Mystery Science Alignment with North Carolina Science Standards



Mystery Science is a hands-on curriculum that aligns with the North Carolina Essential Standards for Science.

Mystery Science's units of study contain:

- Hands-on, easy-prep activities with EVERY lesson
- Engaging, real-world investigative phenomena
- Thoughtful discussions to build background knowledge
- Lesson & unit assessments to evaluate comprehension
- Curated, cross-curricular extensions

Mystery Science also offers the Anchor Layer, which enriches the unit with an anchor phenomenon, incorporates anchor connections after each lesson, & concludes the unit with a performance task.

mystery science

Updated 08/25/2023

North Carolina Standards Alignment

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Plant Needs Unit (Plant Secrets)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	✨New!✨ **Living & Nonliving** Are plants alive?	Students make observations of plants in order to identify their needs and that they are, in fact, living things.	**K.L.1.2** Compare characteristics of living and nonliving things in terms of their structure, growth, changes, movement, and basic needs.
Lesson 2 	**Plant Needs: Water & Light** How do plants and trees grow?	Students investigate to determine the basic needs of plants. They observe to identify ways young plants resemble the parent plant and how the plant changes as it proceeds through its life cycle.	**K.L.1.2** Compare characteristics of living and nonliving things in terms of their structure, growth, changes, movement, and basic needs.
Lesson 3 	**Human Impacts on the Environment Read-Along** Why would you want an old log in your backyard?	Students obtain evidence of living organisms by virtually keeping watch of a log and the living things that visit it.	**K.L.1.2** Compare characteristics of living and nonliving things in terms of their structure, growth, changes, movement, and basic needs.

North Carolina Specific Standard: **K.L.1.1** Compare different types of the same animal (i.e. different types of dogs, different types of cats, etc.) to determine individual differences within a particular type of animal.

Severe Weather Unit (Wild Weather)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Severe Weather & Preparation Read-Along** How can you get ready for a big storm?	Students obtain information of different types of severe weather to observe and describe how the weather changes during these events and what students can do to prepare and stay safe.	**K.E.1.2** Summarize daily weather conditions noting changes that occur from day to day and throughout the year.
Lesson 2 	**Wind & Storms** Have you ever watched a storm?	Students create a simple tool that allows them to observe how hard the wind is blowing. They use this tool to observe weather changes and describe the pattern of faster wind speeds right before a storm.	**K.E.1.2** Summarize daily weather conditions noting changes that occur from day to day and throughout the year.
Lesson 3 	**Weather Conditions** How many different kinds of weather are there?	Students obtain information through observations of the weather. They communicate the information by acting as weather watchers and creating drawings of the weather conditions.	**K.E.1.2** Summarize daily weather conditions noting changes that occur from day to day and throughout the year. **K.E.1.1** Infer that change is something that happens to many things in the environment based on observations made using one or more of their senses.

Weather Patterns Unit (Circle of Seasons)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Daily Weather Patterns Read-Along** How do you know what to wear for the weather?	Students track the weather daily and analyze the data by collecting, recording, and sharing their observations to observe patterns of weather changing throughout the day and from day-to-day.	**K.E.1.3** Compare weather patterns that occur from season to season.
Lesson 2 	**Seasonal Weather Patterns** What will the weather be like on your birthday?	Students evaluate information in a series of unnamed drawings of each season. They use these clues to identify characteristics of each season and describe the yearly cyclical pattern.	**K.E.1.3** Compare weather patterns that occur from season to season.
Lesson 3 	**Animals Changing Their Environment** Why do birds lay eggs in the spring?	Students identify the reasons why birds lay eggs in the spring. Then, they develop a bird nest model and use this model as evidence for how animals can change the environment to meet their needs.	**K.E.1.3** Compare weather patterns that occur from season to season.

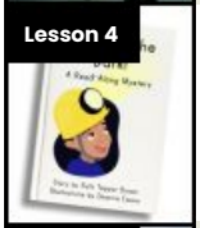
Pushes & Pulls Unit (Force Olympics)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Pushes & Pulls** What's the biggest excavator?	Students observe different machines and use those observations as evidence for why machines make work easier.	**K.P.1.1** Compare the relative position of various objects observed in the classroom and outside using position words such as: in front of, behind, between, on top of, under, above, below, beside.
Lesson 2 	**Pushes, Pulls, & "Work Words" Read-Along** Why do builders need so many big machines?	Students observe construction equipment being used in different ways to move objects.	**K.P.1.2** Give examples of different ways objects and organisms move (to include falling to the ground when dropped 4G/P1): straight, zigzag, round and round, back and forth, fast and slow.
Lesson 3 	*We **recommend teaching this in 1st Grade** if following North Carolina Standards.* *How can you knock down a wall made of concrete?*	*determine how far back they should pull a model wrecking ball to knock down a wall, but not the houses behind it.*	***1.P.1.3** Predict the effect of a given force on the motion of an object, including balanced forces.*
Lesson 4 	*We **recommend teaching this in 1st Grade** if following North Carolina Standards.* ***Read-Along*** *How can you knock down the most bowling pins?*	*bowling to observe the way that objects can move in straight lines, zigzags, and back and forth.*	***1.P.1.3** Predict the effect of a given force on the motion of an object, including balanced forces.*
Lesson 5 	*We **recommend teaching this in 1st Grade** if following North Carolina Standards.* *How can we protect a mountain town from falling rocks?*	*boulder. They design a solution to safely guide the direction of the boulder away from the town.*	***1.P.1.3** Predict the effect of a given force on the motion of an object, including balanced forces.*
Lesson 6 	*We **recommend teaching this in 1st Grade** if following North Carolina Standards.* ***Read-Along*** *How could you invent a trap?*	*using what they know about the locations of objects and how they can move.*	***1.P.1.3** Predict the effect of a given force on the motion of an object, including balanced forces.*

North Carolina Specific Standard: **K.P.2.2** Compare the observable physical properties of different kinds of materials (clay, wood, cloth, paper, etc) from which objects are made and how they are used.

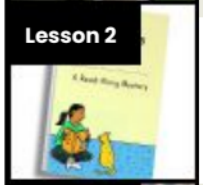
***This unit is found under 1st grade on our site**, but we recommend teaching lessons in Kindergarten if you are following North Carolina Standards.*

Light, Sound, & Communication Unit (Lights & Sounds)

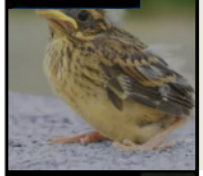
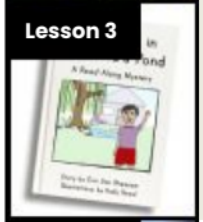
	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* *How do they make silly sounds in cartoons?*	*construct an explanation that objects vibrate when they make a sound, and if the vibration stops, the sound stops.*	*2.P.1.1 illustrate how sound is produced by vibrating objects and columns of air.*
Lesson 2 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* *Read-Along* *Where do sounds come from?*	*makers and construct an explanation about where the vibrations are happening in each sound experiment.*	*nd columns of air.* *2.P.1.2 Summarize the relationship between sound and objects of the body that vibrate - eardrum and vocal cords.*
Lesson 3 	**Light, Materials, Transparent & Opaque** What if there were no windows?	Students investigate the properties of different materials that they can and cannot see through. Then they create a stained glass window using tissue paper to explore how materials interact with light.	**K.P.2.1** Classify objects by observable physical properties (including size, color, shape, texture, weight and flexibility).
Lesson 4 	**Light & Illumination Read-Along** Can you see in the dark?	Students look inside a completely dark box to determine if they can see the shape of the object inside. They allow more light into the box to illuminate the object and allow them to see it. Students use their observations explain that objects need light to be seen.	**K.P.2.1** Classify objects by observable physical properties (including size, color, shape, texture, weight and flexibility).
Lesson 5 	**Light, Communication, & Engineering** How could you send a secret message to someone far away?	Students are presented with the problem that they need to send a message at night, without using noise. They design a solution to create a color-coded message system and communicate with light signals.	*This lesson does not align to North Carolina Science Standards
Lesson 6 	**Lights, Sounds, & Communication Read-Along** How do boats find their way in the fog?	Students obtain information about light and sound signals. They analyze different sounds with eyes closed to determine which type of sound they hear.	*This lesson does not align to North Carolina Science Standards

***This unit is found under Kindergarten on our site**, but we recommend teaching lessons in 1st grade if you are following North Carolina Standards.*

Animal Needs Unit (Animal Secrets)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Animal Needs: Food** Why do woodpeckers peck wood?	Students obtain information through virtual observations of different animal behaviors. They use this evidence to explain that one of the basic needs of animals is food.	**1.L.2.2** Summarize the basic needs of a variety of different animals (including air, water, and food) for energy and growth. **1.L.1.1** Recognize that plants and animals need air, water, light (plants only), space, food, and shelter and that these may be found in their environment.
Lesson 2 	**Animal Needs: Shelter Read-Along** Where do animals live?	Students obtain information through media about how different animal homes are built. They use this evidence to explain that animals need shelter.	**1.L.2.2** Summarize the basic needs of a variety of different animals (including air, water, and food) for energy and growth.
Lesson 3 	**Animal Needs: Safety** How can you find animals in the woods?	Students obtain information through virtual observations of different animal behaviors. They use this evidence to explain that one of the basic needs of animals is shelter.	**1.L.2.2** Summarize the basic needs of a variety of different animals (including air, water, and food) for energy and growth. **1.L.1.1** Recognize that plants and animals need air, water, light (plants only), space, food, and shelter and that these may be found in their environment.
Lesson 4 	**Animals & Changing the Environment Read-Along** How do animals make their homes in the forest?	Students take a nature walk to look for evidence of animal homes.	**1.L.2.2** Summarize the basic needs of a variety of different animals (including air, water, and food) for energy and growth.

Animal Traits & Survival Unit (Animal Superpowers)

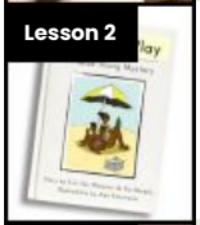
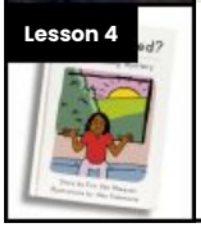
	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* *How can you help a lost baby animal find its parents?*	*and baby animals in order to construct an explanation that most young animals are like, but not exactly like, their parents.*	***2.L.2.1** Identify ways in which many plants and animals closely resemble their parents in observed appearance and ways they are different.*
Lesson 2 	**Animal Structures & Survival** Why do birds have beaks?	Students investigate how different bird beaks are well suited for eating different kinds of food. They explain which beak would help a particular bird survive in a particular environment.	**1.L.1.1** Recognize that plants and animals need air, water, light (plants only), space, food, and shelter and that these may be found in their environment. **1.L.1.2** Give examples of how the needs of different plants and animals can be met by their environments in North Carolina or different places throughout the world.
Lesson 3 	**Animal Behavior & Offspring Survival Read-Along** Why do baby ducks follow their mother?	Students obtain information about the behaviors of animal parents that help their offspring survive.	**1.L.1.2** Give examples of how the needs of different plants and animals can be met by their environments in North Carolina or different places throughout the world.
Lesson 4 	**Camouflage & Animal Survival** Why are polar bears white?	Students use observations of animal parents and their offspring to construct an explanation about young plants and animals being similar, but not identical, to their parents.	**1.L.1.1** Recognize that plants and animals need air, water, light (plants only), space, food, and shelter and that these may be found in their environment. **1.L.1.2** Give examples of how the needs of different plants and animals can be met by their environments in North Carolina or different places throughout the world.
Lesson 5 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* ***Read-Along*** *Why do family members look alike?*	*leaves. They evaluate these plant parts and apply that information to design an umbrella that won't blow down in the wind.*	***2.L.2.2** Recognize that there is variation among individuals that are related.*

Plant Traits & Survival Unit (Plant Superpowers)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* ~~Plant Traits & Offspring~~ *What will a baby plant look like when it grows up?*	~~Students observe seedlings and adult~~ plants and use their observations to identify the pattern that young plants are similar to their parent plants.	***2.L.2.1** Identify ways in which many plants and animals closely resemble their parents in observed appearance and ways they are different.*
Lesson 2 	**Plant Survival & Engineering** Why don't trees blow down in the wind?	Students learn how plants respond to light. They conduct an investigation to compare how the parts of a plant respond to light.	**1.L.2.1** Summarize the basic needs of a variety of different plants (including air, water, nutrients, and light) for energy and growth. **1.L.1.1** Recognize that plants and animals need air, water, light (plants only), space, food, and shelter and that these may be found in their environment.
Lesson 3 	**Plant Movement & Survival Read-Along** What do sunflowers do when you're not looking?	Students learn how plants respond to light. They conduct an investigation to compare how the parts of a plant respond to light.	**1.L.2.1** Summarize the basic needs of a variety of different plants (including air, water, nutrients, and light) for energy and growth. **1.L.1.1** Recognize that plants and animals need air, water, light (plants only), space, food, and shelter and that these may be found in their environment.

North Carolina Specific Standard: **1.L.1.3** Summarize ways that humans protect their environment and/or improve conditions for the growth of the plants and animals that live there. (e.g., reuse or recycle products to avoid littering.)

Day Patterns Unit (Sun & Shadows)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Sun, Shadows, & Daily Patterns** Could a statue's shadow move?	Students observe how shadows change as time passes, or as the Sun moves across the sky. They analyze how to move a light source to change the shape and direction of shadows, constructing an explanation of what causes a shadow to move.	**1.E.1.1** Recognize differences in the features of the day and night sky and apparent movement of objects across the sky as observed from Earth.
Lesson 2 	**Sun, Shadows, & Daily Patterns Read-Along** What does your shadow do when you're not looking?	Students conduct an investigation to gather information about how their shadow changes throughout the day.	**1.E.1.1** Recognize differences in the features of the day and night sky and apparent movement of objects across the sky as observed from Earth.
Lesson 3 	**Sun & Daily Patterns** How can the Sun help you if you're lost?	Students develop a Sun Finder, a model of the Sun's movement across the sky. They use this model to reason about how the Sun can help guide them during the day.	**1.E.1.1** Recognize differences in the features of the day and night sky and apparent movement of objects across the sky as observed from Earth.
Lesson 4 	**Daylight & Seasonal Patterns Read-Along** Why do you have to go to bed early in the summer?	Students obtain information about the seasonal patterns of sunrise and sunset.	**1.E.1.1** Recognize differences in the features of the day and night sky and apparent movement of objects across the sky as observed from Earth.

Night Patterns Unit (Moon & Stars)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	**Moon Phases & Patterns** When can you see the full moon?	Students record observations of the Moon's shape using a series of photos collected over the course of four weeks. Using this information, students discover that the Moon follows a cyclical pattern, which they can use to predict when a full moon will appear.	**1.E.1.2** Recognize patterns of observable changes in the Moon's appearance from day to day.
 Lesson 2	**Stars & Daily Patterns** Why do stars come out at night?	Students develop and use a model of the Big Dipper in the night sky. After conducting a simple investigation, students construct an explanation for why stars are only visible in the night sky.	**1.E.1.1** Recognize differences in the features of the day and night sky and apparent movement of objects across the sky as observed from Earth.
 Lesson 3	**Stars & Seasonal Patterns Read-Along** How can stars help you if you get lost?	Students observe that groups of stars in the sky form a pattern: constellations. Even though the Big Dipper changes its spot in the sky in different seasons, it always points to the North Star.	**1.E.1.1** Recognize differences in the features of the day and night sky and apparent movement of objects across the sky as observed from Earth.

Material Properties Unit (Material Magic)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 6	**Soil Properties** How do you build a city out of mud?	Students conduct an investigation where they examine three different soil models. They use this information to determine which type of soil has the properties that will result in the best mud that can be used to build a house.	**1.E.2.1** Summarize the physical properties of Earth materials, including rocks, minerals, soils, and water that make them useful in different ways. **1.E.2.2** Compare the properties of soil samples from different places relating their capacity to retain water, nourish and support the growth of certain plants.

North Carolina Standards Alignment

1st Grade - Physical Science

mystery science

***This unit is found under Kindergarten on our site**, but we recommend teaching lessons in 1st grade if you are following North Carolina Standards.*

Pushes & Pulls Unit (Force Olympics)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	*We **recommend teaching this in Kindergarten** if following North Carolina Standards.*		
	What's the biggest excavator?	*use those observations as evidence for why machines make work easier.*	*observed in the classroom and outside using position words such as: in front of, behind, between, on top of, under, above, below, beside.*
Lesson 2 	*We **recommend teaching this in Kindergarten** if following North Carolina Standards.*		
	Why do builders need so many big machines?	*equipment being used in different ways to move objects.*	***K.P.1.2** Give examples of different ways objects and organisms move (to include falling to the ground when dropped 4G/P1): straight, zigzag, round and round, back and forth, fast and slow.*
Lesson 3 	**Motion, Speed, & Strength** How can you knock down a wall made of concrete?	Students carry out an investigation to determine how far back they should pull a model wrecking ball to knock down a wall, but not the houses behind it.	**1.P.1.1** Explain the importance of a push or pull to changing the motion of an object. **1.P.1.3** Predict the effect of a given force on the motion of an object, including balanced forces.
Lesson 4 	**Speed & Direction of Force Read-Along** How can you knock down the most bowling pins?	Students play a game of bumper bowling to observe the way that objects can move in straight lines, zigzags, and back and forth.	**1.P.1.3** Predict the effect of a given force on the motion of an object, including balanced forces.
Lesson 5 	**Direction of Motion & Engineering** How can we protect a mountain town from falling rocks?	Students conduct an investigation of how to protect a town from a falling boulder. They design a solution to safely guide the direction of the boulder away from the town.	**1.P.1.3** Predict the effect of a given force on the motion of an object, including balanced forces.
Lesson 6 	**Forces & Engineering Read-Along** How could you invent a trap?	Students define a problem they would like to solve and then design a solution using what they know about the locations of objects and how they can move.	**1.P.1.3** Predict the effect of a given force on the motion of an object, including balanced forces.

North Carolina Specific Standard: **1.P.1.2** Explain how some forces (pushes and pulls) can be used to make things move without touching them, such as magnets.

***This unit is found under 1st grade on our site**, but we recommend teaching lessons in 2nd grade if you are following North Carolina Standards.*

Animal Traits & Survival Unit (Animal Superpowers)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Parent & Offspring Traits** How can you help a lost baby animal find its parents?	Students observe the traits of adult and baby animals in order to construct an explanation that most young animals are like, but not exactly like, their parents.	**2.L.2.1** Identify ways in which many plants and animals closely resemble their parents in observed appearance and ways they are different.
Lesson 5 	**Inheritance & Variation of Traits Read-Along** Why do family members look alike?	Students identify parts of plants such as roots, branches, and leaves. They evaluate these plant parts and apply that information to design an umbrella that won't blow down in the wind.	**2.L.2.2** Recognize that there is variation among individuals that are related.

Plant Traits & Survival Unit (Plant Superpowers)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	✨New!✨ **Plant Traits & Offspring** What will a baby plant look like when it grows up?	Students observe seedlings and adult plants and use their observations to identify the pattern that young plants are similar to their parent plants.	**2.L.2.1** Identify ways in which many plants and animals closely resemble their parents in observed appearance and ways they are different.

Animal Biodiversity Unit (Animal Adventures)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	**Biodiversity & Classification** How many different kinds of animals are there?	Students observe the traits of different animals and use that information to organize them into groups based on their characteristics.	**Foundational for 2.L.1.2** Compare life cycles of different animals such as, but not limited to, mealworms, ladybugs, crickets, guppies, or frogs.
 Lesson 2	**Habitat Diversity** Why would a wild animal visit a playground?	Students observe animals, plants, and the physical characteristics of two different habitats. They collect and analyze data to compare the biodiversity between the two habitats.	**Foundational for 2.L.1.2** Compare life cycles of different animals such as, but not limited to, mealworms, ladybugs, crickets, guppies, or frogs.
 Lesson 3	**Biodiversity, Habitats, & Species** Why do frogs say "ribbit"?	Students identify frogs based on their unique calls and use that information to determine the level of frog species diversity within multiple habitats.	**Foundational for 2.L.1.2** Compare life cycles of different animals such as, but not limited to, mealworms, ladybugs, crickets, guppies, or frogs.
 Lesson 4	**Biodiversity & Engineering** How could you get more birds to visit a bird feeder?	Students investigate which kinds of birds are likely to visit a bird feeder based on what they eat and design and build a prototype bird feeder that attracts a specific type of bird.	**Foundational for 2.L.1.2** Compare life cycles of different animals such as, but not limited to, mealworms, ladybugs, crickets, guppies, or frogs.

Life Cycles Unit (Circle of Life)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	**Animal Life Cycles** How is your life like an alligator's life?	Students create models of several different animal life cycles and compare them to one another. They use these models to discover the pattern that all animals are born, grow, can have babies, and eventually die.	**2.L.1.2** Compare life cycles of different animals such as, but not limited to, mealworms, ladybugs, crickets, guppies, or frogs. **2.L.1.1** Summarize the life cycle of animals: birth, developing into an adult, reproducing, aging and death.

***This unit is found under Kindergarten on our site**, but we recommend teaching lessons in 2nd grade if you are following North Carolina Standards.*

Sunlight & Warmth Unit (Sunny Skies)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Sunlight, Heat, & Earth's Surface Read-Along** How could you walk barefoot across hot pavement without burning your feet?	Students make observations of the pavement heating up after being warmed by the Sun. Then, they design a solution to build a shade structure that can reduce the warming effect of sunlight.	**2.E.1.1** Summarize how energy from the sun serves as a source of light that warms the land, air, and water.
Lesson 2 	**Sunlight, Warming, & Engineering** How could you warm up a frozen playground?	Students carry out an investigation to test which materials can redirect the light and heat of sunlight. (*This lesson has students increase the warming effect of sunlight on an area.)	**2.E.1.1** Summarize how energy from the sun serves as a source of light that warms the land, air, and water.
Lesson 3 	**Sunlight & Warmth** Why does it get cold in winter?	Students construct an explanation for why marshmallows melt in one car and not in another car. Then, they conduct a virtual investigation to determine that the warmth of the Sun is the cause of the melted marshmallows.	**2.E.1.1** Summarize how energy from the sun serves as a source of light that warms the land, air, and water. **2.P.2.1** Give examples of matter that change from a solid to a liquid and from a liquid to a solid by heating and cooling.

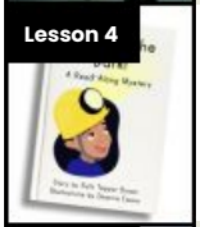
North Carolina Specific Standard: **2.P.2.2** Compare the amount (volume and weight) of water in a container before and after freezing.

***This unit is found under Kindergarten on our site**, but we recommend teaching lessons in 2nd grade if you are following North Carolina Standards.*

Weather & Climate Unit (Stormy Skies)

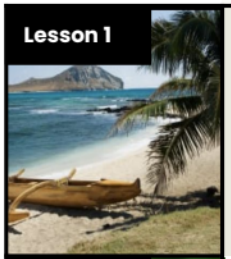
	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Water Cycle & States of Matter** Where do clouds come from?	Students obtain and combine information that water can change from liquid to gas, but that it is always made of tiny drops. Clouds are made of water that has evaporated.	**2.P.2.3** Compare what happens to water left in an open container over time as to water left in a closed container. **2.P.2.1** Give examples of matter that change from a solid to a liquid and from a liquid to a solid by heating and cooling.
Lesson 2 	**Local Weather Patterns & Weather Prediction** How can we predict when it's going to storm?	Students make observations of clouds and develop a tool to make predictions about what kind of weather might happen next.	**2.E.1.2** Summarize weather conditions using qualitative and quantitative measures to describe temperature, wind direction, wind speed, precipitation **2.E.1.3** Compare weather patterns that occur over time and relate observable patterns to time or day and time of year.
Lesson 3 	**Seasonal Weather Patterns** Where's the best place to build a snow fort?	Students gather winter temperature data from three different towns. They represent the data in a table to compare the weather and decide which town is the best candidate to host a snow fort festival in future years.	**2.E.1.4** Recognize the tools that scientists use for observing, recording, and predicting weather changes from day to day and during the seasons. **2.E.1.3** Compare weather patterns that occur over time and relate observable patterns to time or day and time of year.
Lesson 4 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* ***Patterns*** *Why are some places always hot?*	*information to describe the different climate regions of the world.*	*patterns.* ***Foundational for 5.E.1.3** Explain how global patterns such as the jet stream and water currents influence local weather in measurable terms such as temperature, wind direction and speed, and precipitation.*
Lesson 5 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* ***Natural Hazards & Engineering*** *How can you keep a house from blowing away in a windstorm?*	*Students design and build solutions that reduce the hazards associated with strong winds that could damage buildings.*	***5.E.1.2** Predict upcoming weather events from weather data collected through observation and measurements.*

Light, Sound, & Communication Unit (Lights & Sounds)

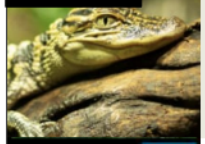
	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Sounds & Vibrations** How do they make silly sounds in cartoons?	Students explore how to make different sounds with everyday objects. They construct an explanation that objects vibrate when they make a sound, and if the vibration stops, the sound stops.	**2.P.1.1** Illustrate how sound is produced by vibrating objects and columns of air.
Lesson 2 	**Sounds & Vibrations Read-Along** Where do sounds come from?	Students create three different sound makers and construct an explanation about where the vibrations are happening in each sound experiment.	**2.P.1.1** Illustrate how sound is produced by vibrating objects and columns of air. **2.P.1.2** Summarize the relationship between sound and objects of the body that vibrate - eardrum and vocal cords.
Lesson 3 	*We **recommend teaching this in Kindergarten** if following North Carolina Standards.* *What if there were no windows?*	*cannot see through. Then they create a stained glass window using tissue paper to explore how materials interact with light.*	*K.P.2.1 Classify objects by observable physical properties (including size, color, shape, texture, weight and flexibility).*
Lesson 4 	*We **recommend teaching this in Kindergarten** if following North Carolina Standards.* ***Read-Along*** *Can you see in the dark?*	*Students look inside a completely dark box the object inside. They allow more light into the box to illuminate the object and allow them to see it. Students use their observations explain that objects need light to be seen.*	*K.P.2.1 Classify objects by observable physical properties (including size, color, shape, texture, weight and flexibility).*
Lesson 5 	**Light, Communication, & Engineering** How could you send a secret message to someone far away?	Students are presented with the problem that they need to send a message at night, without using noise. They design a solution to create a color-coded message system and communicate with light signals.	*This lesson does not align to North Carolina Science Standards
Lesson 6 	**Lights, Sounds, & Communication Read-Along** How do boats find their way in the fog?	Students obtain information about light and sound signals. They analyze different sounds with eyes closed to determine which type of sound they hear.	*This lesson does not align to North Carolina Science Standards

***This unit is found under 2nd grade on our site**, but we recommend teaching lessons in 3rd Grade if you are following North Carolina Standards.*

Plant Adaptations Unit (Plant Adventures)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	✨New!✨ **Seed Dispersal** How did a tree travel halfway around the world?	Students develop physical models of seed structures. They observe how structure affects the seed's function in dispersing away from the tree.	**3.L.2.1** Remember the function of the following structures as it relates to the survival of plants in their environments: roots -- absorb nutrients, stems -- provide support, leaves -- synthesize food, flowers -- attract pollinators and produce seeds for reproduction.
Lesson 2 	✨New!✨ **Animal Seed Dispersal** Why do seeds have so many different shapes?	Students develop a model of a furry animal and then use it to test how far seed models with different structures can travel.	**3.L.2.1** Remember the function of the following structures as it relates to the survival of plants in their environments: roots -- absorb nutrients, stems -- provide support, leaves -- synthesize food, flowers -- attract pollinators and produce seeds for reproduction.
Lesson 3 	**Water, Sunlight, & Plant Growth** Could a plant survive without light?	Students conduct an investigation to determine that plants need water and light to grow.	**3.L.2.1** Remember the function of the following structures as it relates to the survival of plants in their environments: roots -- absorb nutrients, stems -- provide support, leaves -- synthesize food, flowers -- attract pollinators and produce seeds for reproduction.
Lesson 4 	✨New!✨ **Plant Needs & Habitats** How much water should you give a plant?	Students plan and conduct a series of virtual experiments in order to determine how much water and sunlight a set of mystery plants need in order to stay healthy and survive.	**3.L.2.2** Explain how environmental conditions determine how well plants survive and grow.

Life Cycles Unit (Circle of Life)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* ***Animal Life Cycles*** *How is your life like an alligator's life?*	*different animal life cycles and compare them to one another. They use these models to discover the pattern that all animals are born, grow, can have babies, and eventually die.*	*limited to, mealworms, ladybugs, crickets, guppies, or frogs.* ***2.L.1.1** Summarize the life cycle of animals: birth, developing into an adult, reproducing, aging and death.*
Lesson 2 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* ***Environmental Change & Engineering*** *What's the best way to get rid of mosquitoes?*	*about mosquitoes from different sources. They analyze and interpret information about the mosquito life cycle to reduce the number of mosquitoes that live in a certain area.*	***4.L.1.1** Give examples of changes in an organism's environment that are beneficial to it and some that are harmful.*
Lesson 3 	**Pollination & Plant Reproduction** Why do plants grow flowers?	Students model the structure and function of flower parts that are responsible for creating seeds.	**3.L.2.1** Remember the function of the following structures as it relates to the survival of plants in their environments: roots -- absorb nutrients, stems -- provide support, leaves -- synthesize food, flowers -- attract pollinators and produce seeds for reproduction. **3.L.2.3** Summarize the distinct stages of the life cycle of seed plants.
Lesson 4 	**Fruit, Seeds, & Plant Reproduction** Why do plants give us fruit?	Students explore the function of fruits in plants and practice classification.	**3.L.2.1** Remember the function of the following structures as it relates to the survival of plants in their environments: roots -- absorb nutrients, stems -- provide support, leaves -- synthesize food, flowers -- attract pollinators and produce seeds for reproduction. **3.L.2.3** Summarize the distinct stages of the life cycle of seed plants.
Lesson 5 	**Plant Life Cycles** Why are there so many different kinds of flowers?	Students play a game that models the stages of the plant life cycle. After playing the game students use the model to show how changes to one part of the life cycle affect all other stages.	**3.L.2.3** Summarize the distinct stages of the life cycle of seed plants.

North Carolina Specific Standard: **3.L.2.4** Explain how the basic properties (texture and capacity to hold water) and components (sand, clay and humus) of soil determine the ability of soil to support the growth and survival of many plants.

North Carolina Specific Standard:
3.L.1.1 Compare the different functions of the skeletal and muscular system.

The following mini-lessons can be used to support North Carolina Specific Science Standards.

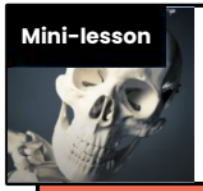
Mini-lesson



3.L.1.1

Why does our skeleton have so many bones?

Mini-lesson



3.L.1.1

What would happen if you didn't have a skull?

Mini-lesson



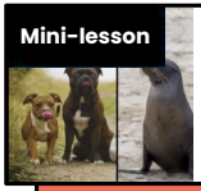
3.L.1.1

Why does the heart pump blood?

North Carolina Specific Standard:
3.L.1.2 Explain why skin is necessary for protection and for the body to remain healthy.

The following mini-lessons can be used to support North Carolina Specific Science Standards.

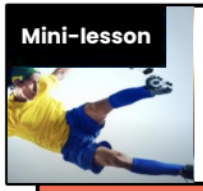
Mini-lesson



3.L.1.2

Can animals get a sunburn?

Mini-lesson



3.L.1.2

Why do we sweat when we play sports?

***This unit is found under 2nd Grade on our site**, but we recommend teaching lessons in 3rd Grade if you are following North Carolina Standards.*

Erosion & Earth's Surface Unit (Work of Water)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Mapping & Earth's Surface Features** If you floated down a river, where would you end up?	Students develop a model of the Earth's surface and use it to discover an important principle about how rivers work: rivers flow downhill, from high places to low places.	**3.E.2.1** Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).
Lesson 2 	**Rocks, Sand, & Erosion** Why is there sand at the beach?	Students investigate the effects of rocks tumbling in a river. Based on their observations, they construct an explanation for why rocks on the top of mountains are much bigger than the sand at the beach.	**3.E.2.2** Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.
Lesson 3 	**Mapping & Severe Weather** Where do flash floods happen?	Students use a model (i.e. a map) to examine the different factors, including the shapes and kinds of land, that contribute to flash floods. They use this to predict where flash floods are most likely to happen.	**3.E.2.2** Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.
Lesson 4 	**Erosion, Earth's Surface, & Landforms** What's strong enough to make a canyon?	Students create a model landform and investigate how some Earth events can occur quickly, while others occur slowly.	**3.E.2.2** Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.
Lesson 5 	**Erosion & Engineering** How can you stop a landslide?	Students compare multiple solutions for preventing erosion.	**3.E.2.2** Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.

***This unit is found under 5th Grade on our site**, but we recommend teaching lessons in 3rd Grade if you are following North Carolina Standards.*

Water Cycle & Earth's Systems Unit (Watery Planet)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Hydrosphere & Water Distribution** How much water is in the world?	Students analyze and interpret data from world maps to determine the relative amounts of fresh, salt, and frozen water. Students figure out that while the Earth has a lot of water, most of Earth's water is not fresh or accessible.	**3.E.2.1** Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).
Lesson 2 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* ***Mixtures & Solutions*** *How much salt is in the ocean?*	*observe how salt seems to completely vanish when dissolved in water. Students measure and graph quantities to provide evidence that the salt is still in the solution, even though we can't see it.*	***5.P.2.2** Compare the weight of an object to the sum of the weight of its parts before and after an interaction.*
Lesson 3 	**Groundwater as a Natural Resource** When you turn on the faucet, where does the water come from?	Students learn most people get fresh water from underground sources. Students determine the best place to settle a town by considering features of the landscape & the characteristics of the plants that thrive there.	**3.E.2.2** Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by constructing models, pictures, diagrams, and maps.
Lesson 4 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* ***Water Cycle*** *Can we make it rain?*	*and sky to investigate how temperature influences evaporation and condensation. Students figure out that higher ocean temperatures lead to more evaporation, thus leading to more rain.*	***5.P.2.1** Explain how the sun's energy impacts the processes of the water cycle (including evaporation, transpiration, condensation, precipitation, and runoff).*
Lesson 5 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* ***Natural Disasters & Engineering*** *How can you save a town from a hurricane?*	*design solutions using different types of flood protection. They realize flooding is caused by severe rainfall generated by hurricanes. Hurricanes are created where ocean temperatures are warm.*	***5.P.2.1** Explain how the sun's energy impacts the processes of the water cycle (including evaporation, transpiration, condensation, precipitation, and runoff).*

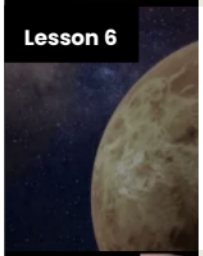
***This unit is found under 5th Grade on our site**, but we recommend teaching lessons in 3rd Grade if you are following North Carolina Standards.*

Stars & The Solar System Unit (Spaceship Earth)

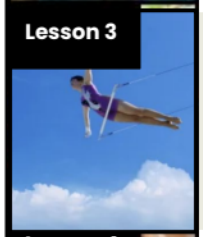
	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* ***Day, Night, & Earth's Rotation*** *How fast does the Earth spin?*	*Investigate why the sun looks like it's moving across the sky. Using evidence they gathered in the investigation, students build a model that explains how the Earth's rotation around its own axis causes the Sun to appear to rise and set.*	***4.E.1.1** Explain the cause of day and night based on the rotation of Earth on its axis.*
 Lesson 2	**Earth's Rotation & Daily Shadow Patterns** Who set the first clock?	Students make a shadow clock (sundial) and investigate how the direction and length of shadows change with the position of the light shining on the sundial. Students realize that the Sun's position in the sky can be used to tell the time of day.	**3.E.1.2** Recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the Sun during the day although the patterns of the stars in the sky, to include the Sun, stay the same.
 Lesson 3	**Seasonal Changes & Shadow Length** How can the Sun tell you the season?	Students examine photos taken at different times of year and figure out the time of year that each photo was taken. Students discover that the Sun's path changes with the seasons, as does the time of sunrise and sunset. The Sun is always highest in the sky at noon, but that height changes with the season.	**3.E.1.2** Recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the Sun during the day although the patterns of the stars in the sky, to include the Sun, stay the same.
 Lesson 4	**Seasonal Patterns & Earth's Orbit** Why do the stars change with the seasons?	Students build a model of the universe and use it to explain why different stars are visible at different times of year. Using evidence from this model, students make an argument that supports the claim that the Earth orbits the Sun.	**3.E.1.2** Recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the Sun during the day although the patterns of the stars in the sky, to include the Sun, stay the same.

Stars & The Solar System Unit continues on the next page

Stars & The Solar System Unit (Spaceship Earth)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 5 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* ***Moon Phases, Lunar Cycle*** *Why does the Moon change shape?*	*and Moon to investigate how the Moon's phase relates to its position relative to the Sun. Students notice that the Moon's phases repeat in a predictable pattern.*	***4.E.1.2** Explain the monthly changes in the appearance of the moon, based on the moon's orbit around the Earth.*
Lesson 6 	✨New!✨ **Solar System & Sun Brightness** How can the Sun help us explore other planets?	Students gather evidence to support an argument that the apparent brightness of the Sun is dependent upon an observer's distance from the Sun. They construct a model of the solar system and gather observations of the Sun's apparent brightness from each planet within their model.	**3.E.1.1** Recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and the Earth is the third planet from the sun in our solar system.
Lesson 7 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* ***Gravity*** *Why is gravity different on other planets?*	*thinking, students calculate how high they could jump on planets and moons that have stronger or weaker gravity than Earth. Students analyze and interpret this data to construct an explanation for why the amount of gravity is different on other planets.*	***5.P.1.1** Explain how factors such as gravity, friction, and change in mass affect the motion of objects.* ***5.P.1.4** Predict the effect of a given force or a change in mass on the motion of an object.*
Lesson 8 	**Star Brightness & Habitable Planets** Could there be life on other planets?	Students discover that the Earth is in the "Goldilocks Zone" — a distance from the Sun with the right amount of light and heat for life to exist. Students evaluate other solar systems, comparing their stars to our Sun. Based on their analysis, students plan a space mission to a planet with conditions similar to those on Earth.	**3.E.1.1** Recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and the Earth is the third planet from the sun in our solar system.

Forces, Motion, & Magnets Unit (Invisible Forces)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Balanced & Unbalanced Forces** How could you win a tug-of-war against a bunch of adults?	Students develop a mental model of the nature of forces and motion and use that model to explain the behavior of an elastic jumper.	**3.P.1.1** Infer changes in speed or direction resulting from forces acting on an object.
Lesson 2 	**Balanced Forces & Engineering** What makes bridges so strong?	Students develop and design a bridge to be as strong as possible while working with limited materials.	**3.P.1.1** Infer changes in speed or direction resulting from forces acting on an object.
Lesson 3 	✨New!✨ **Pattern of Motion, Gravity, & Friction** How high can you swing on a flying trapeze?	Students make observations and measurements of a trapeze model. Then, using that information they predict the motion of a real trapeze.	**3.P.1.1** Infer changes in speed or direction resulting from forces acting on an object. **3.P.1.2** Compare the relative speeds (faster or slower) of objects that travel the same distance in different amounts of time.
Lesson 4 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* ***Magnets & Forces*** *What can magnets do?*	*Students investigate the properties of magnets and the fact that they exert forces that act at a distance.*	*conduct electricity, ability to be attracted by magnets, reactions to water and fire).* ***4.P.1.1** Explain how magnets interact with all things made of iron and with other magnets to produce motion without touching them.*
Lesson 5 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* *How can you unlock a door using a magnet?*	*Students investigate magnetic attraction and repulsion, and design a magnetic lock in the hands-on activity.*	***4.P.1.1** Explain how magnets interact with all things made of iron and with other magnets to produce motion without touching them.*

North Carolina Specific Standard: **3.P.1.3** Explain the effect of earth's gravity on the motion of any object on or near the earth.

***This unit is found under 2nd Grade on our site**, but we recommend teaching lessons in 3rd Grade if you are following North Carolina Standards.*

Material Properties Unit (Material Magic)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Material Properties & Engineering** Why do we wear clothes?	Students investigate different material properties, such as flexibility and absorbency, and use those properties to design and build a hat that protects them from the sun.	**Foundational for 3.P.2.2** Compare solids, liquids, and gases based on their basic properties.
Lesson 2 	**Classify Materials: Insulators** Can you really fry an egg on a hot sidewalk?	Students conduct an investigation of conductors and insulators in order to determine which are best suited for allowing people to handle hot items.	**3.P.3.2** Recognize that energy can be transferred from a warmer object to a cooler one by contact or at a distance and the cooler object gets warmer. **3.P.2.3** Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water.
Lesson 3 	**Heating, Cooling, & Phases of Matter** Why are so many toys made out of plastic?	Student conduct an investigation of different materials in order to determine which are most and least easily melted.	**3.P.2.3** Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water.
Lesson 4 	**Inventions & Engineering** What materials might be invented in the future?	Students design a new invention that takes advantage of the unique properties of a futuristic material.	**3.P.2.2** Compare solids, liquids, and gases based on their basic properties.
Lesson 5 	**Materials, Properties, & Engineering** Could you build a house out of paper?	Students construct an evidence-based account of how a structure built of paper can be disassembled and rebuilt in new ways.	**3.P.2.2** Compare solids, liquids, and gases based on their basic properties.

North Carolina Specific Standard: **3.P.2.1** Recognize that air is a substance that surrounds us, takes up space and has mass.

North Carolina Specific Standard: **3.P.3.1** Recognize that energy can be transferred from one object to another by rubbing them against each other.

***This unit is found under 3rd grade on our site**, but we recommend teaching lessons in 4th grade if you are following North Carolina Standards.*

Fossils & Changing Environments Unit (Animals Through Time)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Habitats, Fossils, & Environments Over Time** Where can you find whales in a desert?	Students explore the idea that the rock under our feet sometimes contains fossils, and investigate how these fossils reveal changes in habitats through time.	**4.E.2.2** Infer ideas about Earth's early environments from fossils of plants and animals that lived long ago. **4.E.2.1** Compare fossils (including molds, casts, and preserved parts of plants and animals) to one another and to living organisms.
Lesson 2 	✨New!✨ **Fossil Evidence & Dinosaurs** How do we know what dinosaurs looked like?	Students learn how we can infer what the outside of an animal looked like by using clues about their skeleton.	**4.E.2.1** Compare fossils (including molds, casts, and preserved parts of plants and animals) to one another and to living organisms.
Lesson 3 	**Trace Fossil Evidence & Animal Movement** Can you outrun a dinosaur?	Students learn how fossilized animal tracks can tell us a great deal about the animals that left them.	**4.E.2.1** Compare fossils (including molds, casts, and preserved parts of plants and animals) to one another and to living organisms.

Life Cycles Unit (Circle of Life)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 2 	**Environmental Change & Engineering** What's the best way to get rid of mosquitoes?	Students obtain and evaluate information about mosquitoes from different sources. They analyze and interpret information about the mosquito life cycle to reduce the number of mosquitoes that live in a certain area.	**4.L.1.1** Give examples of changes in an organism's environment that are beneficial to it and some that are harmful.

North Carolina Specific Standard: **4.L.1.3** Explain how humans can adapt their behavior to live in changing habitats (e.g., recycling wastes, establishing rain gardens, planting native species to prevent flooding and erosion 5D/E3a).

North Carolina Specific Standard: **4.L.2.1** Classify substances as food or non-food items based on their ability to provide energy and materials for survival, growth and repair of the body.

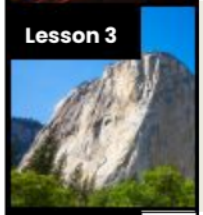
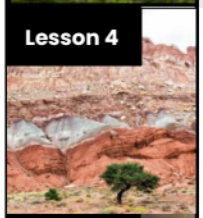
North Carolina Specific Standard: **4.L.2.2** Explain the role of vitamins, minerals and exercise in maintaining a healthy body.

***This unit is found under 3rd grade on our site**, but we recommend teaching lessons in 4th grade if you are following North Carolina Standards.*

Heredity, Survival, & Selection Unit (Fates of Traits)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Trait Variation, Inheritance, & Artificial Selection** How could you make the biggest fruit in the world?	Students investigate how human beings have modified plants based on our knowledge of how plants change from generation to generation.	**4.L.1.4** Explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats.
Lesson 2 	**Trait Variation, Inheritance, & Artificial Selection** What kinds of animals might there be in the future?	Students analyze the traits of parent dogs and their offspring, constructing an explanation about which traits a puppy gets from each parent.	**4.L.1.4** Explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats.
Lesson 3 	**Trait Variation, Natural Selection, & Survival** Can selection happen without people?	Students compare the structures of lizards that live on an island. They simulate multiple generations of these lizards, and analyze and interpret the data to understand how these structures aid in their survival.	**4.L.1.4** Explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats. **4.L.1.1** Give examples of changes in an organism's environment that are beneficial to it and some that are harmful.
Lesson 4 	**Animal Groups & Survival** Why do dogs wag their tails?	Students observe animals that live in groups in order to obtain, evaluate, and communicate information about animal social behavior. Students use evidence to show how animals form groups to help them survive.	**4.L.1.2** Explain how animals meet their needs by using behaviors in response to information received from the environment.
Lesson 5 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* *How long can people (and animals) survive in outer space?*	*balance, and height) and analyze the information to construct an explanation for how the environment can influence traits.*	***5.L.3.2** Give examples of likenesses that are inherited and some that are not.*

Earth's Features & Processes Unit (The Birth of Rocks)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	**Volcanoes & Patterns of Earth's Features** Could a volcano pop up where you live?	Students use coordinates to develop a map of volcanoes to discover a pattern of where volcanoes exist on Earth. Students identify the pattern of volcanoes in the "Ring of Fire."	**4.E.2.3** Give examples of how the surface of Earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes.
 Lesson 2	**Volcanoes & Rock Cycle** Why do some volcanoes explode?	Students investigate the properties of thin and thick lava by attempting to create air bubbles. Students realize that thick lava will cause a volcano to explode, while thin lava will not.	**4.E.2.3** Give examples of how the surface of Earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes. **4.P.2.3** Classify rocks as metamorphic, sedimentary, or igneous based on their composition, how they are formed, and the processes that create them.
 Lesson 3	**Weathering & Erosion** Will a mountain last forever?	Students make observations of the effects of weathering to discover that rocks will become rounded and break into small pieces when they tumble down a mountain.	**4.E.2.3** Give examples of how the surface of Earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes.
 Lesson 4	**Sedimentary Rock & Fossils** What did your town look like 100 million years ago?	Students create a model canyon and use the pattern of fossils found in each rock layer to support the explanation that the landscape has changed many times over millions of years.	**4.E.2.2** Infer ideas about Earth's early environments from fossils of plants and animals that lived long ago. **4.P.2.3** Classify rocks as metamorphic, sedimentary, or igneous based on their composition, how they are formed, and the processes that create them.
 Lesson 5	**Erosion, Natural Hazards, & Engineering** How could you survive a landslide?	Students generate multiple possible solutions to protect homes from a landslide. Students realize that there are many causes for the erosion that causes rocks to fall in landslides.	**4.E.2.3** Give examples of how the surface of Earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes.

North Carolina Specific Standard: **4.P.2.2** Explain how minerals are identified using tests for the physical properties of hardness, color, luster, cleavage, and streak.

***This unit is found under 5th Grade on our site**, but we recommend teaching lessons in 4th Grade if you are following North Carolina Standards.*

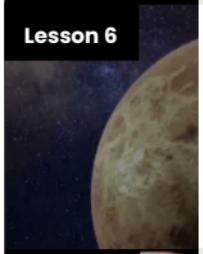
Stars & The Solar System Unit (Spaceship Earth)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Day, Night, & Earth's Rotation** How fast does the Earth spin?	Students model the rotation of the Earth and investigate why the Sun looks like it's moving across the sky. Using evidence they gathered in the investigation, students build a model that explains how the Earth's rotation around its own axis causes the Sun to appear to rise and set.	**4.E.1.1** Explain the cause of day and night based on the rotation of Earth on its axis.
Lesson 2 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Earth's Rotation & Daily Shadow Patterns*** *Who set the first clock?*	*investigate how the direction and length of shadows change with the position of the light shining on the sundial. Students realize that the Sun's position in the sky can be used to tell the time of day.*	***3.E.1.2** Recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the Sun during the day although the patterns of the stars in the sky, to include the Sun, stay the same.*
Lesson 3 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Seasonal Changes & Shadow Length*** *How can the Sun tell you the season?*	*that each photo was taken. Students discover that the Sun's path changes with the seasons, as does the time of sunrise and sunset. The Sun is always highest in the sky at noon, but that height changes with the season.*	***3.E.1.2** Recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the Sun during the day although the patterns of the stars in the sky, to include the Sun, stay the same.*
Lesson 4 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Seasonal Patterns & Earth's Orbit*** *Why do the stars change with the seasons?*	*use it to explain why different stars are visible at different times of year. Using evidence from this model, students make an argument that supports the claim that the Earth orbits the Sun.*	***3.E.1.2** Recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the Sun during the day although the patterns of the stars in the sky, to include the Sun, stay the same.*

Stars & The Solar System Unit continues on the next page

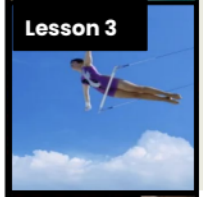
***This unit is found under 5th Grade on our site**, but we recommend teaching lessons in 4th Grade if you are following North Carolina Standards.*

Stars & The Solar System Unit (Spaceship Earth)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 5 	**Moon Phases, Lunar Cycle** Why does the Moon change shape?	Students use a physical model of the Sun and Moon to investigate how the Moon's phase relates to its position relative to the Sun. Students notice that the Moon's phases repeat in a predictable pattern.	**4.E.1.2** Explain the monthly changes in the appearance of the moon, based on the moon's orbit around the Earth.
Lesson 6 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Solar System & Sun Brightness*** *How can the Sun help us explore other planets?*	*Students gather evidence to support an argument that the brightness of the Sun is dependent upon an observer's distance from the Sun. They construct a model of the solar system and gather observations of the Sun's apparent brightness from each planet within their model.*	***3.E.1.1** Recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and the Earth is the third planet from the sun in our solar system.*
Lesson 7 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* **Gravity** Why is gravity different on other planets?	*Students analyze data to determine if they could jump on planets and moons that have stronger or weaker gravity than Earth. Students analyze and interpret this data to construct an explanation for why the amount of gravity is different on other planets.*	*in mass affect the motion of objects.* ***5.P.1.4** Predict the effect of a given force or a change in mass on the motion of an object.*
Lesson 8 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Star Brightness & Habitable Planets*** *Could there be life on other planets?*	*Sun with the right amount of light and heat for life to exist. Students evaluate other solar systems, comparing their stars to our Sun. Based on their analysis, students plan a space mission to a planet with conditions similar to those on Earth.*	***3.E.1.1** Recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and the Earth is the third planet from the sun in our solar system.*

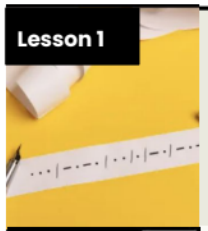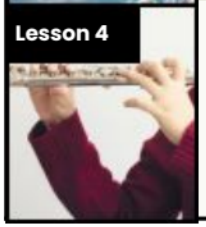
***This unit is found under 3rd grade on our site**, but we recommend teaching lessons in 4th grade if you are following North Carolina Standards.*

Forces, Motion, & Magnets Unit (Invisible Forces)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* *How could you win a tug-of-war against a bunch of adults?*	*and motion and use that model to explain the behavior of an elastic jumper.*	***3.P.1.1** Infer changes in speed or direction resulting from forces acting on an object.*
 Lesson 2	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* *What makes bridges so strong?*	*bridge to be as strong as possible while working with limited materials.*	***3.P.1.1** Infer changes in speed or direction resulting from forces acting on an object.*
 Lesson 3	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Pattern of Motion, Gravity, & Friction*** *How high can you swing on a flying trapeze?*	*and measurements of a trapeze model. Then, using that information they predict the motion of a real trapeze.*	*object.* ***3.P.1.2** Compare the relative speeds (faster or slower) of objects that travel the same distance in different amounts of time.*
 Lesson 4	**Magnets & Forces** What can magnets do?	Students investigate the properties of magnets and the fact that they exert forces that act at a distance.	**4.P.1.1** Explain how magnets interact with all things made of iron and with other magnets to produce motion without touching them. **4.P.2.1** Compare the physical properties of samples of matter (strength, hardness, flexibility, ability to conduct heat, ability to conduct electricity, ability to be attracted by magnets, reactions to water and fire).
 Lesson 5	**Magnets & Engineering** How can you unlock a door using a magnet?	Students investigate magnetic attraction and repulsion, and design a magnetic lock in the hands-on activity.	**4.P.1.1** Explain how magnets interact with all things made of iron and with other magnets to produce motion without touching them.

North Carolina Specific Standard: **4.P.1.2** Explain how electrically charged objects push or pull on other electrically charged objects and produce motion.

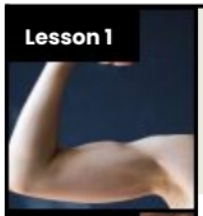
Sound, Waves, & Communication Unit (Waves of Sound)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	✨New!✨ **Pattern Transfer & Technology** How do you send a secret code?	Students explore how digital devices encode complex information. Students generate their own codes in order to transfer information across the classroom. Then, they compare their codes and evaluate which worked best given the criteria and constraints.	**4.P.3.1** Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.
 Lesson 2	**Sound, Vibration, & Engineering** How far can a whisper travel?	Students investigate sound energy using paper cup telephones. Students figure out that sound is a vibration that can travel through a medium.	**4.P.3.1** Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.
 Lesson 3	**Sound & Vibrations** What would happen if you screamed in outer space?	Students construct a model of sound vibrations to explain how air is a medium that sound vibrations travel through.	**4.P.3.1** Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.
 Lesson 4	**Sound Waves & Wavelength** Why are some sounds high and some sounds low?	Students make observations of vibrations and sound waves to discover that high pitch sounds vibrate faster and have short wavelengths and low pitch sounds vibrate slower and have long wavelengths.	**4.P.3.1** Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.

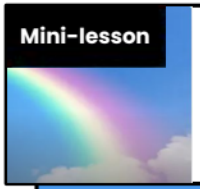
Energy, Energy Transfer, & Electricity Unit (Energizing Everything)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 6	**Electrical Energy** What if there were no electricity?	Students design a flashlight with an on/off switch, using batteries, flights, and tin foil. Students figure out that electricity can be transformed to other forms of energy, such as movement, light, and heat.	**4.P.3.1** Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.
 Lesson 7	**Heat Energy & Energy Transfer** How long did it take to travel across the country before cars and planes?	Students build a paper spinner and conduct an investigation to explain how heat makes things move. Students realize that heat energy can be transformed into motion energy using a turbine.	**4.P.3.1** Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.
 Lesson 8	**Renewable Energy & Natural Resources** Where does energy come from?	Students evaluate the advantages and disadvantages of wind, water, and solar energy to power a town. Students obtain and evaluate information about the needs of each source of energy and analyze and interpret data about the town's resources.	**4.P.3.1** Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.

Human Body, Vision, & The Brain Unit (Human Machine)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.*		
	Why do your biceps bulge?	*human hand to explain how muscles pull on bones to create movement.*	*respiratory, circulatory, muscular, skeletal, and cardiovascular) in terms of their functions necessary for life.*
 Lesson 2	**Light, Eyes, & Vision** What do people who are blind see?	Students develop a working model of an eye. They use the model to reason about how light reflects off an object and into the eye, helping an organism process information from the environment.	**4.P.3.2** Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.
 Lesson 3	**Structure & Function of Eyes** How can some animals see in the dark?	Students use their eye model to discover that the pupil controls the amount of light let into the eye. In the dark, pupils get larger to let in more light.	**4.P.3.2** Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.
 Lesson 4	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.*		
	Brain, Nerves, & Information Processing *How does your brain control your body?*	*works by testing their reflexes. They discover that the brain receives information from the senses, processes the information, and sends signals to the muscles to enable movement.*	***5.L.1.2** Compare major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, and cardiovascular) in terms of their functions necessary for life.*

The following mini-lessons can be used to support North Carolina Science Standards.


Mini-lesson

4.P.3.2

How is a rainbow made?

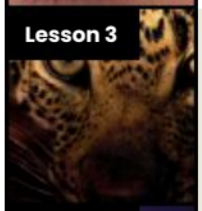

Mini-lesson

4.P.3.2

Why is snow white?

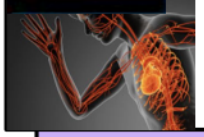
***This unit is found under 4th grade on our site**, but we recommend teaching lessons in 5th grade if you are following North Carolina Standards.*

Human Body, Vision, & The Brain Unit (Human Machine)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Muscles & Skeleton** Why do your biceps bulge?	Students construct a model of the human hand to explain how muscles pull on bones to create movement.	**5.L.1.2** Compare major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, and cardiovascular) in terms of their functions necessary for life.
Lesson 2 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* ***Light, Eyes, & Vision*** *What do people who are blind see?*	*Students develop a working model of an eye. They use the model to reason about how light reflects off an object and into the eye, helping an organism process information from the environment.*	***4.P.3.2** Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.*
Lesson 3 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* ***Structure & Function of Eyes*** *How can some animals see in the dark?*	*Students use their eye model to discover that the pupil controls the amount of light let into the eye. In the dark, pupils get larger to let in more light.*	***4.P.3.2** Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.*
Lesson 4 	**Brain, Nerves, & Information Processing** How does your brain control your body?	Students investigate how their own brain works by testing their reflexes. They discover that the brain receives information from the senses, processes the information, and sends signals to the muscles to enable movement.	**5.L.1.2** Compare major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, and cardiovascular) in terms of their functions necessary for life.

The following mini-lessons can be used to support North Carolina Science Standards.

Mini-lesson



5.L.1.2

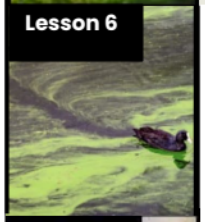
Why do we need blood?

Ecosystems & The Food Web Unit (Web of Life)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	**Food Chains, Producers, & Consumers** Why would a hawk move to New York City?	Students construct models of food chains by linking cards discovering that different interrelationships exist between organisms.	**5.L.2.2** Classify the organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers (biotic factors).
 Lesson 2	**Matter & Plant Growth** What do plants eat?	Students conduct an investigation and interpret data and figure out that water and air account for a plant's weight.	**5.L.2.2** Classify the organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers (biotic factors).
 Lesson 3	**Decomposers & Matter Cycle** Where do fallen leaves go?	Students conduct an investigation to test how mold grows under different conditions to decompose food. Students realize that decomposers, like mold, break down and consume dead plant material.	**5.L.2.2** Classify the organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers (biotic factors).
 Lesson 4	**Decomposers, Nutrients, & Matter Cycle** Do worms really eat dirt?	Students make observations of worms to realize that worms act as decomposers to eat dead matter in an ecosystem and cycle nutrients into the soil.	**5.L.2.2** Classify the organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers (biotic factors).

Ecosystems & The Food Web Unit continues on the next page

Ecosystems & The Food Web Unit (Web of Life)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 5	**Ecosystems & Matter Cycle** Why do you have to clean a fish tank but not a pond?	Students develop a model of a pond ecosystem and realize that interrelationships exist between decomposers, plants, and animals. Students discover that each organism must be in balance for the pond ecosystem to function.	**5.L.2.3** Infer the effects that may result from the interconnected relationship of plants and animals in their ecosystem.
 Lesson 6	✨New ✨ **Protecting Environments** How can we protect Earth's environments?	In this lesson, students learn about what happens in unbalanced ecosystems and how that can lead to an overabundance of algae and harmful algal blooms. In the activity, Bloom Busters, students play a game in which they obtain and combine science ideas in order to help a community respond to and prevent harmful algal blooms.	**5.L.2.3** Infer the effects that may result from the interconnected relationship of plants and animals in their ecosystem.
 Lesson 7	**Food Webs & Flow of Energy** Why did the dinosaurs go extinct?	Students develop a model of a dinosaur food web. Students realize that blocking the sun's energy would have disastrous effects on the organisms that rely on this energy in the food web and cause the extinction of some entire species.	**5.L.2.3** Infer the effects that may result from the interconnected relationship of plants and animals in their ecosystem.

North Carolina Specific Standard: **5.L.2.1** Compare the characteristics of several common ecosystems, including estuaries and salt marshes, oceans, lakes and ponds, forests, and grasslands)in terms of their ability to support a variety of populations.

***This unit is found under 3rd grade on our site**, but we recommend teaching lessons in 5th grade if you are following North Carolina Standards.*

Heredity, Survival, & Selection Unit (Fates of Traits)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.*		
	How could you make the biggest fruit in the world?	*on our knowledge of how plants change from generation to generation.*	*changing habitats.*
 Lesson 2	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.*		
	What kinds of animals might there be in the future?	*an explanation about which traits a puppy gets from each parent.*	*changing habitats.*
 Lesson 3	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.*		
	Trait Variation, Natural Selection, & Survival *Can selection happen without people?*	*Students compare the structures of lizards that live on an island. They simulate multiple generations of these lizards, and analyze and interpret the data to understand how these structures aid in their survival.*	*sometimes give individuals an advantage in surviving and reproducing in changing habitats.* ***4.L.1.1** Give examples of changes in an organism's environment that are beneficial to it and some that are harmful.*
 Lesson 4	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.*		
	Animal Groups & Survival *Why do dogs wag their tails?*	*groups in order to obtain, evaluate, and communicate information about animal social behavior. Students use evidence to show how animals form groups to help them survive.*	***4.L.1.2** Explain how animals meet their needs by using behaviors in response to information received from the environment.*
 Lesson 5	***Traits & Environmental Variation*** *How long can people (and animals) survive in outer space?*	*Students measure and compare their own physical traits (arm strength, balance, and height) and analyze the information to construct an explanation for how the environment can influence traits.*	**5.L.3.2** Give examples of likenesses that are inherited and some that are not.

North Carolina Specific Standard: **5.L.3.1** Explain why organisms differ from or are similar to their parents based on the characteristics of the organism.

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Weather & Climate Unit (Stormy Skies)

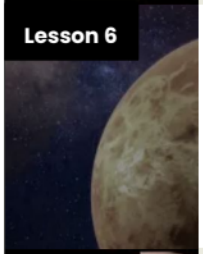
	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* ***Water Cycle & Phases of Matter*** *Where do clouds come from?*	*change from liquid to gas, but that it is always made of tiny drops. Clouds are made of water that has evaporated.*	*time as to water left in a closed container.* ***2.P.2.1** Give examples of matter that change from a solid to a liquid and from a liquid to a solid by heating and cooling.*
Lesson 2 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* ***Prediction*** *How can we predict when it's going to storm?*	*clouds and develop a tool to make predictions about what kind of weather might happen next.*	*precipitation* ***2.E.1.3** Compare weather patterns that occur over time and relate observable patterns to time or day and time of year.*
Lesson 3 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* ***Seasonal Weather Patterns*** *Where's the best place to build a snow fort?*	*different towns. They represent the data in a table to compare the weather and decide which town is the best candidate to host a snow fort festival in future years.*	*predicting weather changes from day to day and during the seasons.* ***2.E.1.3** Compare weather patterns that occur over time and relate observable patterns to time or day and time of year.*
Lesson 4 	**Climate & Global Weather Patterns** Why are some places always hot?	Students obtain and combine information to describe the different climate regions of the world.	**5.E.1.1** Compare daily and seasonal changes in weather conditions (including wind speed and direction, precipitation, and temperature) and patterns. **Foundational for 5.E.1.3** Explain how global patterns such as the jet stream and water currents influence local weather in measurable terms such as temperature, wind direction and speed, and precipitation.
Lesson 5 	**Natural Hazards & Engineering** How can you keep a house from blowing away in a windstorm?	Students design and build solutions that reduce the hazards associated with strong winds that could damage buildings.	**5.E.1.2** Predict upcoming weather events from weather data collected through observation and measurements.

Water Cycle & Earth's Systems Unit (Watery Planet)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Hydrosphere & Water Distribution*** *How much water is in the world?*	*world maps to determine the relative amounts of fresh, salt, and frozen water. Students figure out that while the Earth has a lot of water, most of Earth's water is not fresh or accessible.*	***3.E.2.1** Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).*
Lesson 2 	**Mixtures & Solutions** How much salt is in the ocean?	Students create a model ocean to observe how salt seems to completely vanish when dissolved in water. Students measure and graph quantities to provide evidence that the salt is still in the solution, even though we can't see it.	**5.P.2.2** Compare the weight of an object to the sum of the weight of its parts before and after an interaction.
Lesson 3 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Groundwater as a Natural Resource*** *When you turn on the faucet, where does the water come from?*	*water from underground sources. Students determine the best place to settle a town by considering features of the landscape & the characteristics of the plants that thrive there.*	***3.E.2.2** Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by constructing models, pictures, diagrams, and maps.*
Lesson 4 	**Water Cycle** Can we make it rain?	Students create a model of the ocean and sky to investigate how temperature influences evaporation and condensation. Students figure out that higher ocean temperatures lead to more evaporation, thus leading to more rain.	**5.P.2.1** Explain how the sun's energy impacts the processes of the water cycle (including evaporation, transpiration, condensation, precipitation, and runoff).
Lesson 5 	**Natural Disasters & Engineering** How can you save a town from a hurricane?	Students define the problem that a town needs protection from flooding. They design solutions using different types of flood protection. They realize flooding is caused by severe rainfall generated by hurricanes. Hurricanes are created where ocean temperatures are warm.	**5.P.2.1** Explain how the sun's energy impacts the processes of the water cycle (including evaporation, transpiration, condensation, precipitation, and runoff).

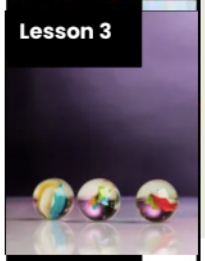
***This unit is found under 5th grade on our site**, but we recommend teaching lessons in 5th grade if you are following North Carolina Standards.*

Stars & The Solar System Unit (Spaceship Earth)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 5 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.*		
	Moon Phases, Lunar Cycle *Why does the Moon change shape?*	*and Moon to investigate how the Moon's phase relates to its position relative to the Sun. Students notice that the Moon's phases repeat in a predictable pattern.*	***4.E.1.2** Explain the monthly changes in the appearance of the moon, based on the moon's orbit around the Earth.*
Lesson 6 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.*		
	Solar System & Sun Brightness *How can the Sun help us explore other planets?*	*of the Sun is dependent upon an observer's distance from the Sun. They construct a model of the solar system and gather observations of the Sun's apparent brightness from each planet within their model.*	***3.E.1.1** Recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and the Earth is the third planet from the sun in our solar system.*
Lesson 7 	**Gravity** Why is gravity different on other planets?	Using mathematics and computational thinking, students calculate how high they could jump on planets and moons that have stronger or weaker gravity than Earth. Students analyze and interpret this data to construct an explanation for why the amount of gravity is different on other planets.	**5.P.1.1** Explain how factors such as gravity, friction, and change in mass affect the motion of objects. **5.P.1.4** Predict the effect of a given force or a change in mass on the motion of an object.
Lesson 8 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.*		
	Star Brightness & Habitable Planets *Could there be life on other planets?*	*Sun with the right amount of light and heat for life to exist. Students evaluate other solar systems, comparing their stars to our Sun. Based on their analysis, students plan a space mission to a planet with conditions similar to those on Earth.*	***3.E.1.1** Recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and the Earth is the third planet from the sun in our solar system.*

***This unit is found under 4th grade on our site**, but we recommend teaching lessons in 5th grade if you are following North Carolina Standards.*

Energy, Energy Transfer, & Electricity Unit (Energizing Everything)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**Speed & Energy** How is your body similar to a car?	Students learn about stored energy and about the relationship between motion and energy. Students build models of an amusement park ride and discover how energy can be stored in materials. Stored energy can be converted to speed.	**5.P.1.2** Infer the motion of objects in terms of how far they travel in a certain amount of time and the direction in which they travel.
Lesson 2 	**Gravitational Energy, Speed, & Collisions** What makes roller coasters go so fast?	Students build a model of a roller coaster and carry out an investigation using marbles. Students learn that lifting an object up stores energy in the object. When the object falls, that stored energy is released. They realize that energy is transferred when objects collide.	**5.P.1.2** Infer the motion of objects in terms of how far they travel in a certain amount of time and the direction in which they travel. **5.P.1.4** Predict the effect of a given force or a change in mass on the motion of an object.
Lesson 3 	✨New!✨ **Collisions & Energy Transfer** How can marbles save the world?	Students investigate how energy transfers when objects collide. In the activity, Bumper Jumper, students ask questions and make predictions about how far a marble will launch over a jump after colliding with other objects.	**5.P.1.4** Predict the effect of a given force or a change in mass on the motion of an object.
Lesson 4 	**Energy Transfer & Engineering** Could you knock down a building using only dominoes?	Students experiment with ways to store and release energy, creating the beginning of a chain reaction machine with a lever and a ramp. Students figure out that a domino standing on end is storing energy, only requiring a small amount of energy (a tiny push) to release the stored energy.	**5.P.1.3** Illustrate the motion of an object using a graph to show a change in position over a period of time. **5.P.1.4** Predict the effect of a given force or a change in mass on the motion of an object.
Lesson 5 	**Energy Transfer & Engineering** Can you build a chain reaction machine?	Students continue to build a chain reaction machine — identifying a goal, brainstorming and testing multiple ideas, and determining an optimal solution. The chain reaction machine uses multiple components to transfer energy from one part to the next.	**5.P.1.3** Illustrate the motion of an object using a graph to show a change in position over a period of time. **5.P.1.4** Predict the effect of a given force or a change in mass on the motion of an object.

Chemical Reactions & Properties of Matter Unit (Chemical Magic)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
 Lesson 1	**Conservation of Matter** Are magic potions real?	Students observe that a salt and vinegar solution will turn a dull penny shiny again indicating that substances can change other substances.	**5.P.2.3** Summarize properties of original materials, and the new material(s) formed, to demonstrate that a change has occurred. **5.P.2.2** Compare the weight of an object to the sum of the weight of its parts before and after an interaction.
 Lesson 2	**Dissolving & Particulate Nature of Matter** Could you transform something worthless into gold?	Students coat a steel nail in copper by placing it into the solution that dissolved bits of the penny. Students realize that substances can change to become particles too small to be seen, but they still exist.	**5.P.2.3** Summarize properties of original materials, and the new material(s) formed, to demonstrate that a change has occurred. **5.P.2.2** Compare the weight of an object to the sum of the weight of its parts before and after an interaction.
 Lesson 3	**Properties of Matter: Acids** What would happen if you drank a glass of acid?	Students figure out that acids are very reactive substances. Students investigate reactions between different substances to determine how known acids react with other materials.	**5.P.2.3** Summarize properties of original materials, and the new material(s) formed, to demonstrate that a change has occurred.
 Lesson 4	**Chemical Reactions** What do fireworks, rubber, and Silly Putty have in common?	Students combine different substances together to discover that chemical reactions can create new substances.	**5.P.2.3** Summarize properties of original materials, and the new material(s) formed, to demonstrate that a change has occurred.
 Lesson 5	**Gases & Particle Models** Why do some things explode?	Students investigate and model the reaction between baking soda and vinegar. They figure out that gases are made of particles too small to be seen.	**5.P.2.3** Summarize properties of original materials, and the new material(s) formed, to demonstrate that a change has occurred.

North Carolina Specific Standard: **5.P.3.1** Explain the effects of the transfer of heat (either by direct contact or at a distance) that occurs between objects at different temperatures. (conduction, convection or radiation)

North Carolina Specific Standard: **5.P.3.2** Explain how heating and cooling affect some materials and how this relates to their purpose and practical applications.