Mystery Science Alignment with North Carolina Science Standards

Mystery Science is a hands-on curriculum that aligns with the 2023 North Carolina 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 6/4/2024

North Carolina Standards Alignment

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Animal Needs Unit (Animal Secrets)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**LS.K.1.2** Use models to exemplify how animals use their body parts to obtain food and other resources, protect themselves, and move from place to place.
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.	**LS.K.1.2** Use models to exemplify how animals use their body parts to obtain food and other resources, protect themselves, and move from place to place.
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.	**LS.K.1.2** Use models to exemplify how animals use their body parts to obtain food and other resources, protect themselves, and move from place to place.
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.	**LS.K.1.2** Use models to exemplify how animals use their body parts to obtain food and other resources, protect themselves, and move from place to place.

North Carolina Specific Standard: **LS.K.2.1** Analyze and interpret data to compare the characteristics of different types of the same animal to determine individual similarities and differences.

Plant Needs Unit (Plant Secrets)

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	**Living & Nonliving** Are plants alive?	Students make observations of plants in order to identify their needs and that they are, in fact, living things.	**LS.K.1.1** Engage in argument from evidence to summarize the characteristics of living organisms and nonliving things in terms of their: structure, growth, changes, movement, basic needs. **LS.K.2.2** Analyze and interpret data to compare the characteristics of different types of the same plant to determine individual similarities and differences.
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.	**LS.K.1.1** Engage in argument from evidence to summarize the characteristics of living organisms and nonliving things in terms of their: structure, growth, changes, movement, basic needs. **LS.K.2.2** Analyze and interpret data to compare the characteristics of different types of the same plant to determine individual similarities and differences.
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.	**LS.K.1.1** Engage in argument from evidence to summarize the characteristics of living organisms and nonliving things in terms of their: structure, growth, changes, movement, basic needs. **LS.K.1.2** Use models to exemplify how animals use their body parts to obtain food and other resources, protect themselves, and move from place to place.

Plant Traits & Survival Unit (Plant Superpowers)

	Topic & Guiding Question	Student Objectives	North Carolina Essential Standards for Science
Lesson 1 	**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.	**LS.K.2.2** Analyze and interpret data to compare the characteristics of different types of the same plant to determine individual similarities and differences.

Severe Weather Unit (Wild Weather)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**ESS.K.1.2** Use mathematics and computational thinking to 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.	**ESS.K.1.2** Use mathematics and computational thinking to 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.	**ESS.K.1.1** Analyze and interpret data to compare changes in the environment due to weather. **ESS.K.1.2** Use mathematics and computational thinking to summarize daily weather conditions noting changes that occur from day to day and throughout the year.

Weather Patterns Unit (Circle of Seasons)

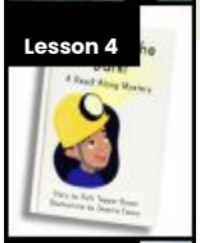
	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	**Daily Weather Patterns Read-Along** How do you know what to wear for the weather?	Students track the weather daily and analyze the data by collecting, recording, and sharing their observations to observe patterns of weather changing throughout the day and from day-to-day.	**ESS.K.1.2** Use mathematics and computational thinking to summarize daily weather conditions noting changes that occur from day to day and throughout the year.
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.	**ESS.K.1.3** Obtain, evaluate, and communicate information to 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.	**ESS.K.1.3** Obtain, evaluate, and communicate information to compare weather patterns that occur from season to season.

Pushes & Pulls Unit (Force Olympics)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**PS.K.2.1** Use models to 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.	**PS.K.2.2** Carry out investigations to illustrate different ways objects and organisms move (to include falling to the ground when dropped): 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.*	**PS.1.1.2** Carry out investigations to compare the effects of a given force on the motion of an object.
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.*	**PS.1.1.2** Carry out investigations to compare the effects of a given force on the motion of an object.
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.*	**PS.1.1.2** Carry out investigations to compare the effects of a given force on the motion of an object.
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.*	**PS.1.1.2** Carry out investigations to compare the effects of a given force on the motion of an object.

***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)

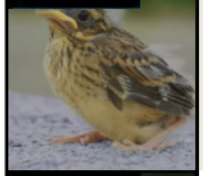
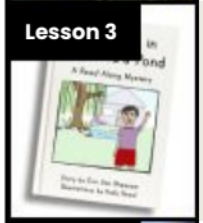
	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.*		
	How do they make silly sounds in cartoons?	*construct an explanation that objects vibrate when they make a sound, and if the vibration stops, the sound stops.*	**PS.2.2.1** Carry out investigations to 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.*		
	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.*	produced by vibrating objects and columns of air. **PS.2.2.2** Use models to summarize the relationship between sound and how sounds are produced and detected by parts of the body that vibrate.
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.	**PS.K.1.1** Analyze and interpret data to classify objects by physical properties (size, color, shape, texture, weight, and flexibility) **PS.K.1.2** Engage in argument from evidence to summarize how different materials (clay, wood, cloth, paper, etc.) are used based on their physical properties.
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.	*This lesson does not align to North Carolina Science Standards
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 Kindergarten if you are following North Carolina Standards.*

Material Properties Unit (Material Magic)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**PS.K.1.1** Analyze and interpret data to classify objects by physical properties (size, color, shape, texture, weight and flexibility). **PS.K.1.2** Engage in argument from evidence to summarize how different materials (clay, wood, cloth, paper, etc.) are used based on their physical properties.
Lesson 2 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* *Can you really fry an egg on a hot sidewalk?*	*determine which are best suited for allowing people to handle hot items.*	*transferred from a warmer object to a cooler one by contact or at a distance.*
Lesson 3 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* ***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.*	***PS.3.1.3** Engage in argument from evidence to explain observable changes to the properties of matter when heated or cooled.*
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.*	**This lesson does not align to North Carolina Science Standards*
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.	**PS.K.1.2** Engage in argument from evidence to summarize how different materials (clay, wood, cloth, paper, etc.) are used based on their physical properties.

Animal Traits & Survival Unit (Animal Superpowers)

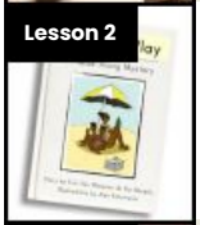
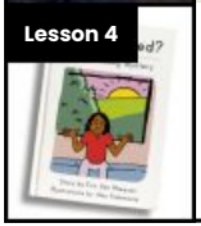
	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	*We **recommend teaching this in 2nd Grade** if following North Carolina Standards.* ~~Parent & Offspring Traits~~ *How can you help a lost baby animal find its parents?*	*and baby animals in order to construct an explanation that most young animals are like, but not exactly like, their parents.*	**LS.2.2.1** Obtain, evaluate, and communicate information to summarize ways in which animals closely resemble their parents 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.	**LS.1.1.1** Obtain, evaluate, and communicate information to summarize the needs of different plants and animals. **LS.1.1.2** Analyze and interpret data to compare how the needs of plants and animals can be met in different environment.
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.	**LS.1.1.1** Obtain, evaluate, and communicate information to summarize the needs of different plants and animals.
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.	**LS.1.1.1** Obtain, evaluate, and communicate information to summarize the needs of different plants and animals. **LS.1.1.2** Analyze and interpret data to compare how the needs of plants and animals can be met in different environment.
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	2023 North Carolina 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.	**LS.1.1.1** Obtain, evaluate, and communicate information to summarize the needs of different plants and animals. **LS.1.1.2** Analyze and interpret data to compare how the needs of plants and animals can be met in different 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.	**LS.1.1.1** Obtain, evaluate, and communicate information to summarize the needs of different plants and animals.

*North Carolina Specific Standards: **ESS.1.3.1** Obtain, evaluate, and communicate information to summarize ways in which humans use natural resources;*
***ESS.1.3.2** Engage in argument from evidence to explain ways that humans can protect natural resources in the environment.*

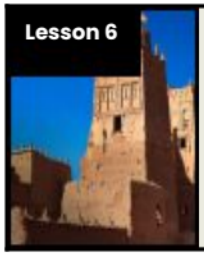
Day Patterns Unit (Sun & Shadows)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**ESS.1.1.1** Use models to 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.	**ESS.1.1.1** Use models to 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.	**ESS.1.1.1** Use models to 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.	**ESS.1.1.1** Use models to 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	2023 North Carolina Standards for Science
	**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.	**ESS.1.1.2** Analyze and interpret data to recognize the patterns of observable changes in the moon's appearance from day to day.
	**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.	**ESS.1.1.1** Use models to recognize differences in the features of the day and night sky and apparent movement of objects across the sky as observed from Earth.
	**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.	**ESS.1.1.1** Use models to 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
	**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.	**ESS.1.2.1** Obtain, evaluate and communicate information to summarize physical properties of Earth materials, including rocks, minerals, soils, and water. **ESS.1.2.2.** Carry out investigations to compare the properties of different soil samples from local places relating to their capacity to retain water, provide nutrients, and support the growth of plants.

***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	2023 North Carolina 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.*	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 	*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.*	objects and organisms move (to include falling to the ground when dropped): 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.	**PS.1.1.1** Use models to explain the effect of a push or pull on the motion of an object, with or without contact. **PS.1.1.2** Carry out investigations to compare the effects of a given force on the motion of an object.
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.	**PS.1.1.2** Carry out investigations to compare the effects of a given force on the motion of an object.
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.	**PS.1.1.2** Carry out investigations to compare the effects of a given force on the motion of an object.
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.	**PS.1.1.2** Carry out investigations to compare the effects of a given force on the motion of an object.

***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	2023 North Carolina 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.	**LS.2.2.1** Obtain, evaluate, and communicate information to summarize ways in which animals closely resemble their parents 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.	**LS.2.2.2** Analyze and interpret data to illustrate variations among offspring of the same parents.

Animal Biodiversity Unit (Animal Adventures)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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 LS.2.1.2** Obtain, evaluate, and communicate information to compare the life cycles of different animals.
 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 LS.2.1.2** Obtain, evaluate, and communicate information to compare the life cycles of different animals.
 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 LS.2.1.2** Obtain, evaluate, and communicate information to compare the life cycles of different animals.
 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 LS.2.1.2** Obtain, evaluate, and communicate information to compare the life cycles of different animals.

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.	**LS.2.1.1** Use models to summarize the life cycle of animals including: birth, developing into an adult, reproducing, aging, and death. **LS.2.1.2** Obtain, evaluate, and communicate information to compare the life cycles of different animals.

***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	2023 North Carolina 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.	**ESS.2.1.1** Obtain, evaluate, and communicate information to summarize how energy from the sun serves as a source of light and 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.)	**ESS.2.1.1** Obtain, evaluate, and communicate information to summarize how energy from the sun serves as a source of light and 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.	**ESS.2.1.1** Obtain, evaluate, and communicate information to summarize how energy from the sun serves as a source of light and warms the land, air, and water. **PS.2.1.1** Carry out investigations to illustrate examples of matter that can change from a solid to a liquid and from a liquid to a solid by heating and cooling.

North Carolina Specific Standard: **PS.2.1.2** Analyze and interpret data to compare the amount (volume and weight) of water in a container before and after freezing

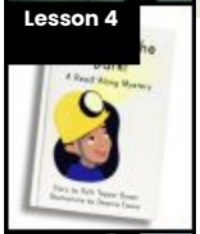
***This unit is found under 3rd grade on our site**, but we recommend teaching lessons in 2nd grade if you are following North Carolina Standards.*

Weather & Climate Unit (Stormy Skies)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**PS.2.1.3** Analyze and interpret data to compare the amount (volume and weight) of water left in an open container over time to the water left in a closed container.
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.	**ESS.2.1.2** Use mathematics and computational thinking to summarize weather conditions (temperature, wind direction, wind speed, precipitation) **ESS.2.1.3** Carry out investigations to collect data and compare weather patterns that occur over time and relate observable patterns to time of 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.	**ESS.2.1.4** Obtain, evaluate, and communicate information to recognize the tools scientists use for observing, recording, and predicting weather changes from day to day and during the season. **ESS.2.1.3** Carry out investigations to collect data and compare weather patterns that occur over time and relate observable patterns to time of day and time of year.
Lesson 4 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* ***Climate, Geography, & Global Weather Patterns*** *Why are some places always hot?*	*Students obtain and combine information to describe the different climate regions of the world.*	*changes in weather conditions (including wind speed and direction, precipitation, and temperature) and patterns.* **Foundational for ESS.5.1.3** Construct an explanation to summarize the ocean's influences on weather and climate in North Carolina.
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.*	**ESS.5.1.2** Analyze and interpret weather data to explain current and upcoming weather conditions (including severe weather such as hurricanes and tornadoes) in a given location.

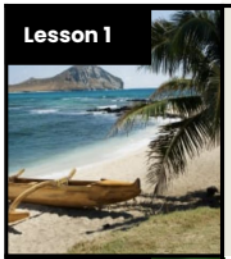
***This unit is found under 1st Grade on our site**, but we recommend teaching lessons in 2nd grade if you are following North Carolina Standards.*

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

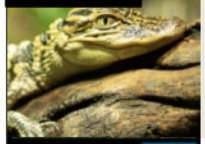
	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	**Sounds & Vibrations** How do they make silly sounds in cartoons?	Students explore how to make different sounds with everyday objects. They construct an explanation that objects vibrate when they make a sound, and if the vibration stops, the sound stops.	**PS.2.2.1** Carry out investigations to 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.	**PS.2.2.1** Carry out investigations to illustrate how sound is produced by vibrating objects and columns of air. **PS.2.2.2** Use models to summarize the relationship between sound and how sounds are produced and detected by parts of the body that vibrate.
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.*	*(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.*	*This lesson does not align to North Carolina Science Standards
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	2023 North Carolina Standards for Science
Lesson 1 	**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.	**LS.3.2.1** Carry out investigations to explain the structure and functions of plants and how they are essential for life.
Lesson 2 	**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.	**LS.3.2.1** Carry out investigations to explain the structure and functions of plants and how they are essential for life.
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.	**LS.3.2.1** Carry out investigations to explain the structure and functions of plants and how they are essential for life. **LS.3.3.1** Carry out investigations to explain how environmental conditions determine how well plants survive and grow.
Lesson 4 	**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.	**LS.3.3.1** Carry out investigations to explain how environmental conditions determine how well plants survive and grow.

Life Cycles Unit (Circle of Life)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**LS.3.2.1** Carry out investigations to explain the structure and functions of plants and how they are essential for life. **LS.3.2.2** Use models to exemplify the distinct stages of the life cycles 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.	**LS.3.2.1** Carry out investigations to explain the structure and functions of plants and how they are essential for life. **LS.3.2.2** Use models to exemplify the distinct stages of the life cycles 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.	**LS.3.2.1** Carry out investigations to explain the structure and functions of plants and how they are essential for life. **LS.3.2.2** Use models to exemplify the distinct stages of the life cycles of seed plants.

North Carolina Specific Standard: **LS.3.3.2** Construct an explanation to infer how the basic properties and components of soil determine its ability to support the growth and survival of many plants.

North Carolina Specific Standard:
LS.3.1.1 Use models to infer the functions of the skeletal and muscular systems.

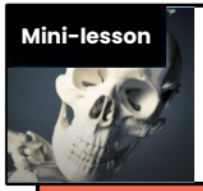
The following mini-lessons can be used to support North Carolina Specific Science Standards.

Mini-lesson

LS.3.1.1

Why does our skeleton have so many bones?

Mini-lesson



LS.3.1.1

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

Mini-lesson

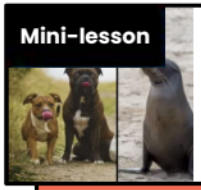
LS.3.1.1

How does your heart pump blood?

North Carolina Specific Standard:
LS.3.1.2 Obtain, evaluate, and communicate scientific information to 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.

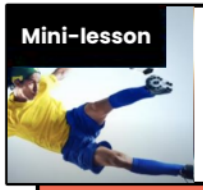
Mini-lesson



LS.3.1.2

Can animals get a sunburn?

Mini-lesson



LS.3.1.2

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	2023 North Carolina 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.	**ESS.3.2.1** Use models to 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.	**ESS.3.2.2** Use models to compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands).
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.	**ESS.3.2.2** Use models to compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands).
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.	**ESS.3.2.2** Use models to compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands).
Lesson 5 	**Erosion & Engineering** How can you stop a landslide?	Students compare multiple solutions for preventing erosion.	**ESS.3.2.2** Use models to compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands).

***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.*

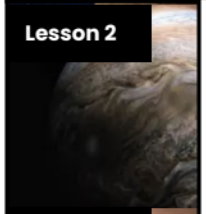
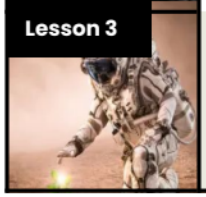
Water Cycle & Earth's Systems Unit (Watery Planet)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**ESS.3.2.1** Use models to 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.*	**PS.5.1.1** Carry out investigations to compare the weight of objects 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.	**ESS.3.2.3** Use models to compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands.)
Lesson 4 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* ***Water Cycle*** *Can we make it rain?*	*influences evaporation and condensation. Students figure out that higher ocean temperatures lead to more evaporation, thus leading to more rain.*	**ESS.5.1.4** Use models to explain how the Sun's energy drives the processes of the water cycle (including evaporation, transpiration, condensation, precipitation).
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.*	**ESS.5.1.4** Use models to explain how the Sun's energy drives the processes of the water cycle (including evaporation, transpiration, condensation, precipitation).

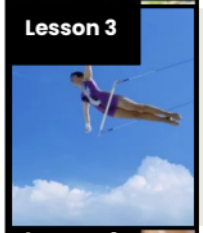
✔ Earth & Space Patterns Unit (Spaceship Earth)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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?*	*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.*	***ESS.4.1.1** Use models to explain the cause of day and night based on the rotation of the Earth's 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.	**ESS.3.1.2** Carry out investigations to recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the sun during the day.
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.	**ESS.3.1.2** Carry out investigations to recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the sun during the day. **ESS.3.1.3** Obtain, evaluate, and communicate information to recognize the patterns of the stars (including the sun) stay the same as they appear to move across the sky.
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.	**ESS.3.1.3** Obtain, evaluate, and communicate information to recognize the patterns of the stars (including the sun) stay the same as they appear to move across the sky.
Lesson 5 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* *Why does the Moon change shape?*	*to its position relative to the Sun. Students notice that the Moon's phases repeat in a predictable pattern.*	*the phases of the moon (new, crescent, quarter, gibbous, and full).*

✔ Stars & Planets Unit

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	**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.	**ESS.3.1.1** Use models to recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and that Earth is the third planet from the sun.
Lesson 2 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* *Why is gravity different on other planets?*	*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.*	*motion of objects.* ***PS.5.2.2** Use mathematics and computational thinking to infer the motion of an object (including position, direction, and speed).*
Lesson 3 	**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.	**ESS.3.1.1** Use models to recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and that Earth is the third planet from the sun.

Forces, Motion, & Magnets Unit (Invisible Forces)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**PS.3.2.1** Carry out investigations to 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.	**PS.3.2.1** Carry out investigations to infer changes in speed or direction resulting from forces acting on an object.
Lesson 3 	**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.	**PS.3.2.2** Carry out investigations to compare the relative speeds (faster or slower) of objects that travel the same distance in different amount of time. **PS.3.2.3** Use models to explain the effect of Earth's gravity on the motion of any object on or near the Earth.
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.*	**PS.4.1.1** Ask questions to summarize the relationship of magnetic interactions between two objects not in contact with each other.
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.*	**PS.4.1.1** Ask questions to summarize the relationship of magnetic interactions between two objects not in contact with each other.

North Carolina Specific Standard: **PS.3.3.1** Ask questions to explain how heat is created by friction.

Material Properties Unit (Material Magic)

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	*We **recommend teaching this in Kindergarten** if following North Carolina Standards.* *Why do we wear clothes?*	*absorbency, and use those properties to design and build a hat that protects them from the sun.*	***PS.K.1.1** Analyze and interpret data to classify objects by physical properties (size, color, shape, texture, weight and flexibility).*
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.	**PS.3.3.2** Carry out investigations to explain how energy can be transferred from a warmer object to a cooler one by contact or at a distance.
Lesson 3 	**Heating, Cooling, & States 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.	**PS.3.1.3** Engage in argument from evidence to explain observable changes to the properties of matter when heated or cooled.
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.*	**This lesson does not align to North Carolina Science Standards*
Lesson 5 	*We **recommend teaching this in Kindergarten** if following North Carolina Standards.* *Could you build a house out of paper?*	*of paper can be disassembled and rebuilt in new ways.*	*different materials (clay, wood, cloth, paper, etc.) are used based on their physical properties.*

North Carolina Specific Standard: **PS.3.1.1** Engage in argument from evidence to infer that air is a substance that surrounds us, takes up space, and has mass.
PS.3.1.2 Carry out investigations to classify solids, liquids, and gases based on their basic properties.

***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	2023 North Carolina 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.	**LS.4.2.1** Analyze and interpret data to compare fossils to one another and living organisms. **LS.4.2.2** Analyze and interpret data to explain how fossils suggest ideas about Earth's early environment.
 Lesson 2	**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.	**LS.4.2.1** Analyze and interpret data to compare fossils to one another and 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.	**LS.4.2.1** Analyze and interpret data to compare fossils to one another and living organisms.

Life Cycles Unit (Circle of Life)

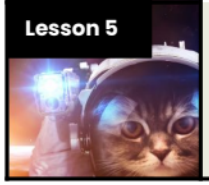
	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
 Lesson 2	**Environmental Change & Engineering** What's the best way to get rid of mosquitoes?	Students obtain and evaluate information about mosquitoes from different sources. They analyze and interpret information about the mosquito life cycle to reduce the number of mosquitoes that live in a certain area.	**ESS.4.3.1** Ask questions to infer whether changes in an organism's environment are beneficial or harmful.

⭐ Animal & Plant Adaptations Unit (Animal & Plant Adaptations)

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
 Lesson 1	✨New!✨ **Animal Adaptations** Why do some sea creatures look so strange?	Students make observations of underwater animals in order to collect evidence that external structures serve specific functions. They use their observations to construct an argument that an animal's structures work together as part of a system to support their growth and survival.	**LS.4.1.1** Use models to explain that plants and animals have external structures that function to support survival.
 Lesson 2	✨New!✨ **Learned Behavior & Instinct** Why would a sea turtle eat a plastic bag?	Students use models to understand how an animal's senses, brain, and memories all work together as a system to influence their behavior and support their survival.	**LS.4.1.2** Use models to explain that animals receive different types of information through their senses, process the information, and respond to the information in different ways.
 Lesson 3	✨New!✨ **Plant Adaptations** Why don't the same trees grow everywhere?	Students use models of roots and branches to explore their functions and then construct an argument about how these structures must work together in order to support the survival of trees in the unique environment of the frozen taiga.	**LS.4.1.1** Use models to explain that plants and animals have external structures that function to support survival.

***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)

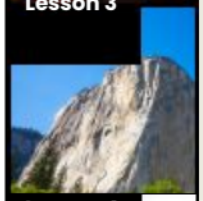
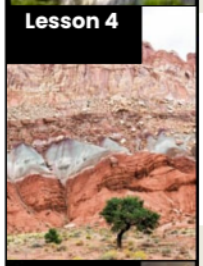
	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	✨New!✨ **Traits & Inheritance** How do you identify a mysterious fruit?	Students examine plant traits and use that information as evidence to help them identify an unknown fruit. They look for similarities and differences in the leaves, flowers, and fruits of plants to sort them into groups and identify patterns of inheritance.	**Foundational for LS.4.1.3** Engage in argument from evidence to explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats.
Lesson 2 	✨New!✨ **Trait Variation, Inheritance, & Artificial Selection** What do dogs and pigeons have in common?	Students analyze trait similarities and differences among parent, offspring, and sibling pigeons. They interpret this data to discover that the variation and inheritance of traits creates a pattern that explains why we see such extreme traits in artificially selected animal breeds.	**Foundational for LS.4.1.3** Engage in argument from evidence to explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats.
Lesson 3 	✨New!✨ **Trait Variation, Survival, & Natural Selection** How could a lizard's toes help it survive?	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.	**LS.4.1.3** Engage in argument from evidence to explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats. **ESS.4.3.1** Ask questions to infer whether changes in an organism's environment are beneficial or 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.	**LS.4.1.2** Use models to explain that animals receive different types of information through their senses, process the information, and respond to the information in different ways.
Lesson 5 	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.* *How long can people (and animals) survive in outer space?*	*height) and analyze the information to construct an explanation for how the environment can influence traits.*	~~***LS.5.3.2** Ask questions to compare inherited and acquired traits.*~~ ***LS.5.3.2** Ask questions to compare inherited and acquired traits.*

***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.*

Ecosystems & The Food Web Unit (Web of Life)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.*	***LS.5.2.3** Use models to infer the effects that may result from the interconnected relationships of plants and animals to their ecosystem.*
Lesson 6 	**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.	**ESS.4.3.2** Engage in argument from evidence to explain how humans can adapt their behavior to live in changing environments (e.g. recycling wastes, establishing rain gardens, planting native species to prevent flooding and erosion). **ESS.4.3.3** Obtain, evaluate and communicate information to compare solutions to environmental problems impacting plants and animals.
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.*	***LS.5.2.3** Use models to infer the effects that may result from the interconnected relationships of plants and animals to their ecosystem.*

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

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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."	**ESS.4.2.3** Use models to explain changes in Earth's surface over time (to include slow changes of erosion and weathering, and fast changes of earthquakes, landslides, and volcanic activity).
 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.	**ESS.4.2.3** Use models to explain changes in Earth's surface over time (to include slow changes of erosion and weathering, and fast changes of earthquakes, landslides, and volcanic activity). **ESS.4.2.2** Carry out investigations to 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.	**ESS.4.2.3** Use models to explain changes in Earth's surface over time (to include slow changes of erosion and weathering, and fast changes of earthquakes, landslides, and volcanic activity).
 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.	**LS.4.2.2** Analyze and interpret data to explain how fossils suggest ideas about Earth's early environment. **ESS.4.2.2** Carry out investigations to 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.	**ESS.4.2.3** Use models to explain changes in Earth's surface over time (to include slow changes of erosion and weathering, and fast changes of earthquakes, landslides, and volcanic activity). **ESS.4.3.2** Engage in argument from evidence to explain how humans can adapt their behavior to live in changing environments (e.g. recycling wastes, establishing rain gardens, planting native species to prevent flooding and erosion).

North Carolina Specific Standard: **ESS.4.2.1** Carry out investigations to classify minerals using tests for the physical properties of hardness, color, luster, cleavage, and streak.

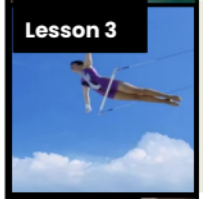
***This unit is found under 5th Grade on our site**, but we recommend teaching lessons in 4th Grade if you are following North Carolina Standards.*

✔ Earth & Space Patterns Unit (Spaceship Earth)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**ESS.4.1.1** Use models to explain the cause of day and night based on the rotation of the Earth's axis.
 Lesson 2	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Patterns*** *Who set the first clock?*	*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.*	changes in the length and direction of an object's shadow indicate the apparent changing position of the sun during the day.
 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?*	*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.*	indicate the apparent changing position of the sun during the day. **ESS.3.1.3** Obtain, evaluate, and communicate information to recognize the patterns of the stars (including the sun) stay the same as they appear to move across the sky.
 Lesson 4	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* *Why do the stars change with the seasons?*	*different times of year. Using evidence from this model, students make an argument that supports the claim that the Earth orbits the Sun.*	to recognize the patterns of the stars (including the sun) stay the same as they appear to move across the sky.
 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.	**ESS.4.1.2** Use models to explain the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous, and full).

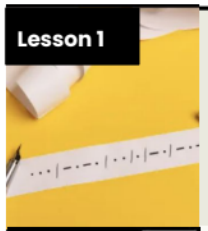
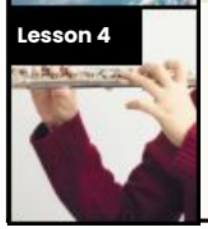
***This unit is found under 3rd grade on our site**, but we recommend teaching lessons in 4th grade if you are following North Carolina Standards.*

Forces, Motion, & Magnets Unit (Invisible Forces)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.*	**PS.3.2.1** Carry out investigations to 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.*	**PS.3.2.1** Carry out investigations to 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.*	resulting from forces acting on an object. **PS.3.2.2** Carry out investigations to compare the relative speeds (faster or slower) of objects that travel the same distance in different amount 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.	**PS.4.1.1** Ask questions to summarize the relationship of magnetic interactions between two objects not in contact with each other.
 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.	**PS.4.1.1** Ask questions to summarize the relationship of magnetic interactions between two objects not in contact with each other.

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

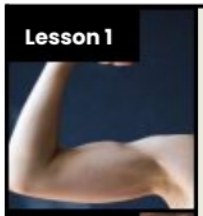
Sound, Waves, & Communication Unit (Waves of Sound)

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
 Lesson 1	**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.	**Foundational for PS.4.2.1** Ask questions to identify basic forms of energy (light, sound, heat, and electrical) that 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.	**Foundational for PS.4.2.1** Ask questions to identify basic forms of energy (light, sound, heat, and electrical) that 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.	**Foundational for PS.4.2.1** Ask questions to identify basic forms of energy (light, sound, heat, and electrical) that 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.	**PS.4.2.1** Ask questions to identify basic forms of energy (light, sound, heat, and electrical) that cause motion or create change.

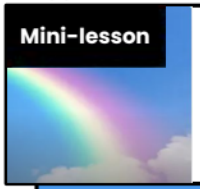
✔⭐ Electricity, Light, & Heat Unit

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	✨New!✨ **Renewable Energy & Natural Resources** What's the best way to light up a city?	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.	**PS.4.2.1** Ask questions to identify basic forms of energy (light, sound, heat, and electrical) that cause motion or create change.
Lesson 2 	**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.	**PS.4.2.1** Ask questions to identify basic forms of energy (light, sound, heat, and electrical) that cause motion or create change. **PS.4.2.2** Use models to explain a simple electrical circuit and the necessary components. **PS.4.2.3** Carry out investigations on common materials to classify them as insulators or conductors of electricity.
Lesson 3 	**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.	**PS.4.2.1** Ask questions to identify basic forms of energy (light, sound, heat, and electrical) that cause motion or create change.

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

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
 Lesson 1	*We **recommend teaching this in 5th Grade** if following North Carolina Standards.*		
	Why do your biceps bulge?	*hand to explain how muscles pull on bones to create movement.*	***LS.5.1.2** Use models to compare the major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, nervous) as it relates to their functions necessary for life.* ***LS.5.1.1** Use models to recognize the organizational structure of humans as a multicellular organism (cell, tissue, organ, system, organism).*
 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.	**PS.4.3.2** Carry out investigations to explain how light is 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.	**PS.4.3.2** Carry out investigations to explain how light is refracted and absorbed.
 Lesson 4	***Brain, Nerves, & Information*** *We **recommend teaching this in 5th Grade** if following North Carolina Standards.*	*Students investigate how their own brain works by testing their reflexes. They*	**LS.5.1.2** Use models to compare the major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, nervous) as it relates to their functions necessary for life.
	How does your brain control your body?	*the information, and sends signals to the muscles to enable movement.*	humans as a multicellular organism (cell, tissue, organ, system, organism).

The following mini-lesson can be used to support North Carolina Science Standards:



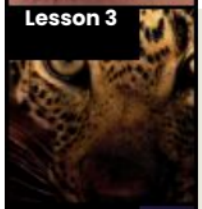
PS.4.3.2

How is a rainbow made?

North Carolina Specific Standard: **PS.4.3.1** Carry out investigations to infer the path light travels from a light source to a mirror and how it is reflected (by the mirror) using different angles.

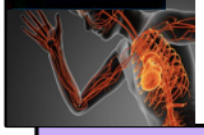
***This unit is found under 4th grade on our site**, but we recommend teaching lessons in 5th grade if you are following North Carolina Standards.*

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

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**LS.5.1.2** Use models to compare the major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, nervous) as it relates to their functions necessary for life.
Lesson 2 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* *What do people who are blind see?*	*reflects off an object and into the eye, helping an organism process information from the environment.*	**PS.4.3.2** Carry out investigations to explain how light is refracted and absorbed.
Lesson 3 	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* *How can some animals see in the dark?*	*the pupil controls the amount of light let into the eye. In the dark, pupils get larger to let in more light.*	**PS.4.3.2** Carry out investigations to explain how light is 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.	**LS.5.1.2** Use models to compare the major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, nervous) as it relates to their functions necessary for life.

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

Mini-lesson



LS.5.1.2

Why do we need blood?

North Carolina Specific Standard: **LS.5.1.1** Use models to recognize the organizational structure of humans as a multicellular organism (cell, tissue, organ, system, organism).

Ecosystems & The Food Web Unit (Web of Life)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**LS.5.2.2** Use models to classify organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers.
 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.	**LS.5.2.2** Use models to classify organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers.
 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.	**LS.5.2.2** Use models to classify organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers.
 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.	**LS.5.2.2** Use models to classify organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers.

Ecosystems & The Food Web Unit continues on the next page

Ecosystems & The Food Web Unit (Web of Life)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**LS.5.2.3** Use models to infer the effects that may result from the interconnected relationships of plants and animals to their ecosystem.
 Lesson 6	*We **recommend teaching this in 4th Grade** if following North Carolina Standards.* ***Protecting Environments*** *How can we protect Earth's environments?*	*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.*	***ESS.4.3.3** Obtain, evaluate and communicate information to compare solutions to environmental problems impacting plants and animals.*
 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.	**LS.5.2.3** Use models to infer the effects that may result from the interconnected relationships of plants and animals to their ecosystem.

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

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
 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.	**LS.5.3.2** Ask questions to compare inherited and acquired traits.

North Carolina Specific Standard: **LS.5.3.1** Ask questions to compare instincts and learned behaviors.

North Carolina Specific Standard: **LS.5.2.1** Engage in argument from evidence to compare the characteristics of several common ecosystems (including estuaries and salt marshes, oceans, lakes and ponds, rivers and streams, 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.*

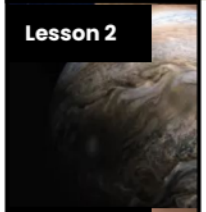
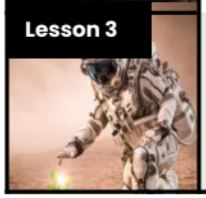
Weather & Climate Unit (Stormy Skies)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.*	closed container. **PS.2.1.1** Carry out investigations to illustrate examples of matter that can change from 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) **ESS.2.1.3** Carry out investigations to collect data and compare weather patterns that occur over time and relate observable patterns to time of 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.*	changes from day to day and during the season. **ESS.2.1.3** Carry out investigations to collect data and compare weather patterns that occur over time and relate observable patterns to time of 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.	**ESS.5.1.1** Analyze and interpret data to compare daily and seasonal changes in weather conditions (including wind speed and direction, precipitation, and temperature) and patterns. **Foundational for ESS.5.1.3** Construct an explanation to summarize the ocean's influences on weather and climate in North Carolina.
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.	**ESS.5.1.2** Analyze and interpret weather data to explain current and upcoming weather conditions (including severe weather such as hurricanes and tornadoes) in a given location.

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

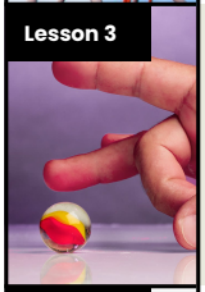
	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.* ***Hydrosphere & Water Distribution*** *How much water is in the world?*	*world maps to determine the relative amounts of 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.*	**ESS.3.2.1** Use models to 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.	**PS.5.1.1** Carry out investigations to compare the weight of objects before and after an interaction. **ESS.5.1.4** Use models to explain how the Sun's energy drives the processes of the water cycle (including evaporation, transpiration, condensation, precipitation).
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.*	**ESS.3.2.3** Use models to compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands.)
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.	**ESS.5.1.4** Use models to explain how the Sun's energy drives the processes of the water cycle (including evaporation, transpiration, condensation, precipitation).
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.	**ESS.5.1.4** Use models to explain how the Sun's energy drives the processes of the water cycle (including evaporation, transpiration, condensation, precipitation).

✔ Stars & Planets Unit

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.*		
Lesson 2 	**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.	**PS.5.2.1** Carry out investigations to explain how factors such as gravity, friction, and change in mass affect the motion of objects. **PS.5.2.2** Use mathematics and computational thinking to infer the motion of an object (including position, direction, and speed).
Lesson 3 	*We **recommend teaching this in 3rd Grade** if following North Carolina Standards.*		

***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 Unit (Energizing Everything) • Page 1 of 2

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 1 	**Speed & Energy** How is your body similar to a car?	**4-PS3-1.** Use evidence to construct an explanation relating the speed of an object to the energy of that object.	**PS.5.2.2** Use mathematics and computational thinking to infer the motion of an object (including position, direction, and speed).
Lesson 2 	**Gravitational Energy, Speed, & Collisions** What makes roller coasters go so fast?	**4-PS3-1.** Use evidence to construct an explanation relating the speed of an object to the energy of that object. **4-PS3-3.** Ask questions and predict outcomes about the changes in energy that occur when objects collide.	**PS.5.2.2** Use mathematics and computational thinking to infer the motion of an object (including position, direction, and speed). **PS.5.2.1** Carry out investigations to explain how factors such as gravity, friction, and change in mass affect the motion of objects.
Lesson 3 	**Collisions & Energy Transfer** How can marbles save the world?	**4-PS3-3.** Ask questions and predict outcomes about the changes in energy that occur when objects collide.	**PS.5.2.1** Carry out investigations to explain how factors such as gravity, friction, and change in mass affect the motion of objects.
Lesson 4 	**Energy Transfer & Engineering** Could you knock down a building using only dominoes?	**4-PS3-4.** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	**PS.5.2.1** Carry out investigations to explain how factors such as gravity, friction, and change in mass affect the motion of objects.

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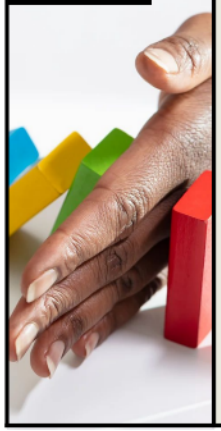
✔ Energy & Energy Transfer Unit (Energizing Everything) • Page 2 of 2

	Topic & Guiding Question	Student Objectives	2023 North Carolina Standards for Science
Lesson 5 	**Energy Transfer & Engineering** Can you build a chain reaction machine?	**4-PS3-4.** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	**PS.5.2.2** Use mathematics and computational thinking to infer the motion of an object (including position, direction, and speed). **PS.5.2.1** Carry out investigations to explain how factors such as gravity, friction, and change in mass affect the motion of objects.

Chemical Reactions & Properties of Matter Unit (Chemical Magic)

	Topic & Guiding Question	Student Objectives	2023 North Carolina 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.	**PS.5.1.2** Carry out investigations to explain whether the mixing of two or more substances results in new substances. **PS.5.1.1** Carry out investigations to compare the weight of objects 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.	**PS.5.1.1** Carry out investigations to compare the weight of objects 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.	**PS.5.1.2** Carry out investigations to explain whether the mixing of two or more substances results in new substances.
 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.	**PS.5.1.2** Carry out investigations to explain whether the mixing of two or more substances results in new substances.
 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.	**PS.5.1.2** Carry out investigations to explain whether the mixing of two or more substances results in new substances.

North Carolina Specific Standard: **PS.5.1.3** Carry out investigations to compare how heating and cooling affect some materials and how this relates to their purpose and practical applications.