FIRST GRADE


Students entering the first grade should have an understanding of the five senses and how the use of their senses help in science observations and investigations. The continued use of high interest subject matter piqued by their natural curiosity will further develop student understanding and skills in making observations, generating questions, planning and conducting simple investigations, meaning-making, and presentation of findings. In addition to the skills the students acquired in their kindergarten experience, first grade students will recognize the importance of multiple trials in their investigations before drawing conclusions or presenting findings. The first grade students, in all three science content disciplines, physical, life, and Earth, will be required to make careful and purposeful observations in order to raise questions, investigate, and make meaning of their findings.

<table>
<thead>
<tr>
<th>Inquiry Processes</th>
<th>Inquiry Analysis &amp; Communication</th>
<th>Reflection &amp; Social Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-7 Standard S.IP: Develop an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems. S.IP.E.1 Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation. S.IP.01.11 Make purposeful observation of the natural world using the appropriate senses. S.IP.01.12 Generate questions based on observations. S.IP.01.13 Plan and conduct simple investigations. S.IP.01.14 Manipulate simple tools (for example: hand lens, pencils, rulers, thermometers, rain gauges, balances, non-standard objects for measurement) that aid observation and data collection. S.IP.01.15 Make accurate measurements with appropriate (non-standard) units for the measurement tool. S.IP.01.16 Construct simple charts from data and observations.</td>
<td>K-7 Standard S.IA: Develop an understanding that scientific inquiry and investigations require analysis and communication of findings, using appropriate technology. S.IA.E.1 Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations. S.IA.01.12 Share ideas about science through purposeful conversation. S.IA.01.13 Communicate and present findings of observations. S.IA.01.14 Develop strategies for information gathering (ask an expert, use a book, make observations, conduct simple investigations, and watch a video).</td>
<td>K-7 Standard S.RS: Develop an understanding that claims and evidence for their scientific merit should be analyzed. Understand how scientists decide what constitutes scientific knowledge. Develop an understanding of the importance of reflection on scientific knowledge and its application to new situations to better understand the role of science in society and technology. S.RS.E.1 Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout history. S.RS.01.11 Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities. S.RS.01.12 Recognize that science investigations are done more than one time.</td>
</tr>
</tbody>
</table>
### Grade 1 Unit Content Expectations

<table>
<thead>
<tr>
<th>Properties of Objects</th>
<th>Animal life cycles and inherited traits</th>
<th>Plant and animal needs</th>
<th>Weather Changes: Daily and Seasonal</th>
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</thead>
<tbody>
<tr>
<td><strong>P.PM.E.1 Physical Properties</strong></td>
<td><strong>L.OL.E.2 Life Cycles</strong> 21 Describe the life cycle of animals</td>
<td><strong>L.OL.E.1 Life Requirements</strong> 13 Identify the needs of animals.</td>
<td><strong>E.ES.E.2 Weather Changes</strong> 21 Compare daily weather</td>
</tr>
<tr>
<td>11 Demonstrate the ability to sort according to observable attributes such as color, shape, size, sinking or floating.</td>
<td><strong>L.HE.E.1 Observable Characteristics</strong> 11 Identify characteristics that are passed on from parents to young. 12 Classify young animals based on characteristics that are passed on from parents.</td>
<td><strong>E.SE.E.1 Earth Materials</strong> 12 Describe how Earth materials contribute to the growth of plant and animal life.</td>
<td>22 Compare weather across seasons</td>
</tr>
<tr>
<td><strong>P.PM.E.3 Magnets</strong> 31 Identify magnetic materials 32 Observe the pattern of magnetic pole interactions</td>
<td><strong>E.E.S.E.1 Solar Energy</strong> 11 Identify the sun as the most important source of heat 12 Demonstrate the importance of sunlight in plant growth.</td>
<td><strong>E.E.S.E.3 Weather Measurement</strong> 31 Identify tools 32 Collect weather data.</td>
<td>23 Describe severe weather 24 Describe precautions</td>
</tr>
<tr>
<td><strong>P.PM.E.2 States of Matter</strong> 21 Demonstrate solid water 22 Demonstrate liquid water</td>
<td></td>
<td></td>
<td><strong>P.PM.E.2 States of Matter</strong> 21 Demonstrate solid water 22 Demonstrate liquid water</td>
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## Integration Teacher Notes

<table>
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<tr>
<th>Curriculum</th>
<th>Instructional Strategies</th>
<th>Resources</th>
<th>Assessment</th>
</tr>
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<tr>
<td>What do we want students to learn?</td>
<td>How will we deliver the curriculum?</td>
<td>What materials/resources will we need to ensure mastery.</td>
<td>How will we know if students learn?</td>
</tr>
</tbody>
</table>

**1st unit of focused instructional strategies, processes, skill development, or content expectations**

### Physical Science: Properties of Objects

#### Topic: Investigating Properties

<table>
<thead>
<tr>
<th>Math/Properties Connection</th>
<th>Physical Properties</th>
<th>Instructional Strategies</th>
<th>Resources</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/PM.01.11 - Demonstrate the ability to sort objects according to observable attributes such as color, shape, size, sinking or floating.</td>
<td>• Establish a Question – How can we sort objects? How do we know if an object belongs to a particular group?</td>
<td><em>BSCS Science Tracks – Investigating Properties</em></td>
<td>• Student reasoning and justification in the following formats</td>
<td></td>
</tr>
<tr>
<td>P/PM.01.31 Identify materials that are attracted by magnets.</td>
<td>• Hold “Science Talks” to discover student ideas.</td>
<td>PI/CRUST Kindergarten Trash Unit</td>
<td>o Science notebooks</td>
<td></td>
</tr>
<tr>
<td>P/PM.01.32 Observe that like poles of a magnet repel and unlike poles of a magnet attract.</td>
<td>• Use science notebooks to elicit student questions and ideas.</td>
<td>City recycling truck – school instructional visit</td>
<td>o Science journals</td>
<td></td>
</tr>
<tr>
<td>P/PM.01.21 Demonstrate that water as a solid keeps its own shape (ice).</td>
<td>• Use science notebooks as a venue for them to clarify and justify their thinking using evidenced based reasoning.</td>
<td>PI/CRUST 3rd Grade Magnet Unit</td>
<td>o Science talks</td>
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</tr>
<tr>
<td>P/PM.01.22 Demonstrate that water as a liquid takes on the shape of various containers.</td>
<td>• Explore and discover patterns relating to phenomena observed.</td>
<td>SCoPE Lessons for Science</td>
<td>o Classroom observations and discussions</td>
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<td></td>
<td>• Provide time for inquiry based instruction.</td>
<td><a href="http://www.oakland.k12.mi.us/scope/index.html">http://www.oakland.k12.mi.us/scope/index.html</a></td>
<td>• Student recorded data such as charts, graphs, worksheets, drawings, models, and descriptions</td>
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<tr>
<td></td>
<td>• Provide opportunities for students to record and interpret data.</td>
<td>SCoPE as a possibility or local development. (Introduce as a mini-unit - make connections as it applies to concepts within this unit. States of Matter GLCEs will be further addressed in the Weather Unit.)</td>
<td>• Teacher work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provide time for students to research questions they have about phenomena.</td>
<td>United Streaming - <a href="http://streaming.discoveryeducation.com">http://streaming.discoveryeducation.com</a></td>
<td>• Teacher created assessment materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provide opportunities for students to share and discuss ideas based on evidence.</td>
<td>Annenberg Media - <a href="http://www.learner.org">http://www.learner.org</a></td>
<td>• Student Presentations</td>
<td></td>
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<td></td>
<td>• Construct charts to display data.</td>
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</table>
Earth Science

**Topic: Weather**

**2nd unit of focused instructional strategies, processes, skill development, or content expectations**

<table>
<thead>
<tr>
<th>Teacher Notes</th>
<th>Curriculum</th>
<th>Instructional Strategies</th>
<th>Resources</th>
<th>Assessment</th>
</tr>
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<tbody>
<tr>
<td><strong>What do we want students to learn?</strong></td>
<td><strong>How will we deliver the curriculum?</strong></td>
<td><strong>What materials/resources will we need to ensure mastery.</strong></td>
<td><strong>How will we know if students learn?</strong></td>
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</table>

### Earth Science

**Math/Properties Connection**

Students describe and compare daily weather in terms of the properties of temperature, cloud cover, precipitations and wind. They identify and use tools to measure the properties and identify patterns of change in weather over the seasons in Michigan. They identify different forms of precipitation as water in solid and liquid form.

**E.E.S.E.2 Weather** - Weather changes from day to day and over the seasons.

- E.E.S.01.21 Compare daily changes in the weather related to temperature (cold, hot, warm, cool); cloud cover (cloudy, partly cloudy, foggy); precipitation (rain, snow, sleet, freezing rain); wind (breezy, windy, calm).
- E.E.S.01.22 Describe and compare weather related to the four seasons in terms of temperature, cloud cover, precipitation, and wind.
- E.E.S.01.23 Describe severe weather events.
- E.E.S.01.24 Describe precautions that should be taken for human safety during severe weather conditions (thunderstorms, lightning, tornadoes, high winds, blizzards, hurricanes).

**E.E.S.E.3 Weather Measurement** - Scientists use

### Assessment

Establish a Question –

- What is weather? How does it affect our daily lives? How can we describe weather? How can we stay safe during inclement weather? What observable characteristics are noticed as the seasons change?

- Record weather data daily throughout the year
- Refer to and use a criteria chart that illustrates temperature in terms of hot, warm, cool, and cold and in regards to appropriate attire: short sleeves, long sleeves, jacket, and heavy coat
- Identify weather patterns using recorded data to explain seasonal trends, cloud cover, precipitation
- Encourage students to watch for Bus Stop weather on local TV stations
- Research and create severe weather community awareness posters illustrating precautionary measures
- Predictions as meteorologists of actual weather
- Student weather reporters for

Possible pilot curricula:

- Weather – Carolina Biological Supply Company
- Investigating Weather (2nd) - BSCS TRACKS (Resource for Severe Weather- Lesson 7)
- Air and Weather – FOSS

Science Kits:

- Weather related instruments:
  - Thermometers
  - Rain Gauges
  - Wind Socks
  - NOAA Radio

Materials:

- Journals/Notebooks
- Chart Paper

- Student reasoning and justification in the following formats
  - Science notebooks
  - Science journals
  - Science talks
  - Classroom observations and discussions
- Student recorded data such as charts, graphs, worksheets, drawings, models, and descriptions
- Student work
- Teacher created assessment materials
- Student Presentations
| tools for observing, recording, and predicting weather changes. E.E.S.01.31 Identify the tools that might be used to measure temperature, precipitation, cloud cover and wind. E.E.S.01.32 Observe and collect data of weather conditions over a period of time. | announcements * Post weather daily near office/entrance 
* Compare weather using senses & weather tools/instruments 
* Practice safety measures 
* Participate in weather illustrations WILX & State Journal 
* Weather station comes to school or fieldtrip/invite a meteorologist 
* Observe & identify outside weather sources (puddles, rain, bird bath, dew, snow, hail, sleet, ice, & icicles 
* Record states of water from above observations 
* Record temperatures (warm, hot, cool, cold, using a criteria chart) 
* Students will identify & explain relationship patterns to outside temperatures and states of water 
* Predict what form of water might exist next week based on past data 
* Teacher will introduce & support student use of weather instruments to record data in appropriate contexts (For example, on a windy day the teacher would introduce a wind instrument (wind sock) after a discussion and an investigation occurs on how to record different strengths of pushes from the wind scale (calm, breezy, windy) | Computers Television Louie the Lightning Bug |
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<thead>
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<tbody>
<tr>
<td>P.P.M.E.2 States of Matter - Matter exists in several different states: solids, liquids and gases. Each state of matter has unique physical properties. Gases are easily compressed but liquids and solids do not compress easily. Solids have their own particular shapes, but liquids and gases take the shape of the container. P.P.M.01.21 Demonstrate that water as a solid keeps its own shape (ice). P.P.M.01.22 Demonstrate that water as a liquid takes on the shape of various containers. E.E.S.01.11 Identify the sun as the most important source of heat that warms land, air, and water on Earth.</td>
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<tr>
<td>Integration Teacher Notes</td>
<td>Curriculum</td>
<td>Instructional Strategies</td>
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**3rd Unit of focused instructional strategies, processes, skill development, or content expectations**

**Life Science: Plant and Animal Needs**

**Topic: Animals and Their Needs**

<table>
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<tbody>
<tr>
<td><strong>L.OL.01.13 Identify the needs of animals</strong></td>
<td>The emphasis should be on water and soil as needs of plants. (Air is a difficult concept for first graders. They can memorize and repeat it, but it is not understood in a conceptual manner.) Soil can contain water and some living things get the water they need from the soil. Without the heat from the sun nothing could live on earth. Living things have a need for a certain range of temperatures to live in their habitats.</td>
<td>Students K-O-W-L Charts</td>
</tr>
<tr>
<td><strong>E.SE.E.1 Earth Materials</strong></td>
<td>Establish a Question – What do living things need to survive and grow?</td>
<td>Recorded data</td>
</tr>
<tr>
<td><strong>E.SE.01.12 Describe how Earth materials contribute to the growth of plant and animal life.</strong></td>
<td>The emphasis should be on water and soil as needs of plants. (Air is a difficult concept for first graders. They can memorize and repeat it, but it is not understood in a conceptual manner.) Soil can contain water and some living things get the water they need from the soil. Without the heat from the sun nothing could live on earth. Living things have a need for a certain range of temperatures to live in their habitats.</td>
<td>Science Talks</td>
</tr>
<tr>
<td><strong>E.SE.E.1 Solar Energy</strong></td>
<td>Establish a Question – What do living things need to survive and grow?</td>
<td>Check lists</td>
</tr>
<tr>
<td><strong>E.ES.E.1 The sun warms the land, air and water and helps plants grow.</strong></td>
<td>Establish a Question – What do living things need to survive and grow?</td>
<td>Science notebooks and journals</td>
</tr>
<tr>
<td><strong>E.ES.01.11 Identify the sun</strong></td>
<td>Establish a Question – What do living things need to survive and grow?</td>
<td>Illustrations – Labeling (parts/function)</td>
</tr>
<tr>
<td></td>
<td>Establish a Question – What do living things need to survive and grow?</td>
<td>Venn diagram</td>
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<tr>
<td></td>
<td>Establish a Question – What do living things need to survive and grow?</td>
<td>Student Interviews</td>
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<td>Establish a Question – What do living things need to survive and grow?</td>
<td>Living Things Research Work and Presentation</td>
</tr>
<tr>
<td></td>
<td>Establish a Question – What do living things need to survive and grow?</td>
<td>Summative Assessment: Museum of Living Things - Application of Learned skills</td>
</tr>
</tbody>
</table>

**Other resources:**

- BSCS: Characteristics of Living Things – 2nd Grade
- 1st Grade McGraw-Hill Animals Are Living Things
- Assorted non-fiction trade books
- Computers to research living things
- Access to live animals i.e. fish, ants, pill & sow bugs

**Suggested pilot materials:**

- Students K-O-W-L Charts
- Recorded data
- Science Talks
- Check lists
- Science notebooks and journals
- Illustrations – Labeling (parts/function)
- Venn diagram
- Student Interviews
- Living Things Research Work and Presentation
- Summative Assessment: Museum of Living Things - Application of Learned skills
as the most important source of heat which warms the land, air, and water of the Earth.  

**E.ES.01.12** Demonstrate the importance of sunlight and warmth in plant growth.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
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</table>
| About Patterns- students will record evidence collected in relation to animal needs, and parts | *Hold a science talk – students will Explain Ideas About Patterns they’ve noticed about how living things use their body parts to live in their habitats  
*Introduce Scientific Ideas – Teacher will allow students to explore and investigate phenomena before introducing vocabulary words and scientific ideas.  
Create a class chart with the following headings, Earth Materials – water & soil, Food, Habitat/Protection, and Heat from the Sun  
* Compare Student Ideas and Scientific Ideas - Whole group - Students will share ideas to fill in the chart using their collected data as evidence of what living things need to survive and grow.  
*Apply to Near & Distant Contexts With Support – Students will research a particular living thing, make a puppet, and report to their peers the following information:  
-What it is/looks like.  
-Its parts & what they are for.  
-Its habitat & how it lives/eats/stays alive.  
*Museum of Living Things - Students will Apply learned skills by creating their own animal and explaining what it needs to survive in its habitat |

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**Rev. 11-13-08, 11-18-08**
<table>
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**4th Unit of focused instructional strategies, processes, skill development, or content expectations**

**Life Science: Animal Life Cycles an Inherited Traits**

**Topic: Investigating Life Cycles**

- **L.OL.E.2 Life Cycles- Plants and animals have life cycles. Both plants and animals begin life and develop into adults, reproduce, and eventually die. The details of this life cycle are different for different organisms.**
  - L.OL.01.21 Describe the life cycle of animals including the following stages: egg, young, adult; egg, larva, pupa, adult.

- **L.HE.E.1 Observable Characteristics- Plants and animals share many, but not all, characteristics of their parents.**
  - L.HE.01.11 Identify characteristics (for example: body coverings, beak shape, number of legs, body parts) that are passed on from parents to young.
  - L.HE.01.12 Classify young animals based on characteristics that are passed on from parents (for example: dogs/puppies, cats/kittens, cows/calves, chicken/chicks).

- **Establish a Question – What major changes does an animal go through over its lifetime? Animals go through identifiable stages during their lifetimes, which can be mapped through specific events.**
  - The following are suggested animals to investigate within the classroom; butterflies, frogs, mealworms, and earthworms.
  - Elicit initial student ideas – Use an O-K-W-L Chart- Students will first observe a mealworm and record under O, then students will write what the Know about mealworms.
  - Students will observe and record behaviors and changes of mealworms over time in a science journal.
  - Students will compare and contrast butterfly larva using a Venn diagram.

- **Establish a Question – Who are the parents are of this baby animal and how do you know?**
  - Students will explore phenomena looking for patterns to identify characteristics (for example: body coverings, beak shape, number of legs, body parts) that are passed on from parents to young. Using magazine photos to create groups of characteristics.
  - Using pictures students will explore phenomena matching parents with young based on characteristics that are passed on (for example: dogs/puppies, cats/kittens, cows/calves, chicken/chicks).
  - Students will share and provide explanations as to why they’ve chosen to group specific animals.

**Suggested Pilot Materials:**
- BSCS Tracks - Investigating Life Cycles (3)
- STC - Life Cycle of Butterflies (2)

**Resources:**
- Urban Options – Worm person
- Butterflies and mealworms should be delivered after directly after Spring Break.

**Field trips to:**
- MSU Butterfly house
- MSU Farms
- Potter Park Zoo