### 2019-2020 Science Curriculum Map, Grade 2

<table>
<thead>
<tr>
<th>Reading Focus: Literature, Informational Writing Focus: Narrative, Opinion, Informative/Explanatory</th>
<th><strong>Unifying Concept: Life Science</strong> Resource Kit: New Plants</th>
<th><strong>Suggested Duration: 11 weeks</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enduring Understandings:</strong> Plants’ basic needs must be met in order for them to develop structurally, to change and to grow. Plants need water, air, nutrients, and light. New plants can be propagated by several means: seeds, stems, bulbs, or roots.</td>
<td><strong>Essential Questions:</strong>  • What do plants need to live and grow?  • What other plant parts can grow new plants?  • What changes happen to plants as they grow?  • How can we make a new plant from an old one?  • How do plants provide food for humans and animals?  • How does a seed grow?  • What data can we collect about plant growth?</td>
<td><strong>Academic Vocabulary:</strong>  Adapt  Alive  Bud  Bulb  Cutting  Fertilizer  Flower  Germination  Grass  Grow  Leaf  Mold  Node  Mow  Pollen  Root  Same  Seed  Soil  Sprout  Stem  Structure</td>
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</table>

**Core Ideas for Knowing Science:**

L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.

**Core Ideas for Using Science:**

U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.

### Science & Engineering Practices:

Develop and Use Models  Observe, Evaluate and Communicate Information

### Crosscutting Concepts:


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**Standards**

2018 AZ Science Standards

**Focus:** Students develop an understanding that life on Earth depends on energy from the Sun or energy from other organisms to survive.

**Life Science Standards:**

Learning Progressions:

All living things need food as their source of energy as well as air, water, and certain temperature conditions. Plants containing chlorophyll can use sunlight to make the food they need and can store food that they do not immediately use. Animals need food that they can break down, which comes either directly by...
2.L2U1.9: **Obtain, analyze, and communicate evidence** that organisms need a source of energy, air, water, and certain temperature conditions to survive.

2.L2U1.10: **Develop a model** representing how life on Earth depends on energy from the Sun and energy from other organisms.

eating plants (**herbivores**) or by eating animals (**carnivores**) which have eaten plants or other animals. Animals are ultimately dependent on plants for their survival. The relationships among organisms can be represented as **food chains** and **food webs**.

All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.

<table>
<thead>
<tr>
<th>Social Justice Standards</th>
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<td><strong>Identity 1</strong> - I know and like who I am and can talk about my family and myself and name some of my group identities. (ID.K-2.1)</td>
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| Teaching Tolerance Anti-Bias Framework | [https://www.tolerance.org/frameworks](https://www.tolerance.org/frameworks) |
|----------------------------------------|

<table>
<thead>
<tr>
<th>Adopted Texts and Materials</th>
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<table>
<thead>
<tr>
<th>Textbook:</th>
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<tbody>
<tr>
<td>“New Plants” materials kit</td>
</tr>
<tr>
<td>Teacher’s manual for “New Plants”</td>
</tr>
<tr>
<td>8 copies of New Plants (Science Stories)</td>
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<td>FOSS website: <a href="http://www.fossweb.com">www.fossweb.com</a></td>
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<tr>
<th>Recommended Extended Texts:</th>
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<tbody>
<tr>
<td>Carol and the Squash Plant. Stevens, Janet</td>
</tr>
<tr>
<td>Tops and Bottoms. Stevens, Janet</td>
</tr>
<tr>
<td>The Little Seed. Carle, Eric</td>
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<table>
<thead>
<tr>
<th>Multicultural Books aligned with Unifying Concept:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Harvesting Hope. Krull, Kathleen</td>
</tr>
<tr>
<td>• The Tree Lady. Hopkins, Joseph.</td>
</tr>
<tr>
<td>• Planting the Trees of Kenya. Nivola, Claire.</td>
</tr>
<tr>
<td>• The Lotus Seed. Garland, Sherry</td>
</tr>
<tr>
<td>• The Forgiveness Garden. Thompson, Lauren</td>
</tr>
<tr>
<td>• Gathering the Sun. Ada, Alma Flor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scholastic Leveled Readers</th>
<th>Multicultural Inclusive Strategies</th>
<th>Science Kit Supplemental Resources</th>
</tr>
</thead>
</table>

| Instructional and Assessment Guides | Additional Instructional Resources |
### Culturally Responsive Practices (TUSD SPARKS, SPARKS Strategies)

**Anchor Phenomena:** Show fast frame video of a seed growing into a plant. What do students wonder? [https://www.youtube.com/watch?v=pB4ASdELBbQ](https://www.youtube.com/watch?v=pB4ASdELBbQ)

**NGSS Phenomena** How and why to use phenomena.

**Anchor Phenomena:** Plants adapt to their environment.

**Pre/Post Unit Assessment:**
[http://intranet/science/Kit_Asmts.html](http://intranet/science/Kit_Asmts.html)

**Class Concept Map** - Create a Class Concept Map-pre and post with linking phrases to indicate relationships of five senses.

**Formative/Performance Assessment** - examples:
- **Annotated Student Drawings:** students carefully record observations of plants found in the real world, both in human grown and naturally. Illustrations should be carefully annotated with scientific labels and short descriptions.
- **Scatterplot:** use this strategy for students to express their prior knowledge and/or learning throughout the unit. Develop higher order thinking questions for students to think and talk about as they “scatter” according to what they learned. Also increases student to student talk.
- **Use graphic organizers** for students to organize and demonstrate their earnings. At “Mowing the Lawn” students can create a “flap book” with illustrations and vocabulary to compare/contrast differences and similarities of the plan.

### Additional Resources:
- TUSD Science Resource Center Website
- Crosscutting Concept Resources
- National Academies Press
- Science and Engineering Practices
- Understanding & Applying Science & Engineering Practices
- EMC Bibliography of additional resources

### Educational Materials Center Resources, including books, kits, panels, and videos:
### Reading Focus: Literature, Informational
Writing Focus: Narrative, Opinion, Informative/Explanatory

### Unifying Concept: Physical Science

#### Resource Kit: Solids and Liquids

#### Suggested Duration: 11 weeks

### Enduring Understandings:
Everything in the universe (that we know of) is either matter or energy.

Matter is the stuff from which tangible objects are made and exists as solids, liquids or gases.

### Essential Questions:
- How can the properties of solids be described and used?
- In what ways are all liquids the same?
- How can mixtures of solid particles be separate?
- What happens when different solids are mixed with water?
- What happens when water is mixed with different liquids?

### Academic Vocabulary:
- Construct
- Rigid
- Crystal
- Screen
- Cylinder
- Separate
- Disappear
- Sieve
- Evaporation
- Sift
- Flow
- Static
- Layer
- Surface
- Mixture
- Swollen
- Observe
- Texture
- Particle
- Translucent
- Powder
- Viscous
- Property

### Core Ideas for Knowing Science:

**P1:** All matter in the Universe is made of very small particles

**P4:** The total amount of energy in a closed system is always the same but can be transferred from one energy store to another during an event

### Core Ideas for Using Science:

**U1:** Scientist explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. A new evidence is discovered, models and theories can be revised.

### Science & Engineering Practices:

**Plan and Carry Out Investigations**
**Analyze and Interpret Data**
**Obtain, Evaluate and Communicate Information**

### Crosscutting Concepts:

- Cause & Effect
- Systems & System Models
- Stability & Change
- Scale, Proportion, & Quantity
- Energy & Matter

### Standards

#### 2018 AZ Science Standards

**Focus:** Students develop an understanding of observable properties of matter and how changes in energy (heating or cooling) can affect matter or materials.

**Physical Science Standards**

### Learning Progressions:
### 2019-2020 Science Curriculum Map, Grade 2

| 2.P1U1.1: Plan and carry out an investigation | All the ‘stuff’ encountered in everyday life, including air, water and different kinds of solid substances, is called matter because it has mass, and therefore weight on Earth, and takes up space. Different materials are recognizable by their properties, some of which are used to classify them as being in the solid, liquid or gas state. Different kinds of matter exist (e.g., wood, metal, water), and many of them can be either solid or liquid, depending on temperature. |
| 2.P1U1.2: Plan and carry out investigations | There are various ways of causing an event or bringing about change in objects or materials. Heating can cause change, as in cooking, melting solids or changing water to vapor. |
| 2.P4U1.3: Obtain, evaluate, and communicate information about ways heat energy can cause change in objects or materials. | |

### Social Justice Standards

- **Identity 1** – I know and like who I am and can talk about my family and myself and name some of my group identities. (ID.K-2.1)
- **Diversity 9** – I know everyone has feelings, and I want to get along with people who are similar to and different from me. (DI.K-2.9)
- **Justice 12** – I know when people are treated unfairly. (JU.K-2.12)
- **Action 16** – I care about those who are treated unfairly. (AC.K-2.16)

### Adopted Texts and Materials

- **Textbook:**
  - “Solids and Liquids” materials kit
  - Teacher’s guide for “Solids and Liquids”
  - 8 copies of Solids and Liquids (Science Stories)
  - FOSS website: [www.fossweb.com](http://www.fossweb.com)
- **Multicultural Books aligned with Unifying Concept:**
  - What is the World Made Of? (2015) (K-4): Can you make an ice cube disappear? Put it on a hot sidewalk. It melts into water and then vanishes! The ice cube changes from solid to liquid to gas. This Level 2 Let’s-Read-and-Find-Out picture book is a fascinating exploration of the three states of matter.

### Instructional and Assessment Guides

- **Scholastic Leveled Readers**
- **Multicultural Inclusive Strategies**
- **Science Kit Supplemental Resources**

### Additional Instructional Resources
### 2019-2020 Science Curriculum Map, Grade 2

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<tr>
<td><strong>Anchor Phenomena</strong>: Watch a time-lapse video of an ice cube melting. Ask students – What do they wonder? <a href="https://www.youtube.com/watch?v=WgjksZoznuA">https://www.youtube.com/watch?v=WgjksZoznuA</a></td>
<td><strong>Additional Resources</strong>:</td>
</tr>
<tr>
<td><strong>NGSS Phenomena</strong> How and why to use phenomena.</td>
<td>- <a href="#">States of Matter Lesson Ideas</a></td>
</tr>
<tr>
<td><strong>Pre/Post Unit Assessment</strong>: <a href="http://curriculum.tusd1.org/Subject-Areas/Science/Science-Grade-2-Curriculum">http://curriculum.tusd1.org/Subject-Areas/Science/Science-Grade-2-Curriculum</a></td>
<td>- <a href="#">Study Jams</a></td>
</tr>
<tr>
<td><strong>Concept Map</strong> - pre and post with linking phrases to indicate relationships of concepts and processes</td>
<td>- <a href="#">BrainPop</a></td>
</tr>
<tr>
<td><strong>Formative/Performance Assessment</strong> - examples:</td>
<td>- <a href="#">EMC bibliography of additional resources</a></td>
</tr>
<tr>
<td>• Quick writes and drawings in science journals (explain how mixtures of particles can be separated, sort objects by their observable properties)</td>
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## 2019-2020 Science Curriculum Map, Grade 2

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<tr>
<th>Reading Focus: Literature, Informational Writing Focus: Narrative, Informative/Explanatory, Opinion</th>
<th><strong>Unifying Concept: Earth &amp; Space Science</strong> Resource Kit: Supplemental</th>
<th><strong>Suggested Duration: 11 weeks</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Enduring Understandings:</strong></td>
<td><strong>Essential Questions:</strong></td>
<td><strong>Academic Vocabulary:</strong></td>
</tr>
</tbody>
</table>
| Water and wind play a role in weather, shaping the earth, and determining where organisms live. | • Why do weather patterns change?  
• How does severe weather affect us and our community?  
• How does Earth’s surface change over time?  
• How do changes on Earth’s surface impact humans and other animals? How do they impact plants? How can wind and water change the Earth’s surface?  
• Why does the apparent shape of the moon change?  
• How does the Earth change position over the course of a day in relation to the Sun? | Air  
Animals  
Day  
Environment  
Lakes  
Land  
Landforms  
Liquid  
Living things  
Moon  
Night  
Ocean  
Organism  
Patterns  
Plants  
Ponds  
Rain  
Region  
Rivers  
Snow  
Solid  
Sunlight  
Temperature  
Water  
Weather  
Wind  |
| Wind and water can change the environment. |  |  |
| People and other organisms can change the environment. |  |  |
| There are patterns in changes in the sky including the position of Sun, Moon, and stars, and the apparent shape of the Moon. |  |  |

### Core Ideas for Knowing Science:

- **E1:** The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth’s surface and its climate.

- **E2:** The Earth and our Solar System are a very small part of one of many galaxies within the Universe.

### Core Ideas for Using Science:

- **U1:** Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. A new evidence is discovered, models and theories can be revised.

- **U2:** The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.

- **U3:** Applications of science often have both positive and negative ethical, social, economic, and/or political implications.

### Science & Engineering Practices:

- Ask Questions and Define Problems
- Develop and Use Models
- Plan and Carry Out Investigations
- Analyze and Interpret Data
- Obtain, Evaluate and Communicate Information

### Crosscutting Concepts:

- Patterns
- Cause & Effect
- Structure & Function
- Systems & System Models
- Stability & Change
### Focus:
Students develop an understanding of the distribution and role of water and wind in weather, shaping the land, and where organisms live. Wind and water can also change environments, and students learn humans and other organisms can change environments too. Students develop an understanding of changing patterns in the sky including the position of Sun, Moon, and stars, and the apparent shape of the Moon.

### Earth & Space Science Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.E1U1.4</td>
<td>Observe and investigate how wind and water change the shape of the land resulting in a variety of landforms.</td>
</tr>
<tr>
<td>2.E1U1.5</td>
<td>Develop and use models to represent that water can exist in different states and is found in oceans, glaciers, lakes, rivers, ponds, and the atmosphere.</td>
</tr>
</tbody>
</table>

### Learning Progressions:
Wind and water can change the shape of the land. The resulting landforms, together with the materials on the land, provide homes for living things. Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. It carries soil and rocks from one place to another and determines the variety of life forms that can live in a particular location.

Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. Designs can be conveyed through sketches, drawings, or physical models. Because there is always more than one possible solution to a problem, it is useful to compare designs, test them, and discuss their strengths and weaknesses.

Plants and animals (including humans) depend on the land, water, and air to live and grow. They in turn can change their environment (e.g., the shape of land, the flow of water).

There are patterns in the position of the Sun seen at different times of the day and in the shape of the Moon from one night to another.

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### Social Justice Standards

**Identity 1** – I know and like who I am and can talk about my family and myself and describe our various group identities. (ID.3-5.1)

**Diversity 6** – I like knowing people who are like me and different from me, and I treat each person with respect. (DI.3.5-6)
# 2019-2020 Science Curriculum Map, Grade 2

| Justice 11 – I try and get to know people as individuals because I know it is unfair to think all people in a shared identity group are the same. (JU.3-5.11) | Action 16 – I pay attention to how people (including myself) are treated, and I try to treat others how I like to be treated. (AC.3-5.116) |
| Teaching Tolerance Anti-Bias Framework [https://www.tolerance.org/frameworks](https://www.tolerance.org/frameworks) |

## Adopted Texts and Materials

<table>
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<tr>
<td>• Where is our Community?</td>
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## Instructional and Assessment Guides

### Culturally Responsive Practices ([TUSD SPARKS, SPARKS Strategies](http://www.tusd1.org/Departments/Educational-Materials-Center/Bibliographies/General-Bibliographies))

### Anchor Phenomena: Find an online picture of a child on a windy day. What do students wonder?

### NGSS Phenomena How and why to use phenomena.

### Pre/Post Unit Assessment: [http://intranet/science/Kit_Asmts.html](http://intranet/science/Kit_Asmts.html)

### Class Concept Map- Create a Class Concept Map-pre and post with linking phrases to indicate relationships of five senses.

### Formative/Performance Assessment - examples:
- Quick writes and drawings in notebooks (e.g., descriptions and drawings of different types of landforms.)
- Engage in arguments with evidence and reasoning.
- Landforms card sort assessment. Students will sort cards into two groups: landforms and not landforms.

## Additional Instructional Resources


### Additional Resources:
- [Models of Land and Water - NASA Lesson](http://www.nasa.gov/education/)
- [Landform Research Project](http://www.natureworkslearn.org/)
- [Sample Landform Lesson](http://www.teachervision.fen.com/)
- [Landform Webquest](http://www.tusd1.org/Departments/Educational-Materials-Center/Bibliographies/General-Bibliographies)
- [What is Weather?](http://www.weather.gov/)
- [The Sun and Moon - Teaching Resources](http://www.scholastic.com/teachers/)
- [Survival of a Plant](http://www.tusd1.org/Departments/Educational-Materials-Center/Bibliographies/General-Bibliographies)
- [Survival of an Animal](http://www.tusd1.org/Departments/Educational-Materials-Center/Bibliographies/General-Bibliographies)