Kindergarten Science
Science K

Scientific Inquiry, Writing and Literacy Skills

Stage 1: Desired Results

Catholic Standards

Targeted Standards

OH Kindergarten 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.

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.K.1. With prompting and support, ask and answer questions about 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.K.2. With prompting and support, identify the main topic and retell key details of 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.K.4. With prompting and support, ask and answer questions about unknown words in a text.

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.K.7. With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).

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.K.9. With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).

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.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

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

W.K.3. Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.

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

W.K.5. With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.

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.K.7. Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).

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.K.8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

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.K.1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

SL.K.1a. Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).

SL.K.1b. Continue a conversation through multiple exchanges.

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

SL.K.2. Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

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

SL.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

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.K.4. Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

SL.K.5. Add drawings or other visual displays to descriptions as desired to provide additional detail.

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

SL.K.6. Speak audibly and express thoughts, feelings, and ideas clearly.

OH Kindergarten 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, conclusion
2. Importance of observations
3. Questioning strategies
4. Value of scientific investigations
5. Scientific tools and safety
6. Units of measurement
7. Interpretation of data
8. Articulate conclusions and explanations
9. Communicate about science in different formats
10. Importance of technology in science
11. Responsible science practices
12. Importance of recycling our resources
13. Ethical practices reflecting Catholic Social Justice Teachings

Skills

1. Develop an awareness of the scientific process (hypothesis, experiment, conclusion).
2. Ask, explore, and generate "what if" questions.

Observe and ask questions about the natural environment.

Plan and conduct simple investigations.

Exercise the five senses to make observations about the natural world.

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 through detailed drawings.

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

1. Prove that new observations can lead to a new hypothesis.
2. Differentiate between objects that are "natural" or "man-made" and explain the differences.
3. Design pictographs and use them to describe observations and draw conclusions.
4. Draw the conclusion that people are more likely to accept your ideas if you can give valid reasons for them.
5. Investigate the intended use of scientific tools that can be helpful or if misused can be harmful (e.g., scissors can be used to cut paper but they can also hurt you).
6. Adopt appropriate safety procedures when completing scientific investigations/experiments.
7. Verify that numbers can be used to count collections of things.
8. Determine and use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers and other appropriate tools).
9. Construct the measurement lengths of objects using U.S. customary and metric units of measurements (e.g., paper clips or rulers).
10. Interact with living things and the environment in ways that promote respect.
11. Cite evidence to show ways responsible science practices affect people in accordance with social justice teachings.
12. Inquire how materials can be used over and over again.
13. Research how technology affects our everyday life.
14. Expand their awareness of careers in science.

**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.

**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.

**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. Conduct research projects.
6. Gather relevant sources.
7. Draw conclusions from evidence in text.
8. Write routinely.

Essential Questions

1. How do scientists learn new things?
2. How is scientific knowledge created and communicated?
3. How do scientists find out about objects, living things, events and phenomena?
4. How do we use science tools safely?
5. Why should we respect our environment?

Standards Vocabulary

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

Stage 2: Assessment Evidence

Sponge Bob Safety Review

Formative: Listening Task

The teacher will read Sponge Bob story aloud to the class. The class will discuss ways in which lab rules were used incorrectly. The class will then create a list of proper science lab rules. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Role Play Science Rules

Formative: Dramatization

Students will role play different scenarios of using correct and incorrect science lab safety rules. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Analyzing a Pictograph

Formative: Class Work

1. Students will sort pictures or objects into man-made and natural categories. 2. Students will create a pictograph using two headings to show the results. 3. Students will make a conclusion orally, as to whether most objects are man made or natural using the pictograph. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Scientific Process

Summative: Lab Assignment

Students will participate in a science investigation observing how water travels up the stem of a daisy. (This investigation is used for background knowledge to the celery experiment). Students put one daisy in a cup of water with red food coloring and another daisy in a cup of water with blue food coloring. The daisies will sit overnight and students will make observations in class the next day. The class will go through the scientific method by listing the steps and explaining what happens at each step. Students will illustrate and compose a written conclusion. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Apple Tasting

Formative: Comparative Study

Students will participate in an investigation utilizing their five senses. Using an apple, students will use their sense to describe it (red, sweet, smooth, crunchy). Introduce other types of apples and hypothesize which will taste the sweetest. Students will explain how their answer could be found. Experiment by tasting the apples. Students will then conclude which was the sweetest. Students can draw a picture of the apples and circle the sweetest apple. 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 become familiar with science lab safety rules using the Sponge Bob Safety resource. (See Link.) Discuss the rules and have students role play various safety procedures. Finally, as a class, develop a list of safety rules to follow in class.
2. Working with a partner, have students categorize pictures of natural and man-made objects. Sort objects into the two headings and make a pictograph to show the results. Conclude whether most objects are man made or natural using the pictograph.
3. Have students participate in a science investigation observing how water travels up the stem of a daisy. (This investigation is used for background knowledge to the celery experiment). Have them put one daisy in a cup of water with red food coloring and another daisy in a cup of water with blue food coloring. The daisies will sit overnight. Have students make observations in class the next day using the scientific method by listing the steps they took and explaining what happened at each step. Finally, have them illustrate their observations and compose a written conclusion.
4. Have students participate in an investigation utilizing their five senses. Using an apple, have them use their senses to describe the apple (red, sweet, smooth, crunchy). Introduce other types of apples and have students hypothesize which will taste the sweetest. Ask the students to explain how their answer could be found. (Experiment by tasting the apples.) Have them draw a picture of the apples and circle the sweetest apple.

Resources

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

Resources

1. iPad Resources
2. Literature Connection
*What is a Scientist?* by Barbara Lehn
I *Want to be a Zookeeper* by Dan Liebman
*I Want to be an Astronaut* by Brian Barton
A *Day in the Life of a Doctor* by Linda Hayward

Resources

* Introduce and Review Science Safety Rules ([www.sciencespot.net/Media/scimthdsafety.pdf](http://www.sciencespot.net/Media/scimthdsafety.pdf))

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ESS: Daily and Seasonal Changes

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OH Kindergarten OH: Science (2011)

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Earth and Space Science (ESS)

Topic: Daily and Seasonal Changes

Weather changes are long term and short term.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

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.

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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

**Weather changes are long-term and short-term.**

a. Weather changes occur throughout the day and from day to day.

b. Air is a nonliving substance that surrounds Earth and wind is air that is moving.

c. Wind, temperature and precipitation can be used to document short-term weather changes that are observable.

d. Yearly weather changes (seasons) are observable patterns in the daily weather changes.

**The moon, sun and stars can be observed at different times of the day or night.**

a. The moon, sun and stars are in different positions at different times of the day or night.
b. Sometimes the moon is visible during the night, sometimes the moon is visible during the day and at other times, the moon is not visible at all.
c. The observable shape of the moon changes in size very slowly throughout each day of every month.
d. The sun is visible only during the day.

e. The suns position in the sky changes in a single day and from season to season.
f. Stars are visible at night.
g. Some stars are visible in the evening or morning.
h. Some stars are brighter than others.

Resources

Skills

1. Perform observations of weather changes throughout the day and from day to day.
2. Describe and observe seasonal changes in weather.
3. Differentiate between air (nonliving substance that surrounds Earth) and wind (air that is moving) and explain those differences.
4. Document short-term weather changes that are observable (e.g., wind, temperature, and precipitation).

Recognize that temperature, wind and precipitation are different ways to measure weather.

Experiment with different methods or make/use tools to collect precipitation amounts (rain, snow or ice).

Experiment with different methods or make/use tools to measure the speed (faster or slower) and direction of wind (*which way is the wind blowing?*).

1. Demonstrate knowledge that the sun (a star) can be seen only in the daytime, stars are usually seen at night, but the moon can be seen sometimes at night and sometimes during the day.

Recognize that the sun changes position in the sky during the day.

1. Explore the differences between day, night, and seasonal changes which are caused by the position of Earth.
2. Recall that the moon is visible at night and sometimes during the day.
3. Recognize that the visible part of the moon changes throughout the month.

Use technology to compare classroom data to local data, study weather events, communicate and share data with other classrooms, and record classroom data.

1. Develop a sense of wonder and awe about the universe that God created.
2. Demonstrate gratitude to God for the seasons and weather.

**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.
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**Common Core Literacy Skills**

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2. Cite evidence from text.
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4. Integrate correct scientific terms.
5. Interpret pictures and diagrams.
6. Compare and contrast two texts on the same topic.

Resources

Essential Questions

1. What is outer space and what objects can I see in space?
2. How can I explain day and night?
3. Why do shadows change from morning to afternoon?
4. What are the seasons?
5. What happens in Autumn? Winter? Spring? Summer?
6. How are the seasons different?
7. How are people, animals, and our environment affected during each season?

Standards Vocabulary

1. weather
2. air
3. wind
4. precipitation
5. season
6. sun
7. moon
8. stars

Stage 2: Assessment Evidence

Weather Graph

Formative: Class Discussion

Create a weather chart that documents observed weather elements throughout the year. Throughout the year, students will observe the changes in temperature, precipitation and wind including the changes that are observed each day, week, and month and discuss reasons for the observed changes and answer questions posed by the teacher or other students. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Student Created Weather Tools

Summative: Cooperative Group Work

Students will work with a partner to make their own weather tools to measure weather using everyday materials. Students will be assessed on: --Brainstorming of ideas --List of materials --Demonstration --Brief explanation of tool What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Comparing Seasonal Changes

Formative: Class Work

Teacher will conduct a class read aloud using stories that contrast seasonal changes in the weather. Following the reading, students will compare and contrast the illustrations of the texts as well as the seasonal changes described. They will then illustrate and describe the differences between the seasonal changes and share their drawings with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Careers in Weather

Formative: Research Project

Explore weather-related careers using nonfiction text as well as the Internet (e.g., www.theweatherchannelkids.com). What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

It is Windy

Formative: Writing Assignment

Using a digital camera or an iPad, the class will take pictures of things the wind is blowing (trees, flag, leaves, paper, bubbles). Using the printed pictures, students will select one to write a sentence about what the wind is blowing in the pictures. They will share their sentence and picture with the class. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Phases of the Moon

Formative: Class Work

As a class, make a table or chart to document the changes in the observable (lit) part of the moon throughout a month. Using the table or chart, the students will compare the differences throughout the month and then determine if the same pattern exists the next month. Students will discuss their observations and conclusions. 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. As a class, create a weather chart that documents observed weather elements throughout the year. Compare changes in temperature, precipitation and wind. Include the changes that are observed each day, week, and month.
2. Have students work with a partner and use everyday materials to create tools to measure weather. (See Link)
3. Conduct a class read aloud using stories that contrast seasonal changes in the weather. Have students compare and contrast the illustrations of the texts as well as the seasonal changes described and have them illustrate and describe the differences between the seasonal changes. Ask them to share their drawings with the class.
4. Have students place some small items or cutout shapes on top of a piece of dark construction paper and put them outside on a sunny day for a few hours. Ask them to observe what happens to the objects and the paper and have them match the objects to the shapes.
5. Using the Solar System link, introduce the students to the concept of space and its vast distance by emphasizing what is observable. Read lots of books to the students and use the vocabulary so the children can hear it and tuck it away for later. Vocabulary: planet, galaxy, solar system, astronomer, orbit, rays, universe, gases, radiation.

Using a digital camera or an iPad, take the class outside on a windy day. Have them observe how the wind is blowing different objects. Take pictures of things the wind is blowing (trees, flag, leaves, paper, bubbles). Print the pictures and have students select one to write a sentence about what the wind is blowing in the pictures. Have the students share their sentence and picture with the class.

As a class, make a table or chart to document the changes in the observable (lit) part of the moon throughout a month. Have students compare the differences throughout the month and then determine if the same pattern exists the next month. Ask students to discuss their observations and conclusions.

1. Explore weather-related careers using nonfiction text as well as the Internet (See Link).

Resources

* Careers in Weather ([www.theweatherchannelkids.com](http://www.theweatherchannelkids.com))

Resources

1. iPad Resources
2. Literature Connection
*Our Stars* by Anne Rockwell
*What Makes Day and Night* by Franklyn Branley

*The Sun is my Favorite Star* by Frank Asch

*Sun Up, Sun Down* by Gail Gibbons

*What Can You Do in the Sun?* by Anna Hines
*Snow* by John Bianchi and Frank B. Edwards

*Planet Earth: What Planet Are You On?* by Simon Basher and Dan Gilpin
*Astronomy: Out of this World!* by Simon Basher (Author, and Dan Green

*Oh Say Can You Say What's the Weather Today?: All About Weather* by Tish Rabe and Aristides Ruiz

*There's No Place Like Space: All About Our Solar System* by Tish Rabe and Aristides Ruiz

*What's Out There?: A Book about Space* by Lynn Wilson and Paige Billin-Frye

Resources

* How Can Kids Build Weather Instruments? ([www.ehow.com/how-does\_4777782\_can-kids-build-weather-instruments.html](http://www.ehow.com/how-does_4777782_can-kids-build-weather-instruments.html))

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LS: Physical & Behavioral Traits of Living Things

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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.K.4. With prompting and support, ask and answer questions about unknown words in a text.

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.K.7. With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).

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.K.9. With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).

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.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

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

W.K.3. Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.

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

W.K.5. With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.

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.K.7. Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).

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.K.8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

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.K.1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

SL.K.1a. Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).

SL.K.1b. Continue a conversation through multiple exchanges.

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

SL.K.2. Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

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

SL.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

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.K.4. Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

SL.K.5. Add drawings or other visual displays to descriptions as desired to provide additional detail.

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

SL.K.6. Speak audibly and express thoughts, feelings, and ideas clearly.

OH Kindergarten 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: Physical and Behavioral Traits of Living Things

Living things are different from nonliving things.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

Life and Dignity of the Human Person

Call to Family, Community, and Participation

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 are different from nonliving things.**

a. Living things include anything that is alive or has ever been alive.
b. Living things have specific characteristics and traits. Living things grow and reproduce.
c. Living things are found almost everywhere in the world.
d. There are different kinds of living things in different places.

**Living things have physical traits and behaviors, which influence their survival.**

a. Living things are made up of a variety of structures.
b. Some structures and behaviors influence the survival of living things.

Skills

1. Recognize that living things have basic needs.
2. Classify living/nonliving things.
3. Compare and contrast living and nonliving things.
4. Recognize that seeds come from and grow into plants.
5. Observe variety of plants as they grow and change.
6. List conditions necessary for plants to grow.
7. Compare and contrast nonfiction literature which accurately describes the characteristics of living things.
8. Develop an awareness of the basic needs of organisms (e.g., air, water, food, living space, and shelter).
9. Investigate observable features of plants and animals that help them live in different types of places.
10. Inquire about the habitats of many different types of local plants and animals and the ways in which animals depend on plants and each other.
11. Appreciate that God has created us and provides for us daily through the gifts of Earth.
12. Value God's gift of human life.

**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.

**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.

**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. Conduct research projects.
6. Gather relevant sources.
7. Draw conclusions from evidence in text.
8. Write routinely.

Essential Questions

1. How are living things the same and different?
2. How do plants and animals grow and change?
3. How are living things dependent upon each other?
4. Why do some plants grow bigger and faster?

Standards Vocabulary

1. Living
2. Nonliving
3. Organisms
4. Basic needs
5. Physical traits and behaviors
6. Habitat
7. Survival

Stage 2: Assessment Evidence

Living vs. Nonliving

Diagnostic: Class Discussion

Working with a partner, students will sort pictures of living and nonliving things by placing the pictures in large circles they have labeled "living" and "nonliving." Partners will verbally explain the differences between living and nonliving things. Note: Teacher can use this as a unit opening activity as a pre-assessment and then again at the end of the unit. Teacher can identify misconceptions of the students' thoughts about living and nonliving. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Terrarium Observations

Summative: Lab Assignment

Using the class terrarium, students will make daily observations noting any changes in the terrarium. They will record the changes in a table or chart and formulate hypotheses and conclusions based on the observations. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Living and Nonliving

Formative: Class Discussion

Each student will name one living and one nonliving thing. Using the list, students will reflect on the organisms they generated and think about all the features that make an organism "alive." They will brainstorm answers to questions such as:a. What are some characteristics of living things?b. What are some characteristics of nonliving things?c. What makes living things different from nonliving things? What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Is It Living or Nonliving? How Do I Know?

Formative: Class Work

Students will compare and contrast a real potted plant to an artificial one. They will observe each plant and name ways the two plants are alike and ways they are different. They will record their answers on the diagram and be guided to conclude that the real potted plant is living and the other is nonliving and state reasons for their conclusions. 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, create a living terrarium. (Use a clear two-liter bottle. Students will measure and mark four inches above the base. The teacher will cut on the mark and remove the top. Fill the bottom with soil. Have students place four holes and insert a bean seed in each hole. Place the top of the bottle back on but secure it into the bottom half of the bottle. Use one cup of water and set in a sunny place. The top portion serves as a greenhouse.) Have students make daily observations noting any changes in the terrarium. Record the changes in a table or chart and ask the students to formulate hypotheses and conclusions based on the observations.

Use a book such as *Are You Living?: A Song About Living and Nonliving Things* by Laura Purdie Salas to help the students understand the differences between living and nonliving things, the qualities of living organisms, and the needs of plants, animals, and humans. (See the Links for a science mini-unit on living and nonliving things.)

1. Working with a partner, have students sort pictures of living and nonliving things by placing the pictures in large circles they have labeled "living" and "nonliving." Ask the partners to verbally explain the differences between living and nonliving things.
2. Have students name one living and one nonliving thing. Write all their contributions on the board, under the column headings "living" and "nonliving." Ask students to reflect on the list of organisms they generated and think about all the features that make an organism "alive." Have them brainstorm answers to questions such as:
a. What are some characteristics of living things?
b. What are some characteristics of nonliving things?
c. What makes living things different from non-living things?
Explain to students the scientific definition of *living* and *nonliving*. To clarify the difference between nonliving and dead give an example of something that is dead but still classified as living, such as a log.
3. Using a large Venn diagram, have the class compare and contrast a real potted plant to an artificial one. Have them observe each plant and ask them to name ways the two plants are alike and ways they are different. Record their answers on the diagram. Guide students to conclude that the real potted plant is living and the other is nonliving and state reasons for their conclusions.

Resources

* ilearn Ohio (<http://ilearnohio.org/teacher/>)

Resources

1. iPad Resources
2. Video: Magic School Bus: Goes to Seed
3. Science to Go program the Cleveland Museum of Natural History: Is it Alive? Call for details 216.231.4600.
4. Literature Connection
*Living and Nonliving* by Angela Royston
*What Is a Living Thing?* by Bobbie Kalman

*Is It Living or Nonliving?* by Rebecca Rissman

*What's Alive?* by Kathleen Weidner Zoehfeld

*Living and Nonliving* by Lindeen

*Is It a Living Thing?* by Bobbie Kalman

*Plants Are Living Things* by Bobbie Kalman

*I Am a Living Thing* by Bobbie Kalman

*Living Things Need Water* by Bobbie Kalman

*From Seed to Plant* by Gail Gibbons

*How a Seed Grows* by Helene J. Jordan

*From Caterpillar to Butterfly* by Deborah Heiligman

Resources

* Critter Craze! (<http://www.beaconlearningcenter.com/WebLessons/CritterCraze/default.htm>)

Kindergarten Science
Science K

PS: Properties of Everyday Objects and Materials

Stage 1: Desired Results

Catholic Standards

Targeted Standards

OH Kindergarten 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.

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.K.1. With prompting and support, ask and answer questions about 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.K.2. With prompting and support, identify the main topic and retell key details of a text.

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

RI.K.3. With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information 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.K.4. With prompting and support, ask and answer questions about unknown words in a text.

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.K.7. With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).

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.K.9. With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).

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.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

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

W.K.5. With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.

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.K.7. Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).

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.K.8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Speaking and Listening

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SL.K.1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

SL.K.1a. Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).

SL.K.1b. Continue a conversation through multiple exchanges.

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

SL.K.2. Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

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

SL.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

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.K.4. Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

SL.K.5. Add drawings or other visual displays to descriptions as desired to provide additional detail.

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

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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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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.

Physical Science (PS)

Topic: Properties of Everyday Objects and Materials

Objects and materials can be sorted and described by their properties.

Catholic Identity

DOC All Grades Catholic Identity

Catholic Social Justice Teachings

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

**Objects and materials can be sorted and described by their properties.**
a. Objects can be sorted and described by the properties of the materials from which they are made.
b. Some of the properties can include color, size and texture.

**Some objects and materials can be made to vibrate to produce sound.**

a. Sound is produced by touching, blowing or tapping objects.
b. Sounds that are produced vary depending on the properties of objects.
c. Sound is produced when objects vibrate.

1. Standard measuring tools (e.g. thermometer, ruler)
2. Non-standard measuring tools (e.g. linking cubes, paper clips)

Skills

1. Demonstrate and explain that objects are made of parts.
2. Explain how larger objects are made of smaller pieces.
3. Examine and describe objects according to the materials that make up the object (e.g., wood, metal, plastic, and cloth).
4. Identify similarities/differences of various objects.
5. Classify objects by one or more properties (e.g., size, color, shape) and explain the characteristics of the group.
6. Describe objects by variety of properties (texture, size, weight, color, smell, shape, buoyancy, hardness).
7. Explain difference between solid, liquid, gas.
8. Recognize sources, uses, and properties of water.
9. Describe how matter can change from one state to another.
10. Predict objects that will sink/float.
11. Discuss concept of gravity (e.g., water falls from sky).

Explore how things can be made to move in many different ways such as straight, zigzag, up and down, round and round, back and forth, or fast and slow.

Investigate ways to change how something is moving (e.g., push, pull).

1. Describe how objects change over time (chemical-rust).
2. Investigate different ways to change some properties of materials (e.g., heating, freezing, melting, mixing, cutting, breaking, dissolving, and bending).
3. Compare different ways to make loud and soft sounds by tapping, blowing or plucking objects.
4. Identify three ways to make sounds from objects.
5. Compare the notes made from rubber bands that are stretched different amounts.
6. Recall that objects that vibrate quickly produce high notes and objects that vibrate slowly produce low notes.
7. Compare the relative speed of vibration (faster/slower) to the pitch (higher/lower notes) of the sound produced.
8. Compare the sounds made from drums with different properties.
9. Recognize that sound is caused by vibrating objects.
10. Apply the use of standard and nonstandard measuring tools to compare objects.
11. Explore and manipulate materials to determine how those materials make sound (e.g., rubber bands, tuning fork, and strings).
12. Appreciate the beauty of creation.

**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.

**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.

**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. Conduct research projects.
6. Gather relevant sources.
7. Draw conclusions from evidence in text.
8. Write routinely.

Essential Questions

1. How can I describe objects?
2. How can I sort objects?
3. What are properties?
4. How do things change?
5. How can I make sound?

Standards Vocabulary

1. properties
2. materials
3. gravity
4. solid
5. liquid
6. gas
7. changes in objects
8. standard measuring tools (e.g. thermometer, ruler)
9. nonstandard measuring tools (e.g. linking cubes, paper clips)
10. pitch
11. vibration
12. sound

Stage 2: Assessment Evidence

Parts of the Whole

Formative: Cooperative Group Work

Working with a partner, students will use hand lenses to observe a small piece of particle board to conclude that it is made from sawdust and wood chips and to see that fabric is made from fibers. Partners will explain what they are seeing and make a concluding statement about the object. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Sound

Formative: Listening Task

1. Students will explore and manipulate materials to determine how those materials make sound (e.g., rubber bands, tuning fork, and strings). 2. Students will focus on vibration, pitch, and loudness of each material. 3. Students will compare the vibration, pitch, and loudness of each material. 4. Suggested method: Have students record comparisons on teacher created chart. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Understanding Gravity

Formative: Class Work

Following the learning experience in which the students explored their understanding of gravity, they will be assessed by observation and participation, as the students are active in both class discussions and the dropping activity. What assessment tools/strategies will you use to assess student work? (checklists, rubrics, self-assessment tools, etc.)

Is the Part Needed?

Formative: Cooperative Group Work

Students will identify and list as many parts of a given toy as they can.Working in small groups, students will select the part that seems most interesting to them and then answer these questions about the part:a. What does this part help the toy do?b. If this part were removed, would the toy still work?c. Is this part made of even smaller parts?Students will classify each part as needed (essential) or not needed (non-essential) justifying each categorization. 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 with a partner, have students use hand lenses to observe a small piece of particle board to conclude that it is made from sawdust and wood chips and to see that fabric is made from fibers. Ask the partners to explain what they are seeing and to make a concluding statement about the object.

Show students a simple, wheeled toy (e.g., dump truck). Ask students to identify and list as many parts of the toy as they can. If students dont know the name of the part, they should make up a name. Display a list of 10-15 parts at the front of the room.
Divide the students into small groups. Have each group pick the part that seems most interesting to them and then answer these questions about the part:
a. What does this part help the toy do?
b. If this part were removed, would the toy still work?
c. Is this part made of even smaller parts?
Discuss the findings with the class. Have students classify each part as needed (essential) or not needed (nonessential) justifying each categorization.

Working with a partner, have students search the classroom to find something made of parts. Have them show another group (or you) one part of the whole item they have selected. Next, have them find an item in the room that is NOT made of parts. Again, have them explain their findings to you or another group.
Follow this activity by asking students this question: "*Are there more things in the classroom that are made of parts or more things that are not made of parts? Why do you think that? Give examples.*"

1. Working with a partner, have students explore and manipulate materials to determine how those materials make sound (e.g., rubber bands, tuning fork, and strings). Have students focus on vibration, pitch, and loudness of each material.

Pick up a marker and ask the class *What do you think will happen if I let go of this marker?* Discuss responses.

Let go of the marker and discuss:
a. Why did the marker fall to the ground?
b. Why didnt the marker fall when it was in my hand?

c. Can you think of anything that would not fall down when dropped?

d. What do you think made the marker fall down?

e. Do any of you know what gravity is?

Divide students into small groups. Have them pick up, one at a time, a supplied product, and carefully let go of it.

Have groups rotate around the classroom so they may drop different objects. Have them observe what happens when they let different objects fall to the floor.

Have students drop a lighter object, like a feather, while on top of a heavier object, like a book. Observe as the two fall at the same rate.

Conclude the experience with a THINK-PAIR-SHARE activity in which partners discuss their observations.

Come back together, as a whole group, and discuss, again, what gravity is, and why things fall to the Earth when dropped.

Resources

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

Resources

1. iPad Resources
2. Teacher Resource: *Making Musical Instruments with Kids: 67 Easy Projects for Adults Working with Children* by Bart Hopkin
3. Literature Connection

*Why Can't I Jump Very High? A Book About Gravity* by Kamal Prasad

*Gravity Is a Mystery* by Franklyn M. Branley

*Forces Make Things Move* by Kimberly Brubaker Bradley

*Energy Makes Things Happen* by Kimberly Brubaker Bradley

*What Is the World Made Of? All About Solids, Liquids, and Gases* by Kathleen Weidner Zoehfeld

*Solids, Liquids, And Gases* by Ginger Garrett

*Matter: See It, Touch It, Taste It, Smell It* by Darlene R. Stille

*Forces Make Things Move* by Kimberly Brubaker Bradley

*Sound and Vibration* by Peter Riley

*What Makes a Magnet?* by Franklyn M. Branley

Resources

* Grouping and Changing Materials ([www.bbc.co.uk/schools/scienceclips/ages/5\_6/sorting\_using\_mate.shtml](http://www.bbc.co.uk/schools/scienceclips/ages/5_6/sorting_using_mate.shtml))