### Reading Focus: Literature, Informational Writing Focus: Narrative, Opinion, Informative/Explanatory

### Unifying Concept: Earth and Space Science

**Air and Weather**

### Suggested Duration: 11 weeks

**Enduring Understandings:**
The Air & Weather unit introduces earth and science concepts to young students. They explore the natural world using simple tools to observe and monitor change.

**Essential Questions:**
- How does air interact with objects?
- How can we determine wind speed and direction?
- How can air do work?
- How can we collect weather information and use it in our lives?
- What does temperature tell us about weather conditions?
- How can we organize weather data to look for change?
- What do clouds tell us about the weather?
- When we observe the night sky what do we see?

**Academic Vocabulary:**
- Air resistance
- Air resistance
- Air resistance
- System
- Compress
- Matter
- Pressure
- Propellor
- Degrees Celsius
- Degrees Fahrenheit
- Monitor
- Prophector
- Degrees Fahrenheit
- Monitor
- Monitor
- Stratus
- Cumulus
- Cirrus
- Anemometer

### Standards

#### Highly-Leveraged Standards

**Strand 6: Earth and Space Science (HLS-22%)**

2.6.C3 Changes in the Earth and Sky: Understand characteristics of weather conditions and climate

- **PO1.** Measure weather conditions (e.g., temperature, precipitation).
- **PO2.** Record weather conditions (e.g., temperature, precipitation).
- **PO3.** Identify the following types of clouds:
  - Cumulus
  - Stratus
  - Cirrus
- **PO4.** Analyze the relationship between clouds, temperature, and weather patterns.

#### Supporting Standards

**Strand 5: Physical Science (HLS- 11%)**

2.5.S.1 Properties of Objects and Materials: Classify objects and materials by their observable properties.

- **PO1.** Describe objects in terms of measurable properties (e.g., length, volume, weight, temperature) using scientific tools.
- **PO2.** Classify materials as solids, liquids, or gases.
- **PO3.** Demonstrate that water can exist as a:
  - Gas – vapor
  - Liquid – water
  - Solid – ice
- **PO4.** Demonstrate that solids have a definite shape and that liquids and gases take the shape of their containers.

#### Constant Standards

**Strand 1: Inquiry Process (HLS- 33%)**

2.5.S.1 Observations, Questions, and Hypotheses: Observe, ask questions, and make predictions.

- **PO1.** Formulate relevant questions about the properties of objects, organisms, and events in the environment.
PO2. Predict the results of an investigation (e.g., in animal life cycles, phases of matter, the water cycle)

PO1. Demonstrate safe behavior and appropriate procedures (e.g., use of instruments, materials, organisms) in all science inquiry.
PO2. Participate in guided investigations in life, physical, and Earth and space sciences.
PO3. Use simple tools such as rulers, thermometers, magnifiers, and balances to collect data (U.S. customary units).
PO4. Record data from guided investigations in an organized and appropriate format (e.g., lab book, log, notebook, chart paper).

2.51.C3 Analysis and Conclusions: Organize and analyze data; compare to predictions.
PO1. Organize data using graphs (i.e., pictograph, tally chart), tables, and journals.
PO2. Construct reasonable explanations of observations on the basis of data obtained (e.g., Based on the data, does this make sense? Could this really happen?)
PO3. Compare the results of the investigation to predictions made prior to the investigation.
PO4. Generate questions for possible future investigations based on the conclusions of the investigation.

2.51.C4 Communication: Communicate results of investigations.
PO1. Communicate the results and conclusions of an investigation (e.g., verbal, drawn, or written).
PO2. Communicate with other groups to describe the results of an investigation.

Strand 2: History and Nature of Science
2.52.C1 History of Science as a Human Endeavor: Identify individual and cultural contributions to scientific knowledge.
PO1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Daniel Hale Williams [physician], supports Strand 4; Charles Drew [physician], supports Strand 4; Elizabeth Blackwell [physician], supports Strand 4
PO2. Identify science-related career opportunities.

2.52.C2 Nature of Scientific Knowledge: Understand how science is a process for generating knowledge.
PO1. Identify components of familiar systems (e.g., organs of the digestive system, bicycle).
PO2. Identify the following characteristics of a system:
  • Consists of multiple parts or subsystems
  • Parts work interdependently
PO3. Identify parts of a system too small to be seen (e.g., plant and animal cells).

Strand 3: Science in Personal and Social Perspectives
2.53.C2 Science and Technology in Society: Understand the impact of technology.
PO1. Analyze how various technologies impact aspects of people’s lives (e.g., entertainment, medicine, transportation, communication).
PO2. Describe important technological contributions made by people, past and present:
  • Automobile – Henry Ford
  • Airplane – Wilbur and Orville Wright
  • Telephone – Alexander G. Bell
PO3. Identify a simple problem that could be solved by using a suitable tool.

Science and Engineering Practices

Practices describe a robust process for how scientists investigate and build models and theories of the natural world or how engineers design and build systems.

- Ask questions and define problems
- Develop and use models
- Plan and carry out investigations
- Analyze and interpret data
- Use mathematics and computational thinking
- Construct explanations and design solutions
- Engage in argument from evidence
- Obtain, evaluate, and communicate information

Crosscutting Concepts (CCC)

Cross boundaries between science disciplines and provide an organizational framework to connect knowledge from various disciplines into a coherent and scientifically based view of the world.

- Patterns
- Stability & Change
- Systems & System Models

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)

Multicultural Books aligned with Air & Weather Science Resource Kit

A Storm Called Katrina (2011) (IL:K-3  RL:3) When flood waters submerge their New Orleans neighborhood in the aftermath of Hurricane Katrina, a young cornet player and his parents evacuate their home and struggle to survive and stay together.

Rain School (2010) (PreK-3) The children arrive on the first day of school and build a mud structure to be their classroom for the next nine months until the rainy season comes and washes it all away.

A Place Where Hurricanes Happen (2010) (IL:K-3  RL:2.7) Told in alternating voices, four friends from the same New Orleans neighborhood describe what happens to them and their community when they are separated, then reunited, as a result of Hurricane Katrina.

Monsoon Afternoon (2008) (K-3) A young boy and his grandfather find much they can do together on a rainy day during monsoon season in India.

Little Dog Moon (2000) (IL:K-3  RL:4) Although she is little, Moon, a Tibetan terrier, guides two refugee children over the mountains from Tibet to Nepal.

Adopted Texts and Materials

- “Air & Weather” materials unit/kit
- Teacher’s manual for “Air & Weather”
- 8 copies of Air & Weather (Science Stories)
- Learning Progressions for K – 5 Science
- FOSS website: www.fossweb.com

Teaching Tolerance Anti-Bias Framework  https://www.tolerance.org/frameworks
### 2018-2019 Science Curriculum Map, Grade 2

<table>
<thead>
<tr>
<th>Scholastic Leveled Readers</th>
<th>Multicultural Inclusive Strategies</th>
<th>Science Kit Supplemental Resources</th>
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<tbody>
<tr>
<td><strong>Four Feet, Two Sandals</strong> (2007) <em>(Grades 1-5)</em> Two young Afghani girls living in a refugee camp in Pakistan share a precious pair of sandals brought by relief workers.</td>
<td><strong>Bintou's Braids</strong> (2001) <em>(IL:K-3  RL:2.1)</em> When Bintou, a little girl living in West Africa, finally gets her wish for braids, she discovers that what she dreamed for has been hers all along.</td>
<td></td>
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### Instructional and Assessment Guides

<table>
<thead>
<tr>
<th>Culturally Responsive Practices</th>
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<td><strong>Examples:</strong></td>
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<td>Quick writes and drawings in notebooks (e.g. how a thermometer works)</td>
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<tr>
<td>Use scientific vocabulary and explain what happens when air provides energy for objects.</td>
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</tr>
<tr>
<td>Compare and contrast clouds and the weather they indicate.</td>
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</tr>
<tr>
<td>Write about the cycle of the moon.</td>
<td></td>
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1. **Highly-Leveraged Standards** are essential for students to learn because they have endurance (knowledge and skills relevant throughout a student’s lifetime); leverage (knowledge and skills used across multiple content areas); and essentiality (knowledge and skills necessary for success in future courses or grade levels).*

2. **Supporting Standards** are emphasized during the quarter as they are integral to achieve mastery of the Highly Leveraged Standards. Mastery of these standards are used measured using classroom assessments.

3. **Constant Standards** are repeatedly addressed to reinforce grade-level mastery.

---

*This definition for Highly-Leveraged Standards was adapted from the “power standard” definition on the website of the Millis Public Schools, K-12, Massachusetts, USA, 2.
### Reading Focus: Literature, Informational

Writing Focus: Narrative, Opinion, Informative/Explanatory

### Unifying Concept: Life Science

**Insects**

### Suggested Duration: 11 weeks

#### Enduring Understandings:

The Insect Unit’s goal is to heighten students’ awareness of the biodiversity that surrounds us and can be found in the animal kingdom.

#### Essential Questions:

- What do insects need for survival?
- How can we determine healthy habitats for different insects?
- What are structures of insects and how do they affect the insects’ behavior?
- How can we organize insect growth data to look for change?
- How are adult insects alike and different?
- How do different insects grow and change?

#### Academic Vocabulary:

- Abdomen
- Antenna(e)
- Larva(e)
- Pupa(e)
- Thorax
- Segment
- Bristle
- Clasper
- Proleg
- Spiracle
- Cocoon
- Caterpillar
- Chrysalis
- Ovipositor
- Stage
- Nymph
- Proboscis
- Habitat
- Hatch
- Eye spot
- Metamorphosis
- Spinneret
- Caterpillar
- Chrysalis
- Ovipositor

#### Standards

**Highly-Leveraged Standards**

<table>
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<tr>
<th>Strand 4: Life Science (HLS-11%)</th>
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<td><strong>2.S4.C1 Characteristics of Organisms</strong>: Understand that basic structures in plants and animals serve a function.</td>
</tr>
<tr>
<td><strong>PO1.</strong> Identify animal structures that serve different functions (e.g., sensory, defense, locomotion).</td>
</tr>
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<td><strong>PO2.</strong> Identify the following major parts of:</td>
</tr>
<tr>
<td>- The digestive system – mouth, esophagus, stomach, small and large intestines.</td>
</tr>
<tr>
<td>- Respiratory system – nose, trachea, lungs, diaphragm</td>
</tr>
<tr>
<td>- Circulatory system – heart, arteries, veins, blood</td>
</tr>
<tr>
<td><strong>PO3.</strong> Describe the basic functions of the following systems:</td>
</tr>
<tr>
<td>- Digestive – breakdown and absorption of food, disposal of waste</td>
</tr>
<tr>
<td>- Respiratory – exchange of oxygen and carbon dioxide</td>
</tr>
<tr>
<td>- Circulatory – transportation of nutrients and oxygen throughout the body</td>
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**Supporting Standards**

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<th>Strand 2: History and Nature of Science</th>
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**2.S4.C2 Life Cycles**: Understand the life cycles of plants and animals.

- **PO1.** Describe the life cycles of various insects.
- **PO2.** Describe the life cycles of various mammals.
- **PO3.** Compare the life cycles of various organisms.
### Constant Standards

#### Strand 1: Inquiry Process (HLS- 33%)

**2.S1.C1 Observations, Questions, and Hypotheses:** Observe, ask questions, and make predictions.

**PO1:** Formulate relevant questions about the properties of objects, organisms, and events in the environment.

**PO2:** Predict the results of an investigation (e.g., in animal life cycles, phases of matter, the water cycle).


**PO1:** Demonstrate safe behavior and appropriate procedures (e.g., use of instruments, materials, organisms) in all science inquiry.

**PO2:** Participate in guided investigations in life, physical, and Earth and space sciences.

**PO3:** Use simple tools such as rulers, thermometers, magnifiers, and balances to collect data (U.S. customary units).

**PO4:** Record data from guided investigations in an organized and appropriate format (e.g., lab book, log, notebook, chart paper).

**2.S1.C3 Analysis and Conclusions:** Organize and analyze data; compare to predictions.

**PO1:** Organize data using graphs (i.e., pictograph, tally chart), tables, and journals.

**PO2:** Construct reasonable explanations of observations on the basis of data obtained (e.g., Based on the data, does this make sense? Could this really happen?)

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**PO4:** Generate questions for possible future investigations based on the conclusions of the investigation.

**2.S1.C4 Communication:** Communicate results of investigations.

**PO1:** Communicate the results and conclusions of an investigation (e.g., verbal, drawn, or written).

**PO2:** Communicate with other groups to describe the results of an investigation.

#### Strand 2: History and Nature of Science

**2.S2.C1 History of Science as a Human Endeavor:** Identify individual and cultural contributions to scientific knowledge.

**PO1:** Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Daniel Hale Williams [physician], supports Strand 4; Charles Drew [physician], supports Strand 4; Elizabeth Blackwell [physician], supports Strand 4).

**PO2:** Identify science-related career opportunities.

#### Strand 3: Science in Personal and Social Perspectives

**2.S3.C2 Science and Technology in Society:** Understand the impact of technology.

**PO1:** Analyze how various technologies impact aspects of people’s lives (e.g., entertainment, medicine, transportation, communication).

**PO2:** Describe important technological contributions made by people, past and present:

- Automobile – Henry Ford
- Airplane – Wilbur and Orville Wright
- Telephone – Alexander G. Bell

**PO3:** Identify a simple problem that could be solved by using a suitable tool.

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<th>Science and Engineering Practices</th>
<th>Crosscutting Concepts (CCC)</th>
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Office of Curriculum, Instruction, and Professional Development  
Last Edited: 6/11/2018
### Practices
Describe a robust process for how scientists investigate and build models and theories of the natural world or how engineers design and build systems.

- Ask questions and define problems
- Develop and use models
- Plan and carry out investigations
- Analyze and interpret data
- Use mathematics and computational thinking
- Construct explanations and design solutions
- Engage in argument from evidence
- Obtain, evaluate, and communicate information

### Cross Boundaries
Cross boundaries between science disciplines and provide an organizational framework to connect knowledge from various disciplines into a coherent and scientifically based view of the world.

- Structure & Function
- Systems & System Models
- Scale, Proportion, & Quantity

### 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) |

### Teaching Tolerance Anti-Bias Framework
[www.tolerance.org/frameworks](https://www.tolerance.org/frameworks)

### Adopted Texts and Materials

**Textbook:**
- “Insects” materials unit/kit
- Teacher’s manual for “Insects”
- 8 copies of *Insects* (Science Stories)
- *Learning Progressions for K – 5 Science*
- FOSS website: [www.fossweb.com](http://www.fossweb.com)

**Multicultural Adoptions:**

- *La Mariposa* (2000) (Grades PK-3) In his first year of school, Francisco understands little of what his teacher says. But he is drawn to the silent, slow-moving caterpillar in the jar next to his desk. He knows caterpillars turn into butterflies, but just how do they do it? To find out, he studies the words in a butterfly book so many times that he can close his eyes and see the black letters, but he still can’t understand their meaning.
- *Gotta Go! Gotta Go!* (2004) (Grades 1-2) The creepy-crawly bug doesn't know why she does what she does. She only knows she has to do it. But making the journey seems impossible for the slow-moving critter, who has no idea what or where Mexico is. Then an everyday miracle occurs, bringing a transformation that will help her fulfill her destiny. Each autumn, millions of Monarch butterflies migrate from the central and eastern United States and Canada.
- *Diary of a Fly* (2007) (ages 5 and up)

[www.youtube.com/watch?v=D_UPLZPbhJk](https://www.youtube.com/watch?v=D_UPLZPbhJk)
## 2018-2019 Science Curriculum Map, Grade 2

### Scholastic Leveled Readers

- ![Image](image1.png)

### Multicultural Inclusive Strategies

- ![Image](image2.png)

### Science Kit Supplemental Resources

- ![Image](image3.png)

<table>
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<th>Instructional and Assessment Guides</th>
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<td>All About Insects <a href="https://kids.nationalgeographic.com/animals/hubs/insects/">https://kids.nationalgeographic.com/animals/hubs/insects/</a></td>
</tr>
<tr>
<td><strong>Concept Map</strong> - pre and post with linking phrases to indicate relationships of concepts and processes</td>
<td>Planet Earth (10th video) Insects <a href="https://www.youtube.com/watch?v=6lEzRqb8y_4">https://www.youtube.com/watch?v=6lEzRqb8y_4</a></td>
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<td><strong>Formative/Performance Assessment Examples:</strong></td>
<td></td>
</tr>
<tr>
<td>Create a model of an insect and/or habitat)</td>
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<tr>
<td>Human Scatterplot – a formative assessment strategy to engage students in thinking about their learning as well as ideas of classmates.</td>
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<tr>
<td>Quick writes and drawings in journals (lifecycle of an insect, structures, habitats, explain role of insect within the ecosystem)</td>
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¹Highly-Leveraged Standards are essential for students to learn because they have endurance (knowledge and skills relevant throughout a student’s lifetime); leverage (knowledge and skills used across multiple content areas); and essentiality (knowledge and skills necessary for success in future courses or grade levels).*

²Supporting Standards are emphasized during the quarter as they are integral to achieve mastery of the Highly Leveraged Standards. Mastery of these standards are used measured using classroom assessments.

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*This definition for Highly-Leveraged Standards was adapted from the “power standard” definition on the website of the Millis Public Schools, K-12, Massachusetts, USA,
## Unifying Concept: Physical Science

### Solids and Liquids

**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 separated?
- What happens when different solids are mixed with water?
- What happens when water is mixed with different liquids?

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

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<th>Standards</th>
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<td><strong>Highly-Leveraged Standards</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
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<td><strong>2-S1-C2 Scientific Testing (Investigating and Modeling):</strong> Participate in planning and conducting investigations, and recording data.</td>
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<td>PO1. Describe objects in terms of measurable properties (e.g., length, volume, weight, temperature) using scientific tools.</td>
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<td>PO3. Demonstrate that water can exist as a:</td>
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<td>PO3. Use simple tools such as rulers, thermometers, magnifiers, and balances to collect data (U.S. customary units).</td>
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<td>- Gas – vapor</td>
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<td>PO4. Record data from guided investigations in an organized and appropriate format (e.g., lab book, log, notebook, chart paper).</td>
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<tr>
<td>- Liquid – water</td>
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<td>- Solid – ice</td>
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<td>PO4. Demonstrate that solids have a definite shape and that liquids and gases take the shape of their containers.</td>
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Office of Curriculum, Instruction, and Professional Development  
Last Edited: 6/11/2018
2.S1.C3 Analysis and Conclusions: Organize and analyze data; compare to predictions.
PO1. Organize data using graphs (i.e., pictograph, tally chart), tables, and journals.
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</tr>
<tr>
<td>• Ask questions and define problems</td>
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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 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)

[Teaching Tolerance Anti-Bias Framework](https://www.tolerance.org/frameworks)

### 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)
- [Learning Progressions for K – 5 Science](http://www.fossweb.com)
- FOSS website: [www.fossweb.com](http://www.fossweb.com)

**Multicultural Adoptions:**

**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.

**Scholastic Leveled Readers**

**Multicultural Inclusive Strategies**

**Science Kit Supplemental Resources**

### Instructional and Assessment Guides

**Culturally Responsive Practices** ([TUSD SPARKS, SPARKS Strategies](http://www.tusd1.org/Subject-Areas/Science/Science-Grade-2-Curriculum))

**Pre/Post Unit Assessment:**
[http://curriculum.tusd1.org/Subject-Areas/Science/Science-Grade-2-Curriculum](http://curriculum.tusd1.org/Subject-Areas/Science/Science-Grade-2-Curriculum)

**Concept Map** - pre and post with linking phrases to indicate relationships of concepts and processes

**Formative/Performance Assessment:**
Examples:

### Additional Instructional Resources

- [https://jr.brainpop.com/games/mattersorter/?tid=63](https://jr.brainpop.com/games/mattersorter/?tid=63)
<table>
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<tr>
<th>Quick writes and drawings in journals (explain how mixtures of particles can be separated, sort objects by their observable properties)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Scatterplot - a formative assessment strategy to engage students in thinking about their learning as well as ideas of classmates.</td>
</tr>
</tbody>
</table>

¹**Highly-Leveraged Standards** are essential for students to learn because they have endurance (knowledge and skills relevant throughout a student’s lifetime); leverage (knowledge and skills used across multiple content areas); and essentiality (knowledge and skills necessary for success in future courses or grade levels).*

²**Supporting Standards** are emphasized during the quarter as they are integral to achieve mastery of the Highly Leveraged Standards. Mastery of these standards are used measured using classroom assessments.

³**Constant Standards** are repeatedly addressed to reinforce grade-level mastery.

*This definition for Highly-Leveraged Standards was adapted from the “power standard” definition on the website of the Millis Public Schools, K-12, Massachusetts, USA, 2