Green Township School District

Grade 2 Science Curriculum Unit 1

Revised July 2017

<table>
<tr><th colspan="3"><u>Unit 1: Measurement</u></th></tr>
<tr>
<td>Lesson 1.1</td>
<td>
NJ Student Learning Science Standards:

● This Science unit is foundational and based on crucial mathematic standards to be used throughout the rest of the year.
● See Grade 2 Math Curriculum Unit 2, 7, & 8

NJ Student Learning Math Standards:
● 2.MD.A.1: Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
● 2.MD.A.2: Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
● 2.MD.A.3: Estimate lengths using units of inches, feet, centimeters, and meters.
● 2.MD.A.4: Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
● 2.MD.B.5: Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g. by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
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<td>
Concept(s):
● Linear measurement using standard and nonstandard units

Students will be able to:
● Measure accurately using both nonstandard and stand units (cm/m) to measure the length of common objects
● Compare and order three or more objects according to their length
● Describe the length of different objects using appropriate vocabulary
● Explain why a standard unit of measurement is more reliable than a nonstandard unit
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Lesson 1.2	***NJ Student Learning Science Standards:*** ● This Science unit is foundational and based on crucial mathematic standards to be used throughout the rest of the year. ● **See Grade 2 Math Curriculum Unit 2, 7, & 8** ***NJ Student Learning Math Standards:*** ● ***3.MD.A.2**: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).	**Concept(s)**: ● Weight measurement using standard and nonstandard units **Students will be able to**: ● Measure accurately using nonstandard units to measure the weight of common objects* ● Compare and order three or more objects according to their weight ● Describe the weight of objects using appropriate vocabulary ● Explain why a standard unit of measurement is more reliable than a nonstandard unit ***Teacher notes regarding book lesson and activities:** *To align the science and math curriculums, modify the book objectives and activities to meet the goal of the grade 2 math measurement standards. Students are not required to measure in grams, kilograms, etc. until grade 3, therefore, students can be introduced to the concept but assessments do not need to include the third grade standard.*
Lesson 1.3	***NJ Student Learning Science Standards:*** ● This Science unit is foundational and based on crucial mathematic standards to be used throughout the rest of the year. ● **See Grade 2 Math Curriculum Unit 2, 7, & 8** ***NJ Student Learning Math Standards:*** ● **2.MD.D..10:** Draw a picture bar graph and a bar graph (with whole number scale) to represent a data set with up to four categories. ● ***3.MD.A.2**: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l)	**Concept(s)**: ● Measuring capacity and liquid measurements **Students will be able to**: ● Measure accurately using both nonstandard units to measure the capacity of containers* ● Use nonstandard units to compare and order the relative capacities of various containers ● Describe the capacity of the containers using comparative language such as more/greater/greatest, less/least, and equal ● Use a bar graph to show results. ***Teacher notes regarding book lesson and activities:** *To align the science and math curriculums, modify the book objectives and activities to meet the goal of the grade*

		2 math measurement standards. Students are not required to measure in liters, milliliters, etc. until grade 3, therefore, students can be introduced to the concept but assessments do not need to include the third grade standard.
Lesson 1.4	***NJ Student Learning Science Standards:*** ● This Science unit is foundational and based on crucial mathematic standards to be used throughout the rest of the year	**Concept(s)**: ● Measuring temperature **Students will be able to**: ● Explain how to measure temperature ● Describe situations in which they use thermometers in their daily lives

Other Interdisciplinary Connections	
NGSS Appendix for Alignment	***English-Language Arts:*** **RI.2.4.** Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area. **RI.2.5**. Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently. **RI.2.6.** Identify the main purpose of a text, including what the author wants to answer, explain, or describe. **RI.2.7.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. **RI.2.8.** Describe and identify the logical connections of how reasons support specific points the author makes in a text. **RI.2.10**. Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed. **W.2.2.** Write informative/explanatory texts in which they introduce a topic, use evidence-based facts and definitions to develop points, and provide a conclusion. **W.2.8.** Recall information from experiences or gather information from provided sources to answer a question. **SL.2.1.** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. A. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). B. Build on others' talk in conversations by linking their explicit comments to the remarks of others. C. Ask for clarification and further explanation as needed about the topics and texts under discussion. **SL.2.2.** Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. **SL.2.3.** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional

	information, or deepen understanding of a topic or issue. **SL.2.4.** Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences. **SL.2.5.** Use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. **SL.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **CRP11. Use technology to enhance productivity.** **CRP12. Work productively in teams while using cultural global competence.**
2014 NJ Technology Standards:	**8.1 Educational Technology** (Word | PDF) All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge. **8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** (Word | PDF) All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. Please see relevant projects for technology standards 8.1 and 8.2:
District/School Primary and Supplementary Resources	
Primary Resource: ***Knowing Science: Second Grade: What's the Matter?*** www.knowingscience.com 2016 Knowing Science, LLC	**BrainPOP** **Pebble Go**

Materials	
Materials for each session activity and lesson are listed in the Knowing Science Teacher's Manual.	
School/ Formative Assessment Plan	**School/District Summative Assessment Plan**
● Teacher observation of students engaged in group and independent activities. ● Individual and small group conferences/interviews to assess understanding with rubric ● Self-assessment by students with guidance from teacher.	● Teacher created assessments and projects ● Teacher/District created benchmark assessments ● Linear Measurement Assessment (Session 8 - Activity sheet 10)

Differentiation/Accommodations/Modifications

Gifted and Talented

(content, process, product and learning environment)

Extension Activities

- Conduct research and provide presentation of various topics.
- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Exploration of art and/or artists to understand society and history.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).

Anchor Activities

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

Modifications for Classroom

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

Modifications for Homework/Assignments

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

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- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication

- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and Assignments

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

Modifications for Assessments

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
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Students at Risk of School Failure

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Grade 2 Science Curriculum Unit 2

Revised July 2017

Unit 2: Matter and Materials		
Lesson 2.1	***NJ Student Learning Science Standards:*** ● **See Grade 2 Math Curriculum Unit 2, 7, & 8** ● **2-PS1-1**. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.] ● **2-PS1-2**. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.] ***NJ Student Learning Math Standards:*** ● **2.MD.D.10:** Draw a picture bar graph and a bar graph (with whole number scale) to represent a data set with up to four categories.	**Concept(s)**: ● Classifying matter by its properties **Students will be able to**: ● Use dichotomous (opposite) sorting to classify a set of attributes ● Define a 'fair test' ● Plan an investigation to determine which material is best suited for a specific task
Lesson 2.2	***NJ Student Learning Science Standards:*** ● **2-PS1-1**. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.] ***NJ Student Learning Math Standards:*** ● **2.MD.D.10:** Draw a picture bar graph and a bar graph (with whole number scale) to represent a data set with up to four categories.	**Concept(s)**: ● States of matter: solid, liquid, gas **Students will be able to**: ● Recognize that all matter takes up space and has mass ● Find distinctions/relationships between solids liquids, and gases, based on observable properties

Green Township School District

Grade 2 Science Curriculum Unit 2

Revised July 2017

Lesson 2.3	***NJ Student Learning Science Standards:*** ● **2-PS1-3**. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.] ● **2-PS1-4**. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]	**Concept(s)**: ● Change in matter **Students will be able to**: ● Describe how water can change from one state to another ● Explain that a change in temperature causes water to change states ● Describe how heating/cooling can cause reversible/irreversible changes ● Explore how a structure made of separate pieces can be rearranged to form a new one

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www.knowingscience.com 2016 Knowing Science, LLC	

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(content, process, product and learning environment)

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- Provide regular parent/ school communication
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Modifications for Homework and Assignments

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Students at Risk of School Failure

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Green Township School District

Grade 2 Science Curriculum Unit 3

Revised July 2017

Unit 3: Ecosystems		
Lesson 3.1	***NJ Student Learning Science Standards:*** ● **2-LS2-1**. Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.]	**Concept(s)**: ● What plants need to survive **Students will be able to**: ● Explain that all of a plant's basic needs must be met in order for it to live and grow ● Describe the roles that a plant's roots, stems, and leaves play in its food production and survival ● Plan and carry out a guided inquiry about the basic needs of plants ● Record observations from the inquiry ● Communicate ideas about their observations both verbally and in writing
Lesson 3.2	***NJ Student Learning Science Standards:*** ● **2-LS4-1**. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]	**Concept(s)**: ● Habitat **Students will be able to**: ● Compare characteristics of the following ecosystems: woodland forest and rainforest; desert and polar (tundra); and fresh and saltwater ● Give examples of animals and plants that live in each ecosystem ● Understand that within each ecosystem there are many habitats which are able to support the plants and animals suited specifically to living there ● Locate main idea and details in content-based nonfiction text using text features

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Grade 2 Science Curriculum Unit 3

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Lesson 3.3	***NJ Student Learning Science Standards:*** ● **2-LS2-2**. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	**Concept(s)**: ● Plant and animal adaptations and interdependency **Students will be able to**: ● Differentiate between structural and behavioral adaptations ● Classify adaptations in terms of basic needs: taking in water and nutrients, breathing, defense and protection from predators, finding shelter, and managing body temperature ● Give examples of external structures and information processing systems which are suited to a particular ecosystem ● Explain interdependent relationships between animals and plants in any given ecosystem (pollination, dees dispersal, food, and shelter) ● Locate main idea and details on content-based nonfiction text using text features
Lesson 3.4	***NJ Student Learning Science Standards:*** ● **2-LS2-2**. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	**Concept(s)**: ● Food chains **Students will be able to**: ● Differentiate between and give examples of producers and consumers ● Differentiate between and give examples of herbivore, carnivore, omnivore, decomposer, predator, and prey ● Construct a food chain that correctly shows the relationship among the sun, producers, consumers, and decomposers ● Explain how members of any food chain or food web are connected to, or dependent upon, each other

Green Township School District

Grade 2 Science Curriculum Unit 3

Revised July 2017

Lesson 3.5	***NJ Student Learning Science Standards:*** ● **2-LS4-1**. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]	**Concept(s)**: ● Habitat change and interconnectedness **Students will be able to**: ● Explain interdependency within a food web or habitat as a 'system' ● Give cause and effect examples of natural changes in a habitat: rain or snowfall, flood, drought, wildfire, or other natural disaster ● Give cause and effect examples of human impact on habitats and classify them as positive or negative ● Give examples of how people can be good stewards of their local habitat

Other Interdisciplinary Connections	
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<u>Differentiation/Accommodations/Modifications</u>

Gifted and Talented

(content, process, product and learning environment)

Extension Activities

- Conduct research and provide presentation of various topics.
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Anchor Activities

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

Modifications for Classroom

- Pair visual prompts with verbal presentations

- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

Modifications for Homework/Assignments

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

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- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and Assignments

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

Modifications for Assessments

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
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Students at Risk of School Failure

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Green Township School District

Grade 2 Science Curriculum Unit 4

Revised July 2017

Unit 4: Fast and Slow Changes and Earth's Structure		
Lesson 4.1	***NJ Student Learning Standards:*** ● **2-ESS2-2**. Develop a model to represent the shapes and kinds of land and bodies of water in an area. [Assessment Boundary: Assessment does not include quantitative scaling in models.]	**Concept(s)**: ● Landforms and water features **Students will be able to**: ● Explain how landform maps serve as models of Earth's features ● Locate and describe the main types of landform and water features ● Differentiate between salt and fresh water features ● Create a model to represent landforms and water features
Lesson 4.2	***NJ Student Learning Standards::*** ● **2-ESS1-1**. Use information from several sources to provide evidence that Earth events can occur quickly or slowly. [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]	**Concept(s)**: ● Fast and slow changes in Earth's surface features **Students will be able to**: ● Differentiate between slow and fast changes to Earth's surface ● Explain and give examples of weathering as a slow change ● Explain and give examples of erosion as a slow changes ● Explain and give examples of fast changes to Earth's surface

Green Township School District

Grade 2 Science Curriculum Unit 4

Revised July 2017

Lesson 4.3	***NJ Student Learning Standards::*** ● **2-ESS2-1**. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.* [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.] ● **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. ● **K-2-ETS1-3**. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. The performance expectations above were developed usin	**Concept(s)**: ● Erosion prevention engineering challenge **Students will be able to**: ● Design and compare multiple solutions designed to prevent or slow water from changing the shape of the land ● Create a labeled diagram and physical model to illustrate how the solution solves the given problem ● Analyze observational data from tests of multiple design solutions ● Compare how each design solution performs

Other Interdisciplinary Connections	
NGSS Appendix for Alignment	***English-Language Arts:*** **RI.2.4.** Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area. **RI.2.5**. Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently. **RI.2.6.** Identify the main purpose of a text, including what the author wants to answer, explain, or describe. **RI.2.7.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. **RI.2.8.** Describe and identify the logical connections of how reasons support specific points the author makes in a text. **RI.2.10**. Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed. **W.2.2.** Write informative/explanatory texts in which they introduce a topic, use evidence-based facts and definitions to develop points, and provide a conclusion. **W.2.8.** Recall information from experiences or gather information from provided sources to answer a question. **SL.2.1.** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. A. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). B. Build on others' talk in conversations by linking their explicit comments to the remarks of others. C. Ask for clarification and further explanation as needed about the topics and texts under discussion.

	SL.2.2. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. **SL.2.3.** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue. **SL.2.4.** Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences. **SL.2.5.** Use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. **SL.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **CRP11. Use technology to enhance productivity.** **CRP12. Work productively in teams while using cultural global competence.**
2014 NJ Technology Standards:	**8.1 Educational Technology** (Word | PDF) All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge. **8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** (Word | PDF) All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. Please see relevant projects for technology standards 8.1 and 8.2:
District/School Primary and Supplementary Resources	
Primary Resource: ***Knowing Science: Second Grade: What's the Matter?***	**BrainPOP** **Pebble Go**

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