Grade 2 Science
Science 2

Scientific Process and Inquiry

Stage 1: Desired Results

Catholic Standards

Targeted Standards

OH Grade 2 OH: ELA & Literacy in History/Social Studies, Science, & Technical Subjects PreK-5

Capacities of the Literate Individual

Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, & Language

They demonstrate independence.

Speaking and Listening

Comprehension and Collaboration 1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others ideas and expressing their own clearly and persuasively.

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.

SL.2.1a. Follow agreed-upon rules 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).

SL.2.1b. Build on others talk in conversations by linking their comments to the remarks of others.

SL.2.1c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

SL.2.2. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

Evaluate a speakers point of view, reasoning, and use of evidence and rhetoric.

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.

Presentation of Knowledge and Ideas 4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

SL.2.4. Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

W.2.2. Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

W.2.3. Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

W.2.5. With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

W.2.6. With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

Research to Build and Present Knowledge 7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

W.2.7. Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

W.2.8. Recall information from experiences or gather information from provided sources to answer a question.

Reading: Informational Text

Key Ideas and Details 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

RI.2.2. Identify the main topic of a multiparagraph text as well as the focus of specific paragraphs within the text.

Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

RI.2.3. Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.

Craft and Structure 4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

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.

Assess how point of view or purpose shapes the content and style of a text.

RI.2.6. Identify the main purpose of a text, including what the author wants to answer, explain, or describe.

Integration of Knowledge and Ideas 7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

RI.2.7. Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

RI.2.8. Describe how reasons support specific points the author makes in a text.

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

RI.2.9. Compare and contrast the most important points presented by two texts on the same topic.

Range of Reading and Level of Text Complexity 10. Read and comprehend complex literary and informational texts independently and proficiently.

RI.2.10. By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.

OH Grade 2 OH: Science (2011)

Science Inquiry and Application

Theme: Observations of the Environment This theme focuses on helping students develop the skills for systematic discovery to understand the science of the physical world around them in greater depth by using scientific inquiry. During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Observe and ask questions about the natural environment;

Plan and conduct simple investigations;

Employ simple equipment and tools to gather data and extend the senses;

Use appropriate mathematics with data to construct reasonable explanations;

Communicate about observations, investigations and explanations;

Review and ask questions about the observations and explanations of others.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

Rights and Responsibilities

Care for God's Creation

The Rights of Children

1. THE RIGHT TO A CATHOLIC COMMUNITY that witnesses to Christ and the Gospel by protecting them from child abuse, including sexual abuse and neglect.

2. THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection, and security.

3. THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.

4. THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.

5. THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION and challenges its members to critical and reflective thinking in their search for truth.

6. THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.

7. THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.

8. THE RIGHT TO LEARN RESPONSIBILITY for themselves and their actions.

9. THE RIGHT TO MAKE RESPONSIBLE DECISIONS founded on religious conviction.

10. THE RIGHT TO GUIDANCE FROM THE CHURCH in their development as loving people.

Content

1. Scientific process: hypothesis, experiment, observation, conclusion
2. Importance of communication
3. Scientific tools/equipment/instruments
4. Safety procedures
5. Importance of technology
6. Ethical Practices Reflecting Catholic Social Teachings

Skills

Observe the world of familiar objects using the senses and tools.

Ask questions, make logical predictions, plan investigations, and represent data.

1. Identify the major components of the process by which scientists learn about the world.

Communicate understanding of simple data using age-

appropriate vocabulary.

1. Collaborate in small groups to design and implement an investigation/experiment utilizing the scientific process (hypothesis, experiment, observation, and conclusion).

Use appropriate safety procedures when completing scientific investigations.

Collect, discuss, and communicate findings from a variety of investigations.

Use evidence to develop explanations of scientific investigations. (What do you think? How do you know?)

Recognize that explanations are generated in response to observations, events and phenomena.

Explain how simple tools are used to extend the senses, make life easier, and solve everyday problems.

1. Predict how building or trying something new might affect other people and the environment.

Describe that scientific investigations generally work the same way under the same conditions.

1. Communicate orally, pictorially, or in written form the design process used to make something (e.g. musical instrument).
2. Ask, explore, and generate "how can I/we" or "how do you know" questions.
3. Share explanations with others to provide opportunities to ask questions, examine evidence, and suggest alternative explanations.
4. Prove through investigation that scientific experiments generally work the same way under the same conditions.
5. Propose an explanation as to why scientists review and ask questions about the results of other scientists' work.
6. Demonstrate that in science it is helpful to work with a team and share findings with others.
7. Cite evidence to develop explanations of scientific investigations. (How do you know?)
8. Determine and use the correct tools and simple equipment/instruments because it is vital to safe and effective work.
9. Estimate and measure properties of objects in U.S. customary and metric units using tools such as rulers, balances, and thermometers.
10. Interact with living things and the environment in ways that promote respect.
11. Compare/contrast the benefits and risks of developing and using technology.
12. Inquire about why people make new products or invent new ways to meet their individual wants and needs.
13. Assess ways in which using the solution to a problem might affect other people and the environment.
14. Discover how men and women everywhere have found practicing science rewarding both as a career and in their daily life.

**Common Core Literacy Skills**

1. Read closely and comprehend scientific text.
2. Cite evidence from text.
3. Draw conclusions from text.
4. Integrate correct scientific terms.
5. Interpret pictures and diagrams.
6. Compare and contrast two texts on the same topic.
7. Utilize various text features (e.g., headings, tables of contents, glossaries, electronic menus, and icon).
8. Distinguish between pictorial and informational text.

**Common Core Writing Content**

1. Formulate arguments focused on discipline-specific content.
2. Compose informative/explanatory text.
3. Produce clear and coherent writing, appropriate to task, purpose, and audience.
4. Edit and revise writing samples.
5. Utilize technology to produce and publish writing.
6. Conduct research projects.
7. Gather relevant sources.
8. Draw conclusions from evidence in text.

Write routinely for a range of discipline-specific tasks, purposes, and audiences.

**Common Core Listening and Speaking Skills**

1. Participate in collaborative skills.
2. Follow agreed-upon rules for discussions.
3. Ask and answer clarifying questions.
4. Use background knowledge to describe familiar people, places, things, and events.
5. Add drawings to provide additional details.
6. Speak audibly and express thoughts, feelings and ideas clearly.

Essential Questions

1. How are scientific questions answered?
2. How can I communicate what I have discovered?
3. How do I use science tools safely?
4. Why should I respect the environment?
5. How does technology improve my life?

Standards Vocabulary

1. scientific process
2. hypothesis
3. experiment
4. conclusion
5. observation
6. communicate
7. estimate
8. tools
9. safety procedures
10. data
11. equipment
12. instruments
13. measurements
14. technology

Stage 2: Assessment Evidence

Broken Safety Rules Game

Formative: Cooperative Group Work

Students will evaluate different teacher-created scenarios that depict a safety procedure that went wrong. They will work in teams to see which team can identify the broken rule the quickest. Teams must deliberate to determine what went wrong and how the scenario should be corrected. When a team arrives at a decision, its members shout, "Done." To summarize the activity, students will write a short statement on the importance of safety in the science classroom. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Bubbles Experiment

Formative: Lab Assignment

Using different bubble wands to discuss the scientific process, students will predict and investigate whether the shape of a bubble wand affects the shape of the bubbles. Students will divide a paper into four squares. In each box the students will draw one step in the bubble experiment. As part of the investigation, students will analyze through written expression the following questions:a. Would the experiment change if it was conducted at home?b. How does it help to work with a team to conduct this investigation? Finally, students will create a list of "how do you know" questions about the experiment. They will share these questions with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Careers in Science

Formative: Visual Arts Project

Following a class discussion on the importance of science careers, students will select a career that interests them and create a poster about that career. They will share their posters with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Technology Advancements

Summative: Project

Students will interview a family member regarding the effects that technology has played in their life (e.g. cell phones, cable, iPods, cars). After collecting the information, they will compare/contrast the benefits and risks of developing and using technology. Students will then select one piece of technology and research basic facts regarding it. Using a digital tool, they will prepare a short report summarizing some simple basic facts about the piece of technology they researched and share their report with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Resources

Stage 3: Learning Plan

Learning Experiences

1. Broken Safety Rules Game.

Create several scenarios that depict a safety procedure that went wrong and see which team of students can identify the broken rule the quickest. Create six scenarios that describe a potential classroom safety hazard handled incorrectly. Divide your class into six teams and assign each team a number. Pass out scenarios and ask students to keep their papers face down.

Shout, "Go" and then have teams turn the papers over and study a scenario. Teams must deliberate to determine what went wrong and how the scenario should be corrected. When a team arrives at a decision, its members shout, "Done." Write each team's number on the board in the order in which it completed the assignment. Summarize the activity by having students write a short statement on the importance of safety in the science classroom and have them share their statements with the class.

1. Bubbles (SciTT Kits #7) -- Use different bubble wands to discuss the scientific process. Students will predict and investigate whether the shape of a bubble wand made with a pipe cleaner affects the shape of the bubbles. Students will divide a paper into four squares. In each box the students will draw one step in the bubble experiment. As part of the investigation, students will analyze through written expression the following questions: Would the experiment change if it was conducted at home? Create a list of "how do you know" questions about the experiment. How does it help to work with a team to conduct this investigation?
2. Read aloud one of several books on Scientist in the Field. (e.g. *Digging for Bird-Dinosaur* by Nic Bishop, *The Wildlife Detectives* by Donna Jackson, *The Snake Scientist* by Sybil Montgomery.) As a class discuss the importance of science careers. Have students select a career that interests them and have them create a poster about that career and share it with the class.
3. Have students interview a family member regarding the effects that technology has played in their life (e.g. cell phones, cable, iPods, cars). After collecting the information, have them compare/contrast the benefits and risks of developing and using technology. Have students select one piece of technology and research basic facts regarding the piece of technology. Using a digital tool, have them prepare a short report summarizing some simple basic facts about the piece of technology they researched. Have them share their report with the class.

Resources

* Safety Rules (<http://www.ehow.com/way_5503018_science-lab-safety-activities.html#ixzz2Wr5jLluL>)

Resources

1. iPad Resources
2. Literature Connection
*The Magic School Bus and the Science Fair Expedition* by Joanna Cole and Bruce Degen
*How to Think Like A Scientist: Answering Questions by the Science Method* by Stephen P. Kramer
*Solving Science Questions: A Book about the Scientific Process* by Rachel Chappell
*What Is A Scientist?* by Barbara Lehn
*Scientists Ask Questions* by Ginger Garrett
*What Is Science?* by Rebecca Kai Dotlich
*Mad Margaret Experiments with the Scientific Method* by Eric Braun
*The Scientific Method in Fairy Tale Forest* by Laura Magner
*Science Safety Rules* by Kelli Hicks

Resources

* Science Fair Ideas (<http://www.sciencebob.com/sciencefair/scientificmethod.php>)

Grade 2 Science
Science 2

ESS: The Atmosphere

Stage 1: Desired Results

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OH Grade 2 OH: Science (2011)

Earth and Space Science (ESS)

Topic: The Atmosphere

The atmosphere is made up of air.

Science Inquiry and Application

Theme: Observations of the Environment This theme focuses on helping students develop the skills for systematic discovery to understand the science of the physical world around them in greater depth by using scientific inquiry. During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

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Content

**The atmosphere is made up of air.**

a. Air has properties that can be observed and measured.
b. Air takes up space (has volume) and has mass.
c. Heating and cooling of air (transfer of energy) results in movement of air (wind).
d. The transfer of energy in the atmosphere causes air movement, which is felt as wind.
e. Wind speed and direction can be measured.

**Water is present in the air.**

a. Water is present in the air as clouds, steam, fog, rain, ice, snow, sleet or hail.
b. When water in the air cools (change of energy), it forms small droplets of water that can be seen as clouds. c. Water can change from liquid to vapor in the air and from vapor to liquid.
d. The water droplets can form into raindrops.
e. Water droplets can change to solid by freezing into snow, sleet or hail.
f. Clouds are moved by flowing air.

Skills

Recognize that air takes up space and can be weighed.

Recall that weather changes occur due to energy changes.

1. Describe four elements of weather: wind, temperature, pressure, precipitation and how they can be measured.
2. Recognize that wind can be measured with numeric value and direction.
3. Calculate measurements of the direction and speed of wind and the air temperature using a variety of instruments (e.g., windsocks, weather vane, thermometers or simple anemometers).
4. Recognize that a weather front is an area where different air masses collide.
5. Name and compare weather events that are related to wind (e.g., tornadoes, hurricanes).
6. Monitor weather changes using technology.

Recall that water can change from liquid to vapor and/or vapor to liquid.

1. Demonstrate and explain the physical properties of water including water vapor.
2. Explore the concepts of condensation and evaporation through experimentation and observation.
3. Explore and discuss the different parts of the water cycle.
4. Compare how changes in energy affect all aspects of weather, including temperature, precipitation amount and wind.
5. Document and explain weather patterns and fronts.
6. Recognize cloud formation and types of clouds as they relate to weather, storm fronts and changing weather.

Identify clouds as droplets of water and the droplets can combine and form into raindrops.

1. Appreciate the gift of different seasons and types of weather.
2. Introduce factors such as water contamination as they relate to pollution.

Identify and list sources of air, noise, and ground pollution.

Compare renewable and non-renewable resources.

Identify harmful effects of pollution on our fragile planet.

Evaluate benefits of reduce, reuse, recycle in classroom, school, and home.

**Common Core Literacy Skills**

1. Read closely and comprehend scientific text.
2. Cite evidence from text.
3. Draw conclusions from text.
4. Integrate correct scientific terms.
5. Interpret pictures and diagrams.
6. Compare and contrast two texts on the same topic.
7. Utilize various text features (e.g., headings, tables of contents, glossaries, electronic menus, and icon).
8. Distinguish between pictorial and informational text.

**Common Core Writing Content**

1. Formulate arguments focused on discipline-specific content.
2. Compose informative/explanatory text.
3. Produce clear and coherent writing, appropriate to task, purpose, and audience.
4. Edit and revise writing samples.
5. Utilize technology to produce and publish writing.
6. Conduct research projects.
7. Gather relevant sources.
8. Draw conclusions from evidence in text.
9. Write routinely for a range of discipline-specific tasks, purposes, and audiences.

**Common Core Listening and Speaking Skills**

1. Participate in collaborative skills.
2. Follow agreed-upon rules for discussions.
3. Ask and answer clarifying questions.
4. Use background knowledge to describe familiar people, places, things, and events.
5. Add drawings to provide additional details.
6. Speak audibly and express thoughts, feelings and ideas clearly.

Essential Questions

1. How do we get day and night?
2. Does everyone in the world have day and night at the same time?
3. How does the atmosphere shape Earth's climate and weather?
4. How do air and water relate to weather and weather changes?
5. How does weather change over time?
6. Why is it important to conserve our natural resources?

Standards Vocabulary

1. atmosphere
2. water vapor
3. volume
4. mass
5. anemometer
6. condensation
7. evaporation
8. water cycle
9. cloud formation
10. weather patterns
11. fronts
12. temperature
13. precipitation
14. conservation
15. natural resources

Stage 2: Assessment Evidence

Making an Anemometer

Formative: Cooperative Group Work

Using the anemometer they have made, students will collect wind direction, speed and force readings from the anemometer daily for two weeks. They will record their findings on a data table and graph their results. Students will draw conclusions from their data table, prepare a summary report, and present their findings to the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Condensation and Evaporation

Formative: Lab Assignment

Working with a partner, students will design and create a community in an aquarium that is enclosed and has soil, plants, and water. Over a specified period of time, they will observe and test the effects of sun on evaporation and condensation rates and the air and/or water temperature. They will evaluate their findings in a written summary and discuss their findings with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

What Is a Weather Front?

Summative: Lab Assignment

Students will illustrate what happens when a warm air mass collides with and replaces a cold air mass. After completing the activity, they will describe what they saw happen when the oil and water mixed and share their conclusions with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Wind and Cloud Changes

Formative: Class Work

Using the collected data, the class will outline the relationship between wind and cloud changes vs. changes in weather from one season to another season. They will describe the relationships in a class discussion using their written summary and graphic representation. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Resources

Stage 3: Learning Plan

Learning Experiences

1. Making an Anemometer. Have students work in cooperative groups to construct an anemometer. See the Links.
***The materials that youll be needing are:***
*5 cups (can either be plastic or styro; as long as they are light)*
*2 long straws*
*1 pencil with eraser*
*1 pin (pushpins or thumbtacks)*
*Colored marker*
*Tape*
***Steps in How to Make an Anemometer***
*First, students will mark one of the cups with the colored marker. Any mark will do, as long as it is big for the student to see it clearly when it spins. This then becomes your starting point or marker when measuring the wind speed.*
*After the students have made the mark, you set aside that marked cup. Then get another cup that will be used for the center piece. Make four small holes at the upper part of the cup. The holes must be big enough for the straws to fit, and the straws must be making a cross (+) at the center of the cup. Then the students will tape the center of the straws where they intersected, for it to hold together.*
*Next, the students will take a pencil with an eraser, make another hole at the bottom of their center piece cup and insert the pencil with the eraser up and under where the two straws intersect. Then with the use of a pushpin or thumbtack, the students will pin the intersected portion of the straws down to the eraser to hold them. (Note: Dont push the pin too much because the straws might not spin with the wind because the pin holds them down too tight.)*
*Finally, make a small hole on the side of each remaining cup (including the first cup that you marked) for the ends of the straws to be inserted. They must be facing the same direction for when the wind blows, theyll be dragged by it.*
*Now, place the DIY anemometer on the ground and wait until the wind comes.*
*In measuring the speed, count the times in which your marked cup has made one complete turn in one minute. The results will therefore be turns per minute, and thats the speed of the wind. Its also the same as with revolutions per minute (RPM), which is the standard unit of measurement for speed.*
Using the anemometer, have students collect wind direction, speed and force. Students will take readings from the anemometer daily for two weeks. Students will record their findings on a data table and graph their results. Students will draw conclusions from their data table and present them in writing to the class.
2. Condensation and Evaporation. Working with a partner, have students design and create a community in an aquarium that is enclosed and has soil, plants, and water. Over a specified period of time, have them test the effects of sun on evaporation and condensation rates and the air and/or water temperature. Have partners observe various aspects of the "community" and evaluate their findings in a written summary and discuss their findings with the class.
3. What are weather fronts? Have students illustrate what happens when a warm air mass collides with and replaces a cold air mass. (See Link.) After completing the activity, have students describe what they saw happen when the oil and water mixed. Have them share their conclusions with the class.

As a class, compare the different appearances of clouds (shapes, sizes, shades of white/gray). Document the observations over a period of time to find if there is a relationship between the characteristics of the clouds and the weather (storms, precipitation types and/or amounts).

Using student-collected data, outline the relationship between wind and cloud changes vs. changes in weather from one season to another season. Outline relationships in writing or through a class discussion, oral presentation and/or graphic representation.

Resources

* PBS Learning Media (<http://www.pbslearningmedia.org>)

Resources

Resources

1. iPad Resources
2. Literature Connection
*Th*e *Cloud Book* by Tomie dePaola
*The Magic School Bus Rides the Wind* by Anne Capeci and Carolyn Bracken
*Who Likes the Wind? (Exploring the Elements)* by Etta Kaner
*Air and Weather* by Lawrence Hall of Science
*Down Comes the Rain* by Franklyn M. Branley
*The Water Cycle* by Rebecca Olien
*A Drop Around the World* by Barbara McKinney
*Water Dance* by Thomas Locker
*The Snowflake : A Water Cycle Story* by Neil Waldman
*Water, Water Everywhere* by Cynthia Overbeck Bix
*Weather Patterns* by Monica Hughes

Resources

* Teacher Resource -- Atmosphere (classroom.jc-schools.net/sci-units/atmosphere.htm)

Grade 2 Science
Science 2

LS: Interactions within Habitats

Stage 1: Desired Results

Catholic Standards

Targeted Standards

OH Grade 2 OH: ELA & Literacy in History/Social Studies, Science, & Technical Subjects PreK-5

Capacities of the Literate Individual

Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, & Language

They demonstrate independence.

Speaking and Listening

Comprehension and Collaboration 1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others ideas and expressing their own clearly and persuasively.

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.

SL.2.1a. Follow agreed-upon rules 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).

SL.2.1b. Build on others talk in conversations by linking their comments to the remarks of others.

SL.2.1c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

SL.2.2. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

Evaluate a speakers point of view, reasoning, and use of evidence and rhetoric.

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.

Presentation of Knowledge and Ideas 4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

SL.2.4. Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

W.2.2. Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

W.2.3. Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

W.2.5. With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

W.2.6. With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

Research to Build and Present Knowledge 7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

W.2.7. Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

W.2.8. Recall information from experiences or gather information from provided sources to answer a question.

Reading: Informational Text

Key Ideas and Details 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

RI.2.2. Identify the main topic of a multiparagraph text as well as the focus of specific paragraphs within the text.

Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

RI.2.3. Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.

Craft and Structure 4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

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.

Assess how point of view or purpose shapes the content and style of a text.

RI.2.6. Identify the main purpose of a text, including what the author wants to answer, explain, or describe.

Integration of Knowledge and Ideas 7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

RI.2.7. Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

RI.2.8. Describe how reasons support specific points the author makes in a text.

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

RI.2.9. Compare and contrast the most important points presented by two texts on the same topic.

Range of Reading and Level of Text Complexity 10. Read and comprehend complex literary and informational texts independently and proficiently.

RI.2.10. By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.

OH Grade 2 OH: Science (2011)

Life Science (LS)

Topic: Interactions within Habitats

Living things cause changes on Earth.

Science Inquiry and Application

Theme: Observations of the Environment This theme focuses on helping students develop the skills for systematic discovery to understand the science of the physical world around them in greater depth by using scientific inquiry. During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Observe and ask questions about the natural environment;

Plan and conduct simple investigations;

Employ simple equipment and tools to gather data and extend the senses;

Use appropriate mathematics with data to construct reasonable explanations;

Communicate about observations, investigations and explanations;

Review and ask questions about the observations and explanations of others.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

Rights and Responsibilities

Care for God's Creation

The Rights of Children

1. THE RIGHT TO A CATHOLIC COMMUNITY that witnesses to Christ and the Gospel by protecting them from child abuse, including sexual abuse and neglect.

2. THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection, and security.

3. THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.

4. THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.

5. THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION and challenges its members to critical and reflective thinking in their search for truth.

6. THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.

7. THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.

8. THE RIGHT TO LEARN RESPONSIBILITY for themselves and their actions.

9. THE RIGHT TO MAKE RESPONSIBLE DECISIONS founded on religious conviction.

10. THE RIGHT TO GUIDANCE FROM THE CHURCH in their development as loving people.

Content

**Living things cause changes on Earth.**

a. Living things function and interact with their physical environments.
b. Living things cause changes in the environments where they live.
c. Changes made by living things can be very noticeable or slightly noticeable, fast or slow.

**Some kinds of individuals that once lived on Earth have completely disappeared, although they were something like others that are alive today.**

a. Living things that once lived on Earth no longer exist.
b. Their basic needs were no longer met.

Skills

Recognize scientifically accurate facts in stories about environmental change caused by living things.

Recognize that the environment is a combination of the interactions between living and non-living components.

Explain that living things can cause changes in their environment, which can be observed and recorded.

Recognize that the interactions between living and non-living things in the environment can cause changes in groups of living things and the physical environment (soil, rocks, water).

1. Research reasons why organisms can survive only in environments that meet their needs.
2. Explain that fossils are physical traces of living things that are preserved in rock.
3. Define extinction as the disappearance of the last member of a living things kind.
4. Explain that extinction generally occurs as a result of changed conditions to which the living things kind is not suited.
5. Recognize that some kinds of living things that once lived on Earth are something like others that are alive today.
6. Discover and communicate how fossils provide evidence about plants and animals that lived long ago and the nature of the environment at that time.
7. Observe how living things can cause changes in their environment.
8. Evaluate how interactions can cause changes in groups of living things and the physical environment.
9. Describe and explain how living things become extinct.
10. Name an organism that was once abundant in the local area that now is extinct.
11. Explore and compare an array of organisms, both extinct and extant.

Compare the macroscopic features of organisms (e.g., an elephant) that are alive today with those of similar extinct organisms (e.g., a mammoth).

1. Appreciate that God provides us, and all creatures, with all they need to live.

**Common Core Literacy Skills**

1. Read closely and comprehend scientific text.
2. Cite evidence from text.
3. Draw conclusions from text.
4. Integrate correct scientific terms.
5. Interpret pictures and diagrams.
6. Compare and contrast two texts on the same topic.
7. Utilize various text features (e.g., headings, tables of contents, glossaries, electronic menus, and icon).
8. Distinguish between pictorial and informational text.

**Common Core Writing Content**

1. Formulate arguments focused on discipline-specific content.
2. Compose informative/explanatory text.
3. Produce clear and coherent writing, appropriate to task, purpose, and audience.
4. Edit and revise writing samples.
5. Utilize technology to produce and publish writing.
6. Conduct research projects.
7. Gather relevant sources.
8. Draw conclusions from evidence in text.

Write routinely for a range of discipline-specific tasks, purposes, and audiences.

**Common Core Listening and Speaking Skills**

1. Participate in collaborative skills.
2. Follow agreed-upon rules for discussions.
3. Ask and answer clarifying questions.
4. Use background knowledge to describe familiar people, places, things, and events.
5. Add drawings to provide additional details.
6. Speak audibly and express thoughts, feelings and ideas clearly.

Essential Questions

1. How do animals and plants survive?
2. How do animals and plants interact with their environment?
3. How can plant/animal life cycles be compared and contrasted?
4. How do seasonal weather changes affect plants?
5. How do fossils provide us with information about plants and animals that lived long ago?

Standards Vocabulary

1. organisms
2. fossils
3. extinct
4. extant
5. environment
6. adaptation

Stage 2: Assessment Evidence

Fossils

Summative: Writing Assignment

Using the fossil they make in class, students will write a creative story about the fossil and how it came to be. They will share their stories with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Worm Composting

Summative: Comparative Study

Students will create a worm composting area on school grounds and observe how worms compost food scraps into planting material. After composting takes place, students will use the material in flower beds and/or gardens around the school grounds. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Comparing Soil Samples

Summative: Project

Working with a partner, students will plan an investigation that will compare identical soil samples, one with earthworms and one without earthworms. They will record observations over an extended period of time, including data about temperature, amount of moisture, appearance, materials added, materials removed and/or odor. They will represent data from the investigation in a chart, table or pictograph (compare data between containers with and without earthworms). Students will write a report in which they draw conclusions analyzing how land changes over time and present their report to the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Extinct Animal Research

Summative: Research Project

Students will research and find information about extinct animals. Students will write and share three facts about the extinct animal from nonfiction material supplied by the teacher. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Changes Observed in Nature

Formative: Project

Students will find and observe a plot of land that has been abandoned near their home or in a nearby location and make predictions about how the appearance of that property might change over time if there is no human intervention. They will document the changes they observe over a period of time and write a report describing those changes. Students will share their report with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Stage 3: Learning Plan

Learning Experiences

1. Make a Fossil! Have students create fossils using the following materials: Plaster of Paris, water, clean sand and a hard object to make an impression.
*Steps:*
*a. Students will fill a pan or bowl with sand.*
*b. Sprinkle the sand with water until it is moist enough to hold an impression.*
*c. Make an impression in the sand with the hard object of your choice.*
*d. Mix the water and the Plaster of Paris together in a small bowl.*
*e. Immediately pour the Plaster of Paris mixture into the sand impression.*
*f. Let the Plaster of Paris dry for about an hour or until it is hard.*
*g. Remove your fossil from the sand!*
Using their fossil, have them write a creative story about the fossil and how it came to be. Have them share their stories with the class. Create a class *Fossil Stories* book.
2. Worm Composting. As a class, have students create a worm composting area on school grounds. Have them observe how worms compost food scraps into planting material. After composting takes place, have the students use the material in flower beds and/or gardens around the school grounds.
*Extension to task:* Working with a partner, have students plan an investigation that will compare identical soil samples, one with earthworms and one without earthworms. Have them record observations over an extended period of time, including data about temperature, amount of moisture, appearance, materials added, materials removed and/or odor. Have students represent data from the investigation in a chart, table or pictograph (compare data between containers with and without earthworms). Then have them write a report in which they draw conclusions analyzing how land changes over time. Have them present their report to the class.
3. Using various nonfiction materials supplied by the teacher, have students do research to find information about extinct animals. Have them identify three facts about the extinct animal and share their findings with the class.
4. Independent study. Have students find and observe a plot of land that has been abandoned near their home or in a nearby location. Have them make predictions about how the appearance of that property might change over time if there is no human intervention. Have them document the changes over a period of time and write a report describing any changes they have observed. Have them share their report with the class.
5. Explore a beavers habitat in nature or through media. Document observations of the beavers habitat. Working in cooperative groups, have students discuss questions about the impact of the dam on the ecosystem.
a. *How many other organisms are impacted by the presence of the dam?*
*b. How does the dam impact the river or stream?*

Resources

* Worm Composting (<http://www.wikihow.com/Make-Your-Own-Worm-Compost-System>)

Resources

1. iPad Resources
2. Literature Connection
*The Magic School Bus Hops Home: A Book About Animal Habitats* by Pat Relf and Nancy Stevenson
*Magic Tree House Fact Tracker #1: Dinosaurs: A Nonfiction Companion to Magic Tree House #1: Dinosaurs Before Dark* by Will Osborne and Mary Pope Osborne
*Animals and Habitats of the United States* by Jeff Corwin
*Fossils Tell of Long Ago* by Aliki
*Archaeologists Dig for Clues* by Kate Duke
*Digging Up Dinosaurs* by Aliki
3. Field Trip:
Natural History Museum, The Secret Lives of Dinosaurs. Call for information 216.231.4600

Resources

* Construct A Saurus (<http://www.metroparks.cc/education-documents/education_brochure.pdf>)

Grade 2 Science
Science 2

PS: Changes in Motion

Stage 1: Desired Results

Catholic Standards

Targeted Standards

OH Grade 2 OH: ELA & Literacy in History/Social Studies, Science, & Technical Subjects PreK-5

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Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

W.2.2. Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

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W.2.3. Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

W.2.5. With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

W.2.6. With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

Research to Build and Present Knowledge 7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

W.2.7. Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

W.2.8. Recall information from experiences or gather information from provided sources to answer a question.

Reading: Informational Text

Key Ideas and Details 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

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Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

RI.2.3. Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.

Craft and Structure 4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

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.

Assess how point of view or purpose shapes the content and style of a text.

RI.2.6. Identify the main purpose of a text, including what the author wants to answer, explain, or describe.

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RI.2.7. Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

RI.2.8. Describe how reasons support specific points the author makes in a text.

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

RI.2.9. Compare and contrast the most important points presented by two texts on the same topic.

Range of Reading and Level of Text Complexity 10. Read and comprehend complex literary and informational texts independently and proficiently.

RI.2.10. By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.

OH Grade 2 OH: Science (2011)

Physical Science (PS)

Topic: Changes in Motion

Forces change the motion of an object.

Science Inquiry and Application

Theme: Observations of the Environment This theme focuses on helping students develop the skills for systematic discovery to understand the science of the physical world around them in greater depth by using scientific inquiry. During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Observe and ask questions about the natural environment;

Plan and conduct simple investigations;

Employ simple equipment and tools to gather data and extend the senses;

Use appropriate mathematics with data to construct reasonable explanations;

Communicate about observations, investigations and explanations;

Review and ask questions about the observations and explanations of others.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

Rights and Responsibilities

The Dignity of Work and the Rights of Workers

Care for God's Creation

The Rights of Children

1. THE RIGHT TO A CATHOLIC COMMUNITY that witnesses to Christ and the Gospel by protecting them from child abuse, including sexual abuse and neglect.

2. THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection, and security.

3. THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.

4. THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.

5. THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION and challenges its members to critical and reflective thinking in their search for truth.

6. THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.

7. THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.

8. THE RIGHT TO LEARN RESPONSIBILITY for themselves and their actions.

9. THE RIGHT TO MAKE RESPONSIBLE DECISIONS founded on religious conviction.

10. THE RIGHT TO GUIDANCE FROM THE CHURCH in their development as loving people.

Content

**Forces change the motion of an object.**

a. Motion can increase, change direction or stop depending on the force applied.

b. The change in motion of an object is related to the size of the force.

c. Some forces act without touching, such as using a magnet to move an object or objects falling to the ground. d. Forces change the motion of an object.

1. **Basic simple machines are of various types and have different uses (levers, wedges, screws, pulley, wheels, incline planes).**

Skills

1. Observe how forces are needed to change the movement (speed up, slow down, change direction or stop) of an object.
2. Demonstrate and explain that forces are needed to change the movement (speed up, slow down, change direction or stop) of an object.
3. Compare forces that act when objects are in contact (e.g. pushing or pulling) and not in contact (e.g., magnetic or gravitational) with one another.
4. Determine why larger forces can cause larger changes in motion.
5. Recognize that Earths gravity pulls any object toward it, without touching the object.
6. Show how static electricity also can pull or push objects without touching the object.
7. Demonstrate how magnets can pull some objects to them (attraction) or push objects away from them (repulsion).
8. Conduct experiments investigating the effects of gravity, static electricity and magnets on different types of objects.
9. Identify a non-contact force that can affect the motion of an object.
10. Give two examples of how a force can be applied to an object.

Identify magnetic and non-magnetic materials.

Demonstrate attraction and repulsion of magnetic poles.

Observe and describe a magnetic field.

Recognize that magnetic force decreases as distance increases.

Describe how magnetic forces can affect objects through gases, liquids and solids.

1. Explain the relationship between forces and motion.
2. Identify contact/non-contact forces that affect motion of an object (e.g., gravity, magnetic force, contact).
3. Recognize that greater changes in the motion of an object require larger forces.
4. Apply strategies for comparing and measuring objects to solve problems.

Investigate examples of the six simple machines and correctly identify them.

Explain that tools are used to do things better, faster, or more easily.

Distinguish between objects that have wheels and axles and those that do not.

Use a pulley to lift a heavy object and record their observations.

Use lubricants and rollers and observe how they reduce friction.

Evaluate which simple machine to use for a given task.

1. Appreciate the movement of all things God has created.

**Common Core Literacy Skills**

1. Read closely and comprehend scientific text.
2. Cite evidence from text.
3. Draw conclusions from text.
4. Integrate correct scientific terms.
5. Interpret pictures and diagrams.
6. Compare and contrast two texts on the same topic.
7. Utilize various text features (e.g. headings, tables of contents, glossaries, electronic menus, and icon).
8. Distinguish between pictorial and informational text.

**Common Core Writing Content**

1. Formulate arguments focused on discipline-specific content.
2. Compose informative/explanatory text.
3. Produce clear and coherent writing, appropriate to task, purpose, and audience.
4. Edit and revise writing samples.
5. Utilize technology to produce and publish writing.
6. Conduct research projects.
7. Gather relevant sources.
8. Draw conclusions from evidence in text.
9. Write routinely for a range of discipline-specific tasks, purposes, and audiences.

**Common Core Listening and Speaking Skills**

1. Participate in collaborative skills.
2. Follow agreed-upon rules for discussions.
3. Ask and answer clarifying questions.
4. Use background knowledge to describe familiar people, places, things, and events.
5. Add drawings to provide additional details.
6. Speak audibly and express thoughts, feelings and ideas clearly.

Essential Questions

1. How are motion and force related?
2. How can we make objects move?
3. How and why do machines make our work easier?

Standards Vocabulary

1. force
2. motion
3. push
4. pull
5. gravity
6. magnetism
7. movement
8. simple machines
9. levers
10. wedges
11. screws
12. pulley
13. wheels
14. incline planes

Stage 2: Assessment Evidence

Move A Matchbox Car

Summative: Cooperative Group Work

Working in cooperative groups, students will design and construct a device to move a matchbox car from one position to another without touching it. They will test the device and evaluate their design to make any necessary modifications. Using their device, they will plan and implement a scientific experiment to explore the effects some objects have on others even when the two objects do not touch (e.g., magnets). Finally, they will pictorially represent the design and compare their design with the designs from the different groups in the class and compare their effectiveness. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Forces and Motion

Formative: Class Work

Students will plan and implement a scientific experiment to explore how to change how something is moving (e.g., push, pull, speeding up, slowing down, changing direction, stopping). They will conduct the investigation and represent their observations from the experiment orally and in writing. Using their observations in a class discussion, they will explain the relationship between forces and motion. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Getting Objects to Move

Formative: Cooperative Group Work

Students will predict and investigate the changes in motion that a moving object or an object at rest experiences when acted on by a force (e.g., push, pull, gravity). They will compare what is needed to get stationary objects moving and what is needed to get moving objects to stop and share their work with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Simple Machines

Summative: Observation

Working with a partner, students will walk around the school grounds looking for evidence of simple machines and create a list of the simple machines they find. They will pictorially depict the machines and write a brief statement about how the machines make life easier. They will share their report with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Resources

Stage 3: Learning Plan

Learning Experiences

1. Move A Matchbox Car. Working in cooperative groups, have students design and construct a device to move a matchbox car from one position to another without touching it. Have them test the device and evaluate their design to make any necessary modifications.

Using their device, have them plan and implement a scientific experiment to explore the effects some objects have on others even when the two objects do not touch (e.g., magnets).

Have them pictorially represent the design and then have them compare the designs and their effectiveness from the different groups in the class.

As a class, have the students plan and implement a scientific experiment to explore how to change how something is moving (e.g., push, pull, speeding up, slowing down, changing direction, stopping). (See Links.) Conduct the investigation and then have students represent their observations from the experiment orally and in writing. Using their observations in a class discussion explain the relationship between forces and motion.

Working in cooperative groups, have students predict and investigate the changes in motion that a moving object or an object at rest experiences when acted on by a force (e.g., push, pull, gravity). (See Links.) Have them compare what is needed to get stationary objects moving and what is needed to get moving objects to stop and share their work with the class.

1. Simple Machines. Working with a partner, have students walk around the school grounds looking for evidence of simple machines and create a list of the simple machines they found. Have them pictorially depict the machines and write a brief statement about how the machines make life easier. Have them share their report with the class.
2. Have a class discussion around the types of careers that design vehicles or devices that respond to or are impacted by force (e.g., airplanes, boats, trucks). Have students explore a career related to various types of transportation, including those connected to the military, through available resources in the school or classroom library. Have them depict their findings in a drawing.

Resources

* Simple Machines Activity (<http://edheads.org/activities/simple-machines/>)

Resources

Resources

1. iPad Resources
2. Literature Connection
*Pull, Lift, and Lower: A Book About Pulleys (Amazing Science: Simple* Machines) by Michael Dahl
*Wheels and Axles* by Michael Dahl
*How Do You Lift a Lion?* by Robert E. Wells
*Simple Machines* by Deborah Hodge
*Forces Make Things Move* by Kimberly Brubaker Bradley
*Energy Makes Things Happen* by Kimberly Brubaker Bradley
*What Magnets Can Do* by Allan Fowler
*Magnets: Pulling Together, Pushing Apart* by Natalie M. Rosinsky
*Motion: Push and Pull, Fast and Slow* by Darlene R. Stille

Resources

* Simple Machines ([www.edheads.org/activities/simple-machines/](http://www.edheads.org/activities/simple-machines/))