Grade 3 Science  
Science 3

Scientific Process and Inquiry

Stage 1: Desired Results

Catholic Standards

Targeted Standards

OH Grade 3 OH: ELA & Literacy in History/Social Studies, Science, & Technical Subjects PreK-5

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.3.1. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

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

RI.3.2. Determine the main idea of a text; recount the key details and explain how they support the main idea.

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

RI.3.3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

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.3.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 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.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

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.3.7. Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

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.3.9. Compare and contrast the most important points and key details presented in 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.3.10. By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2-3 text complexity band independently and proficiently.

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.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

W.3.2a. Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.

W.3.2b. Develop the topic with facts, definitions, and details.

W.3.2c. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.

W.3.2d. Provide a concluding statement or section.

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

W.3.6. With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.

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.3.7. Conduct short research projects that build knowledge about a topic.

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.3.8. Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

Range of Writing 10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

W.3.10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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.3.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

SL.3.1a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

SL.3.1b. 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.3.1c. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.

SL.3.1d. Explain their own ideas and understanding in light of the discussion.

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

SL.3.2. Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

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

SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

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.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

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

SL.3.6. Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Capacities of the Literate Individual

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

They demonstrate independence.

OH Grade 3 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

Life and Dignity of the Human Person

Rights and Responsibilities

The Dignity of Work and the Rights of Workers

Call to Family, Community, and Participation

Solidarity

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, conclusion

How to observe and ask questions about the natural environment

How to plan and conduct simple investigations

How to employ simple equipment and tools to gather data and extend the senses

How to use appropriate mathematics with data to construct reasonable explanations

How to communicate about observations, investigations and explanations

How to ask questions about the observations and explanations of others

1. Scientific interpretation of information
2. Scientific tools and equipment
3. Science safety rules
4. Ethical practices reflecting Catholic Social Justice Teachings

Resources

Skills

1. Identify the scientific process and recognize the steps in the process. (hypothesis, experiment, conclusion)
2. Apply use of senses to investigations (sight, sound, touch, smell, and taste, as well as prior knowledge).
3. Follow step by step directions.

Pose questions about objects, materials, organisms and events in the environment.

Plan and conduct a fair test to answer a question.

1. Ask, explore, and generate testable questions collaboratively.
2. Use a simple design plan to solve a problem and describe the possible solutions.
3. Make qualitative observations using the five senses.
4. Make observations using simple tools and equipment.
5. Discuss observations and measurements made by self and others.
6. Communicate scientific findings to others through a variety of methods (written, oral, recorded and pictorial observations).
7. Know that scientific inquiry generally works the same way under the same conditions.
8. Read and interpret simple tables and graphs produced by self/others.
9. Record and organize observations (journals, charts, tables).
10. Evaluate explanations/observations with others to provide opportunities to ask questions, examine evidence, and suggest alternative explanations.
11. Use appropriate safety procedures in conducting experiments to answer questions.
12. Select appropriate tools to measure and record in metric and U.S. customary units.
13. Identify and apply relevant safety procedures.
14. Interact with living things and the environment in ways that promote respect.
15. Describe ways in which using the solution to a problem might affect other people and the environment.
16. Explain why keeping records of investigations and observations is important.
17. Make various kinds of measurements using appropriate tools.
18. Compare amounts/measurements.
19. Judge whether measurements and computations of quantities are reasonable.
20. Demonstrate the understanding that using technology can have helpful and/or harmful results.
21. Demonstrate that in science it is helpful to work as a team and share findings with others.
22. Review safety procedures

**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. What is science and how does it differ from other disciplines?

How do scientists find out about objects, living things, events and phenomena?

1. How are scientific questions answered?
2. To what extent are science and common sense related?
3. How does opinion affect inquiry?
4. What drives scientific and technological advancement?

What tools, skills, knowledge, and dispositions are needed to conduct scientific inquiry?

Standards Vocabulary

1. hypothesis
2. experiment
3. conclusion
4. observation
5. inquiry
6. mathematical data
7. reasonable explanations
8. safety rules
9. science tools and equipment

Stage 2: Assessment Evidence

Flip Flop Journal

Summative: Response Journal

Flip Flop Journal: Using an old file folder, plastic tape, and pipe cleaners students can make journals shaped like flip flops. They can flip through the pages and record observations or results of their activities. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Pennies in a Jar

Formative: Observation

Working with a partner, students will observe a stack of pennies in a jar and predict the number of pennies it will take to fill the jar. They will compare the number of pennies it took to fill the jar with their prediction. Write a summary to explain their results. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Working with M&Ms

Formative: Lab Assignment

Students will conduct an experiment using MMs in which they will predict and test what will happen when one MM is placed in water. Working in cooperative groups, students will place one MM in a small dish of water and observe what happens and make a diagram of what they see. They will repeat the experiment with another color of MM and record the results as before.As groups conduct the inquiry, they will follow the steps in the scientific process. When completed, the groups will compare their results with the results of the other groups. Finally, students will write a report about what they learned from the experiment. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Scientist for a Day

Formative: Report

Students will choose one type of scientist to research and present the information to the class. They will be asked to dress as their scientist and use props and visual aids to represent what type of science they study as a way of enhancing their presentation. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Stage 3: Learning Plan

Learning Experiences

1. As a class, review the rules of safety that should be observed in the science classroom.
2. Flip Flop Journal: Using an old file folder, plastic tape, and pipe cleaners, students can make journals shaped like flip flops. They can flip through the pages and record observations or results of their activities.
3. As a class, observe a stack of pennies in a jar. Working with a partner, have students predict the number of pennies they think it will take to fill the jar. Record the predictions. Fill the jar with pennies and record the number it took to fill the jar. Ask the students to compare the number of pennies it took to fill the jar with their predictions. Conduct a class discussion on the role of predictions in making scientific explanations.
4. Engage students in an inquiry lesson. Ask them to predict what will happen when one M M is placed in water? Working in cooperative groups, have students place one M M in a small dish of water, observe what happens, and make a diagram of what they see. Have them repeat the experiment with another color of M M and record the results as before.  
   As groups conduct the inquiry, have them follow the steps in the scientific process as follows:  
   a. **INQUIRY** - What do I want to find out? (Asks a question about an activity or task.)  
   b. **HYPOTHESIS** - What do I think I'll find out? (A statement about how the inquiry question could be answered.)  
   c. **PROCEDURE** - How do I find out? (Identifies/lists steps or sequence.)  
   d. **SCIENCE SKILLS MATERIALS** - What science tools will/did I use (ruler, scale, magnet, thermometer, hand lens, etc. for measuring, observing, inferring, predicting, recording data, etc.)  
   e. **RESULTS** - What happened? (tables, graphs, charts; drawings; qualitative quantitative data.)  
   f. **CONCLUSIONS** - What did I learn from this activity? (written, graphic, oral, etc.)  
   When completed, have each group compare their results and then compare their results with the results of the other groups. They will discover that every color of M M dissolves in a similar way.
5. Research various branches of science and the careers that are part of each branch. Have students choose from one type of scientist to report on and present information about their scientist to the class. Ask students to dress as their scientist and use props and visual aids to represent what type of science they studied as a way of enhancing their presentation.

Resources

* Ohio Dept. of Education - Science Model Curriculum (<http://education.ohio.gov/Topics/Academic-Content-Standards/Science>)

Resources

1. iPad Resources
2. Literature Connection  
   *11 Experiments That Failed* by Jenny Offill and Nancy Carpenter  
   *Lessons in Science Safety with Max Axiom, Super Scientist* by Donald B. Lemke  
   *Investigating the Scientific Method with Max Axiom, Super Scientist* by Donald B. Lemke  
   *Solving Science Questions: A Book about the Scientific Process* by Rachel Chappell

Resources

* Scientific Method (<http://barnett.nebo.edu/sites/barnett.nebo.edu/files/Scientific%20Method%20Graphic%20Organizer.pdf>)

Grade 3 Science  
Science 3

ESS: Earth's Resources

Stage 1: Desired Results

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Earth and Space Science (ESS)

Topic: Earths Resources

Earth's nonliving resources have specific properties.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

Life and Dignity of the Human Person

Rights and Responsibilities

The Dignity of Work and the Rights of Workers

Call to Family, Community, and Participation

Solidarity

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Content

1. **Earths nonliving resources have specific properties.**  
   a. Soil is composed of pieces of rock, organic material, water and air and has characteristics that can be measured and observed.  
   b. Rocks have unique characteristics that allow them to be sorted and classified.  
   c. Rocks form in different ways.  
   d. Air and water are nonliving resources.

**Earths resources can be used for energy.**

a. Many of Earths resources can be used for the energy they contain.  
b. Renewable energy is an energy resource, such as wind, water or solar energy, that is replenished within a short amount of time by natural processes.  
c. Nonrenewable energy is an energy resource, such as coal or oil, that is a finite energy source that cannot be replenished in a short amount of time.

**Some of Earths resources are limited.**

a. Some of Earths resources become limited due to overuse and/or contamination.  
b. Reducing resource use, decreasing waste and/or pollution, recycling and reusing can help conserve these resources.

Skills

1. Analyze information on the composition and properties of nonliving things (rocks, soil, water, and air) found on earth.

Identify rock, soil, air and water as examples of non-living resources.

Recognize that soil can have different texture, composition, or color depending on the environment in which it formed.

Recognize that soil is composed of pieces of rock, organic material, water, and air.

Identify the characteristics of soil that can be measured and observed.

Recognize that rocks have unique characteristics that allow them to be sorted and classified.

Recall that rocks can be sorted based on characteristics such as grain-size (texture), color, and patterns.

Explain the different ways in which rocks form.

1. Classify rocks according to their characteristics (color, hardness, texture, size and shape of the particles, or grain within the rock).
2. Create a table of the information collected during rock classification using the scientific tools.

Determine that air and water are nonliving resources.

1. Observe and test soil samples to determine the ability of water to pass through, color, texture, composition, and moisture level.
2. Compare and contrast the benefits and limits of the Earth's nonrenewable resources (fossil fuels), and renewable resources (water, air).
3. Differentiate the types of renewable energy sources (wind, solar, hydropower).
4. Distinguish between renewable and nonrenewable resources through observation and investigation.
5. Analyze and synthesize how overuse and contamination can lead to earth's resources being limited.
6. Compare and contrast the different types of recycling and determine which is most effective.
7. Recognize the importance of respectfully using the resources 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.
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2. Compose informative/explanatory text.
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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.

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1. Participate in collaborative skills.
2. Follow agreed-upon rules for discussions.
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5. Add drawings to provide additional details.
6. Speak audibly and express thoughts, feelings and ideas clearly.

Essential Questions

1. What tools and technologies do scientists use to study earth systems?
2. To what extent do our lives depend on the Earth's nonrenewable and renewable resources?
3. How does the composition of rocks and soil help to classify them?

How is energy important to every day life?

What is the purpose for each form of energy?

Standards Vocabulary

1. nonrenewable resource
2. renewable resource
3. fossil fuels
4. composition
5. properties
6. energy
7. solar
8. classify
9. soil
10. mineral
11. streak plate
12. luster
13. hardness
14. texture
15. conservation
16. recycle

Stage 2: Assessment Evidence

Sediment Tube

Formative: Lab Assignment

Working in cooperative groups, students will build a sediment tube to demonstrate how water flows and settles through the various layers. They will test soil to determine properties (ability to absorb water, soil color, ability for water to pass through soil, filtering properties of soil) of different types of soil and make a chart or graph to compare the soil composition and properties. Groups will present their findings to the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Create a Pond Water Garden/Wetland Terrarium

Summative: Performance

The class will design and construct a pond water garden or wetland environment in a terrarium using the results of the soil test to determine the best soil. On a regular basis, students will record their observations of the growth in the terrarium and discuss these observations in class. Using the steps in the scientific process, students will ask and answer questions about the investigation. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Rock Investigation

Formative: Project

Create a dichotomous key to classify rock characteristics. Choose a type of rock to investigate the rock uses in the real world. Using the data gathered from the dichotomous key, justify why this rock is best suited to be used in that particular way. Write a persuasive paragraph to prove your point. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Energy Resources Efficiency and Cost

Formative: Research Project

Students will research the efficiency and cost of different types of energy resources (renewable and/or nonrenewable) and compare and contrast the findings by creating a table or graph. They will synthesize the information in a compare and contrast essay. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Reducing the Use of Resource

Summative: Cooperative Group Work

Design and carry out a plan to reduce the use of a specific item in the classroom (paper, food). Once data is analyzed and plan is chosen, present findings to the school. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Stage 3: Learning Plan

Learning Experiences

1. Working in cooperative groups, have students build a sediment tube to demonstrate how water flows and settles through the various layers. Test soil to determine properties (ability to absorb water, soil color, ability for water to pass through soil, filtering properties of soil) of different types of soil. Make a chart or graph to compare the soil composition and properties. Ask groups to share their findings with the class. As a whole class, draw conclusions about the soils tested to determine the best soil based on the observations and reports of each group.
2. As a follow-up to the above investigation, have the class design and construct a pond water garden or wetland environment in a terrarium using the results of the soil test to determine the best soil. On a regular basis, have students record their observations of the growth in the terrarium and discuss these observations in class. Use the steps in the scientific process to ask and answer questions about the investigation.
3. Have students create a dichotomous key to classify rock characteristics. Ask them to choose a type of rock to investigate and research the uses of that rock in the real world. Using the data gathered from the dichotomous key, have them explain why the rock is best suited to be used in a particular way. Using a digital tool, have students present their findings to the class.
4. Working with a partner, have students research the efficiency and cost of different types of energy resources (renewable and/or nonrenewable). Have them compare and contrast the findings by creating a table or graph. Using the table/graph, have them synthesize the information in a compare and contrast essay.
5. Working in cooperative groups, have students design and carry out a plan to reduce the use of a specific item in the classroom (paper, food). Have each group present their plan and design to the class. After all groups have presented their plan, have the class select the best plan and present the plan to the school. (This activity can be extended to includ the whole school and/or community.)

Resources

* Ohio Dept. of Education - Science Model Curriculum (<http://education.ohio.gov/Topics/Academic-Content-Standards/Science>)

Resources

1. iPad Resources
2. Literature Connection  
   *The Boy Who Harnessed the Wind* by William Kamkwamba  
   *Just a Dream* by Chris Van Allsburg  
   *Soil: The Scoop on Dirt* by Natalie Mya Rosinski  
   *Diggin' Dirt: Science Adventures with Kitanai the Origami Dog* by Thomas Kingsley Troupe  
   *Rocks: Hard, Soft, Smooth, and Rough* by Natalie M. Rosinsky  
   *Let's Go Rock Collecting* by Roma Gans  
   *Jump into Science: Dirt* by Steve Tomecek  
   *A Handful of Dirt* by Raymond Bial  
   *The Earth's Resources: Renewable and Non-Renewable* by Rebecca Harman  
   *Earth's Resources* by Sue Barraclough  
   *Natural Resources* by Louise Spilsbur  
   *Where Does the Garbage Go?* by Paul Showers  
   *Michael Recycle* by Ellie Bethel  
   *Why Should I Recycle?* by Jen Green  
   *Where Do Recyclable Materials Go? Read, Think, Recycle* by Sabbithry Persad  
   *Earth-Friendly Energy* by Gillian Gosman

Resources

* When Rocks Tell Stories (<http://education.usgs.gov/lessons/schoolyard/RockDescription.html>)

Grade 3 Science  
Science 3

LS: Behaviors, Growth, and Change

Stage 1: Desired Results

Catholic Standards

Targeted Standards

OH Grade 3 OH: ELA & Literacy in History/Social Studies, Science, & Technical Subjects PreK-5

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.3.1. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

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

RI.3.2. Determine the main idea of a text; recount the key details and explain how they support the main idea.

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

RI.3.3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

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.3.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 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.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

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.3.7. Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

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.3.9. Compare and contrast the most important points and key details presented in 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.3.10. By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2-3 text complexity band independently and proficiently.

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.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

W.3.2a. Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.

W.3.2b. Develop the topic with facts, definitions, and details.

W.3.2c. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.

W.3.2d. Provide a concluding statement or section.

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

W.3.6. With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.

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.3.7. Conduct short research projects that build knowledge about a topic.

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.3.8. Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

Range of Writing 10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

W.3.10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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.3.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

SL.3.1a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

SL.3.1b. 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.3.1c. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.

SL.3.1d. Explain their own ideas and understanding in light of the discussion.

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

SL.3.2. Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

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

SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

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.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

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

SL.3.6. Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Capacities of the Literate Individual

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

They demonstrate independence.

OH Grade 3 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.

Life Science (LS)

Topic: Behavior, Growth and Changes

Offspring resemble their parents and each other.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

Life and Dignity of the Human Person

Rights and Responsibilities

The Dignity of Work and the Rights of Workers

Call to Family, Community, and Participation

Solidarity

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

**Individuals of the same kind differ in their traits and sometimes the differences give individuals an advantage in surviving and reproducing.**

a. Plants and animals have physical features that are associated with the environments where they live.

b. Plants and animals have certain physical or behavioral characteristics that improve their chances of surviving in particular environments.

c. Individuals of the same kind have different characteristics that they have inherited.  
d. Different characteristics give individuals an advantage in surviving and reproducing.

**Plants and animals have life cycles that are part of their adaptations for survival in their natural environments.**

a. Over the whole earth, organisms are growing, reproducing, dying and decaying.  
b. The details of the life cycle are different for different organisms, which affects their ability to survive and reproduce in their natural environments.

Skills

1. Investigate the structures of plants and animals which help them to meet their basic needs. (adaptations)
2. Explain that organisms have different structures and behaviors that serve different functions.
3. Recognize that organisms are similar to their parents in appearance and behavior but still show some variation.
4. Explain that there are some traits that are passed down that increase the ability of organisms to survive and reproduce.
5. Compare living organisms to determine if offspring resemble their parents.
6. Recognize that organisms have a reliable mechanism for ensuring that offspring resemble their parents.
7. Recognize that some plants have leaves, stems and roots; each part serves a different function for the plant.
8. Recognize that some animals have wings, feathers, beaks; each part serves a different function for the animals.

Give examples of variations among individuals of a local population of dandelions (e.g., height, color, weight).

Observe variations in color, size, weight, etc., as an organism develops.

1. Compare the life cycles of different animals including birth to adulthood, reproduction and death (metamorphosis of frogs/butterflies).
2. Explain how organisms have different structures and behaviors that serve different functions.
3. Explain how plants and animals that survive and reproduce pass successful features on to future generations.
4. Use Venn diagrams to illustrate the similarities and differences between individuals of the same type.

Name some physical features of plants and animals that are associated with the environment in which they live (e.g., coloration, location of eyes, type of feet).

Write a report explaining how the behavioral or physical characteristic is an advantage of a specific animal or plant for surviving in its environment.

Recognize that plants and animals have life cycles that are adapted to survive in distinct environments .

Explain that most life cycles start with birth, then progress to growth, development, adulthood, reproduction, and death and that the process can be interrupted at any time.

Explain how the life cycles are different for different organisms.

Label photographs of stages of animal or plant life cycles and place them in sequence from egg to adult.

Explain why some animals have offspring in the spring and some plants produce seeds in the fall.

1. Respect the natural cycles of life that God has designed.

**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. What does it mean to be living?
2. How do the parts of living things help them to survive?
3. How does studying cycles help us to understand natural processes?
4. To what extent do traits determine an organism's characteristics?
5. How do the life cycles of living things ensure the survival of species?

How can living things be so different yet be so alike?

Standards Vocabulary

1. offspring
2. organism
3. species
4. trait
5. environment
6. adaptation
7. cycle
8. metamorphosis
9. stem
10. leaf
11. root
12. basic needs
13. photosynthesis
14. survival
15. inherit

Stage 2: Assessment Evidence

Observations of Animals

Summative: Comparative Study

Using webcams to view animals in their natural habitats or simulated environments, students will observe and record physical characteristics of the animals, as well as behavioral traits that are taught from parent to offspring. They will develop a chart that compares features to emphasize the similarities and differences between offspring and parents. Students will illustrate and explain the differences and similarities found among the family members through a family portrait. They will share their findings and report with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Life Cycle Journal/Book

Summative: Response Journal

Students will watch a butterfly or frog go through the stages of the life cycle. They will illustrate and explain the changes that are observed, and using a digital tool, they will create a book or journal using the information gathered. They will share their book/journal with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Seed Germination

Formative: Lab Assignment

Working in cooperative groups, students will use the steps in the scientific process to plan and conduct an experiment to find out the optimal conditions for seed germination. They will write a report on their investigation and present their findings to the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Surviving in the Environment

Formative: Research Project

Using various research tools, students will research and write a report explaining how the behavioral or physical characteristic is an advantage of a specific animal or plant for surviving in its environment. 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.)

Stage 3: Learning Plan

Learning Experiences

1. Have students use webcams to view animals in their natural habitats or simulated environments to observe and record physical characteristics of the animals, as well as behavioral traits that are taught from parent to offspring. Based on their observations, have them develop a chart that compares features such as stages of development, food sources, where they are found in the environment, and physical appearance to emphasize the similarities and differences between offspring and parents. Illustrate and explain the differences and similarities found among the family members through a family portrait. Share their findings and report with the class
2. Class activity. While watching a butterfly or frog go through the stages of the life cycle, have students illustrate and explain the changes that are observed. Using a digital tool, have them create a book or journal using the information gathered.

Working in cooperative groups, have students use the steps in the scientific process to plan and conduct an experiment to find out the optimal conditions for seed germination. Have them write a report on their investigation and present their findings to the class.

Using various research tools, have students research and write a report explaining how the behavioral or physical characteristic is an advantage of a specific animal or plant for surviving in its environment (e.g., *what adaptations does a pine tree have for living in colder environments?).*

Class activity. In the process of planning an investigation to study the life cycle of a butterfly, evaluate the design of three emergence cages. Evaluate each cage using scientific knowledge about the needs of butterflies. Using the information from the study, design and build an improved butterfly emergence cage. Learn more at http://monarchwatch.org/rear/cages.htm

Resources

* Falcon Webcam (<http://ohiodnr.com/wildlife/dow/falcons/columbus.aspx>)

Resources

1. iPad Resources
2. Literature Connection

*From Seed to Plant* by Gail Gibbons  
*Where Do Polar Bears* *Live?* by Sarah Thomson

*From Caterpillar to Butterfly* by Deborah Heiligman

*Are You My Mother?* by P.D. Eastman  
*The Life Cycle of an Emperor Penguin* by Bobbie Kalman  
*The Life Cycle of a Sea Turtle* by Bobbie Kalman  
*The Life Cycle of a Wolf* by Bobbie Kalman  
*The Life Cycle of a Frog* by Bobbie Kalman

Resources

* Life Science videos (<http://www.learner.org/resources/series179.html>)

Grade 3 Science  
Science 3

PS: Matter and Forms of Energy

Stage 1: Desired Results

Catholic Standards

Targeted Standards

OH Grade 3 OH: ELA & Literacy in History/Social Studies, Science, & Technical Subjects PreK-5

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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.

Physical Science (PS)

Topic: Matter and Forms of Energy

All objects and substances in the natural world are composed of matter.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

Life and Dignity of the Human Person

Rights and Responsibilities

The Dignity of Work and the Rights of Workers

Call to Family, Community, and Participation

Solidarity

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

**All objects and substances in the natural world are composed of matter.**

a. Matter takes up space and has mass.

**Matter exists in different states, each of which has different properties.**

a. The most common states of matter are solids, liquids and gases.

b. Shape and compressibility are properties that can distinguish between the states of matter.

c. One way to change matter from one state to another is by heating or cooling.

d. Matter exists in a variety of forms and can be classified by physical properties.  
d. Matter can be mixed and separated.

**Heat, electrical energy, light, sound and magnetic energy are forms of energy.**

a. There are many different forms of energy.  
b. Energy is the ability to cause motion or create change.

Skills

1. Recognize that objects are composed of matter and matter has observable properties.
2. Define matter and its properties (mass, volume, and weight).
3. Explain that gases, liquids and solids are different states of matter that have different properties.

Name observable differences between the three states of matter.

1. Sort various substances into the categories: solid, liquid, and gas.
2. Recognize that matter continues to exist when broken into pieces too tiny to be visible.
3. Explain that volume is a measure of the amount of space an object takes up.
4. Show that volumes of liquids can be measured in metric units.
5. Distinguish between weight and volume.
6. Explain how weight is a measure of gravity and that weight is measured using a scale.
7. Recognize that states of matter depend on the distance between molecules.
8. Collect examples of matter that changes form when exposed to a change in temperature.

Explain how warm water can cause motion or create change.

Recognize that energy can cause motion or create change.

Explain how a magnet can cause motion or create change.

Identify objects with energy in the environment (e.g., moving water, windmill, water wheel, sunlight) and determine what types of energy they have.

1. Measure and record the mass, volume, and weight of an object using a balance, scale, measuring cup and/or ruler.
2. Label the correct unit of measure for volume, mass and weight.
3. Calculate the volume of a regular solid using the mathematical formula (length x width x height).
4. Determine the characteristics of the three states of matter and recognize that heating and cooling contribute to the changes of state.
5. Explain how different forms of energy are responsible for motion and creating change.
6. Collect and sort examples of energy forms, including electrical, mechanical, sound, light, thermal, and chemical energy.
7. Recognize the difference between potential and kinetic energy.
8. Describe the various types of energy and the motion and change they cause.
9. Identify the action forces and reaction forces involved in simple machines.
10. Identify and collect six fundamental types of simple machines: inclined plane, lever, pulley, wedge, screw, wheel, and axle.
11. Appreciate the nature of the energy that 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

How does my understanding of physical science help me explain the connections among matter, time, space and energy?

1. How do the properties of matter affect its behavior?
2. How and why does matter change?
3. How does matter and energy compare?

How and why do objects move?

1. To what extent does energy affect the motion or change of an object?

Standards Vocabulary

1. matter
2. mass
3. volume
4. weight
5. motion
6. gram
7. milliliter
8. cubic centimeter
9. solid
10. liquid
11. gas
12. scale
13. balance scale
14. thermal energy
15. magnetic energy
16. heat energy
17. light energy
18. sound energy
19. electrical energy

Stage 2: Assessment Evidence

Properties of Matter

Formative: Cooperative Group Work

Working in cooperative groups and using three different items, students will measure as many properties for each item as possible and record the measurements for each item on a separate index card. When finished, they will switch the samples and index cards with another group and identify which set of measurements belong with which item. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Magnets and Motion

Formative: Lab Assignment

Working with a partner, students will test and explain how a magnet causes motion or creates change. For each item tested, they will draw a picture showing what happens and write a brief explanation of what they observed. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Measurement of Objects

Summative: Cooperative Group Work

Working with a partner, students will identify various objects in the environment that possess energy (e.g., moving water, windmill, water wheel, sunlight) and create a chart listing each item and the type(s) of energy they have. Using the results of their observations and the chart they have created, students will prepare a digital presentation of their work and share it with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Objects with Energy

Summative: Cooperative Group Work

Working in cooperative groups, students will design, construct and test a small boat or aircraft that can move in different directions (or against the flow of air/water) in nature. They will document the forms of energy and resulting motion as the boat or aircraft is being demonstrated to the class. When all groups have completed their demonstration, the class will discuss what they observed and determine what conclusions they can make based on their observations. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Stage 3: Learning Plan

Learning Experiences

Working in cooperative groups and using three different items, measure as many properties for each item as possible. Record the measurements for each item on a separate index card. When finished, switch the samples and index cards with another group and identify which set of measurements belong with which item. Repeat until all groups have worked with the samples from another group.

1. Working with a partner, have students test and explain how a magnet causes motion or creates change. For each item tested, have them draw a picture showing what happens and write a brief explanation of what they observed.
2. Working with a partner, have students identify various objects in the environment that possess energy (e.g., moving water, windmill, water wheel, sunlight). Have them create a chart listing each item and the type(s) of energy they have. Using the results of their observations and the chart they have created, have them prepare a digital presentation of their work which they will share with class.

Working in cooperative groups, have the students design, construct, and test a small boat or aircraft that can move in different directions (or against the flow of air/water) in nature. Have them document the forms of energy and resulting motion as the boat or aircraft is being demonstrated to the class. When all groups have completed their demonstration, conduct a class discussion on what was observed. What conclusions can they make based on their observations?

Resources

* Graphic Organizers (<http://www.edhelper.com/teachers/General_graphic_organizers.htm>)

Resources

1. iPad
2. Literature Connection

*What's the Matter in Mr. Whiskers' Room?* by Michael Elsohn Ross and Paul Meisel

*What Is the World Made Of?: A Book about Solids, Liquids, and Gases* by Kathleen Weidner Zoehfeid and Paul Meisel  
*Solids. Liquids, and Gases* by Ginger Garrett

*States of Matter: A Question and Answer Book* by Bayrock, Fiona, McMullen and Anne

*What Is Matter?* by Don L. Curry

*Solids, Liquids and Gases* by Ontario Science Centre and Ray Boudreau

*Bartholomew and the Oobleck* by Dr. Seuss  
*An Early Start to Energy and Its Effects* by Roy Richards *Wind Energy: Blown Away!* (Powering Our World) by Amy S. Hansen  
*The Boy Who Harnessed the Wind* by William Kamkwamba  
*Energy from the Sun* by Allan Fowler  
*Energy Makes Things Happen* by Kimberly Brubaker Bradley

Resources

* Lesson Ideas (Unit on Physical Science)