Observe plants in the forest from pages and ask questions. **Elaborate:** Observe plants from various picture resources. Step 1 – Students create a picture of a plant and compare with a partner. Step 2 – Ask questions about their plant characteristics. Ask 321 questions. **Evaluate:** "Wrap it Up" – Define and Recall understandings in Science Notebook and/or Class Chart	• Assortment of leaves from trees / shrubs • Blank Paper • Books with pictures of plants • Science Notebook • Chart Paper • Online source of different types of leaves https://www.youtube.com/watch?v=hCZyPVpKhjk
Lesson 2 (Pages Text 44-45 Online 24-25) Roots, Stems, and Leaves NJSLS LS1.A: Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1) Objective: Identify the parts of plants. Explain how roots, stems, and leaves help plants survive and grow. 1 Day	**Engage:** Discuss how to drink with a straw (or do activity with celery and colored water) and relate it to a plant part (stem). **Explore:** Take a picture walk through pages 44-45 / 24-25 noting the parts of the tree (leaves, roots, stem). Students read pages. **Explain:** Use the pictures on pages 44-45 to identify roots, stems, and leaves. Describe how plants get what they need. Ask Teach Dimensions questions. **Elaborate:** Students create a T chart listing plant parts and their function. Students draw a picture of a plant that includes all of these parts. Students compare two plants with very different leaves (deciduous, evergreen) **Evaluate:** "Wrap it Up" – Recall and Explain understandings in Science Notebook and/or Class Chart.	• Celery and water (colored with food coloring) or Straw • Science Notebook • Chart Paper • Optional Mystery Science Activity: Why Don't Trees Blow Down In The Wind? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/plant-superpowers/mystery-2/plant-survival-engineering/133?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 3 (Pages Text 46-47 Online 26-27) Flowers and Fruits NJSLS LS1.A: Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1) Objective: Identify flowers and fruits as parts of many plants. Explain how flowers and fruits help these plants survive and grow. 1 Day	**Engage:** Ask questions about new plants coming from old plants. View video of "Life Cycle of a Strawberry Plant" in the Interactive EBook. **Explore:** Take a picture walk of pages 46-47 / 26-27 noting the cherries, flowers and leaves. Ask focus questions and read pages. **Explain:** Define fruit, flowers, and seeds. Reread the caption about flowers of the cherry tree and discuss why flowers are important. Refer to the strawberry plant video and ask further questions. Ask Teach the Dimensions questions. Students write about what plant parts they know about and what plants they would like to grow in a garden in the Science Notebook and/or Class Chart. **Elaborate:** Discuss the flowers of the cherry tree and ask questions about flowers turning into cherries and seed turning into trees. Students further investigate how a seed moves from place to place. **Evaluate: "**Wrap it Up" – Describe and explain understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Websites: (about seeds traveling) • https://askabiologist.asu.edu/content/how-do-seeds-travel • https://www.youtube.com/watch?v=6hcjxaBz8mw

Note: Lessons 4 and 5 require students to make observations over a five day period. Continue with the other lessons. Allow for additional lesson periods for the 5th day of each investigation to complete the lesson.		
Lesson 4 (Pages Text 48-49 Online 28-29) Investigate: Plants and Light NJSLS LS1.D: Plants also respond to some external inputs. (1-LS-1) Objective: Observe and describe how a plant responds to light. 5 Days- (To complete observations) 1 Day for this Part	***Note advanced preparation on TG page 48** **Engage:** View and discuss "Plant Growth" photo in Interactive Ebook. Student sketch drawing of why plants grow in different directions. Share. Revisit lessons 1-3 reviewing parts of a plant. **Explore:** Students add "Plants and Light" table to their Science Notebook / Class Chart. Preview and read pages 48-49 / 28-29. Complete investigation steps. ***Stop this lesson here until the 5 day observations are completed.** **Explain:** Students compare results with the class. Groups review predictions and compare with their results. Share explanations as a class. Ask Teach the Dimension questions. **Elaborate:** Continue the investigation observing the plant longer, rotating it after 1 week, making further predictions and observations and discussing results.Ask 321 questions. **Evaluate:** "Wrap it Up" – Compare and Draw Conclusions of understandings in Science Notebook and/or Class Chart.	• bean plant in a pot • soil • small pots • boxes • Science Notebook • Chart Paper • Optional Mystery Science Activity: What Do Sunflowers Do When You Are Not Looking? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/plant-superpowers/mystery-3/plant-movement-survival/157?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 5 (Pages Text 50-51 Online 30-31) Investigate: Root Growth NJSLS LS1.D: Plants also respond to some external inputs. (1-LS-1) Objective: Observe and describe how the roots of a plant respond to gravity. 5 Days- (To complete observations) 1 Day for this Part	**Engage:** View video "Seeds Sprouting" in Interactive Ebook and discuss. Recall lesson 2 about roots. **Explore:** Students add "Root Growth" table to their Science Notebook and/or Class Chart Preview and read pages 50-51 / 30-31. Complete investigation steps. ***Stop this lesson here until the 5 day observations are completed.** **Explain:** Students compare results with the class. Groups review predictions and compare with their results. Share explanations as a class. Ask Teach the Dimension questions. **Elaborate:** Continue the investigation observing the roots longer, rotating cup A, making further predictions and observations and discussing results. Ask 321 questions. **Evaluate:** Wrap it Up" – Describe, Contrast, and Infer understandings in Science Notebook and/or Class Chart.	• masking tape • plastic cups • black markers • paper towels • bean seeds • plastic spoons • centimeter rulers • clay • Science Notebook • Chart Paper
Lesson 6 (Pages 52-53 Online 32-33) Life Cycle of a Tomato Plant NJSLS LS1.B: Adult plants and animals can have young. (1-LS1-2) Objective: Identify that adult plants can make new young plants. Describe the stages of a tomato plant's life cycle. 1 Day	**Engage:** Quick Hands-On - observe fruits with seeds and then cut fruit to see seeds. Review and discuss past observations. **Explore:** Examine the images on pages 52-53 / 32-33 and explore a tomato's life cycle. Read pages. **Explain:** Define a life cycle. Describe the stages in a tomato plant's life cycle. Compare and contrast these stages. Ask Teach the Dimensions questions. **Elaborate:** Students research different types of plants. Ask 321 questions. **Evaluate:** Wrap it Up" – Contrast, and Infer understandings in Science Notebook and/or Class Chart.	• Various fruits with seeds inside • Website about different tomato types (this site shows pictures of different tomatoes) https://www.youtube.com/watch?v=e3MDP 59ZW0s • Literacy By Design extra text Mrs. Spitzer's Garden and Big Book / Multiple copies of How to Grow a Hyacinth / Sunflower • Science Notebook • Chart Paper

Lesson 7 (Pages Text 54-55 Online 34-35) Young Plants Look Like Their Parents NJSLS LS3.A: Plants also are very much, but not exactly, like their parents. (1-LS3-1) Objective: Identify that plants are very much, but not exactly, like their parents. 1 Day	**Engage:** View video of Lotus Plant to see differences from seed to plant. Discuss similarities and differences between parents and children (be conscientious of different family situations) **Explore:** Read the title on page 54 / 34 and determine what the lesson is about. Examine the images on pages 55. Read pages. **Explain:** Review and describe how the young plants and their parents are alike and different.Ask Teach the Dimensions questions. **Elaborate:** Class takes a nature walk to observe and discuss other plants and trees. **Evaluate:** Wrap it Up" – Compare and Contrast understandings in Science Notebook and/or Class Chart.	• Video of a Lotus Plant • https://www.youtube.com/watch?v=IPIzVK2WZo4 • Science Notebook • Chart Paper • Optional Mystery Science Activity: What Will A Baby Plant Look Like When It Grows Up? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/plant-superpowers/mystery-1/plant-traits-offspring/834?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 8 (Pages 56-57 Online 36-37) Plants Can Be Different NJSLS LS3.B: Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1) Objective: Observe that plants of the same kind are similar, but can also vary in many ways. 1 Day	**Engage:** View video on different types of tomato plants and discuss. Discuss how different teachers in the building are alike and different. **Explore:** Look at the pictures on pages 56-57 / 36-37 and ask probing questions about the different flowers. Set purpose to find out about how adult plants of the same type can be different. Read pages. **Explain:** Identify plant similarities and differences. Ask Teach the Dimensions questions. **Elaborate:** Students research other plants of the same kind and compare. Can refer back to the video on different tomato plants. **Evaluate:** Wrap it Up" – Explain and Generalize understandings in Science Notebook and/or Class Chart.	• Website about different tomato types (this site shows pictures of different tomatoes) https://www.youtube.com/watch?v=e3MDP 59ZW0s • Science Notebook • Chart Paper
Lesson 9 and 10 (Pages Text 58-59 Online 38-39) How Are Plants Alike and Different NJSLS LS3.A: Plants also are very much, but not exactly, like their parents. (1-LS3-1) LS3.B: Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1) Objective: Identify that plants are very much, but not exactly, like their parents. Observe that plants of the same kind are similar, but can also vary in many ways. 1 Day	**Engage:** Discuss how plants are alike and different? View and discuss photos from lessons 5 (seedling and adult) and 6 (different tomatoes) How were the young and adult plants alike and different? **Explore:** Look at the pictures on pages 58-59 / 38-39. Determine which plants are young and which are adult plants. Read pages. **Explain:** Compare young and adult cabbage plants and lilac plants. **Elaborate:** Follow steps for Share and Compare. View video from Maria Fadiman. **Evaluate:** Compare, Restate and Predict understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper

Lesson 11 (Pages 60-63 Online 40-43) Think Like a Scientist (Show that young plants are alike and different from their parents.) NJSLS 1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. Objective: Make and record observations to show that young plants are like, but not exactly like, their parents. Use evidence from their observations to explain that young plants are like, but not exactly like, their parents. 1 Day	**Engage:** Role play and discuss how trees grow from a sapling into a huge tree. Ask students what they know about young and adult plants. Read the introduction and steps on pages 60-62 / 40-43. In their Science Notebook and/or Class Chart, students plan an investigation to determine how plants are alike and different. (Video about young and adult plants) **Explore:** Students add "Comparing Young and Adult Plants" table in their Science Notebook and/or Class Chart and conduct investigation. **Explain:** Students review their results and revisit the beginning question. Students record conclusions and share results. Ask Teach the Dimensions questions. **Elaborate:** Students perform the task again using different plants and altering their research methods. **Evaluate:** Students Restate, Explain and Cite Evidence in their Science Notebook and/or Class Chart. Teachers and students use rubrics.	• Video about young and adult plants https://www.youtube.com/watch?v=yhH26qHoF8A • Science Notebook • Chart Paper
Lesson 12 (Pages Text 64-65 Online 44-45) Animal Parts NJSLS LS1.A: 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. (1LS1-1) Objective: Explain that different animals use their body parts in different ways. Identify the different body parts of animals that help them survive and grow. 1 Day	**Engage:** View video "Scorpion" in the Interactive Ebook and ask questions.. Ask students questions about parts of their body that help them survive. Discuss the purpose of a person's mouth. **Explore:** Examine and discuss the picture on pages 64-65 / 44-45. Students read pages. **Explain:** Discuss animals and their parts. Describe the parts of a Caiman and look closely at its tail, feet, mouth, skin and other parts. View video "Anusha Shankar on Animal Parts. **Elaborate:** Extend Your Thinking About Animal Parts: Students research an animal and learn how their feet or paws help them survive. View photos in "axolotl" and "Walking Stick" in the Life Science Gallery and ask questions. **Evaluate:** "Wrap it Up" Recall and explain understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Literacy By Design supplemental text What Do You Do With a Tail Like This, Mentor Text Amazing Animals

Lesson 13 (Pages Text 66-67 Online 46-47) Animals See and Hear NJSLS LS1.A: 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. (1LS1-1) Objective: Explain that animals use their body parts in different ways to see and hear. 1 Day	**Engage:** Students think about how animals see and hear and what body parts they use. View video "Tarsier" in Interactive Ebook and ask questions. Think about how people see and hear and what body parts we use. **Explore:** Students look at heading at the top and take a picture walk on pages 66-67 / 46-47 noticing the animals eyes and ears. Students read pages. **Explain:** Identify ways animals see and hear. Focus next on the captions first for the sense of sight and second for the sense of hearing. **Elaborate:** Find out more about animal sight (bats, deep ocean animals, insects, worms, rodents). Extend your thinking about hearing first how people hear and then how different animals hear. Share findings. **Evaluate:** "Wrap it Up" - Identify, Explain and Infer understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Literacy By Design supplemental text What Do You Do With a Tail Like This, Mentor Text Amazing Animals(pg 8-9) • Schoolwide Short Shared Text Collection article "Animals Don't Hear Alike" (page 43-44) "Hearing Sounds • Through the Ground" (page 47), "Sound Feelers" (page 53-54)

Lesson 14 (Pages Text 68-69 Online 48-49) Animals Grasp NJSLS LS1.A: 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. (1LS1-1) Objective: Explain that animals use their body parts in different ways to grasp objects. Identify the different body parts of animals that help them survive and grow. 1 Day	**Engage:** Ask students how do animals use their body parts to survive? View and discuss the video "Fruit Bat with Young" from the Interactive Ebook. Ask questions about how we pick up a pencil. **Explore:** Look at the pictures of the animals on pages 68-69 / 48-49 and ask probing questions to encourage exploration. Set purpose to find out about how animals use different body parts. Read pages. **Explain:** Reread the text on the top of page 68 / 48 and identify how different animals grasp. Revisit the pictures and captions and discuss this with the eagle, elephant and seahorse. Explain how grasping helps these animals survive. Discuss the structure and form of how these body parts help animals grasp. **Elaborate:** Students research other animal grasps and if there are any animals that cannot grasp. **Evaluate:** Wrap it Up" – Recall and Infer understandings in the Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Literacy By Design supplemental text What Do You Do With a Tail Like This, Mentor Text Amazing Animals(pg 4-5,12-15)

Lesson 15 (Pages Text 70-71 Online 50-51) Animals Protect NJSLS LS1.A: 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. (1LS1-1) Objective: Explain that animals use their body parts in different ways to protect themselves. Identify the different body parts of animals that help them survive and grow. 1 Day	**Engage:** Ask students to think about how animals use their body parts to survive. View video "Porcupine" from the Interactive Ebook and ask questions. Ask questions about animals defending themselves. Review other animal body parts that helped them survive (elephant's trunk, eagle's feet and seahorse's tail). **Explore:** Look at the pictures and headings on pages 70-71 / 50-51 and do a picture walk to see what students notice. Set purpose to find out about how animals protect themselves. Read pages. **Explain:** Review from previous lessons about how animals protect themselves. Reread the text on the top of page 70 / 50 drawing attention to the boldfaced word protect. Define protect. Describe how animals protect themselves to survive by revisiting the pictures and captions. Discuss this with the gecko, box turtle and porcupine. Discuss the structure and form of how these body parts protect the animal. View and discuss the photo "Poisonous Frog" in the Life Science Gallery. Ask Teach the Dimensions questions. **Elaborate:** Students sketch then discuss an animal and think how that animal protects itself. **Evaluate:** Wrap it Up" – Summarize, Infer and Apply understandings in the Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Literacy By Design Guided Reading Book Animals Hide Level B and supplemental book Verdi • Optional Mystery Science Activity: Why Are Polar Bears White? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/animal-superpowers/mystery-4/camouflage-animal-survival/118?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 16 (Pages Text 72-73 Online 52-53) Animals Move NJSLS LS1.A: 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. (1LS1-1) Objective: Explain that animals use their body parts in different ways to move from place to place. Identify the different body parts of animals that help them survive and grow. 1 Day	**Engage:** Ask students to think about how animals use their bodies to move. View and discuss the.video “Flamingo” in the Interactive Ebook. Students name ways they move. Discuss why and where we move. Compare the way we move with the flamingo. **Explore:** Look at the pictures on pages 72-73 /52-53 and do a picture walk stopping to discuss each animal. Set purpose to find out about how and why animals move. Read pages. **Explain:** Reread the text on the top of page 72-73 / 52-53 to describe how and why the snake, butterfly and octopus move. Discuss the structure and form of these body parts that help these animals move. **Elaborate:** Students work in groups to determine how animals in different habitats move from place to place. **Evaluate:** Wrap it Up” – Identify and Infer understandings in the Science Notebook and//or Class Chart.	● Science Notebook ● Chart Paper ● Literacy By Design supplemental text What Do You Do With a Tail Like This, Mentor Text Amazing Animals(pg 6-7, 10-11)

Lesson 17 (Pages Text 74-75 Online 54-55) Animals Find What They Need NJSLS LS1.A: 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. (1LS1-1) Objective: Explain that animals use their body parts in different ways to seek and find food. Identify the different body parts of animals that help them survive and grow. 1 Day	**Engage:** Ask students how animals use their body parts to get what they need? View and discuss video "Praying Mantis" in the Interactive Ebook. Have students draw a picture of an animal that has paws or claws. Discuss what they use their paws or claws to do. **Explore:** Look at the headings and pictures on pages 74-75 / 54-55 and ask what they think the animals are looking for. Set a purpose to find out what animals need to survive using their different body parts and read pages. **Explain:** Reread the text on page 74 / 54 and describe body parts that help animals find what they need (armadillo, hawk, coyote). Discuss the structure and form of these body parts that help these animals get what they need. Explain how paws and claws help animals survive. Ask Teach the Dimensions questions. **Elaborate:** Students research to find out more about how the nine-banded armadillo, hawk or coyote survives. Students then extend their thinking about claws and paws that help animals survive. **Evaluate:** Wrap it Up" – Compare and Identify understandings in the Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Website about the armadillo http://kids.nationalgeographic.com/explore/5-reasons-why-hub/5-reasons-why-armadillos-are-awesome/ • Literacy By Design supplemental text What Do You Do With a Tail Like This, Mentor Text Amazing Animals

Lesson 18 (Pages Text 74-75 Online 56-57) Meet a Spider Woman NJSLS LS1.A: 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. (1LS1-1) Objective: Explain that animals use their body parts in different ways to seek and find food. Identify the different body parts of animals that help them survive and grow. 1 Day	**Engage:** View and discuss the video "European Garden Spider." Ask: how do spider webs help spiders survive? **Explore:** Observe pictures and read captions on page 74 / 56**.** Ask: What are some properties of spider silk? **Explain:** Read the story and ask questions intermittently. Discuss How Cheryl thinks spiders are helpful. Ask Teach the Dimensions questions. **Elaborate:** Talk more about Cheryl Hayashi. Students view, draw, and discuss video of a spider. **Evaluate:** Wrap it Up" – Identify and Describe understandings in the Science Notebook and/or Class Chart.	• Online spider video https://www.youtube.com/shorts/Bzdtms7tELY • Science Notebook • Chart Paper

Lesson 19 (Pages Text 76-77 Online 58-59) Animals Take in Food, Water and Air NJSLS LS1.A: 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. (1LS1-1) Objective: Explain that animals use their body parts in different ways to take in food, water and air. Identify the different body parts of animals that help them survive and grow. 1 Day	**Engage:** Ask How animals use their body parts to take in food, water and air. View and discuss the video "Blue Whale" from the Interactive Ebook. Role play and discuss taking in air with your mouth and nose. Discuss with students the ways people eat, drink and breathe. **Explore:** Have students look at the picture of the habitat on pages 76-77 / 58-59 and take a picture walk pointing out the different animals and features of the habitat. Set a purpose to find out ways in which animals take in food, water and air to survive. Read pages. **Explain:** Look at the pictures and reread the text on pages 76-77 and identify parts that help animals take in food, water and air (antelope, lion and elephant). Explain how animals eat, drink and breathe to survive. View and discuss photo "Diving Bell Spider." Students view and discuss the video clip of the blue whale surfacing in the ocean. Ask Teach the Dimension questions. **Elaborate:** Students research animals in the ocean to find out how the animals take in air. Share findings with the class. Ask 321 questions. **Evaluate:** Wrap it Up" – Recall and Contrast understandings in the Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Optional Mystery Science Activity: Why Do Birds Have Beaks? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/animal-superpowers/mystery-2/animal-structures-survival/117?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 20 (Pages Text 78-79 Online 60-61) Animal Senses NJSLS LS1.D: Animals have body parts that capture and convey different kinds of information needed for growth and survival. (1LS1-1) Objective: Describe how animals capture and convey different kinds of information needed for growth and survival. Identify animal responses to these inputs with behaviors that help them survive. 1 Day	**Engage:** Ask how do animals use their body parts to sense danger? View and discuss video " Rattlesnake" Discuss what senses and body parts people might use to cross a busy street. **Explore:** Have students look at the big picture of the deer on pages 78-79 / 60-61. Ask probing questions to determine what the deer is doing and why. Set a purpose to find out how some animals use their body parts to sense different things around them and react in order to survive. Read pages. **Explain:** Have students recall what they know about their senses and describe how animals use their senses. Explain how deer respond in order to survive using their senses. **Elaborate:** In small groups, students discuss other reasons animals use their senses. View and discuss photo "Parent Duck and Duckling" in the Life Science Photo Gallery. **Evaluate:** Wrap it Up" – Identify, Explain and Infer understandings in the Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper

Stem Space Project (Pages Online 62-63) Eating Objectives: Explain how animals use the parts of their body to find and take in food under water. Compare and contrast the challenges of eating in space with animals eating under water. NJSLS 1-LS1-2- Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.[Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).] 1 Day	**Engage:** View and discuss photos "Floating Breakfast in Space," "Snacking on Nuts in Space," and "Thanksgiving in Space" in the Life Science Gallery. Think-Pair-Share questions about animals eating under water. Ask Teach the Dimensions questions. Step 1 - Students select a topic and develop research questions. **Explore:** Step 2: Plan and conduct research. View and discuss video "Our World: Eating in Space." **Explain:** Step 3: Students prepare a report. Step 4: Share **Elaborate:** Students present reports and on Class Chart record information. Turn and talk about how animals presented are alike. Investigate further with a virtual field trip to Monterey Bay Aquarium. **Evaluate:** Wrap it Up" – Identify, Explain and Infer understandings in the Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Monterey Bay Aquarium videos https://www.youtube.com/watch?v=OLJrgklYgow https://www.youtube.com/watch?v=zIfxVukq8Ys

Lesson 21-22 (Pages Text 80-83 Online 64-65) Think Like An Engineer – A Better Train NJSLS 1-LS1-1 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. NJSLSK-2-ETS1-1 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. NJSLS ETS1.A Before beginning to design a solution, it is important to clearly understand the problem. Objective: Describe how engineers design solutions to a human problem by mimicking how animals use their external parts to help them survive, grow and meet their needs. 1 Day	**Engage:** How can engineers use ideas from the natural world to solve problems? Quick Hands On: Demonstrate how velcro works. Discuss how this is similar to burrs that can stick and be easily pulled off. **Explore:** Preview pages 80-81 / 64 and discuss how Eiji Nakatsu tried to solve the problem of noise on this fast moving train. Set purpose to see how Eiji sought to solve this problem and read pages. **Explain:** Reread the text on page 80-81 to identify the problem and what is Eiji's job Identify the solution and how Eiji used animal structures to reach this solution. Determine what the result was for this solution. Ask Teach the Dimensions questions. **Elaborate:** Discuss how scientists use materials to design a device and often look to nature. Discuss machines and how they may have been inspired by nature (Seeds falling like helicopter rotors, boat paddles shaped like a duck's foot). **Evaluate:** "Wrap it up" – Relate and Explain understandings in the Science Notebook and/ or Class Chart.	• Science Notebook • Chart Paper

Lesson 23 - (Pages Text 84-85d Online 68-69) Think Like An Engineer – Design a Solution NJSLS 1-LS1-1 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. NJSLS K-2-ETS1-1 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. NJSLS ETS1.A Before beginning to design a solution, it is important to clearly understand the problem. Objective: Use materials to design a solution to a human problem by mimicking how animals use their external parts to help them survive. 1 Day	**Engage:** View photos of different turtles and ask how a shell protects a turtle? Students sketch a turtle and discuss. Ask: How does your body protect you? Read the introduction and discuss why a turtle may need to protect itself from and what body part it would use. Define the problem of how you can protect yourself from danger. **Explore:** Read step 2 and design a prototype to solve this problem. Students add a "Protection From Physical Contact" table to their Science Notebook and/or Class Chart, read step 3 and test their prototype recording their observations. **Explain:** Students examine their results and determine if their prototype protected them. Students make modifications and perform the same tests. Students examine their new results. Students think about how they worked like an engineer. Students share their results. Ask Teach the Dimensions questions. **Elaborate:** Students further revise their prototypes based on class feedback or design a new prototype. **Evaluate:** Students Identify, Compare and Evaluate their understandings in the Science Notebook and/or Class Chart. Teacher and students complete the rubric.	• Online pictures of different turtles. https://www.youtube.com/watch?v=YzP0ramTNWw • Science Notebook • Chart Paper • Provide a wide variety of materials such as cardboard boxes, poster board, construction paper etc) • Markers • Scissors • Glue • Tape • Magazines and books with pictures of animals • Safety goggles
Lesson 24 (Pages Text 86-87 Online 70-71) Hear Me NJSLS LS1.B: Adults 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. (1-LS1.2) Objective: Explain that some young animals make noises to let their parents know that they need something. Describe how some animal parents and their offspring engage in behaviors that help offspring to survive. 1 Day	**Engage:** Ask: How do baby animals get what they need to survive? View and discuss video? "Young Birds in the Nest." Students think about a time when they heard a baby cry. What happened and why was the baby crying? **Explore:** Read the title and look at the pictures on pages 86-87 / 70-71. Take a picture walk and ask questions. Set the purpose is to read to find out how different young animals cry for their parents in order to survive. Read pages. **Explain:** Reread page 86 and discuss that young animals make sounds to call for help referring to the bear, lion and bird. Explain how some parents and young animals communicate for survival. Ask Teach the Dimensions questions. **Elaborate:** Extend thinking about if all baby animals need parents to survive. Students explore different animals to find out how they communicate. **Evaluate:** "Wrap it Up" – Recall and Relate understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper

Lesson 25 (Pages Text 88-89 Online 70-71) Warm Me NJSLS LS1.B: Adults 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. (1-LSb-2) Objective: Explain that young animals need help to stay warm. Describe how some animal parents and their offspring engage in behaviors that help offspring to survive. 1 Day	**Engage:** Ask how do baby animals keep warm to survive? View and discuss video "Parents and Young Birds.**"** Discuss how people stay warm and remind students that a home is a shelter that provides protection. **Explore:** Students look at internet video of penguins staying warm. Ask probing questions to encourage exploration (what are the young penguins doing?) Set the purpose to read to find out about young animals that need help to stay warm. Read pages. **Explain:** Reread the text and describe how some young animals keep warm (baby chicks, penguins). Ask Teach the Dimensions questions. **Elaborate:** Students research to find out how other animals stay warm. **Evaluate:** "Wrap it Up" – Infer and Explain understandings in Science Notebook and/or Class Chart	• Science Notebook • Chart Paper • Internet video about penguins staying warm https://www.youtube.com/watch?v=OL7O5O7U4Gs

Lesson 26 (Pages Text 90-91 Online 74-75 Carry Me NJSLS LS1.B: Adults 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. (1-LSb-2) Objective: Explain that many young animals need to be carried to move from place to place. Describe how some animal parents and their offspring engage in behaviors that help offspring to survive. 1 Day	**Engage:** Ask: How do baby animals get what they need to survive? View and discuss the video "Water Bird and Young." Have students think about how a baby moves around. **Explore:** Students look at the picture on page 90-91 / 74-75 and ask probing questions to encourage exploration about what the opossums are doing? Set the purpose to read to find out how some parent animals carry offspring from place to place **Explain:** Reread and explain why some animals carry their young and what might happen if a young animal is left behind. View and discuss the photo"crocodile and Young" from the Life Science Gallery. Ask Teach the Dimensions questions. **Elaborate:** Students brainstorm a list of animals and divide into animals that carry and don't carry their young. **Evaluate:** "Wrap it Up" - Describe and Infer understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Websites about animals carrying their young https://www.youtube.com/watch?v=-CcCZog5Fy4 https://www.youtube.com/watch?v=ys1oE3 4qxQ4 https://www.youtube.com/watch?v=4Nv3c FiMRvU

Lesson 27 (Pages Text 92-93 Online 76-77) Protect Me NJSLS LS1.B: Adults 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. (1-LSb-2) Objective: Explain that many adult animals protect their young. Describe how some animal parents and their offspring engage in behaviors that help the offspring to survive. 1 Day	**Engage:** Ask: How do baby animals get what they need to survive? View and discuss video (elephant herd protecting a young elephant) in Interactive Ebook. Students recall a time when a parent protected them. **Explore:** Students look at the picture of the polar bear on pages 92-93 / 76-77 and ask what they notice about the polar bear. Define what the word protect means. Set the purpose to read how some adult animals protect their young and read pages. **Explain:** Reread page 92 / 76 and describe animals protecting their young. Compare and contrast how the baby polar bear and baby sea turtle are protected. Ask Teach the Dimensions questions. **Elaborate:** Students discuss other animals who protect their young starting at birth. What about the types of protection some plants have? **Evaluate:** "Wrap it Up" – Recall and Infer understandings in Science Notebook and/or Class Chart	• Science Notebook • Chart Paper • Internet video of elephants https://www.youtube.com/watch?v=zM7y0PH2HMU • Optional Mystery Science Activity: Why Do Baby Ducks Follow Their Mother? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/animal-superpowers/mystery-3/animal-behavior-offspring-survival/139?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 28 (Pages Text 94-95 Online 78-79) Meerkat Teachers NJSLS LS1.B: Adults 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. (1-LSb-2) Objective: Identify that some animal parents and their offspring engage in behaviors that help the offspring survive. Describe how some young animals learn how to survive from their parents. 1 Day	**Engage:** LAsk: How do animals learn to survive? Play Game "I can…" and discuss how students learned that. Discuss when students were babies and how they learned. **Explore:** Students look at the pictures on pages 94-95 / 78-79 and determine what the meerkats are doing. Set the purpose to read how young meerkats learn how to survive and read pages. **Explain:** Reread the heading on page and describe what meerkats teach their young to do. Explain how young meerkats learn to survive. Ask Teach the Dimensions questions. **Elaborate:** Students follow the steps on page 95 "Share and Compare" and choose an animal that helps its young survive. **Evaluate:** Recall, Explain and Infer understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper

Lesson 29 (Pages Text 96-97 Online 80-81) Think Like A Scientist – Look for Patterns NJSLS 1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. Objective: Determine patterns in the behavior of parents and offspring that help offspring survive. 1 Day	**Engage:** Ask: How do animals help their young survive? How do young animals help themselves survive? Students role play answers. Ask: How do your parents help you survive? How do you help yourself survive? review how other animals studied survive (lions, birds, bears, penguins, opossums, polar bears and meerkats). **Explore:** Ask: What patterns in nature do you know about? Read the heading on page 96 / 80 and define a pattern and ask what patterns are in nature. Set the purpose to read to identify patterns of behavior that help young animals survive. Read pages. **Explain:** Reread the text on page 96 / 80 and look at the pictures on pages to observe patterns in behaviors of young and adult animals. Explain how patterns in behavior help young animals to survive. Ask Teach the Dimensions questions. **Elaborate:** Ask questions about thinking like a scientist and where else do you see patterns in science? Students research other animals and how they behave to survive using literature. **Evaluate: "**Wrap it Up" Identify and Explain understandings in the Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Books about animals and their babies

Lesson 30 (Pages Text 98-99 Online 82-83) Young Animals Look Like Their Parents NJSLS LS3.A Young animals are very much, but not exactly, like their parents. Objective: Observe that young animals are very much, but not exactly, like their parents. 1 Day	**Engage:** Ask: Do Parents and their children look exactly alike? Quick Hands-On: Students bring in photos of themselves as babies and their parents. as adults. Ask: How can you tell babies and parents are related? **Explore:** Students look at the pictures on pages 98-99 / 82-83 about giraffes and ask probing questions to encourage exploration about young animals and their parents. Set the purpose to read how young animals look like their parents and read pages. **Explain:** Have students look closely at the young and adult giraffe on pages 98-99 / 82-83 Compare and contrast a young giraffe with its parent by rereading pages. View and discuss video "Baby Animals" in Resources Menu. **Elaborate:** Ask and discuss: Do you think most young and adult animals look like each other? **Evaluate:** "Wrap it Up" Compare and Contrast understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Student pictures as babies and parents as adults • Literacy by Design Guided Reading Book Oh Baby! Level E and supplemental text Only Tadpoles Have Tails • Websites about adult and baby animals http://scienceyear2.blogspot.com/p/animals-look-like-their-parents.html http://scienceyear2.blogspot.com/p/animals-look-different-from-their.html • Optional Mystery Science Activity: How Can You Help A Lost Baby Animal Find Its Parents? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/animal-superpowers/mystery-1/parent-offspring-traits/815?code=Mjc0MTM1OTc0&t=student&chapter=all • Optional Mystery Science Activity: Why Do Family Members Look Alike? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/animal-superpowers/mystery-5/inheritance-variation-of-traits/145?code=Mjc0MTM1OTc0&t=student&chapter=all

Lesson 31 (Pages Text 100-101 Online 84-85) Different Dogs NJSLS LS3.A Young animals are very much, but not exactly, like their parents. Objectives: Recognize that individuals of the same type of animal are similar, but can also vary in many ways. 1 Day	**Engage:** Ask: Do animals of the same kind look exactly alike? Quick Hands-On: View and discuss video in Interactive Ebook of adult rabbit and their young. Students can draw a picture of a dog they have seen or know. Discuss differences among the drawings. **Explore:** Students take a picture walk of pages 100-101 / 84-85 discussing what they notice about the different dogs. Set the purpose to read how animals of the same type can differ and read pages. **Explain:** Have students look closely at the pictures on page 100-101 and compare and contrast different dogs. Ask Teach the Dimensions questions. View and Discuss video "Animal Traits" in the Resources Menu. **Elaborate:** Students create a list of things all dogs do and things some dogs do. Share and discuss. **Evaluate:** "Wrap it Up" Compare and Contrast understandings in Science Notebook and/or Class Chart.	● Science Notebook ● Chart Paper

Lesson 32 (Pages Text 102-103 Online 86-87) How Are Animals Alike and Different NJSLS LS3.A Young animals are very much, but not exactly, like their parents. NJSLS LS3.B Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. Objectives: Observe patterns that young animals are very much, but not exactly, like their parents. Recognize patterns that individuals of the same kind of animal are similar but can also vary in many ways. 1 Day	**Engage:** Ask: How are people similar and different? Play Game eliminating students based on physical traits. Partner Talk: Students discuss similarities and differences between themselves. **Explore:** Students look at the animals on pages 102-103 / 86-87 and ask probing questions about how the animals are alike and different . Set the purpose to read how animals can be alike and different and read pages. **Explain:** Have students look closely at the pictures on page 102-103 and compare young and adult animals and then compare animals of the same kind to see similarities and differences. Ask Teach the Dimensions questions. **Elaborate:** Students share findings comparing adult and young animals with the class. **Evaluate:** "Wrap it Up" Compare, Contrast and Infer understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Literacy by Design Guided Reading Book Oh Baby! Level E
Lesson 33 (Pages Text 104-105b Online 88-89) Think Like A Scientist – Make Observations NJSLS 1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. Objectives: Plan and conduct an investigation in order to make and record observations to show that young animals are like, but not exactly like, their parents. Use evidence from their observations to explain their results. 1 Day	**Engage:** Ask: How do scientists observe animals? Role Play: Students role play scientists observing animals. Ask: What they know about young animals and their parents pointing out the question they will investigate. Students add "Comparing Animals and Their Young" table to their Science Notebook and/or Class Chart and read step 1 on page 104 / 88 to plan their investigation. **Explore:** Students read step 2 and conduct their investigation. **Explain:** Have Teach the Dimensions discussion. Students review the details of their results and the teacher asks questions. Revisit the question from the beginning of the investigation. Students share their results. **Elaborate:** Students perform the investigation again with different animal types and determine if the results of the second investigation support their original results. **Evaluate:** Students Compare, Contrast and Infer understandings in Science Notebook and/or Class Chart. Teacher and students complete the rubric.	• Science Notebook • Chart Paper

Science Career (Pages TExt 106-107 Online 90-91) Conservationist NJSLS Science uses different ways to study the world. Objectives: Connect concepts about animals and how they survive with the career of a conservationist. 1 Day	**Engage:** Ask: Why do some animals need protecting? View and discuss videos of endangered animals (black rhino, gorilla). Have students talk about the different animals they explored in the previous lessons and the different ways they survive and help their young. **Explore:** Students look at the pictures on pages 106-107 / 90-91 and ask probing questions to encourage exploration. Set a purpose to read to find out about a career of a conservationist and read pages. **Explain:** Define the word conserve. Identify Dereck Joubert as a conservationist and discuss this career and its importance. **Elaborate:** discuss what other conservationists try to protect? **Evaluate:** Students Describe, Recall and Infer understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet video of black rhino https://www.youtube.com/watch?v=ilF0nU_d0CY • Internet video of gorilla https://www.youtube.com/watch?v=_YN1bwIFB2Y

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): **1-LS1-1. 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.* [Clarification Statement: 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.]** **K-2-ETS1-1. 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.**	
4.0	**Students will be able to:** **In addition to planning and conducting investigations at 3.0, students can** ● Revise designs or create an alternative design to solve a human problem based on class and/or teacher feedback.
3.0	**Students will be able to:** ● **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.* [Clarification Statement: 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.]** ● **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**
2.0	**Students will be able to:** ● Define survive, grow, needs, grasp, protect, senses, respond. ● Identify ways plants/animals survive, grow and meet their needs.
1.0	**With help, partial success at level 2.0 content and level 3.0 content:**
0.0	**Even with help, no success**

Standard(s): **1.LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. [Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).]**	
4.0	**Students will be able to:** **In addition to completing research and determining patterns at 3.0, students can** ● Compare and contrast a variety of animals' behavior patterns. ● Infer other patterns that may exist among different species.

3.0	**Students will be able to:** ● **Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. [Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).]**
2.0	**Students will be able to:** ● Define pattern, offspring, behaviors, survive, communicate, protect. ● Identify ways animals help their offspring survive.

1.0	**With help, partial success at level 2.0 content and level 3.0 content:**
0.0	**Even with help, no success**

Standard(s): **1.LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.**	
4.0	**Students will be able to:** **In addition to planning and conducting investigations at 3.0, students can** ● Conduct investigations again with other young plants and animals using different research methods. ● Compare these results with the results of the first investigation.
3.0	**Students will be able to:** ● **Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.**
2.0	**Students will be able to:** ● Define alike, different, adult, young/offspring. ● Identify characteristics of different plants and animals.
1.0	**With help, partial success at level 2.0 content and level 3.0 content:**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	● Vocabulary – deciduous, evergreen ● Challenge students to research concepts on their own from the Elaborate Section of each lesson. ● Ask probing questions at the beginning of lessons to tap into prior knowledge and allow students to explain their thinking (example – TG page 91)
Struggling Learners	● Provide concrete examples of living and nonliving objects ● Revisit pages with key concepts and have students point out and retell what they have learned (provide further information where gaps exist) ● Ask questions where students look for pictures in the book to provide an answer ● Focus on one animal picture in the student text book for students to discuss (example – TG page 101)

English Language Learners	● Vocabulary – survive, leaves, roots, stems, flowers, fruits, seeds, life cycle, seedling, grasp, protect (provide visual examples with each word) (make flashcards for difficult words) ● Ask yes or no questions to help students describe understandings ● Provide sentence frames to help students express their ideas (example- TG page 65, 73, 79) ● Provide picture cards of the different animals discussed in this unit for students to refer to. ● Have students practice asking each other yes or no questions (give animal parts vocabulary as a starting point – example – TG page 103)
Special Needs Learners	● Provide concrete examples when introducing new vocabulary and concepts. ● Vocabulary – add unknown words to the student notebook to refer to during the unit. ● Provide drawings for students to add to the Science Notebook to name and/or label parts.

Interdisciplinary Connections

Indicators:
Reading:
RL.CR.1.1. Ask and answer questions about key details in a **literary** text (e.g., who, what, where, when, why, how).
RI.CR.1.2. Determine main topic and retell a series of key details in informational texts (e.g., who, what, where, when, why, how).
RI.IT.1.3 Describe relationships among pieces of information (e.g., sequence of events, steps in a process, cause-effect and compare-contrast relationships) within a text.
L.VL.1.2 Ask and answer questions to determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1 reading and content.
RI.MF.1.6 With prompting and support, use text features (e.g., diagrams, tables, animations) to describe key ideas.
Writing:
W.IW.1.2 With prompts and support, write informative/explanatory texts to examine a topic and convey ideas and information.
W.WR.1.5 With prompting and support, generate questions through shared research about a topic and determine possible sources to obtain information on that topic.
W.SE.1.6 With guidance and support from adults, gather and select information from multiple sources to answer a question or write about a topic.
Mathematics:
1.DL.A.1 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Integration of 21st Century Skills

Indicators:
8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.D.1 Develop an understanding of ownership of print and nonprint information.
8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
8.2.2.A.5 Collaborate to design a solution to a problem affecting the community.
8.2.2.B.3 Identify products or systems that are designed to meet human needs.
8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product.
8.2.2.D.1 Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.2.2.D.3 Identify the strengths and weaknesses in a product or system.
9.2.4.A.1 Identify different types of work and how work can help people achieve personal and professional goals
9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

Unit Title: Space Systems: Patterns and Cycles (Earth Science)

Unit Description: Students will explore patterns and cycles of space systems. First, students will learn about the sun as a star, its apparent motion in the sky and the patterns of day and night. Then students will learn about the moon, its apparent motion in the sky and its patterns. Next, students will learn about stars, the patterns stars make, how people use these patterns and specifically investigate some star patterns. Then, students will study the patterns of seasons and how they affect light and temperature. The unit will conclude with students studying the career of an astronomer.

Unit Duration: Making Period 2

Desired Results

New Jersey Student Learning Standards:

1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted. [Clarification Statement: 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. Make observations at different times of year to relate the amount of daylight to the time of year. [Clarification Statement: 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.]

Indicators:

ESS1.A: The Universe and Its Stars

- **Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1- ESS1-1)**

ESS1.B: Earth and the Solar System

- **Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)**

Understandings:
Students will understand that…

- the sun is a star that gives off light and heat.
- day and night make a pattern.
- the sun's apparent motion makes a pattern in the sky that is predictable.
- the moon is visible at night when the sky is dark.
- the moon's apparent motion makes a pattern in the sky that is predictable.
- stars are seen on clear nights.
- people make patterns of stars that they can use.
- the shape of the Little Dipper can help locate the North Star.
- Alkaid is located at the end of the Big Dipper and has a pattern of motion.
- Cepheus and the North Star appear to move.
- seasons have a pattern once a year.
- daylight changes with the seasons.
- sunrise and sunset change daily.
- an astronomer studies objects in space.

Essential Questions:

- What are the sun's patterns of day and night?
- What is the moon's pattern in the sky?
- How do people use the stars' patterns?
- How do the changes in the patterns of the sun relate to the different seasons?
- What does an astronomer do?

Assessment Evidence

Performance Tasks:

Investigate Lessons – Students will practice performance tasks in cooperative groups engaging in scientific steps of an investigation.

- Lesson 4 – Observe the pattern of the sun in the sky and predict its future pattern.
- Lesson 7 – Describe the pattern of the moon in the sky and predict its future pattern.
- Lesson 13 – Describe how Cepheus and the North Star appear to move.

Think Like A Scientist: Plan and Investigate Lessons – Students will engage in performance tasks in cooperative groups to plan and conduct an investigation, provide evidence and use that evidence to explain results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric.

- Lesson 15 – Observe and record when sunrise and sunset occur at different times of the year. Compare data to relate the amount of daylight to the time of the year.

Other Evidence:

Students will demonstrate their understandings through:

- Science Notebook Entries
- Goals and Scales Analysis
- Unit Tests

Benchmarks:

Benchmarks will be administered twice during the school year (at the end of Marking Period 2 and 4). The benchmark at the end of Marking Period 2 will include concepts from Physical and Earth Science. The benchmark at the end of Marking Period 4 will include concepts from Life Science. Results will be graded on the scale of Secure, Developing and Beginning Skills.

Earth Science Unit Test Percentages (Based on 12 Questions):

Secure = 80% - 100%

Developing = 60% - 79%

Beginning = Below 60%

Learning Plan

Resources: National Geographic Learning: Exploring Science Teacher's Guide, Student Book, Interactive eBook, Website and Student Science Notebook. Become an Expert "Day and Night on Cinco de Mayo" is a supplemental student leveled book that can be used throughout the unit in either a whole group, small group or individual setting.

Learning Activities:

Lesson and Duration	Activities	Materials / Suggested Resources
Lesson 1 (Pages Text 110-111 Online 98-99) The Sun NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe the sun. 1 Day	**Engage:** View and discuss the video "Active Sun" in the Interactive Ebook. Tap the student's knowledge about the sun and stars. **Explore:** Students observe the picture of the sun on page 110-111 / 98-99 and describe what they see. Ask probing questions to encourage exploration. Set a purpose to read to be able to describe the sun. Read pages. **Explain:** Discuss with students how to describe the sun. Go on a sentence hunt to answer questions related to stars and the sun. Define the word sun. Ask Teach the Dimensions questions. **Elaborate:** View and sketch images of the sun from the internet. Students can create stories of the sun from different times of the day. **Evaluate:** "Wrap it Up" Recall and Observe understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • YouTube pictures of the sun https://www.youtube.com/watch?v=uI2yZQOKOGk https://www.youtube.com/watch?v=ZJjYB-hWxMc https://www.youtube.com/shorts/tw495rLt2l4 • Literacy By Design Guided Reading Books "Stars in the Sky" Level E and "A Dictionary of Space" Level F
Lesson 2 (Pages Text 112-113 Online 100-101) Day and Night NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe how day and night make a pattern. 1 Day	**Engage:** Students describe the appearance of the sky in the day and night. View and discuss online pictures of daytime and nighttime (not the image at night is the moon / not the sun) **Explore:** Students observe the pictures on pages 112-113 / 100-101 and ask probing questions to encourage exploration. Set a purpose to read in order to describe how day and night make a pattern. Read pages. **Explain:** Define the word pattern. Students refer back to the text and describe how day and night make a pattern.Ask Teach the Dimensions questions. **Elaborate:** Students think more about day and night and list activities they do for each. **Evaluate:** "Wrap it Up" Explain and Observe understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet of day and night time https://www.youtube.com/watch?v=uI2yZQOKOGk

Lesson 3 (Pages Text 114-115 Online 102-103) The Sun in the Sky NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe the pattern of the sun's apparent motion in the sky. 1 Day	**Engage:** View and discuss the video "Star and Sunrise" in the Interactive Ebook. Help students recall what causes daylight. **Explore:** Students observe and explain the picture on page 114 / 102-103 and the sequence of pictures on page 115 /102-103. Set a purpose to read in order to describe the pattern of the sun in the sky. Read pages. **Explain:** Describe the pattern of the sun in the sky and predict the sun's pattern for tomorrow. Ask Teach the Dimensions questions. **Elaborate:** Students identify East and West relative to your school and discuss the sun's path. **Evaluate:** "Wrap it Up" Recall and Predict understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Optional Mystery Science Activity: How Can The Sun Help You If You're Lost? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/sun-shadows/mystery-3/sun-daily-patterns/81?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 4 (Pages Text 116-117b Online 104-105) Investigate – The Sun NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Observe the pattern of the sun in the sky. Predict the future pattern of the sun in the sky. 1 Day (Elaborate can extend this lesson into weekend activities.)	**Engage:** View and discuss internet photos of the solar system (just need to show part of the video to see size different). Quick Hands-On activity to understand the sun's size close and far away. Ask probing questions about when you see the sun. Students sketch what they know about the sun at morning, noon, and at night. **Explore:** Guide students through the investigation on pages 116-117 / 104-105 through steps 1-4. Students record their observations and predictions in their Science Notebook and/or Class Chart. **Explain:** Students share their observations. Ask probing questions to help students draw conclusions. Ask Teach the Dimensions questions. **Elaborate:** Lead a teacher demonstration about the sun moving across the sky using a globe and flashlight.Ask 321 questions. **Evaluate:** "Wrap it Up" Describe, Explain and Predict understandings in Science Notebook and/or Class Chart.	* • Science Notebook • Chart Paper • Internet picture of the solar system https://www.youtube.com/watch?v=nqPV8K6Zqfw • Paper • Crayons • Paper plates (9x9") cut in half • Earth/Sky scene as a template • Flashlight • Globe

Lesson 5 (Pages Text 118-119 Online 106-107) The Moon NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe when the moon is visible. 1 Day	**Engage:** View and discuss photographs of the moon up close. Students share experiences with seeing the moon. **Explore:** Students observe the picture of the moon first on pages 118-119 / 106-107. Ask probing questions to encourage exploration. Set a purpose to read in order to describe when the moon is visible. Read pages. **Explain:** Students find sentences to describe the moon. Generate a list of words to describe the moon. Preview other moon books and discuss new learnings. **Elaborate:** Students examine pictures of the phases of the moon to further describe. Extend students thinking about the moon by drawing its different shapes. **Evaluate:** "Wrap it Up" Describe and Explain understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet pictures of the moon https://www.youtube.com/watch?v=giTdkmurDts • Internet pictures of phases of the moon https://www.youtube.com/watch?v=f4ZHdzl6ZWg • Literacy By Design "A Dictionary of Space" Level F *Schoolwide Mentor Text Day Light, Night Light.(pg18) • Other books on hand about the moon • Optional Mystery Science Activity: When Can You See The Full Moon? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/moon-stars/mystery-1/moon-phases-patterns/812?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 6 (Pages Text 120-121 Online 108-109) The Moon in the Sky NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe the pattern of the moon's apparent motion in the sky. 1 Day	**Engage:** View and discuss the video "Moonrise" in the Interactive Ebook. Students recall where in the sky they have seen the moon. Recall from previous lessons when the moon is visible. **Explore:** Students observe the picture of the full moon on page 120 / 108 and then the picture of the sequence of the moon in the night sky on page 121 / 108-109. Set a purpose to read to describe the pattern of the moon in the sky. Read pages. **Explain:** Recall the definition of a pattern. Describe the pattern of the moon in the sky and predict what will happen tomorrow. **Elaborate:** Students find out more about the pattern of the moon in the sky stressing the arch-shaped path and east to west pattern. **Evaluate:** "Wrap it Up" Recall and Predict understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper

Lesson 7 (Pages Text 122-123b Online 110-111) Investigate – The Moon NJSLS 1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted. Objective: Describe the pattern of the moon in the sky. Predict the future pattern of the moon in the sky. 1 Day (Can extend into observing the moon at home at night)	**Engage:** Teacher leads a demo using basketball and tennis ball representing the Earth and Moon. Discuss what the moon looks like in the daytime. **Explore:** Guide students through the investigation steps on pages 122-123 / 110-111. **Explain:** Students share their observations and predictions. Students point to their pictures where their observations match and do not match their predictions. Ask "Graffiti Board" questions. In Teach the Dimensions questions students about the "moon's light" and relate to reflecting light from physical science lessons. **Elaborate:** Students repeat their observations at home at nighttime and predict the moon's pattern. Quick Hands-On activity exploring effects of light sources and sources that reflect light. Ask 321 questions. **Evaluate:** "Wrap it Up" Describe and Predict understandings in Science Notebook and/or Class Chart.	● Science Notebook ● Chart Paper ● Basketball ● Tennis Ball ● Paper ● Crayons ● Paper plate (9x9") cut in half ● Template of the Earth/Sky scene and make copies for students. ● Flashlights

Lesson 8 (Pages Online 112-113) Katherine Johnson: Space Hero NJSLS 1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted. (Related to a scientist's career.) Objective: How math can influence and achieve success in the space program. 1 Day	**Engage:** Conduct Teacher-led Demo with a paper plane and questioning. Tap prior knowledge about becoming a mathematician. **Explore:** Read about Katherine Johnson and her contributions to space travel. **Explain:** Describe how math is important to space exploration. View and discuss video "Katherine Johnson: The Girl Who Loved to Count." Ask Teach the Dimensions questions. **Elaborate:** Students further discuss what can math do to help you achieve? **Evaluate:** "Wrap it Up" Describe and Predict understandings in Science Notebook and/or Class Chart.	● Science Notebook ● Chart Paper

Lesson 9 (Pages Text 124-125 Online 114-115) Stars NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe when you can observe stars. Explain why you can see stars only at night. 1 Day	**Engage:** View and discuss photos of the Milky Way. Ask students to describe observing stars at night. **Explore:** Students observe the photographs on page 124-125 / 114-116 and determine how the stars are alike and different. Set a purpose to read in order to describe when you can observe stars. Read pages. **Explain:** Students describe when you can observe stars and explain why you can see stars only at night. Ask Teach the Dimensions questions. **Elaborate:** View internet video of stars and galaxies. Students can draw what they see. **Evaluate:** "Wrap it Up" Describe and Explain understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet view of Milky Way https://www.youtube.com/watch?v=Da_Wc_G9ms4 • Internet video of stars / galaxies (can also play other time during day or scroll through during lesson) https://www.youtube.com/watch?v=CrgYEblQkac • *Literacy By Design guided reading book "Stars" • Schoolwide Mentor Text Day Light, Night Light (pg 11) • Optional Mystery Science Activity: Why Do The Stars Come Out At Night? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/moon-stars/mystery-2/stars-daily-patterns/128?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 10 (Pages Text 126-127 Online 116-117) Star Patterns NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe how people use stars to make a pattern. Explain how people use star patterns. 1 Day	**Engage:** View and discuss stars in the Milky Way. Draw dots on the board in the shape of a square and have students imagine connecting the dots to make a square. Introduce constellations. **Explore:** Observe and discuss the pictures on pages 126-127/ 116-117 Set a purpose to read in order to describe how people use stars to make a pattern. Read pages. **Explain:** View ;pictures of Big Dipper, Orion and Scorpius. Students describe and explain how people use stars to make a pattern. View Internet sky map to view other constellations. **Elaborate:** View the Milky way again and search for more patterns. **Evaluate:** "Wrap it Up" Describe, Recall and Explain understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet view of Milky Way https://www.youtube.com/watch?v=Da_Wc_G9ms4 • Internet sky map (go to heading "What to Look for?" https://www.amnh.org/explore/ology/astronomy/a-kids-guide-to-stargazing • Literacy by Design guided reading book "Stars in the Sky" Level E • black paper • White chalk or crayon • Literacy By Design" Guided Reading Book Stars in the Sky (pg 10-12)

Lesson 11 (Pages Text 128-129 Online 118-119) Stars in the Sky NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe the Little Dipper and the location of the North Star. Explain how the Little Dipper appears to move in the night sky. 1 Day	**Engage:** View and discuss video "Stars Appear to Move" in the Interactive Ebook. Tap prior knowledge about seeing stars late at night or early in the morning. Students recall Big Dipper from the previous lesson. **Explore:** Students view pictures and set a purpose to find out about how the Little Dipper appears to move in the night sky. Read pages. **Explain:** Describe the Little Dipper and the location of the North Star. Explain how the Little Dipper appears to move across the night sky. **Elaborate:** Further discuss the Little Dipper and the North Star and its apparent motion and if it is similar or different from the motion of the sun and the moon. **Evaluate:** "Wrap it Up" Describe and Predict understanding in a Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Optional Mystery Science Activity: How Can Stars Help You If You Get Lost? See prep work, materials, and handouts in this link as well: https://mysteryscience.com/moon-stars/mystery-3/stars-seasonal-patterns/156?code=Mjc0MTM1OTc0&t=student&chapter=all
Lesson 12 (Pages Text 130-131 Online 120-121) Patterns of Motion NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Describe Alkaid's pattern of motion. 1 Day	**Engage:** View and discuss the video of the Big and Little Dipper. Recall how the sun appears to move across the sky. Discuss the path of the sun and remind students about the pattern of the Little Dipper. **Explore:** Students observe the picture and read the caption - pg 130/ 120. Discuss terms Alkaid and its relation to the picture. Students look again to identify the fainter group of stars. Read pages. **Explain:** Students describe Alkaid's and motion. Question students about this pattern. **Elaborate:** Students find out more about Alkaid's Motion by modeling the apparent movement of the sun, moon and the Big Dipper. **Evaluate:** "Wrap it Up" Identify, summarize understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet video of the Big and Little Dipper https://www.youtube.com/watch?v=yPevaP1Zt1s

Lesson 13 (Pages Text 132-133b Online 122-123) Investigate- The Night Sky NJSLS ESS1.1 Use observations of the sun, moon, and stars to describe patterns that can be predicted. Objective: Describe how Cepheus appears to move. Describe how the North Star appears to move. 1 Day	**Engage:** Review how stars appear to move in the sky. View and discuss internet videos of stars that appear to move across the night sky. Recall Alkaid's pattern of motion and what students learned. Investigate how other star patterns move. **Explore:** Read pages 132-133 / 122-123 and complete steps 1-4. **Explain:** Students share predictions and observations. Teacher asks Teach the Dimensions questions about how students think like a scientist. **Elaborate:** Students use the night sky model to observe and predict how the North Star appears to move. Compare this to how Cepheus appears to move. Students create their own cartoon constellations. Ask 321 questions. **Evaluate:** "Wrap it Up" Compare, Summarize and Predict understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Paper • Scissors • Sharp pencils • Brass fasteners • Blackline Masters from Teacher's Guide. • Internet video of stars moving across the night sky https://www.youtube.com/watch?v=HsJxGpDmJrQ

Stem Lesson (Pages Online 124-125) NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) Objective: Identify an engineering problem. Design, build, test and analyze a prototype of a sundial. Use observations to make predictions and test the predictions.	**Engage:** Conduct teacher-led demo about the sun and why the sun appears to change position. View and discuss the sundial in the Earth Science Gallery. Students sketch a landscape indicating N, S, E, W and how the sun is seen in the sky. Step 1: Define the problem of how to tell time without a clock. Ask Teach the Dimensions questions. **Explore:** Carry out the investigation. Step 2: Design a solution. Step 3: Test your solution. Step 4: Refine or change your solution. **Explain:** Students share and explain their findings. Ask Teach the Dimensions questions. **Elaborate:** Students make predictions about the sundial's position at the start of the school day. Further investigate the sundial and its markings. **Evaluate:** Wrap it Up" Compare, Summarize and Predict understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Materials to make a sundial

Lesson 14 (Pages Text 134-135 Online 126-127) Seasons NJSLS ESS1.B Seasonal patterns of sunrise and sunset can be observed, described and predicted. Objective: Describe the pattern of the seasons. Conclude that each season happens once each year. 1 Day	**Engage:**View and discuss the photo "New York City in Winter" in the Earth Science Gallery. Ask students to describe their favorite time of year making reference to the weather. **Explore:** Observe the background picture on page 134-135 / 126-127 and describe the maple tree. Then observe and discuss the tree in the four seasons. Set a purpose to read in order to describe the pattern of the seasons. Read pages. **Explain:** Define and describe the four seasons. Use Teach the Dimensions questions so students name and describe the pattern of the seasons. Conclude that each season happens once each year. **Elaborate:** Explore animals that are seasonal migrators. View and discuss videos of salmon swimming upstream and the salmon life cycle and how it migrates. **Evaluate:** "Wrap it Up" Summarize and Conclude understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet video of Life Cycle of Salmon and their migration https://www.youtube.com/watch?v=2xG6waimZnI • Internet video of Salmon swimming upstream https://www.youtube.com/watch?v=aPf4qtCDRtE
Lesson 15 (Pages Text 136-137 Online 128-129) Light and the Seasons NJSLS ESS1.B Seasonal patterns of sunrise and sunset can be observed, described and predicted. Objective: Explain how daylight changes with the seasons. Predict how sunrise and sunset will change from one day to the next. 1 Day	**Engage:** View and discuss internet video of the summer / winter solstice (start at second 40). Have students share their experiences about the number of hours of daylight in different seasons. **Explore:** Observe and compare the pictures on page 136-137 / 128-129. Set a purpose to read in order to explain how daylight changes with the seasons. Read pages. **Explain:** Draw a picture of a horizon line and define the terms sunrise and sunset. Project the table on TG page 136 / 128 and compare daylight hours during the different seasons. Students conduct a virtual lab "Patterns in the Sky" from the Resource menu. Ask Teach the Dimensions questions. **Elaborate:** Students find out more about daylight and the seasons by examining a table of sunrise and sunset in our area. **Evaluate:** "Wrap it Up" Recall, Infer and Predict understandings in Science Notebook and/or Class Chart.	• Science Notebook • Chart Paper • Internet video of summer / winter solstice https://www.youtube.com/watch?v=UiAUG1HtWIM • Choose a city and create a calendar for sunrise and sunset http://sunrisesunset.com/predefined.asp • Sunrise / Sunset Times in NJ https://www.timeanddate.com/sun/@5101760 • Optional Mystery Science Activity: Why Do You Have To Go To Bed Early In The Summer? See prep work, materials, and handouts in this link as well: **https://mysteryscience.com/sun-shadows/mystery-4/daylight-seasonal-patterns/143?code=Mjc0MTM1OTc0&t=student&chapter=all**

Lesson 17 (Pages 138-139b Online 132-133) Think Like a Scientist – Make Observations About Sunrise, Sunset and the Seasons NJSLS 1-ESS1-2 Make observations at different times of the year to relate the amount of daylight to the time of year. Objective: Observe and record when sunrise and sunset occur at different times of the year. Compare data to relate the amount of daylight to the time of year.	**Engage:** Students share what they learned in the previous lesson about how daylight changes with the seasons. Students sketch pictures of evenings in summer and winter. Read pages 138-139 / 132-133 to find out how they will make observations and think like a scientist. Reread step 1 to determine what Sheena observed and what question she asked. **Explore:** Students begin planning their own investigation rereading step 2 on page 138 / 132. Guide students in carrying out their plans by asking questions. See questions on TG page 139 / 133 Students add the "Sunrise and Sunset in Fall" table to add to their science notebook. **Explain:** Students analyze their results referring back to the investigation question "Could the time of sunrise and sunset change? "What evidence supports your findings?" Ask Teach the Dimensions questions. **Elaborate:** Find out more about how the time of sunrise and sunset change by researching other cities' data. Students write about other things students can observe in the sky. **Evaluate:** Students Summarize and Infer understandings in Science Notebook and/or Class Chart. Teacher and students use rubrics.	• Science Notebook • Chart Paper • paper • crayons
Science Career (Pages Online134-135 Astronomer NJSLS ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) (Scientists look for patterns and order when making observations about the world.) Objective: Connect the concept of patterns of motion of the sun, moon, stars, and planets with the career of an astronomer. 1 Day	**Engage:** Students share experiences they have with using a telescope or visiting an observatory with a large telescope. View and discuss videos on the internet about Hubble Telescope images. **Explore:** Preview and discuss the background picture of the telescope. On page 134-135 read about Knicole Colon and determine her career. Discuss what she wants to discover. Set a purpose to discover what an astronomer does and read pages. **Explain:** Describe the work of an astronomer by referring back to sentences in the text. Connect the science concepts of the moon's pattern to the career of an astronomer. Students ponder if this is a career they would like to pursue and why. **Elaborate:** Students discuss and write more about the career of an astronomer. **Evaluate:** Students Recall, Explain and Predict understandings in Science Notebook and/or Class Chart..	• Science Notebook • Chart Paper • Internet videos of the Hubble Telescope https://www.youtube.com/watch?v=0V08M1NcdJQ https://www.youtube.com/watch?v=IN1KJ8LYW3U https://www.shutterstock.com/video/search/hubble-telescope-images?cr=c&gad_source=2&gclid=EAIaIQobChMIgOTjtqa5hwMV383CBB1vWwgiEAEYASABEgIQe_D_BwE&gclsrc=aw.ds&kw=&pl=PPC_GOO_US_FT_PM-

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): **1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted. [Clarification Statement: 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.]**	
4.0	Students will be able to: **In addition to completing research and determining patterns at 3.0, students can** ● Conduct repeated observations of the sun, moon and stars over several days to describe and extend patterns and make future predictions.
3.0	Students will be able to: ● **Use observations of the sun, moon, and stars to describe patterns that can be predicted. [Clarification Statement: 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.]**
2.0	Students will be able to: ● Define stars, sun, pattern, apparent motion, moon, appeared. ● Identify changes in the sun, moon and stars.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): **1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year. [Clarification Statement: 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.]**	
4.0	**Students will be able to:** **In addition to completing research and determining patterns at 3.0, students can** ● Conduct further observations over several consecutive days to determine the amount of daylight. ● Predict a pattern of daylight within a given season.
3.0	**Students will be able to:** ● **Make observations at different times of year to relate the amount of daylight to the time of year. [Clarification Statement: 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.]**
2.0	**Students will be able to:** ● Define seasons, patterns, year, sunrise, sunset, daylight. ● Identify the amount of daylight in a given day.
1.0	**With help, partial success at level 2.0 content and level 3.0 content:**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	● Students make comparison drawings to extend thinking. (Examples on TG pages 115) ● Extend the idea of apparent motion with kinesthetic activities. (Example on TG pages 129) ● Students make different charts or graphs to depict differences. (Example on TG page 137) ● Students extend thinking in the Elaborate section of lessons.
Struggling Learners	● Direct students to make more concrete drawings to understand concepts (Examples on TG pages 115, 129, 137) ● Group students by ability to differentiate instruction or mix abilities to provide exposure to advanced thinking.
English Language Learners	● Vocabulary: pattern, moon, seasons, sunrise, sunset ● Ask yes or no questions when seeking understandings. (Examples on TG pages 119, 125) ● Provide sentence frames to assist with articulation of concepts.(Examples on TG pages 119, 125) ● Give students sentence stems to complete. (Examples on TG pages 119, 125)
Special Needs Learners	● Pre-cut and/or Pre-assemble models students will need to study. ● Limit questions to the core content of the lessons. ● Provide tables for students to add to the science notebook.

Interdisciplinary Connections

Indicators:
8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
8.2.2.B.1 Identify how technology impacts or improves life.
8.2.2.B.3 Identify products or systems that are designed to meet human needs.
9.2.4.A.1 Identify different types of work and how work can help people achieve personal and professional goals
9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

Integration of 21st Century Skills

Indicators:
Reading:
RL.CR.1.1. Ask and answer questions about key details in a **literary** text (e.g., who, what, where, when, why, how).
RI.CR.1.2. Determine main topic and retell a series of key details in informational texts (e.g., who, what, where, when, why, how).
RI.IT.1.3 Describe relationships among pieces of information (e.g., sequence of events, steps in a process, cause-effect and compare-contrast relationships) within a text.
L.VL.1.2 Ask and answer questions to determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1 reading and content.
RI.MF.1.6 With prompting and support, use text features (e.g., diagrams, tables, animations) to describe key ideas.
Writing:
W.IW.1.2 With prompts and support, write informative/explanatory texts to examine a topic and convey ideas and information.
W.WR.1.5 With prompting and support, generate questions through shared research about a topic and determine possible sources to obtain information on that topic.
W.SE.1.6 With guidance and support from adults, gather and select information from multiple sources to answer a question or write about a topic.
Mathematics:
1.DL.A.1 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.