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

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<tr>
<th>Subject Area: Science</th>
<th>Grade Level: Kindergarten</th>
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#### Unit 1: September-October (8 Weeks)
**Focus:** Push/Pull

- **Transfer Goals**
  1. Develop and evaluate the strength of a push or a pull.
  2. Gather information to determine if a design works as intended to change the direction or speed of an object.
  3. Compare two tests that are designed for the same problem and determine strengths and weaknesses of each test’s performance.

- **Enduring Understandings**
  - Science helps in the design of a playground through exploring the impact of “pushes” and “pulls”, speed, force, and how to design equipment that is safe.
  - A design can be changed to increase or decrease the impact of push and pull through changing the incline.

#### Unit 2: November-December (8 Weeks)
**Focus:** Weather

- **Transfer Goals**
  1. Observe local weather conditions to describe patterns over time.
  2. Design and conduct investigations about the weather forecasting.
  3. Analyze results of observation and develop a plan to solve a problems that has been presented.

- **Enduring Understandings**
  - Weather can be measured by observing and recording weather data in order to identify patterns.
  - There is a cause and effect relationship within weather events.
  - Problems can be solved by:
    - Defining simple problem
    - Developing new or improved object or tool

#### Unit 3: January-February (8 Weeks)
**Focus:** Living Things

- **Transfer Goals**
  1. Observe and compare multiple observations of living things (animals and plants).
  2. Create a model to represent the needs of different plants and animals and the places they live in the natural world.

- **Enduring Understandings**
  - Living things need water, air and resources from the land, and they live in places that have the things they need.
  - Systems in the natural and designed world have parts, or structures, that work together.
  - Plants, animals and humans can change their environments to meet their needs.

#### Unit 4: March-April (8 Weeks)
**Focus:** Needs of Living Things

- **Transfer Goals**
  1. Engineer, design or plan a solution that will reduce the impact of humans on land, water, air and/or living things in the local environment.
  2. Make observations of the sun and earth’s surface to describe patterns of change.

- **Enduring Understandings**
  - Humans can change their environments to meet their needs.
  - Asking questions, making observations, and gathering information are helpful in thinking about problems. Before designing and engineering a solution, it is important to clearly understand the problem.

#### Unit 5: May-June (8 Weeks)
**Focus:** Effects of the Sun

- **Transfer Goals**
  1. Design and build a structure that will reduce the warming effect of sunlight, and then conduct tests to determine if the structure works as intended.

- **Enduring Understandings**
  - Scientists use different ways to study the world.
  - Events have causes that generate observable patterns.
  - Sunlight warms Earth’s surface.
  - The shape and stability of structures of natural and designed objects are related to their function(s).
  - Designs can be conveyed through sketches, drawings, or physical models. These
representations are useful in communicating ideas for a problem’s solutions to other people.
- Because there is always more than one possible solution to a problem, it is useful to compare and test designs.

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<tr>
<th>Essential Questions</th>
<th>Major Skills</th>
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<td>● What does science have to do with playing on the playground? ● How can you design a simple way to change the speed or direction of an object using a push or pull?</td>
<td>● Designing simple tests to gather evidence to support or refute ideas about cause and effect relationships ● Planning and conducting an investigation with peers ● Comparing the strengths of different directions of pushes and pulls on the motion of an object ● Analyzing data from a test of an object or tool to determine if it works as intended ● Pushes and pulls can have different strengths and directions ● Designing simple “push or pull” tests can gather evidence to support or refute ideas about cause and effect relationships</td>
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<td>● How can someone predict what the weather will be tomorrow? ● How does weather forecasting help us to prepare for dangerous weather?</td>
<td>● Use and share observations of local weather conditions to describe patterns over time ● Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather ● 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 ● Generate questions</td>
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<td>● What do plants and animals need to live and grow? ● Where do plants and animals live and why do they live there? ● How can animals and plants change their habitat?</td>
<td>● Using observations to describe patterns in what animals and plants need to survive ○ Plants do not need to take in food, all plants require light, all living things need water ○ Animals need to take in food, different kinds of food are needed by different types of animals, all living things need water ● Using a model to represent the needs of different plants and animals and the places they live</td>
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<td>● How can humans reduce their impact on the land, water, air and other living things in the local environment?</td>
<td>● Communicating solutions with others, orally or in written form, using models and drawing ● Communicating solutions that will reduce the impact of humans on the land, water, air, and other living things in the local environment ● Asking questions based on observations to find more information about the natural and/or designed world ● Define a simple problem that can be solved through the development of a new or improved object or tool ● Ask questions, make observations, and gather information about a situation that people want to change to define a simple problem that can be solved through the development of a new or improved object or tool ● Generate questions</td>
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| ● How does sunlight affect the playground? ● Imagine that we have been asked to design a new playground. How would we keep the sand, soil, rocks, and water found on the playground cool during the summer? | ● Observe patterns in events generated by cause-and-effect relationships. ● Describing how the shape and stability of structures are related to their function. ● Using tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. ● Using tools and materials to design and build a structure (e.g., umbrellas, canopies, tents) that will reduce the warming effect of sunlight on an area. ● Developing a simple model based on evidence to represent a proposed model.
refute ideas about cause-and-effect relationships
● Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it
● When objects touch or collide, the object’s motion can be changed
● The force of the push or pull will make things speed up or slow down more quickly.
● There is a cause and effect relationship within push and pull investigations
● Problems can be solved by:
  ○ Defining simple problem
  ○ Developing new or improved object or tool

about the designed world and the purpose of weather

● Students will take on the role of a meteorologist and collect information about the weather in Somerville in order to make logical predictions for future weather. In addition to tracking and predicting weather in Somerville, students will research weather patterns in other states and countries to learn

● Students will take on the role of a biologist and will plan, design and build a model of what a habitat at a newly built zoo would look like for an animal of their choice. Students will learn of the role of a biologist and other individuals that would collaborate with the biologist to maintain a zoo. In their model, students will show

● Students will take on the role of an environmentalist and will plan and develop a solution to an environmental issue caused by humans. Students will create a flyer, advertisement, book or commercial to demonstrate their solution. These solutions will be provided to the VDV community whether

● Developing 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.
● Analyzing data from tests of an object or tool to determine if it works as intended.

| PBL’s & Assessments | PBL Name: The Ultimate Playground | Goal: Students will take on the role of a playground engineer and plan, design and construct a playground structure for a playground in Somerville, NJ. They will explore different ways of pushing and pulling objects, specifically, where pushes and pulls can be found on the playground. Students about the designed world and the purpose of weather to change in order to define a simple problem that can be solved through the development of a new or improved object or tool. | PBL Name: “Newsflash!” - What’s the Weather? Goal: Students will take on the role of a meteorologist and collect information about the weather in Somerville in order to make logical predictions for future weather. In addition to tracking and predicting weather in Somerville, students will research weather patterns in other states and countries to learn. | PBL Name: A Home for All Goal: Students will take on the role of a biologist and will plan, design and build a model of what a habitat at a newly built zoo would look like for an animal of their choice. Students will learn of the role of a biologist and other individuals that would collaborate with the biologist to maintain a zoo. In their model, students will show. | PBL Name: A Greener and Healthier Tomorrow! Goal: Students will take on the role of an environmentalist and will plan and develop a solution to an environmental issue caused by humans. Students will create a flyer, advertisement, book or commercial to demonstrate their solution. These solutions will be provided to the VDV community whether | PBL Name: The Ultimate Playground: Part 2 Goal: Students will take on the role of a playground engineer and plan, design and construct a playground structure for a playground in Somerville, NJ. The summer is right around the corner and the sun makes the playground hot. They will explore different materials found on the playground and ways to keep the |
### Role: Engineer of a playground

**Audience:** Mayor or government officials

**Situation:**
- An engineer was hired by Somerville, NJ to create the ultimate playground and he needs your help! You will join him as a fellow engineer in training to plan, design and construct a structure on the playground. Once your structure is complete, you will test it to see if it will keep the playground cool.

**Product:**
- Create a shade structure to keep the playground cool made from a variety of materials.

### Role: Meteorologist for a news channel

**Audience:** News Weather Station, parents and community

**Situation:**
- A new friend has moved to Somerville from another country. He/She doesn’t know what to wear to be comfortable and prepared to go outside. You will take on the role of a meteorologist (or weather forecaster) and create a news segment for your new friend so he/she knows what to wear when going outside.

**Product:**
- Create a fake news video segment of a weather forecast based on research.

### Role: Zoologist/Biologist

**Audience:** Biologist/Zoologist professors and/or students from local colleges

**Situation:**
- There is a new exhibit being built at the Turtle Back Zoo and they are in need of a zoologist/biologist to manage the collection of animals for the new zoo habitat. As the newly hired zoologist/biologist, students will choose an animal to add to the Turtle Back Zoo’s group of animals. They will research different types of animals and use their research to build a habitat that will sustain the animal’s needs. At Van Derveer School and in the town of Somerville. He needs your help to teach the VDV community about some alternative solutions to create a “Greener and Healthier Tomorrow.”

**Product:**
- Create a flyer, advertisement, book, or commercial about a plan to help people be healthy.

### Role: Engineer of a playground

**Audience:** Engineers or engineering students

**Situation:**
- An engineer was hired by Somerville, NJ to complete the ultimate playground that began construction in September! You will join him as a fellow engineer in training to plan, design and construct a structure on the playground. Once your structure is complete, you will test it to see if it will keep the playground cool.

**Product:**
- Create a shade structure to keep the playground cool made from a variety of materials.
At the end of their research and habitat creation, they will share their habitats and will vote on what new habitat would be the best to share with a zoologist at the Turtle Back Zoo.

**Product:**
- Drawing, diorama or poster of a zoo habitat
- Teacher Anecdotal Notes
- Unit 3 Summative Assessment

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<td>NJSLS Standards</td>
<td>K-PS2-1 Plan and conduct an investigation to compare the effects of different strengths or different directions of</td>
<td>K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time</td>
<td>K-LS1-1: Use observations to describe patterns of what plants and animals need to survive.</td>
<td>K-ESS3-3 Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.</td>
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| ELA Standards: | • RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS2-1)  
| W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS2-2)  
| SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2)  
| Math Standards: | • MP.2 Reason abstractly and quantitatively. (K-PS2-1) |
| K.MD.A.1 | MP.4 Model with mathematics. (K-ESS2-1) |
| K.MD.A.1 | K.CC.A Know number names and the count sequence. (K-ESS2-1) |
| K.MD.A.1 | K.MD.A.1 Describe measurable attributes of objects, such as length or weight. |
| K.MD.B.3 | K.MD.B.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1) |
| W.K.7 | W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1) |

**Math Standards:**
- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. (K-ESS2-1)
- K.MD.B.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1)

**Technology Standards:**
- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.B.1 Illustrate and communicate original ideas and stories using multiple digital tools and resources.
- 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.
- 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.
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