Science

2nd Grade Science Standard 1.1

2.Physical Science.1.1 Changes in speed or direction of motion are caused by forces such as pushes and pulls.

<table>
<thead>
<tr>
<th>Essential Questions - 21st Century Skills and Readiness Competencies:</th>
<th>Evidence Outcomes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What is force?</td>
<td>• Predict how the direction or speed of an object may change due to an outside force.</td>
</tr>
<tr>
<td>• What must be known about a force to predict how it will change an object’s motion?</td>
<td>• Identify and analyze how the direction or speed of an object may change due to an outside force.</td>
</tr>
<tr>
<td>• How does applying a force affect the way an object moves?</td>
<td>• Analyze and interpret observable data about the impact of forces on the motion of objects.</td>
</tr>
<tr>
<td>• How do an object’s properties affect how it will move when a force is applied?</td>
<td>• Select appropriate tools for data collection.</td>
</tr>
<tr>
<td>• What are the different types of forces?</td>
<td>• Measure the change in speed or direction of an object using appropriate units.</td>
</tr>
<tr>
<td>• How do the different types of forces affect speed and/or direction?</td>
<td>• Collaboratively design an experiment, identifying the constants and variables.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Academic Vocabulary:</th>
<th>Assessment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>analyze</td>
<td>1. Observe for accuracy as students use the Smartboard lesson to practice force and motion vocabulary.</td>
</tr>
<tr>
<td>collaborate</td>
<td>2. Observe as students familiarize themselves with force and motion vocabulary through various activities.</td>
</tr>
<tr>
<td>constant</td>
<td>3. Observe for participation as students brainstorm about the types of forces and take notes from the video.</td>
</tr>
<tr>
<td>distance traveled</td>
<td>4. Use the Push and Pull Pre-assessment to guide instruction and the follow-up activity to evaluate the similarities and differences of pushing versus pulling.</td>
</tr>
<tr>
<td>force</td>
<td>5. Evaluate student journal entries for sentences explaining two forces that move the truck and at least one sentence telling about what they learned from the activity.</td>
</tr>
<tr>
<td>impact</td>
<td>6. Evaluate as students share individual journal entries and explain conclusions learned during the experimentation process as described in the Force and</td>
</tr>
<tr>
<td>interpret</td>
<td>motion</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Motion Lesson Plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Use the assessment quiz embedded in <strong>Friction</strong> website.</td>
</tr>
<tr>
<td>8. Use pp. 3-5 of the Dragon Racer performance task to evaluate proper use of the Scientific evaluation and of the students' abilities to apply knowledge learned into real-life situations.</td>
</tr>
<tr>
<td>9. Use the Speed, Eggs, and Slam self-assessment to analyze experiment results.</td>
</tr>
<tr>
<td>10. Evaluate as students communicate their experiment results recorded in their journals at the conclusion of Physics Motion Activities.</td>
</tr>
<tr>
<td>11. Use the Force and Motion Rubric to evaluate experiment participation and results in the Marble Challenge performance task.</td>
</tr>
<tr>
<td>12. Use the assessment quiz embedded in <strong>Motion and Force</strong> Activity.</td>
</tr>
</tbody>
</table>

**Suggested Activities/Strategies:**

1. Introduce vocabulary using the Force and Motion Smartboard lesson. (You must have Smartboard software installed to view this lesson.)
2. Explore the vocabulary associated with force and motion using the vocabulary worksheets and activities attached. (See the Force and Motion Vocabulary Match and the Force and Motion Mystery Word 1 & 2 attached.)
3. Students work in collaborative pairs to brainstorm a list of words associated with types of forces and write the words in their Science journals.

**Resources/Technology:**

- **Push and Pull Activity Assessment**
- **Dragon Racer Performance Task**
- **Eggs, Speed, and Slam Assessment**
- **Force and Motion Rubric**

- **Study Jams Science Videos**
- **Project Based Learning Checklists**
- **Variety of Science Lessons and Resources**
- **Force and Motion Resource**
- **Virtual Field Trips and Experiments**
- **Physical Science Teacher Background Information**
- **MnSTEP Science Activities**
- **2nd Grade Science Smartboard Lessons**
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<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Watch a video and write down additional words that they hear from the video. In pairs, use the Venn diagram to discuss the similarities and differences in the two lists.</td>
<td>Use the Push and Pull Activity as a collaborative pair activity to investigate force and motion and to compare and contrast with a Venn Diagram.</td>
</tr>
<tr>
<td>4. Use the Push and Pull Activity as a collaborative pair activity to investigate force and motion and to compare and contrast with a Venn Diagram.</td>
<td>Observe and discuss how pushing or pulling affects motion with the Push and Pull Lesson.</td>
</tr>
<tr>
<td>5. Observe and discuss how pushing or pulling affects motion with the Push and Pull Lesson.</td>
<td>Using the Force and Motion Lesson Plan attached, investigate how an object's properties affect how it will move when a force is applied and the different types of forces that affect speed and/or direction.</td>
</tr>
<tr>
<td>6. Using the Force and Motion Lesson Plan attached, investigate how an object's properties affect how it will move when a force is applied and the different types of forces that affect speed and/or direction.</td>
<td>Investigate friction when the surface and force varies using the Forces and Motion Lesson Plan attached. (This would also work well with a Smartboard.)</td>
</tr>
<tr>
<td>7. Investigate friction when the surface and force varies using the Forces and Motion Lesson Plan attached. (This would also work well with a Smartboard.)</td>
<td>Use the Scientific Method to repeatedly explore how different surfaces affect motion in this Dragon Racer performance task.</td>
</tr>
<tr>
<td>8. Use the Scientific Method to repeatedly explore how different surfaces affect motion in this Dragon Racer performance task.</td>
<td>Investigate the effects of motion by watching a demonstration of the experiment or by performing the Speed, Eggs, and Slam experiment in class.</td>
</tr>
<tr>
<td>9. Investigate the effects of motion by watching a demonstration of the experiment or by performing the Speed, Eggs, and Slam experiment in class.</td>
<td>Experiment with how pushing and pulling affect motion using Physics Motion Activities.</td>
</tr>
<tr>
<td>10. Experiment with how pushing and pulling affect motion using Physics Motion Activities.</td>
<td>Use The Marble Challenge performance task to investigate what effect force will have on an object's motion.</td>
</tr>
<tr>
<td>11. Use The Marble Challenge performance task to investigate what effect force will have on an object's motion.</td>
<td>Investigate the effects of weight, force, and incline on motion using this online Motion and Force Activity. (This would work well with a Smartboard.)</td>
</tr>
</tbody>
</table>

**Variety of 2nd Grade Science Activities**
- Virtual Lab for Kinetic Energy
- BBC Interactive Science Clips
- Lessons at Sciencelinks.com
- Lesson Bank at
- www.discoveryeducation.com
- Colorado Standards and Instructions
### Science

#### 2nd Grade Science Standard 1.1

| 13. Use the [Gravity Launch Lesson](#) and [Student Data Sheet](#) to investigate the force of gravity. |

- Force and Motion Vocabulary Smartboard Lesson
- Visualizing Vocabulary
- Force and Motion Vocabulary Match
- Force and Motion Mystery Word 1
- Force and Motion Mystery Word 2
- Push and Pull Activity: Venn Diagram
- Push and Pull Activity
- Push and Pull Worksheets
- Forces and Motion Lesson Plan
- Dragon Racer Performance Task
- The Marble Challenge

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Science

2nd Grade Science Standard 2.1

2.Life Science.2.1 Organisms depend on their habitat’s nonliving parts to satisfy their needs.

Essential Questions - 21st Century Skills and Readiness Competencies:

- What are the basic needs of plants and animals?
- How are the basic needs of all living things similar and different?
- How do living things depend on their environment?
- What are the characteristics of a healthy environment?
- What are the living components of a habitat?
- What are the non-living components of a habitat?
- What makes a habitat suitable for a specific organism?
- How does an organism respond when basic needs are not met?
- How do organisms interact in a habitat to create a healthy environment?
- How do the organisms depend on living components in their habitat?
- How are the habitats of two organisms similar and different?

Evidence Outcomes:

- Use evidence to develop a scientific explanation about how organisms depend on their habitat.
- Analyze and interpret data about non-living components of a habitat.
- Assess and provide feedback on other scientific explanations regarding why an organism can survive in its habitat.
- Use instruments to make observations about habitat components. (For example, data such as dissolved oxygen, pH, and/or nitrogen content can be collected from a fish tank to assess the environmental health.)
- Identify the different organisms and their needs.
- Describe different ways that scientists seek to understand about organisms and their interactions with their environment.
- Collaborate with other students in developing a scientific explanation about how organisms depend on their habitat.
- Use evidence to develop an explanation as to why a habitat is suitable for a specific organism.
- Use evidence to develop an explanation as to why a habitat is not suitable for a specific organism.

Academic Vocabulary:

advantage
analyze
assess
basic need
behavior
collaborate
data
environment
environmental health

Assessment:

1. Evaluate K-W-L charts and written summaries included in the Plants and Animals lesson.
2. Encourage student involvement and discussion as they explore animals' needs, groups, and habitats with the Critter Craze webquest.
3. Take the Easy Quiz or Hard Quiz to check for comprehension of the
### Suggested Activities/Strategies:

1. Explore the basic needs of plants and animals, their similarities and differences, and what they need to

### Resources/Technology:

- BrainPOP Jr. Movie.
- Use the Habitat Assessment at the conclusion of the Habitat PowerPoint.
- Use the **rubric** attached to evaluate the Habitats Flip Book.
- Encourage student discussion about the characteristics of a healthy environment as they explore the Interactive Habitat.
- Use the **rubric** attached to evaluate the Habitats Flip Book.
- Encourage student discussion of the pictures as they view the Habitat Picture Story.
- Observe as students participate in activities, re-enactments, and projects. Encourage and observe deeper discussion into animals and the role their habitat plays in their survival.
- Observe and guide students as they pretend to be deer surviving in their habitat. Students should record what they learned in a journal.
- Observe as students explore how a bear's survival is directly influenced by its habitat. Students should record their discoveries in a journal.
- Use the [Project Based Learning Checklist](#) to evaluate group murals.
- Observe for student participation in the discussion about what negatively affects animal habitats.
- Evaluate oral presentations using the [Protecting the Environment checklist](#).
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<table>
<thead>
<tr>
<th>Task</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Survive and grow through the Plants and Animals lesson.</strong></td>
<td></td>
</tr>
<tr>
<td>2. Use the online webquest, <a href="#">Critter Craze</a>, to explore animals' basic needs, grouping by physical characteristics, and to become familiar with habitats.</td>
<td></td>
</tr>
<tr>
<td>3. Watch BrainPOP Jr.'s <a href="#">Classifying Animals</a> to introduce classification and grouping.</td>
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<tr>
<td>4. Introduce animal habitats with The Magic School Bus <a href="#">Habitat Game</a>.</td>
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<tr>
<td>5. Activate discussion about Habitats using this PowerPoint.</td>
<td></td>
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<tr>
<td>6. Make a Habitats Flip Book and use Habitats from the Grade 2 <a href="#">website</a> to gather information about each habitat.</td>
<td></td>
</tr>
<tr>
<td>7. Use this <a href="#">Interactive Habitat</a> site to explore the characteristics of habitats and the types of animals that live there.</td>
<td></td>
</tr>
<tr>
<td>8. Follow the cartoon mouse through this Habitat Picture Story to discuss the various habitats, animals that live there, and animal adaptations. (The attachment is large and may take a few minutes to open.)</td>
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</tr>
<tr>
<td>9. Use the Denver Zoo Activities link for a variety of hands-on ideas, re-enactments, and projects that teach students about animals, their habitats, and how they are dependent upon their habitat for survival.</td>
<td></td>
</tr>
<tr>
<td>10. Adapt the Project Wild: Oh Deer! lesson to take a hands-on approach in illustrating how organisms need the environment to survive.</td>
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<tr>
<td>11. Use The Bears in the Forest lesson from Project Wild to re-enact how habitats directly influence animal populations.</td>
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</tr>
<tr>
<td>12. Create large murals of animal habitats all over the world in this group project from the Magic School Bus <a href="#">Animal Habitat Lesson</a>.</td>
<td></td>
</tr>
<tr>
<td>13. Launch a discussion about how to help protect the environment by investigating <a href="#">issues that negatively</a></td>
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</tr>
</tbody>
</table>

**Additional Resources:**
- [Project Based Learning Checklists](#)
- [Study Jams Science and Math Videos](#)
- [Variety of Science Lessons and Resources](#)
- [Interactive Habitat Activity](#)
- [Diversity and Adaptation Among Living Things Lessons](#)
- [Printable Worksheets and Rubrics](#)
- [Second Grade Science Lesson Bank](#)
- [BrainPOP Jr.](#)
- [National Geographic for Kids](#)
Science

2nd Grade Science Standard 2.1

affect habitats and the animals that live there.

14. Allow students to do an oral presentation or research project about a problem that has negative effects on the habitat that they live in and have them present the project to the class. Use the Protecting the Environment checklist to guide project preparation.

Plants and Animals Unit
Habitat Flip Book
Habitat Picture Story
Project Wild: Oh Deer!
Bears in the Forest
## Science
### 2nd Grade Science Standard 2.2

**2.Life Science.2.2** Each plant or animal has different structures or behaviors that serve different functions.

### Essential Questions - 21st Century Skills and Readiness Competencies:

- What structures help a population to survive?
- What makes a habitat suitable for a specific organism?
- Why is the behavior and structure of plants and animals important?
- How are the behaviors of a plant and an animal similar and different?
- What are the advantages of an animal or plant having a specific structure?
- What are the advantages of an animal or plant having a specific behavior?
- What different structures do plants and animals have that perform the same functions? For example, what different structures do plants and animals have to get water?

### Evidence Outcomes:

- Use evidence to develop an explanation as to why a habitat is or is not suitable for a specific organism.
- Analyze and interpret data about structures or behaviors of a population that help that population survive.
- Analyze and interpret data about behaviors of a population that help that population survive.

### Academic Vocabulary:

- advantage
- analyze
- assess
- behavior
- collaborate
- data
- environment
- evidence
- feedback
- function
- habitat
- interpret
- observation
- population
- resource
- scientific explanation
- structure
- suitable
- unique

### Assessment:

1. Evaluate the Plant Graphic Organizers for accurate information about the structures and functions of a plant.
2. Evaluate diagrams and paragraphs for accurate depictions of a plant's structure and function.
3. Listen for correct words as students sing about the parts and functions of a flower.
4. Evaluate the Monster Plant Storia observation charts for evidence of ability to conduct research and use appropriate scientific investigation strategies.
5. Observe as students use tools to investigate and experiment with leaves. Listen as students communicate their findings in small groups.
6. Evaluate insect posters at the conclusion of It's a Bug's Life unit.
# Science

## 2nd Grade Science Standard 2.2

using the Poster Rubric attached. Have students present and share about their insect's structures and functions.

7. Evaluate each student's understanding of camouflage by having them draw an example mentioned in the PowerPoint or by using an example of their own. Use the Science Drawing Rubric attached to evaluate the illustration's effectiveness.

8. Evaluate journal entries at the end of each lesson in the I Am a Survivor unit.

9. Evaluate each student's How Animals Prepare for Winter Workbook to assess for correct categorization.

10. Evaluate the activity using the Bird Beak Buffet Assessment.

<table>
<thead>
<tr>
<th>Poster Rubric</th>
<th>Science Drawing Rubric</th>
<th>Bird Beak Buffet Assessment</th>
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</table>

## Suggested Activities/Strategies:

1. Introduce the structures of a plant with this PowerPoint and take notes on the Plant Graphic Organizer.

2. Create a three-dimensional flower diagram to depict the parts of the plant. Then using a flower template, have students write about the functions of each structure of the plant. Ideas and examples can be found at this site.

3. Memorize the structures of a plant and their functions by singing this song.

4. Capture interest about unusual plants in the Monster Plants Storia lesson, as well as explore the physical characteristics and survival tactics of these plants.

5. Examine the structure of a leaf using a variety of activities involving scientific exploration and the appropriate

## Resources/Technology:

- Variety of Life Science Worksheets
- Variety of Science Smartboard Lessons
- Study Jams Science Videos
- Project Based Learning Checklists
- Variety of Science Lessons and Resources
- Lesson Plans at Utah Educational Network
- Hands-On Projects at www.warts.org
### Science
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<table>
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<tr>
<th>Equipment</th>
<th>Have students journal observations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Explore the insect's structures and their functions in detail with It's a Bug's Life unit.</td>
</tr>
<tr>
<td>7.</td>
<td>Use the What is Camouflage? and the Camouflaged Animals PowerPoints to open the investigation into animal adaptations.</td>
</tr>
<tr>
<td>8.</td>
<td>Investigate how plants and animals use their structures to survive the environment using this detailed unit, I Am a Survivor.</td>
</tr>
<tr>
<td>9.</td>
<td>Use How Animals Prepare for Winter to discuss animal adaptations for survival during the wintertime. Create an adaptations booklet using the attachment.</td>
</tr>
<tr>
<td>10.</td>
<td>Using the Bird Beak Buffet lesson, students engage in hands-on activities while exploring the variety of beaks birds have and their purpose.</td>
</tr>
</tbody>
</table>

- Structure of a Plant Graphic Organizer
- Comparing and Contrasting Physical Plant Structures
- Monster Plants Teaching Guide
- Monster Plant Vocabulary Cards
- Monster Plant Cause and Effect
- Monster Plant Big Activity
- It's a Bug's Life Lesson
- What is Camouflage? PowerPoint
- Camouflaged Animals PowerPoint
- I Am a Survivor
- How Do Animals Prepare for Winter Workbook
- Bird Beak Buffet