Belvidere Clusterwide Curriculum









Science

Kindergarten

Updated Summer, 2024

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.

> Curriculum Coordinator: Timm Gast Authors: Timm Gast

UNITS	Duration	Essential Questions:
Unit 1: Forces	1 Trimester	 What's the biggest excavator? Why do builders need so many big machines? How can you knock down a wall made of concrete? How can you knock down the most bowling pins? How can you protect a mountain town from falling rocks? How can you invent a trap?
Unit 2: Weather and Climate	1 Trimester	 How can you get ready for a big storm? Have you ever watched a storm? How many different kinds of weather are there? How could you walk across pavement without burning your feet? How could you warm up a frozen playground? Why does it get cold in winter? How do you know what to wear for the weather? What will the weather be like on your birthday? Why do birds lay eggs in the spring?
Unit 3: Animals, Plants and Environment	1 Trimester	 What do plants need to live and grow? What is the relationship between what plants need and where they live? How can plants change their habitat? Where do animals live? How can you find animals in the woods? How do animals make their homes in the forest? How do plants and trees grow? Why would you want an old log in your backyard?

Student Learning

Career Education (NJDOE CTE Clusters)

21st Century Life and Careers

- 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
- 9.1.2.FP.1: Explain how emotions influence whether a person spends or saves.
- 9.2.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job.
- 9.2.2.CAP.2: Explain why employers are willing to pay individuals to work.
- 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives
- 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- 9.4.2.DC.6: Identify respectful and responsible ways to communicate in digital environments

Technology:

- 8.1.2.CS.1: Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
- 8.1.2.NI.1: Model and describe how individuals use computers to connect to other individuals, places, information and ideas through a network.
- 8.1.2.NI.2: Describe how the Internet enables Individuals to connect with others worldwide.
- 8.2.2.ITH.3: Identify how technology impacts or improves life.
- 8.2.2.ITH.4: Identify how various tools reduce work and improve daily tasks.
- 8.2.2.NT.2: Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.
- 8.2.2.ETW.1: Classify products as resulting from nature or produced as a result of technology.
- 8.2.2.EC.1: Identify and compare technology used in different schools, communities, regions, and parts of the world.

Modifications and Accommodations:

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
- •
- <u>ELL</u>
- 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
- •
- <u>At Risk</u>
- 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
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- 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
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- Exploration by interest
- Flexible grouping
- Goal setting with students
- Mini workshops to re-teach or extend skills Open-ended activities
- Think-Pair-Share
- Varied supplemental materials

Unit 1 Summary: Students are introduced to forces of pushes and pulls and how those forces affect the motion of objects. Students also observe the effects of what happens when the strength or direction of those pushes and pulls are changed.

Essential Questions:

Knowledge:

- What's the biggest excavator?
- Why do builders need so many big machines?
- How can you knock down a wall made of concrete?
- How can you knock down the most bowling pins?
- How can you protect a mountain town from falling rocks?
- How can you invent a trap?

New Jersey Student Learning Standards (Please Bold all Climate related standards met throughout all Units)

New Jersey Student Learning Standards: Science

- K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
- K-PS2-2 Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.
- 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.
- 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.
- K-ESS-3 Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.
- K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to (ie. climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2-ETS1-2 Develop a simple sketch, drawing or physical model to illustrate how the shape of an object helps its function as needed to solve a given problem.

Interdisciplinary Connections:

ELA:

- SL1. 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.4 Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.
- SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2)
- 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.

Speaking and Listening:

- RL.K.1 With prompting and support, ask and answer questions about key details in a text (e.g., who, what, where, when, why, how).
- RL.K.4. Ask and answer questions about unknown words in a text.

SEL:

- Responsible Decision-Making
- Develop, implement, and model effective problem-solving and critical thinking skills.
- Identify the consequences associated with one's actions in order to make constructive choices.
- Evaluate personal, ethical, safety, and civic impact of decisions.

Mathematics

- K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1)
- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. (K-PS2-1)
- MP.2 Reason abstractly and quantitatively. (K-PS2-1)

Disciplinary Core Ideas

• DCIs: Foundational for PS2.A, PS2.B, PS2.C

- PS2.A: Forces and Motion Pushes and pulls can have different strengths and directions. (KPS2-1),(K-PS2-2) • Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
- (K-PS2-1),(K-PS2-2) PS2.B: Types of Interactions When objects touch or collide, they push on one another and can change motion.
- (K-PS2-1) PS3.C: Relationship Between Energy and Forces

• A bigger push or pull makes things speed up or slow down more quickly. (secondary to K-PS2-1)

ETS1.A: Defining Engineering Problems • A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions.

- DCIs: PS2.A, PS2.B, Foundational PS3.C and ETS1.A
 - Machines create pushes and pulls, or "forces". A wrecking ball is a machine that uses a push to knock things over. By changing the strength and direction of the push, you can make the force larger or smaller.

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Science and Engineering Practices

Planning and Carrying Out Investigations

- Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.
- With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1) Analyzing and Interpreting Data Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
- Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2)

Connections to Nature of Science Scientific Investigations Use a Variety of Methods

• Scientists use different ways to study the world. (K-PS2-1)

Crosscutting Connections

Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1),(K-PS2-2)

Unit 1 Student Learning Objectives

Students will know:

- that there are pushes and pulls involved in any kind of work, including the work done by machines.
- what the words "push" and "pull" mean.
- how to explain how ramp heights affect speed and distance.
- that pushes can change the speed and direction of falling objects.

Students will be able to:

- discover that there are pushes & pulls involved in any kind of work, including the work done by machines.
- problem solve regarding the change in strength and direction of a wrecking ball's push.

- conduct investigations and make observations to explain how ramps and their height can affect speed and distance.
- conduct investigations and make observations to explain how pushes can change the speed and direction of falling objects

Unit 1 Assessments

Formative: Entrance/Exit Tickets, Science Notebook Entries, activities, etc.

Summative: Lesson Assessments, Rubrics for Exploration

Benchmark: End of Unit Assessment

Alternative Assessment:

Exemplars:

- Students will show understanding by drawing a machine that does work.
- Push and pull assessment

Unit 2 Overview: Weather and Climate

Unit 2 Summary: Students explore storms and severe weather. They gather information from weather forecasts to prepare for storms and stay safe. Students practice describing characteristics of weather (wind, clouds, temperature, and precipitation) in order to make their own predictions about storms. The students then gather evidence in order to identify daily and seasonal weather patterns. The students observe how sunlight warms the Earth's surface.. Using what they learn, students think about ways that shade and structures can reduce the warming effect of the Sun.

Essential Questions:

Knowledge:

- How can you get ready for a big storm?
- Have you ever watched a storm?
- How many different kinds of weather are there?
- How could you walk across pavement without burning your feet?

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- How could you warm up a frozen playground? Why does it get cold in winter? How do you know what to wear for the weather? What will the weather be like on your birthday? Why do birds lay eggs in the spring? •
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New Jersey Student Learning Standards

New Jersey Student Learning Standards: Science

- K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time.
- K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
- K-ESS3-3. Communicate solutions that will reduce the impact of climate change and humans on land, water, air, and/or other living things in the local environment.
- K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface.
- K-PS3-2. Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.
- 2.1.2.CHSS.4. Describe how climate change affects the health of individuals, plants and animals.
- K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.
- 6.1.2.GeoPP.1. Explain the different physical and human characteristics that might make a location a good place to live (e.g., landforms, climate and weather, resource availability).
- 6.1.2.Geo.HE.1. Explain how seasonal weather changes, climate, and other environmental characteristics affect people's lives in a place or region.

Interdisciplinary Connections:

ELA:

- 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.
- RL.K.1 With prompting and support, ask and answer questions about key details in a text (e.g., who, what, where, when, why, how).
- RL.K.4. Ask and answer questions about unknown words in a text.
- SL1. 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.4 Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.

Mathematics:

- K.CC Counting and Cardinality (K-ESS3-2)
- K.CC.A Know number names and the count sequence. (K-ESS2-1)
- K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)
- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. (K-PS3-1), (K-PS3-2)
- K.MD.B.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (K-ESS2-1)
- MP.2 Reason abstractly and quantitatively. (K-ESS2-1)
- MP.4 Model with mathematics. (K-ESS2-1), (K-ESS3-2)

Science: Climate Change

- K-PS3-1: Make observations to determine the effect of sunlight on Earth's surface.
- K-PS3-2: Use tools and materials to design and build a structure that will reduce the warming effect of

sunlight on an area.

Social Studies:

- 6.1.2.GeoPP.1: Explain the different physical and human characteristics that might make a location a good place to live (e.g., landforms, climate and weather, resource availability).
- 6.1.2.Geo.HE.1: Explain how seasonal weather changes, climate, and other environmental characteristics affect people's lives in a place or region.
- SEL:
 - Responsible Decision-Making
 - Develop, implement, and model effective problem-solving and critical thinking skills.
 - Identify the consequences associated with one's actions in order to make constructive choices.
 - Evaluate personal, ethical, safety, and civic impact of decisions.

Disciplinary Core Ideas

- ESS2.D: Weather and Climate
 - Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1)
- ESS2.E: Biogeology
 - Plants and animals can change their environment. (KESS2-2)
- ESS3.C: Human Impacts on Earth Systems
 - Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2)

Science and Engineering Practices

Analyzing and Interpreting Data

- Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
 - Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1)

Engaging in Argument from Evidence

- Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).
 - Construct an argument with evidence to support a claim. (K-ESS2-2)

Connections to Nature of Science

- Science Knowledge is Based on Empirical Evidence
 - Scientists look for patterns and order when making observations about the world. (K-ESS2-1)

Crosscutting Connections

Patterns

• Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1)

Systems and System Models

• Systems in the natural and designed world have parts that work together. (K-ESS2-2)

Unit 2 Student Learning Objectives

Students will know:

- the different factors involved in describing the weather.
- the four classic seasons.
- knowledge of the engineering and design process.
- about weather tools and how they measure and describe temperature.

Students will be able to:

- observe and draw the weather.
- spot patterns in the seasons.
- determine the seasons' order.
- create a structure that provides shade.
- measure and describe the weather and temperature.

Unit 2 Assessments

Formative Assessments

• Entrance/Exit Tickets, Slate Work, Science Notebook Entries, Activities

Summative Assessments

• Science Lesson Assessments, Rubrics for Exploration

Benchmark Assessments

• End of Unit Assessment

Alternative Assessment:

Embedded as ideas:

- Printable Weather Window Activity Sheet
- Printable "Today's Weather Worksheet"
- Vocabulary Cards
- Weather Window
- Science Notebook
- *Make a simple windsock*
- alphabet cards Aa-Zz The Snowy Day center

Unit 3 Summary: Students use observations to understand what animals and plants need to survive. Students explore how animals need things to eat and a safe place to live. They also investigate the needs of plants and how those might be different from the needs of animals.

Essential Questions:

- What do plants need to live and grow?
- What is the relationship between what plants need and where they live?
- How can plants change their habitat?
- Where do animals live?
- How can you find animals in the woods?
- How do animals make their homes in the forest?
- How do plants and trees grow?
- Why would you want an old log in your backyard?

New Jersey Student Learning Standards

New Jersey Student Learning Standards: Science

- K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS2-2 Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
- K-ESS3-1 Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
- K-ESS3-3 Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.
- K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.
- 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.
- 6.1.2.GeoPP.1. Explain the different physical and human characteristics that might make a location a good place to live (e.g., landforms, climate and weather, resource availability).
- 6.1.2.Geo.HE.1. Explain how seasonal weather changes, climate, and other environmental characteristics affect people's lives in a place or region.
- 6.3.2.CivicsPD.1. With adult guidance and support, bring awareness of a local issue to school and/or community members and make recommendations for change.

Interdisciplinary Connections:

ELA:

- RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS2-2)
- SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1)
- W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2)
- 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. (K-ESS2-2), (K-ESS3-3)

Speaking and Listening:

- RL.K.1 With prompting and support, ask and answer questions about key details in a text (e.g., who, what, where, when, why, how).
- RL.K.4. Ask and answer questions about unknown words in a text.

SEL:

- Responsible Decision-Making
- Develop, implement, and model effective problem-solving and critical thinking skills.
- Identify the consequences associated with one's actions in order to make constructive choices.

• Evaluate personal, ethical, safety, and civic impact of decisions.

Mathematics

- K.CC Counting and Cardinality (K-ESS3-1)
- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. (K-LS1-1)
- MP.2 Reason abstractly and quantitatively. (K-ESS3-1)

• MP.4 - Model with mathematics. (K-ESS3-1)

Disciplinary Core Ideas

- K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
- ESS2.E: Biogeology Plants and animals can change their environment. (KESS2-2)
- ESS3.C: Human Impacts on Earth Systems Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2)

Science and Engineering Practices

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Crosscutting Connections

Patterns

• Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1)

Systems and System Models

• Systems in the natural and designed world have parts that work together. (K-ESS2-2)

Unit 3 Student Learning Objectives

Students will know:

- the basic needs of animals for survival.
- information through observations of different animal behaviors.
- patterns of animal behavior.
- seeds and their role in plant survival.
- physical structures of plants and their functions.
- the parts of a plant and the conditions they need to survive.
- the relationship between humans and plants
- natural resources that all living things need to live and grow.
- properties of metal and plastic containers.

• solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.

Students will be able to:

- use dramatizations to model the behavior of different animals.
- support an argument that all animals need safety to survive.
- use evidence from observations to argue explanations of why animals are acting in different ways.
- model different behaviors and use these patterns as evidence to support an argument that all animals need food to survive.
- describe requirements for plant growth.
- describe the parts of a plant and the conditions they need to survive.
- communicate ideas of how people can conserve natural resources.
- sort waste into two categories: recyclable and not recyclable.
- work cooperatively within a group to accomplish a goal.
- use solutions to reduce the impact of climate change and humans on the land, water, air and other living things in the local environment.

Unit 3 Assessments

Formative Assessments

• Entrance/Exit Tickets, Science Notebook Entries, Activities, etc.

Summative Assessments

• Science Lesson Assessments, Rubrics for Exploration

Benchmark Assessments

• End of Unit Assessment

Alternative Assessment:

- Ordering How a Seed Grows
- Parts of a Plant

Performance Tasks/Use of Technology: