Belvidere Cluster Wide
Science Curriculum
2nd grade
Updated September, 2018

All Belvidere Cluster curriculum and instruction areas are aligned to the New Jersey Student Learning Standards (NJSLS) in accordance with the NJ Department of Education's curriculum implementation requirements.

Interdisciplinary Connections

- English Language Arts
- Mathematics
- Social Studies
- Technology
- Visual and Performing Arts

Technology Standards and Integration
iPads
TCI Science
iXL
Scholastic Online
Interactive SmartBoard activities

NJSLA Technology
8.1.2.A.2
Create a document using a word processing application.
8.1.2.A.4
Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.P.B.1
Create a story about a picture taken by the student on a digital camera or mobile device.
8.1.P.C.1
Collaborate with peers by participating in interactive digital games or activities.
8.1.2.E.1
Use digital tools and online resources to explore a problem or issue.

CAREER EDUCATION
(NJDOE CTE Clusters)

- Education & Training
- Finance
- Information Technology
- Science, Technology, Engineering & Mathematics (STEM)

21st Century Skills/ Themes

- Global Awareness
- Financial, Economic, Business and Entrepreneurial Literacy
- Civic Literacy
- Health Literacy
- Environmental Literacy
- Creativity and Innovation
- Critical Thinking

- Problem Solving
- Communication
- Collaboration
- Information Literacy
- Media Literacy
- ICT (Information, Communication and Technology) Literacy

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP5. Consider the environmental, social and economic impacts of decisions.
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP10. Plan education and career paths aligned to personal goals.
CRP11. Use technology to enhance productivity.

Integrated Accommodations and Modifications

Special Education

- Printed copy of board work/notes provided
- Additional time for skill mastery
- Assistive technology
- Behavior management plan
- Center-Based Instruction
- Check work frequently for understanding
- Computer or electronic device utilization
- Extended time on tests/ quizzes
- Have student repeat directions to check for understanding
- Highlighted text visual presentation
- Modified assignment format
- Modified test content
- Modified test format
- Modified test length
- Multiple test sessions
- Multi-sensory presentation
- Preferential seating
- Preview of content, concepts, and vocabulary
- Reduced/shortened written assignments
- Secure attention before giving instruction/directions
- Shortened assignments
- Student working with an assigned partner
- Teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills Open-ended activities
- Think-Pair-Share
- Varied supplemental materials

ELL

- Allowing students to correct errors (looking for understanding)
- Teaching key aspects of a topic Eliminate nonessential information Using videos, illustrations, pictures, and drawings to explain or clarify
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slideshows, videos, etc.) to demonstrate student's learning
- Allowing students to correct errors (looking for understanding)
- Allowing the use of note cards or open-book during testing
- Decreasing the amount of work presented or required
- Having peers take notes or providing a copy of the teacher's notes
- Modifying tests to reflect selected objectives
- Providing study guides
- Reducing the number of answer choices on a multiple choice test
- Tutoring by peers
- Explain/clarify key vocabulary terms

At Risk

- Allowing students to correct errors (looking for understanding)
- Teaching key aspects of a topic Eliminate nonessential information allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slideshows, videos, etc.) to demonstrate student's learning
- Allowing students to select from given choices .
- Allowing the use of note cards or open-book during testing
- Collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test
- decreasing the amount of work presented or required .
- Having peers take notes or providing a copy of the teacher's notes
- Marking students' correct and acceptable work, not the mistakes
- Modifying tests to reflect selected objectives
- Providing study guides
- Reducing the number of answer choices on a multiple choice test
- Tutoring by peers
- Using authentic assessments with real-life problem-solving
- Using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills Open-ended activities
- Think-Pair-Share
- Varied supplemental materials

Gifted and Talented

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Independent research and projects Interest groups for real world application
- Learning contracts
- Leveled rubrics

- Multiple intelligence options
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products

504

- Printed copy of board work/notes provided
- Additional time for skill mastery
- Assistive technology
- Behavior management plan
- Center-Based Instruction
- Check work frequently for understanding
- Computer or electronic device utilization
- Extended time on tests/ quizzes
- Have student repeat directions to check for understanding
- Highlighted text visual presentation
- Modified assignment format
- Modified test content
- Modified test format
- Modified test length
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Grade 2, Science, Unit 1, Relationships in Habitats

Content Area: **Science**
Course(s): **Science**
Time Period: **May**
Length: **8 weeks**
Status: **Published**

Next Generation Science Standards

SCI.K-2-ETS1-1	**Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.**
SCI.K-2-ETS1	**Engineering Design**
SCI.K-2-ETS1-2	**Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.**

Student Learning Objectives

Plan and conduct investigations collaboratively to produce evidence to answer a question. (1- PS4-1),(2
Observe and collect data (firsthand or from media) that can be used to make comparisons. (2-LS4-1)
Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)
Develop a hypothesis based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1)
Identify a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)
Describe how adaptations help living things survive in their environment.
Explain how technology can affect the environment?

Enduring Understanding

Students will develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Compare the diversity of life in different habitats.

Essential Questions

Part A: How does the diversity of plants and animals compare among different habitats? **Part B: What do plants need to live and grow?**
Part C: Why do some plants rely on animals for reproduction?

Assessment

Formative Assessments:

A-B-C Summaries: Each student in the class is assigned a different letter of the alphabet and they must select a word starting with that letter that is related to the topic being studied.
Debriefing: A form of reflection immediately following an activity.
Idea Spinner: The teacher creates a spinner marked into 4 quadrants and labeled "Predict, Explain, Summarize, Evaluate." After new material is presented, the teacher spins the spinner and if the spinner lands in the "Summarize" quadrant, the teacher might say, "List the key concepts just presented."
Inside-Outside Circle: Inside and outside circles of students face each other. Within each pair of facing students, students quiz each other with questions they have written. Outside circle moves to create new
Reader's Theater:
Exit Card: Exit cards are written student responses to questions posed at the end of a class or learning activity or at the end of a day.

Portfolio Check: Check the progress of a student's portfolio. A portfolio is a purposeful collection of significant work, carefully selected, dated and presented to tell the story of a student's achievement or growth in well-defined areas of performance, such as reading, writing, math, etc. A portfolio usually includes personal reflections where the student explains why each piece was chosen and what it shows about his/her growing skills and abilities.
Quiz: Quizzes assess students for factual information, concepts and discrete skill. There is usually a single best answer.
Journal Entry: Students record in a journal their understanding of the topic, concept or lesson taught. The teacher reviews the entry to see if the student has gained an understanding of the topic,lesson or concept that was taught.
Choral Response: In response t o a cue, all students respond verbally at the same time. The response can be either to answer a question or to repeat something the teacher has said.
Misconception Check: Present students with common or predictable misconceptions about a designated concept, principle, or process. Ask them whether they agree or disagree and explain why. The misconception check can also be presented in the form of a multiple-choice or true-false quiz.
Student Conference: One on one conversation with students to check their level of understanding.
3-Minute Pause: The Three-Minute Pause provides a chance for students to stop, reflect on the concepts and ideas that have just been introduced, make connections to prior knowledge or experience, and seek clarification.
Observation: Walk around the classroom and observe students as they work to check for learning.
Self-Assessment: A process in which students collect information about their own learning, analyze what it reveals about their progress toward the intended learning goals and plan the next steps in their learning.
Index Card/Summaries/Questions: Periodically, distribute index cards and ask students to write on both sides, with these instructions: (Side 1) Based on our study of (unit topic), list a big idea that you understand and word it as a summary statement. (Side 2) Identify something about (unit topic) that you do not yet fully understand and word it as a statement or question.
Hand Signals: Ask students to display a designated hand signal to indicate their understanding of a specific concept, principal, or process: - I understand_____ and can explain it (e.g., thumbs up). - I do not yet understand _____ (e.g., thumbs down). - I'm not completely sure about _____ (e.g., wave hand).
One Minute Essay: A one-minute essay question (or one-minute question) is a focused question with a specific goal that can, in fact, be answered within a minute or two.
Analogy Prompt: Present students with an analogy prompt: (A designated concept, principle, or process) is like _____ because _____.
Web or Concept Map: Any of several forms of graphical organizers which allow learners to perceive relationships between concepts through diagramming key words representing those concepts.
http://www.graphic.org/concept.html

Benchmark:

ELA Research Based Benchmark
Interim Assessments

Summative:

End-of- Unit Assessment/ Performance Task
Culminating Learning Project
End-of-year Assessment

Alternative:

Self Selected Science Projects
Group Collaboration Projects
Extension Projects
Concept Map

Students who understand the concepts can:
• Look for patterns and order when making observations about the world.
• Make observations (firsthand or from media) to collect data that can be used to make comparisons.
• Make observations of plants and animals to compare the diversity of life in different habitats. ((Note: The emphasis is on the diversity of living things in each of a variety of different habitats.

Students who understand the concepts can:
• Observe patterns in events generated by cause-and-effect relationships.
• Plan and conduct an investigation collaboratively to produce data to serve as a basis for evidence to answer a question.
• Plan and conduct an investigation to determine whether plants need sunlight and water to grow. (Note: Assessment is limited to one variable at a time.)

Students who understand the concepts can:
• Describe how the shape and stability of structures are related to their function.
• Develop a simple model based on evidence to represent a proposed object or tool.
• Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
• Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem

Instructional Activities

What do plants need to grow?
Children read, discuss, and learn about the job of each part of the plants. They design their own plants and label how each part helps keep the plant alive.
Block the Light- Cover some leaves with black paper and predict what will happen to the covered leaves.
Airtight Seal- Plan an investigation- What happens to leaves when they don't get air?/ Use petroleum jelly to cover some leaves and observe what happens.
Roots/ No roots/- Use two plants/ remove the roots of one plant. Over two weeks water both plants and see if the growth remains the same.
Using google draw, children create a diagram of a plant. They label and report how all plants needs certain things to grow.
Some animals spread pollen for plants/
Present digital lessons through the "Science Fusion Curriculum"/
http://ngss.nsta.org/Resource.aspx?ResourceID=460/ Pollination
Can plants survive in different environments? What happens to a desert plant in a rainforest environment? Use 1 desert plant and one rainforest plants. Water both daily. Observe and record information on a data chart.
Compare different plant characteristics of plants that grow in different habitats. Can a plant from 1 environment survive in another? Record data and make conclusions.
Use Velcro “seeds” and furry material to model how seeds with hooks adhere to animal fur. (Making a model to explain seed dispersion)
Use pipe cleaners to gather and distribute “pollen” in a way similar to bees pollinate flowers.
How do dams harm the environment? Read, discuss, and record data about the helpful and harmful ways dams affect the environment. (Fusion)

Interdisciplinary Connections

English Language Arts The NJSLS for English Language Arts can be incorporated in this unit in a number of ways. Students can participate in shared research, using trade books and online resources, to learn about the properties of matter. As students explore different types of materials, they can record their observations in science journals, and then use their notes to generate questions that can be used for formative or summative assessment. Students can add drawings or other visual displays to their work, when appropriate, to help clarify their thinking. To teach students how to describe how reasons support specific points an author makes in a text, teachers can model the comprehension skill of main idea and details using informational text about matter. Technology can be integrated into this unit of study using free software programs (e.g., Animoto) that students can use to produce and publish their writing in science. Mathematics Throughout this unit of study, students have opportunities to model with mathematics and reason abstractly and quantitatively. During investigations, students can collect and organize data using picture graphs and/or bar graphs (with a single-unit scale). This can lead to opportunities to analyze data and solve simple put together, take-apart, and compare problems using information presented in these types of graphs. Some examples of ways to sort and classify materials in order to create graphs include: Classifying materials as solids, liquids, or gases. Classifying materials by color, shape, texture, or hardness. Classifying materials based on what they are made of (e.g., wood, metal, paper, plastic). Classifying materials based on potential uses. With any graph that students create, they should be expected to analyze the data and answer questions that require them to solve problems

Texts and Resources

http://ngss.nsta.org/Resource.aspx?ResourceID=217 Do Plants Need Sunlight?
Science Fusion/Houghton Mifflin Harcourt/ Digital component for lessons and experiments
Various plants for experiments
http://ngss.nsta.org/Resource.aspx?ResourceID=460
brainpopjr.com
pebblego.com
"TeacherpayTeacher"/Animals: Adaptations, Food Chains & Habitats, Animal Adaptations Science Vocabulary Bingo Game Printable (Free)/

Animal Adaptations Unit: Science & Literacy Unit through Close Reading

Related Books:
"Seeds Go, Seeds Grow"/Newbridge Discovery Links
"Plants Live Everywhere"/ Mary Dodson Wade
"Grow for It"/ Keep on Reading Science!/ PeoplesEducation.com
"What Do Plants Need?"/ Debra Castor
The Gift of the Tree.
Tell Me Tree: All About Trees for Kids. Gail Gibbons
"Desert Life"/Alice Jablonsky
"Life in the Rainforest"/Keep on Reading Science!
"Animals of the Tropical Rain Forest"/ Joanne Mattern

Grade 2 , Science, Unit 2, Properties of Matter

Content Area: **Science**
Course(s): **Science**
Time Period: **September**
Length: **5 weeks**
Status: **Published**

Next Generation Science Standards

SCI.2-PS1-2	**Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.**
SCI.K-2-ETS1-3	**Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.**
SCI.2-PS1-1	**Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.**

Student Learning Objectives

• Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.(2-PS1-1)
• Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2)
• Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)

Enduring Understanding

Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Essential Questions

How can we sort objects into groups that have similar patterns?
Can some materials be a solid or a liquid?
What should the three little pigs have used to build their houses?

Assessment

Formative Assessments:

A-B-C Summaries: Each student in the class is assigned a different letter of the alphabet and they must select a word starting with that letter that is related to the topic being studied.
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Inside-Outside Circle: Inside and outside circles of students face each other. Within each pair of facing students, students quiz each other with questions they have written. Outside circle moves to create new
Reader’s Theater:
Exit Card: Exit cards are written student responses to questions posed at the end of a class or learning activity or at the end of a day.
Portfolio Check: Check the progress of a student’s portfolio. A portfolio is a purposeful collection of significant work, carefully selected, dated and presented to tell the story of a student’s achievement or growth in well-defined areas of performance, such as reading, writing, math, etc. A portfolio usually includes personal reflections where the student

explains why each piece was chosen and what it shows about his/her growing skills and abilities.
Quiz: Quizzes assess students for factual information, concepts and discrete skill. There is usually a single best answer.
Journal Entry: Students record in a journal their understanding of the topic, concept or lesson taught. The teacher reviews the entry to see if the student has gained an understanding of the topic,lesson or concept that was taught.
Choral Response: In response t o a cue, all students respond verbally at the same time. The response can be either to answer a question or to repeat something the teacher has said.
Misconception Check: Present students with common or predictable misconceptions about a designated concept, principle, or process. Ask them whether they agree or disagree and explain why. The misconception check can also be presented in the form of a multiple-choice or true-false quiz.
Student Conference: One on one conversation with students to check their level of understanding.
3-Minute Pause: The Three-Minute Pause provides a chance for students to stop, reflect on the concepts and ideas that have just been introduced, make connections to prior knowledge or experience, and seek clarification.
Observation: Walk around the classroom and observe students as they work to check for learning.
Self-Assessment: A process in which students collect information about their own learning, analyze what it reveals about their progress toward the intended learning goals and plan the next steps in their learning.
Index Card/Summaries/Questions: Periodically, distribute index cards and ask students to write on both sides, with these instructions: (Side 1) Based on our study of (unit topic), list a big idea that you understand and word it as a summary statement. (Side 2) Identify something about (unit topic) that you do not yet fully understand and word it as a statement or question.
Hand Signals: Ask students to display a designated hand signal to indicate their understanding of a specific concept, principal, or process: - I understand_____ and can explain it (e.g., thumbs up). - I do not yet understand _____ (e.g., thumbs down). - I'm not completely sure about _____ (e.g., wave hand).
One Minute Essay: A one-minute essay question (or one-minute question) is a focused question with a specific goal that can, in fact, be answered within a minute or two.
Analogy Prompt: Present students with an analogy prompt: (A designated concept, principle, or process) is like _____ because _____.
Web or Concept Map: Any of several forms of graphical organizers which allow learners to perceive relationships between concepts through diagramming key words representing those concepts.
http://www.graphic.org/concept.html\
Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer question
Plan and conduct an investigation to describe and classify different kinds of material by their observable properties. Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.
Observe patterns in the natural and human-designed world.
Design simple tests to gather evidence to support or refute student ideas about causes.

Benchmark:

ELA Research Based Benchmark
Interim Assessments

Summative:

End-of- Unit Assessment/ Performance Task
Performance based assessment;
http://www.mccracken.kyschools.us/Downloads/2%20NGSS%20UNIT%20Matter.pdf lesson 8 https://www.youtube.com/watch?v=IVc9Uz6zE1A; Unit Test at end\

Alternative:

Self Selected Science Projects
Extension Projects
Concept Map

Instructional Activities

Investigate the physical properties of straw, sticks, and bricks in order to determine what properties make bricks the material best suited for building a house.
Work together to brainstorm a list of possible structures that could be built with different materials. For example, students could build bridges or simple roller coasters for marbles.
Select one structure from the list and determine the intended purpose of that structure.
Select two or three different materials that could be used to build the structure.
Investigate the physical properties of the materials, including shape, strength, flexibility, hardness, texture, or absorbency.
Collect and analyze data to determine whether or not the given materials have properties that are suited for the intended purpose of the selected structure.
In groups, use one of the materials to build the structure. (Teachers should have different groups use different materials.)
Test and compare how each structure performs. Because there is always more than one possible solution to a problem, it is useful to compare the strengths.
http://www.mccracken.kyschools.us/Downloads/2%20NGSS%20UNIT%20Matter.pdf states of matter song, scavenger hunt, compare/contrast, absorbancy, strength, flexibility,create a shelter/animal for purpose of defense, lesson 11-15 reversable/irrreversable states of matter;

https://www.youtube.com/watch?v=IVc9Uz6zE1A states of matter w/ Bill Nye
http://www.abcya.com/states_of_matter.htm
https://www.youtube.com/watch?v=oAqompxk7fY&feature=related matter rap
ttps://www.youtube.com/watch?v=snRLfYTjtcM quicksand experiment
https://educators.brainpop.com/lesson-plan/changing-states-of-matter-activities-for-kids/

Interdisciplinary Connections

The NJSLS for English Language Arts can be incorporated in this unit in a number of ways. Students can participate in shared research, using trade books and online resources, to learn about the properties of matter. As students explore different types of materials, they can record their observations in science journals, and then use their notes to generate questions that can be used for formative or summative assessment. Students can add drawings or other visual displays to their work, when appropriate, to help clarify their thinking. To teach students how to describe how reasons support specific points an author makes in a text, teachers can model the comprehension skill of main idea and details using informational text about matter. Technology can be integrated into this unit of study using free software programs (e.g., Animoto) that students can use to produce and publish their writing in science. Mathematics Throughout this unit of study, students have opportunities to model with mathematics and reason abstractly and quantitatively. During investigations, students can collect and organize data using picture graphs and/or bar graphs (with a single-unit scale). This can lead to opportunities to analyze data and solve simple put together, take-apart, and compare problems using information presented in these types of graphs. Some examples of

ways to sort and classify materials in order to create graphs include: Classifying materials as solids, liquids, or gases. Classifying materials by color, shape, texture, or hardness. Classifying materials based on what they are made of (e.g., wood, metal, paper, plastic). Classifying materials based on potential uses. With any graph that students create, they should be expected to analyze the data and answer questions that require them to solve problems.

Texts and Resources

http://www.state.nj.us/education/modelcurriculum/sci/2u2.pdf
https://learningcenter.nsta.org/products/symposia_seminars/NGSS/webseminar16.aspx
https://learningcenter.nsta.org/products/symposia_seminars/NGSS/webseminar49.aspx
http://ngss.nsta.org/Resource.aspx?ResourceID=183
http://ngss.nsta.org/Resource.aspx?ResourceID=424
http://ngss.nsta.org/Resource.aspx?ResourceID=426
http://ngss.nsta.org/Resource.aspx?ResourceID=303
http://ngss.nsta.org/Resource.aspx?ResourceID=427
http://www.mccracken.kyschools.us/Downloads/2%20NGSS%20UNIT%20Matter.pdf
https://www.youtube.com/watch?v=_8MI8akAR_Y 2nd grade matter song
ww.vrml.k12.la.us/2nd/Homework/science/links/2_scienceu1.htm

Related books:

Wax to Crayon by: Inez Snyder
What is the World Made Of? By: Kathleen Weidner Zoehfeld
"States of Matter"/ Delta Science Readers

Grade 2, Science, Unit 3, Changes to Matter

Content Area: **Science**
Course(s): **Science**
Time Period: **November**
Length: **8 weeks**
Status: **Published**

Next Generation Science Standards

SCI.2-PS1-3	**Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.**
SCI.2-PS1-4	**Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.**

Student Learning Objectives

• Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)
• Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3)
• Construct an argument with evidence to support a claim. (2-PS1-4)
Classify matter by its properties.
Identify the distinguishing characteristics of solids, liquids, and gases.
Measure the mass and volume of solids and liquids.

Enduring Understanding

Students demonstrate an understanding of observable properties of materials through analysis and classification of different materials.

Essential Questions

How can we sort objects into groups that have similar patterns? Can some materials be a solid or a liquid?

What should the three little pigs have used to build their houses?

Assessment

Formative Assessments:

A-B-C Summaries: Each student in the class is assigned a different letter of the alphabet and they must select a word starting with that letter that is related to the topic being studied.
Debriefing: A form of reflection immediately following an activity.
Idea Spinner: The teacher creates a spinner marked into 4 quadrants and labeled "Predict, Explain, Summarize, Evaluate." After new material is presented, the teacher spins the spinner and if the spinner lands in the "Summarize" quadrant, the teacher might say, "List the key concepts just presented."
Inside-Outside Circle: Inside and outside circles of students face each other. Within each pair of facing students, students quiz each other with questions they have written. Outside circle moves to create new
Reader's Theater:
Exit Card: Exit cards are written student responses to questions posed at the end of a class or learning activity or at the end of a day.
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carefully selected, dated and presented to tell the story of a student's achievement or growth in well-defined areas of performance, such as reading, writing, math, etc. A portfolio usually includes personal reflections where the student explains why each piece was chosen and what it shows about his/her growing skills and abilities.
Quiz: Quizzes assess students for factual information, concepts and discrete skill. There is usually a single best answer.
Journal Entry: Students record in a journal their understanding of the topic, concept or lesson taught. The teacher reviews the entry to see if the student has gained an understanding of the topic,lesson or concept that was taught.
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Student Conference: One on one conversation with students to check their level of understanding.
3-Minute Pause: The Three-Minute Pause provides a chance for students to stop, reflect on the concepts and ideas that have just been introduced, make connections to prior knowledge or experience, and seek clarification.
Observation: Walk around the classroom and observe students as they work to check for learning.
Self-Assessment: A process in which students collect information about their own learning, analyze what it reveals about their progress toward the intended learning goals and plan the next steps in their learning.
Index Card/Summaries/Questions: Periodically, distribute index cards and ask students to write on both sides, with these instructions: (Side 1) Based on our study of (unit topic), list a big idea that you understand and word it as a summary statement. (Side 2) Identify something about (unit topic) that you do not yet fully understand and word it as a statement or question.
Hand Signals: Ask students to display a designated hand signal to indicate their understanding of a specific concept, principal, or process: - I understand_____ and can explain it (e.g., thumbs up). - I do not yet understand _____ (e.g., thumbs down). - I'm not completely sure about _____ (e.g., wave hand).
One Minute Essay: A one-minute essay question (or one-minute question) is a focused question with a specific goal that can, in fact, be answered within a minute or two.
Analogy Prompt: Present students with an analogy prompt: (A designated concept, principle, or process) is like _____ because _____.
Web or Concept Map: Any of several forms of graphical organizers which allow learners to perceive relationships between concepts through diagramming key words representing those concepts.
http://www.graphic.org/concept.html

Benchmark:

ELA Research Based Benchmark
Interim Assessments

Summative:

End-of- Unit Assessment/ Performance Task
Culminating Learning Project
End-of-year Assessment

Alternative:

Self Selected Science Projects
Extension Projects
Concept Map

Students who understand the concepts can:
• Observe patterns in the natural and human-designed world.
• Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.
• Plan and conduct an investigation to describe and classify different kinds of material by their observable properties.
Observations could include color, texture, hardness, and flexibility.

Students who understand the concepts can:
• Design simple tests to gather evidence to support or refute student ideas about causes.
• Analyze data from tests of an object or tool to determine if it works as intended.
• Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

Instructional Activities

Students plan and conduct investigations to describe different kinds of material using observable properties. They will collect data during these investigations; analyze the data to find patterns, such as similar properties that different materials share; and use the data to classify materials. Materials can be classified by color, texture, hardness, flexibility, or state of matter. For example, students can explore hardness of rocks by shaking them in containers to see how easily they break apart. They can explore viscosity by pouring a set amount of various liquids, such as glue, oil, and water from one container to another to observe the relative speed that each flows. Students can also heat or cool a variety of materials, such as butter, chocolate, or pieces of crayon, in order to determine whether or not these materials can be either solid or liquid depending on temperature. Because every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world, it is important that students understand that different properties are suited to different purposes.

Investigate the physical properties of straw, sticks, and bricks in order to determine what properties make bricks the material best suited for building a house. Work together to brainstorm a list of possible structures that could be built with different materials. For example, students could build bridges or simple roller coasters for marbles. Select one structure from the list and determine the intended purpose of that structure. Select two or three different materials that could be used to build the structure. Investigate the physical properties of the materials, including shape, strength, flexibility, hardness, texture, or absorbency. Collect and analyze data to determine whether or not the given materials have properties that are suited for the intended purpose of the selected structure. In groups, use one of the materials to build the structure. (Teachers should have different groups use different materials.) Test and compare how each structure performs. Because there is always more than one possible solution to a problem, it is useful to compare the strengths

http://www.mccracken.kyschools.us/Downloads/2%20NGSS%20UNIT%20Matter.pdf states of matter song, scavenger hunt, compare/contrast, absorbancy, strength, flexibility,create a shelter/animal for purpose of defense, lesson 11-15 reversable/irrreversable states of matter; https://www.youtube.com/watch?v=IVc9Uz6zE1A states of matter w/ Bill Nye

http://www.abcya.com/states_of_matter.htm
https://www.youtube.com/watch?v=oAqompxk7fY&feature=related matter rap
ttps://www.youtube.com/watch?v=snRLfYTjtcM quicksand experiment
https://educators.brainpop.com/lesson-plan/changing-states-of-matter-activities-for-kids/
http://mybigcampus.com/bundles/what-s-the-matter-second-grade---55970 documents/worksheets
file:///C:/Users/libuser/Downloads/InquiryinAction.pdf investigating matter through inquiry
http://www.teach-nology.com/teachers/lesson_plans/science/chemistry/matter/

Interdisciplinary Connections

English Language Arts The NJSLS for English Language Arts can be incorporated in this unit in a number of ways. Students can participate in shared research, using trade books and online resources, to learn about the properties of matter. As students explore different types of materials, they can record their observations in science journals, and then use their notes to generate questions that can be used for formative or summative assessment. Students can add drawings or other visual displays to their work, when appropriate, to help clarify their thinking. To teach students how to describe how reasons support specific points an author makes in a text, teachers can model the comprehension skill of main idea and details using informational text about matter. Technology can be integrated into this unit of study using free software programs (e.g., Animoto) that students can use to produce and publish their writing in science. Mathematics Throughout this unit of study, students have opportunities to model with mathematics and reason abstractly and quantitatively. During investigations, students can collect and organize data using picture graphs and/or bar graphs (with a single-unit scale). This can lead to opportunities to analyze data and solve simple put together, take-apart, and compare problems using information presented in these types of graphs. Some examples of ways to sort and classify materials in order to create graphs include: Classifying materials as solids, liquids, or gases. Classifying materials by color, shape, texture, or hardness. Classifying materials based on what they are made of (e.g., wood, metal, paper, plastic). Classifying materials based on potential uses. With any graph that students create, they should be expected to analyze the data and answer questions that require them to solve problems.

Texts and Resources

http://ngss.nsta.org/Resource.aspx?ResourceID=183

Science Fusion/ Houghton Mifflin Harcourt/ Unit 9/ "Changes in Matter"
https://educators.brainpop.com/lesson-plan/changing-states-of-matter-activities-for-kids/
http://www.learninggamesforkids.com/changes-in-matter-games.html
https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=changes+in+states+of+matter+2nd+grade

Related books:

Wax to Crayon by: Inez Snyder
Drip! Drop! How Water Gets to Your Tap.

Grade 2, Science, Unit 4, The Earth's Land and Water

Content Area: **Science**
Course(s): **Science**
Time Period: **January**
Length: **8 weeks**
Status: **Published**

Next Generation Science Standards

SCI.2-ESS2-2	**Develop a model to represent the shapes and kinds of land and bodies of water in an area.**
SCI.2-ESS2-3	**Obtain information to identify where water is found on Earth and that it can be solid or liquid.**

Student Learning Objectives

• Obtain information using various texts, text features, and other media that will be useful in answering a scientific question. (2-ESS2-3)
• Develop a model to represent patterns in the natural world. (2-ESS2-2)
Investigate how the addition or removal of heat affects water.
Identify ways earth's surface changes.

Enduring Understanding

Students use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth.

Essential Questions

How can we identify where water is found on Earth and if it is solid or liquid?
In what ways can you represent the shapes and kinds of land and bodies of water in an area?

Assessment

Formative Assessments:

A-B-C Summaries: Each student in the class is assigned a different letter of the alphabet and they must select a word starting with that letter that is related to the topic being studied.
Debriefing: A form of reflection immediately following an activity.
Idea Spinner: The teacher creates a spinner marked into 4 quadrants and labeled “Predict, Explain, Summarize, Evaluate.” After new material is presented, the teacher spins the spinner and if the spinner lands in the “Summarize” quadrant, the teacher might say, “List the key concepts just presented.”
Inside-Outside Circle: Inside and outside circles of students face each other. Within each pair of facing students, students quiz each other with questions they have written. Outside circle moves to create new
Reader’s Theater:
Exit Card: Exit cards are written student responses to questions posed at the end of a class or learning activity or at the end of a day.
Portfolio Check: Check the progress of a student’s portfolio. A portfolio is a purposeful collection of significant work, carefully selected, dated and presented to tell the story of a student’s achievement or growth in well-defined areas of performance, such as reading, writing, math, etc. A portfolio usually includes personal reflections where the student explains why each piece was chosen and what it shows about his/her growing skills and abilities.
Quiz: Quizzes assess students for factual information, concepts and discrete skill. There is usually a single best answer.
Journal Entry: Students record in a journal their understanding of the topic, concept or lesson taught. The teacher reviews the entry to see if the student has gained an understanding of the topic,lesson or concept that was taught.
Choral Response: In response to a cue, all students respond verbally at the same time. The response can be either to answer a question or to repeat something the teacher has said.

Misconception Check: Present students with common or predictable misconceptions about a designated concept, principle, or process. Ask them whether they agree or disagree and explain why. The misconception check can also be presented in the form of a multiple-choice or true-false quiz.
Student Conference: One on one conversation with students to check their level of understanding.
3-Minute Pause: The Three-Minute Pause provides a chance for students to stop, reflect on the concepts and ideas that have just been introduced, make connections to prior knowledge or experience, and seek clarification.
Observation: Walk around the classroom and observe students as they work to check for learning.
Self-Assessment: A process in which students collect information about their own learning, analyze what it reveals about their progress toward the intended learning goals and plan the next steps in their learning.
Index Card/Summaries/Questions: Periodically, distribute index cards and ask students to write on both sides, with these instructions: (Side 1) Based on our study of (unit topic), list a big idea that you understand and word it as a summary statement. (Side 2) Identify something about (unit topic) that you do not yet fully understand and word it as a statement or question.
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Interim Assessments

Summative:
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Culminating Learning Project
End-of-year Assessment

Alternative:
Self Selected Science Projects
Extension Projects
Concept Map

Students who understand the concepts are able to:
• Observe patterns in the natural world.
• Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) and other media that will be useful in answering a scientific question.
• Obtain information to identify where water is found on Earth and to communicate that it can be a solid or
• Develop a model to represent the shapes and kinds of land and bodies of water in an area.

Instructional Activities

Students identify where water is found on Earth and whether it is solid or liquid. Using texts, maps, globes, and other resources (including appropriate online resources), students will observe that water is found in liquid form in oceans, rivers, lakes, and ponds. They also discover that water exists as a solid in the Earth's snowcaps and glaciers.
Using firsthand observations and media resources, students should look for patterns among the types of landforms and bodies of water. For example, students should notice that mountains are much taller and more rugged than hills, lakes are an enclosed body of water surrounded by land, and streams flow across land and generally end at a larger body of water, such as a lake or the ocean.
Students should also have opportunities to use maps to determine where landforms and bodies of water are located. As students become more familiar with the types and shapes of landforms and bodies of water, they develop models to represent the landforms and bodies of water found in an area. For example, students can draw/create a map of the area

of the state in which they live, showing various landforms (e.g., hills, coastlines, and islands) and bodies of water (e.g., rivers, lakes, ponds, and the ocean).
https://www.youtube.com/watch?v=KWTDmg8OI_Y learning about landforms Mr. DeMaio
https://www.youtube.com/watch?v=BsqKTJtK_vw exploring landforms and bodies of water for kids
https://www.youtube.com/watch?v=FN6QX43QB4g Landforms, hey crash course for kids #17.1
https://www.superteacherworksheets.com/landforms/landforms-matching-game.pdf?up=1466611200
https://www.superteacherworksheets.com/landforms/landforms-1_WMWNF.pdf?up=1466611200 cut & glue
https://www.superteacherworksheets.com/landforms/bodies-of-water-1.pdf?up=1466611200 cut & glue
https://www.superteacherworksheets.com/landforms/bodies-of-water-matching-game.pdf?up=1466611200
https://www.superteacherworksheets.com/landforms/landform-definitions.pdf?up=1466611200
https://www.superteacherworksheets.com/landforms/landform-fitb.pdf?up=1466611200 fill in the blanks bodies of water and landforms
https://www.superteacherworksheets.com/landforms/land-and-water-formations-2.pdf?up=1466611200
https://www.superteacherworksheets.com/landforms/landforms-2.pdf?up=1466611200 cut, paste & color
http://www.vrml.k12.la.us/2nd/ss/Unit_activities08/unit2/un2_act4.htm some online activities
https://www.teacherspayteachers.com/Product/Landforms-Second-Grade-483154 free
http://www.lessonplandiva.com/2012/10/landforms-and-bodies-of-water-freebie.html

Interdisciplinary Connections

English Language Arts Students gather information about the types of landforms and bodies of water from experiences or from text and digital resources. They can use this information to answer questions such as, “Where can water be found as solid ice or snow year round?” Students should also have the opportunity to use their research to publish a writing piece, with guidance and support from adults or collaboratively with peers, based on their findings about various landforms and bodies of water. Diagrams, drawings, photographs, audio or video recordings, poems, dioramas, models, or other visual displays can accompany students’ writing to help recount experiences or clarify thoughts and ideas. Mathematics As students collect data about the size of landforms and bodies of water, these numbers can be used to answer questions, make comparisons, or solve problems. For example, If students know that a mountain is 996 feet in height, a lake is 550 feet deep, a river is 687 miles long, and a forest began growing about 200 years ago, have students show each number in three ways using base-ten blocks, number words, and expanded form. A stream was 17 inches deep before a rainstorm and 33 inches deep after a rainstorm. How much deeper did it get during the rainstorm? As students engage in these types of mathematical connections, they are also modeling with mathematics and reasoning abstractly and quantitatively. When modeling with mathematics, students diagram situations mathematically (using equations, for example) and/or solve addition or subtraction word problems. When students reason abstractly and quantitatively, they manipulate symbols (numbers and other math symbols) abstractly and attend to the meaning of those symbols while doing so.

Texts and Resources

Science Fusion thinkcentral.com
"Teacherpayteachers" (Landforms, Continents, and Oceans)/Skittles Weathering and Erosion Lab Activity
https://learningcenter.nsta.org/products/symposia_seminars/NGSS/webseminar41.aspx
http://ngss.nsta.org/Resource.aspx?ResourceID=390
https://learningcenter.nsta.org/products/symposia_seminars/NGSS/webseminar32.aspx
http://ngss.nsta.org/Resource.aspx?ResourceID=401
http://ngss.nsta.org/Resource.aspx?ResourceID=391
Related Books:
Earth's Water by Joy Brewster
Gettting Water by Jo Windsor
Pebblego.com
Freezing and Melting. Robin Nelson. Lerner Publications (2003)
Forest Explorer: A Life-Size Field Guide

Grade 2, Science, Unit 5, " Changes to Earth's Land"

Content Area: **Science**
Course(s): **Science**
Time Period: **April**
Length: **8 weeks**
Status: **Published**

Next Generation Science Standards

SCI.2-ESS1-1	**Use information from several sources to provide evidence that Earth events can occur quickly or slowly.**
SCI.2-ESS2-1	**Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.**
SCI.K-2-ETS1-2	**Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.**
SCI.K-2-ETS1-1	**Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.**

Student Learning Objectives

• Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1)
• Compare multiple solutions to a problem. (2- ESS2-1) Asking Questions and Defining Problems
• Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1)
• Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) Developing and Using Models
• Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

Enduring Understanding

In this unit of study, students apply their understanding of the idea that wind and water can change the shape of land to compare design solutions to slow or prevent such change. Students demonstrate grade-appropriate proficiency in asking questions and defining problems, developing and using models, and constructing explanations and designing solutions.

Essential Questions

What evidence can we find to prove that Earth events can occur quickly or slowly?

In what ways do humans slow or prevent wind or water from changing the shape of the land?

Assessment

Formative Assessments:

A-B-C Summaries: Each student in the class is assigned a different letter of the alphabet and they must select a word starting with that letter that is related to the topic being studied.
Debriefing: A form of reflection immediately following an activity.
Idea Spinner: The teacher creates a spinner marked into 4 quadrants and labeled “Predict, Explain, Summarize, Evaluate.” After new material is presented, the teacher spins the spinner and if the spinner lands in the “Summarize”

quadrant, the teacher might say, “List the key concepts just presented.”
Inside-Outside Circle: Inside and outside circles of students face each other. Within each pair of facing students, students quiz each other with questions they have written. Outside circle moves to create new
Reader’s Theater:
Exit Card: Exit cards are written student responses to questions posed at the end of a class or learning activity or at the end of a day.
Portfolio Check: Check the progress of a student’s portfolio. A portfolio is a purposeful collection of significant work, carefully selected, dated and presented to tell the story of a student’s achievement or growth in well-defined areas of performance, such as reading, writing, math, etc. A portfolio usually includes personal reflections where the student explains why each piece was chosen and what it shows about his/her growing skills and abilities.
Quiz: Quizzes assess students for factual information, concepts and discrete skill. There is usually a single best answer.
Journal Entry: Students record in a journal their understanding of the topic, concept or lesson taught. The teacher reviews the entry to see if the student has gained an understanding of the topic,lesson or concept that was taught.
Choral Response: In response to a cue, all students respond verbally at the same time. The response can be either to answer a question or to repeat something the teacher has said.
Misconception Check: Present students with common or predictable misconceptions about a designated concept, principle, or process. Ask them whether they agree or disagree and explain why. The misconception check can also be presented in the form of a multiple-choice or true-false quiz.
Student Conference: One on one conversation with students to check their level of understanding.
3-Minute Pause: The Three-Minute Pause provides a chance for students to stop, reflect on the concepts and ideas that have just been introduced, make connections to prior knowledge or experience, and seek clarification.
Observation: Walk around the classroom and observe students as they work to check for learning.
Self-Assessment: A process in which students collect information about their own learning, analyze what it reveals about their progress toward the intended learning goals and plan the next steps in their learning.
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Alternative:
Self Selected Science Projects
Extension Projects
Concept Map

• Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. Examples of solutions could include: Different designs of dikes and windbreaks to hold back wind and water/dams/ different designs for using shrubs, grass, and trees to hold back the land.
• Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
• Make observations from several sources to construct an evidence-based account for natural phenomena. • Use information from several sources to provide evidence that Earth events can occur quickly or slowly. (Assessment does not include quantitative measurements of timescales.
Volcanic explosions Earthquakes Erosion of rock

Instructional Activities

As a class, with teacher guidance, students brainstorm a list of natural Earth events, such as a volcanoes, earthquakes, tsunamis, or floods. As a class or in small groups, with guidance, students conduct research on the selected Earth event using books and other reliable sources. They gather information about the problems that are caused by the selected event, and gather information on the ways in which humans have minimized the effects of the chosen earth event. Children can do a powerpoint explaining their facts of these events.
Children can make and erupt volcanoes.
Children can also design dams or develop ways to contain water with natural resources/plants/trees.
Next, students look for examples in their community of ways that humans have minimized the effect of natural Earth events. This can be accomplished through a nature walk or short hike around the schoolyard, during a field trip, or students can make observations around their own neighborhoods. Students can carry digital cameras in order to document any examples they find. Groups select one solution they have found through research and develop a simple sketch, drawing, or physical model to illustrate how it minimizes the effects of the selected Earth event. They present it to the class.
http://science-ed.pnnl.gov/teachers/plans/quilt500.jpg
http://science-ed.pnnl.gov/teachers/earth.stm powerpoint slide

Interdisciplinary Connections

English Language Arts Students participate in shared research to gather information about Earth events from texts and other media and digital resources. They will use this information to answer questions and describe key ideas and details about ways in which the land can change and what causes these changes. Students should also have opportunities to compose a writing piece, either independently or collaboratively with peers, using digital tools to produce and publish their writing. Students should describe connections between Earth events and the changes they cause, and they should include photographs, videos, poems, dioramas, models, drawings, or other visual displays of their work, when appropriate, to clarify ideas, thoughts, and feelings. Mathematics Students have multiple opportunities to reason abstractly and quantitatively as they gather information from media sources. Students can organize data into picture graphs or bar graphs in order to make comparisons. For example, students can graph rainfall amounts. Students can use the data to solve simple addition and subtraction problems using information from the graphs to determine the amount of change that has occurred to local landforms. For example, a gully was 17 inches deep before a rainstorm and 32 inches deep after a rainstorm. How much deeper is it after the rainstorm? Students must also have an understanding of place value as they encounter the varying timescales on which Earth events can occur. For example, students understand that a period of thousands of years is much longer than a period of hundreds of years, which in turn is much longer than a period of tens of years. In addition, teachers should give students opportunities to work with large numbers as they describe length, height, size, and distance when learning about Earth events and the changes they cause. For example, students might write about a canyon that is 550 feet deep, a river that is 687 miles long, or a forest that began growing about 200 years ago.

Texts and Resources

http://ngss.nsta.org/Resource.aspx?ResourceID=390- How can water change the shape of land?

http://ngss.nsta.org/Resource.aspx?ResourceID=401- How can wind change the shape of land?

http://ngss.nsta.org/Resource.aspx?ResourceID=391- Finding Erosion at our school.

Science Fusion/Houghton Mifflin Harcourt

http://web.compton.k12.ca.us/pages/departments/curriculum/pdf/2ndgradesciunitc.pdf

http://beyondpenguins.ehe.osu.edu/issue/earths-changing-surface/hands-on-science-and-literacy-activities-about-erosion-volcanoes-and-earthquakes
http://www.helpteaching.com/questions/Earth_Science/Grade_2
Related Books:
"Danger! Earthquakes"/ Seymour Simon
"Danger! Volcanoes"/ Seymour Simon

"Flood"/Linda Strachan
"This Changing Earth"/Fusion-Harcourt

- *Time for Kids Earthquakes!* by Barbara Collier, Harper Collins, 2006.
- *Time for Kids Volcanoes*! by Jeremy Caplan, Harper Collins, 2006.

Youtube- "Weathering/Erosion"/ Crash Course Kids#10.2
Youtube- "What on Earth?"/ Crash Course Kids #10

http://www.netl.doe.gov/about/education/k-12-stem-activities