## Somerville Public Schools
### CURRICULUM MAP WITH SCOPE AND SEQUENCE

**Subject Area:** Science  
**Grade Level:** First Grade

<table>
<thead>
<tr>
<th>Unit 1</th>
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</table>
| **September-November - 10 Weeks**  
**Focus:** Earth & Space Sciences | **December-February - 10 Weeks**  
**Focus:** Waves and their Applications in Technologies for Information Transfer | **March-April - 10 Weeks**  
**Focus:** Researching Heredity in Animals and Plants | **May-June - 10 Weeks**  
**Focus:** Using Animal Research to Solve Human Problems |

### Transfer Goals

| Transfer Goal 1: Observe the sun, moon, and stars and record the patterns that are occurring  
**Transfer Goal 2:** Apply understanding of patterns of daylight and how it impacts seasons and everyday life. | **Transfer Goal 1:** Observe that vibrating materials can make sound  
**Transfer Goal 2:** Observe that objects can be seen only when illuminated and determine the effect of different materials in the path of a beam of light  
**Transfer Goal 3:** Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. | **Transfer Goal 1:** Physical traits that are similar but not identical are passed down from parent to child. | **Transfer Goal 1:** Investigate how plants and animals use their external structures to help them survive, grow, and meet their needs.  
**Transfer Goal 2:** Use materials to design a device that solves a specific problem. |

### Enduring Understandings

- Shadows are created by the sun  
- Shadows are a result of light being blocked  
- Depending on where the sun is in the sky shadows can be longer or shorter.  
- There is a connection between earth’s place in relation to the sun  
- Seasons are impacted by the amount of sunlight and earth’s placement in the sky  
- The sun is a large object that looks small because it is far away  
- Stars cannot be seen during the daytime, but are still  
- Light is important because objects can be seen if light is available to illuminate them or if they give off their own light  
- Light and sound can be used to solve a problem of communicating over a distance  
- Vibrating materials can make sound and sound can make materials vibrate  
- Young plants and animals are very similar to their parents.  
- Young plants and animals are not exactly the same as their parents.  
- Similarities and differences in features are evidence that young plants and animals are very much, but not exactly, like their parents  
- Similarities and differences in features are evidence that although individuals of the same type of animal or plant are recognizable as similar, they can also vary in many ways.  
- Plants and animals have traits inherited from parents  
- There is a variation of traits inherited in a group of similar  
- Every human-made product is designed by applying some knowledge of the natural world  
- The shape of natural and human-made objects are related to their function  
- 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.  
- Animals have different behaviors that help them survive  
- Plants have different parts that help them survive and grow. (Roots, stems, leaves, flowers, fruits)
there

● The sun appears to move across the sky always rising in the east and setting in the west in a predictable pattern.
● The moon is another object in the sky that follows a predictable pattern.

organisms

● A physical characteristic is a feature on a plant or animal such as hair color

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### Essential Questions

- What is in the sky that impacts life on earth?
- What patterns do you see in the sky?
- How do people adapt to the patterns in the sky?
- Why is light important?
- How can you use light and sound to solve a problem of communicating over a distance?
- How are young animals/plants like their parents? What traits do they share?
- How are young animals/plants different from their parents? What makes each organism unique?
- How can you describe the different body parts and behaviors that animals use to survive?
- How would you design something that will solve a real-life problem or make life easier?

### Major Skills

- Observing objects in the sky
- Identifying patterns of night and day
- Relating the position of the sun to the size and direction of shadows
- Asking questions about phenomena (including objects in the sky and the surrounding environment)
- Observe that sound and light are all around us.
- Observe that sound can travel through waves.
- Identify how the behavior of light changes when it strikes different objects (translucent, transparent, opaque).
- Observe that light is a form of energy and can travel very fast.
- Identify physical characteristics between a parent and offspring
- Understand that not all offspring will be identical to their parent (concept of variation)
- A group of organisms (living things) share physical traits as they are passed down from generation to generation
- Researching texts and media to analyze the physical characteristics of plants and animals
- Describing the physical characteristics of plants and animals as well as their purpose
- Determining the function of an object based on its shape and structure. (Describing the purpose of plants or animals’ physical characteristics.)
- Designing logical solutions to real problems
- Explaining how animals respond to danger in their surroundings

### PBL’s & Assessments

#### PBL Name: VDV Space School

**Goal:**
- Students will take the role of an astronomer to explain a pattern observed in the sky

**Role:** Astronomer

**Audience:** Astronomers, NASA employees, parents

#### PBL Name: Light and Sound Interactive Museum

**Goal:**
- The students will take on the role of a scientist to create an exhibit for a light and sound museum. The students will use information obtained to create an exhibit showcasing cause and effect relationships between light and

#### PBL Name: Animals or Plant Creations

**Goal:**
- Research how physical traits and how traits are passed down to offspring. Students will then create a new/original animal with specific physical traits and create a model of that offspring using a classmate’s animal.

**Goal:**
- Students will research different plants and animals. Learning about what plants and animals look like is important, and the goal of this unit is to learn how these characteristics help plants and
| Situation: | You are preparing for a mission to space. Your captain tells you that you cannot go on the spaceship without understanding patterns in the sky. You must pass the astronomer test and earn your different badges. Each badge will represent a different pattern in the sky. The students will be responsible for showcasing their understanding of patterns in the sky through choosing one pattern to become an expert on. The following patterns may be chosen as options:  
○ Moon Phases  
○ Rotation (day/night, sunrise/sunset and stars)  
○ Revolution (seasons, amount of daylight changing)  
○ Shadow Explanation | sound using real world materials. The students will be presented a scenario where their boss has asked you to create a show that teaches your friends about light or sound. Your job is to choose which form of energy you think your friends need to learn more about. Choose 2 of the requirements your show must include based upon your choice:  
○ Include or make objects that create sound  
○ A way to make sound softer or louder  
○ How to change pitch  
○ A way sound can be used to communicate  
○ Teacher Anecdotal Notes  
○ Unit 2 Summative Assessment | Role: Zoologist, farmer or Botanist  
**Audience:** Local flower shop owners, farmers and parents  
**Situation:**  
You are the boss at the zoo or flower shop and you are very worried because people haven’t been visiting your establishment. Your boss has asked you to create a new type of animal or plant for guests to come visit. Your job is to create the following:  
○ Pick two animals/plants that will help create your original creation  
○ Outline at least 3 physical traits  
○ Develop a name for that animal/plant  
○ Compare your animal/plant to your classmates  
**Product:**  
Students may create one of the following products to fulfill requirements:  
○ Clay model  
○ Drawing  
○ Google Presentation  
○ Teacher Anecdotal Notes  
○ Unit 3 Summative Assessment |  
| Role: Architect  
**Audience:** Architects, parents, and community  
**Situation:**  
An egg is in danger! What can you do to help make sure that this egg stays safe? Build a house that will include different ideas that mimic animal adaptations.  
**Product:**  
Students may create one of the following products to fulfill requirements:  
○ Live Presentations with a model  
○ Utilize digital device (iPad, Google Presentation)  
○ Teacher Anecdotal Notes  
○ Unit 4 Summative Assessment |
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<th>Modifications, Accommodations, and Enrichment</th>
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<td>SMARTboard technology</td>
<td>Chromebooks</td>
<td>Link to Modifications</td>
<td>1-ESS1-1: Use observations of the sun, moon, and stars to describe patterns that can be predicted</td>
<td>9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve</td>
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<tr>
<td>Google Applications</td>
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<td>Link to Modifications</td>
<td>1-ESS1-2: Make observations at different times of the year to relate the amount of daylight to the time of the year</td>
<td>9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve</td>
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<td>(Documents, Forms, Spreadsheet, Presentation)</td>
<td>Pencils</td>
<td>Link to Modifications</td>
<td>1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.</td>
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<td>iPads</td>
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<td>1-PS4-2 Make observations to construct an evidence-based account that objects can be seen only when illuminated.</td>
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<td>Anchor Charts</td>
<td>1-PS4-3 Plan &amp; conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.</td>
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<td>Teacher Laptop</td>
<td>1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.</td>
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<td>Chromebooks</td>
<td>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.</td>
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<td>Pens</td>
<td>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.</td>
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<td>Pencils</td>
<td>1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.</td>
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<td>K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</td>
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<td>Career Awareness, Exploration, and Preparation</td>
<td>CRP, ELA, Math, and Technology Standards</td>
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<td>work can help a person achieve personal and professional goals. 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.</td>
<td>CRP Standards:</td>
<td>CRP1. Act as a responsible and contributing citizen and employee.</td>
<td>CRP2. Apply appropriate academic and technical skills.</td>
<td>CRP4. Communicate clearly and effectively and with reason.</td>
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<td>CRP7. Employ valid and reliable research strategies.</td>
<td>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</td>
<td>CRP11. Use technology to enhance productivity.</td>
<td>CRP12. Work productively in teams while using cultural global competence.</td>
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<td>CRP12. Work productively in teams while using cultural global competence.</td>
<td>ELA Standards:</td>
<td>W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure. (1-PS4-2)</td>
<td>W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-LS3-1)</td>
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<td>W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-LS3-1)</td>
<td>W.1.7 Participate in shared research and writing projects (e.g.,</td>
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Math Standards:

- MP.2 Reason abstractly and quantitatively. (1-PS4-1)
- 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-PS4-3)
- 1.MD.A.2 Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (1-PS4-4)

Math Standards:

- MP.5 Use appropriate tools strategically. (1-PS4-1)
- 1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)
- 1.OA.C.6 Add and subtract within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)
- 1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 - 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.

Math Standards:

- MP.2 Reason abstractly and quantitatively. (1-LS1-1)
- MP.5 Use appropriate tools strategically. (1-LS1-1)
- 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-LS1-1)
- 1.MD.A.2 Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (1-LS1-1)

Math Standards:

- 1.NBT.B.3 Compare two two-digit numbers based on the meanings of the tens and one digits, recording the results of comparisons with the symbols , , and . (1-LS1-2)
- 1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. (1-LS1-2)
- 1.NBT.C.5 Given two two-digit numbers, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. (1-LS1-2)
- 1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the
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<th>Technology Standards:</th>
<th>8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).</th>
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<td>8.1.2.B.1 Illustrate and communicate original ideas and stories using multiple digital tools and resources.</td>
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<td>8.1.2.C.1 Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media</td>
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<td>8.1.2.D.1 Develop an understanding of ownership of print and nonprint information.</td>
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<td>8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.</td>
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| Technology Standards: | 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue. |