"Our mission is to prepare each student to be a successful and responsible member of society."
North Smithfield School District

Third Grade Science Curriculum

North Smithfield Scope and Sequence SCIENCE Curriculum: K-12

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Structures of Life Unit Design - Grade 3

The **Structures of Life Module** consists of four sequential investigations dealing with observable characteristics of organisms. Students observe, compare, categorize, and care for a selection of organisms, and in so doing they learn to identify properties of plants and animals and to sort and group organisms on the basis of observable properties. Students investigate structures of the organisms and learn how some of the structures function in growth and survival.

RI Statements of Enduring Knowledge - (Established Goals):
LS 1 All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, and species).LS 3 Groups of organisms show evidence of change over time (structures, behaviors, and biochemistry).

LS2 Matter cycles and energy flows through an ecosystem.

Related Rhode Island GSE's (Understandings)	**RI Assessment Targets** Assessment Evidence*****High Emphasis Targets**

LS1 (3-4)-1 **Students demonstrate an understanding of classification of organisms by…** **1a** citing evidence to distinguish between living and non-living things. **1b** identifying, sorting and comparing based on similar and/or different external features. **1c** recording and analyzing observations/data about external features (e.g., within a grouping, which characteristics are the same and which are different). **1d** citing evidence (e.g., prior knowledge, data) to draw conclusions explaining why organisms are grouped/not grouped together (e.g., mammal, bird, fish).	***LS1 (K-4) – INQ+POC –1*** *Sort/classify different living things using similar and different characteristics. Describe why organisms belong to each group or cite evidence about how they are alike or not alike.* Investigations 1-4 Science Stories, pp. 1-48 Investigation 3, Part 1, pp. 8-15 Investigation 4, Parts 1-2, pp. 8-19 Science Stories, pp. 17-18, 41-42 Investigation 4, Part 2, pp. 14-19 Investigation 4, Part 2, pp. 14-19
LS1 (3-4)-2 Students demonstrate understanding of structure and function-survival requirements by… **2a** observing that plants need water, air, food, light and space to grow and reproduce; observing that animals need water, air, food, and shelter/space to grow and reproduce.	***LS1 (K-4) SAE -2***** *Identify the basic needs of plants and animals in order to stay alive. (i.e., water, air, food, space).* Investigation 1, Part 2, pp. 18-27 Investigation 2, Part 2, pp. 14-17 Investigation 3, Part 2, pp. 16-19 Science Stories, pp. 4-5, 10-11, 18, 22-34
LS1 (3-4)-3 **Students demonstrate an understanding of reproduction by…** **3a** observing changes and recording data to scientifically draw and label the stages in the life cycle of a familiar plant and animal. **3b** sequencing the life cycle of a plant or animal when given a set of data/pictures. **3c** comparing the life cycles of 2 plants or 2 animals when given a set of pictures.	***LS1 (K-4) POC –3*** *Predict, sequence or compare the life stages of organisms – plants and animals (e.g., put images of life stages of an organism in order, predict the next stage in sequence, compare two organisms*) Investigation 2, Part 3, pp. 18-22 Investigation 2, Part 3, pp. 18-22 FOSS web, Activity: Life Cycles

	LS1 (3-4)-4 **Students demonstrate an understanding of structure and function survival requirements by…** **4a** identifying and explaining how the physical structure/characteristic of an organism allows it to survive and defend itself (e.g., of a characteristic – the coloring of a fiddler crab allows it to camouflage itself in the sand and grasses of its environment so that it will be protected from predators). **4b** analyzing the structures needed to for survival of populations of plants and animals in a particular habitat/environment (e.g., populations of desert plants and animals require structures that enable them to obtain/conserve/retain water **LS2 (3-4)-5** **Students demonstrate an understanding of energy flow in an ecosystem by** **…** **5a** identifying sources of energy for survival of organisms (i.e. light or food). **LS2 (3-4)-6** **Students demonstrate an understanding of food webs in an ecosystem by…** **6a** demonstrating in a food web that all animals' food begins with the sun. **6b** use information about organisms to design a habitat and explain how the habitat provides for the needs of the organisms that live there. **6c** explaining the way that plants and animals in that habitat depend on each other. **LS3 (3-4)-7Students demonstrate an understanding of equilibrium in an ecosystem by…** **7a** explaining what plants or animals might do if their environment changes (e.g., changing food supply or habitat due to fire, human impact, sudden weather related changes).	***LS1 (K-4) – FAF –4*** *Identify and explain how the physical structures of an organism (plants or animals) allow it to survive in its habitat/environment (e.g., roots for water; nose to smell fire).* Investigation 3, Part 1, pp. 8-15 Investigation 4, Part 1-2, pp. 8-19 Science Stories, pp. 3, 17-18, 20-21, 22-34, 37-39 Science Stories, pp. 20-21, 22-34 ***LS2 (K-4) – SAE –5*** *Recognize that energy is needed for all organisms to stay alive and grow or identify where a plant or animal gets its energy.* Science Stories, p. 43 ***LS2 (K-4) – SAE –6*** *Describe ways plants and animals depend on each other (e.g., shelter, nesting, food).* Science Stories, p. 43 Investigation 3, Part 2, pp. 16-19 ***LS3 (K-4) – SAE –7*** *Using information (data or scenario), explain how changes in the environment can cause organisms to respond (e.g., survive there and reproduce, move away, die).* Science Stories, pp. 35-36

Investigation – Time(45min periods)	**Focus Questions** (Essential Questions)	**Big Ideas** (Understandings)
1	• Where do seeds come from? • Where are seeds found on plants?	• Seeds develop in the plant part called a fruit. • Different kinds of fruits have different kinds and number of seeds. • Seeds have a variety of **properties**.
3	• Can a seed grow without soil? • What effect does water have on seeds? • What would happen if we just watered the seeds instead of planting them in soil?	• Seeds undergo change in the presence of water. • A seed is an **organism**, a **living thing.**
1	• How much water does a seed soak up?	• A seed contains the embryo plant and stores food and water.
1	• What effect does water have on the seeds in the mini-sprouter? • How do the plants change over time? • How do seeds develop into plants?	• **Germination** is the onset of a seed's growth.
1	• How can you grow plants without soil • What conditions do plants need in order to grow?	• Plants need water, light, and nutrients to grow • Plants can grow in water if nutrients are added
1	• What is the sequence of the bean plant's life cycle?	• The **life cycle** is the process of a seed growing into a mature plant, which in turn produces seeds. • The fruit of the plant develops from the flower
3	• What are the structures of a crayfish? • How do the structures of the crayfish help the crayfish to survive?	• Crayfish have observable **structures** (legs, eyes, antennae, carapace, swimmerets, tail, pincers and mouth parts).

2	• What do we need to think about in order to build a suitable habitat for the crayfish in the classroom? • What do we need to know about the crayfish in order to keep them here in our classroom?	• Crayfish have particular requirements for life (water, food and shelter). • **Habitat** is where an animal lives.
1	• What do crayfish do when something happens to them?	• **Behavior** is what an animal does.
1	• Does each crayfish have its own house that it always goes to? • How can we keep track of crayfish movements over many days?	• Some animals claim a territory that they protect from other animals.
2	(NOTE: Since snails are hard to come by, Investigation 4 is optional.) • What structures do land snails have? • What does a snail need in its habitat?	• Land snails have a coiled shell, a large foot on which they glide, and a body with a variety of structures. • Land snails need water, food, air, and space.
1	• What functions do land snails structures serve? • How are the structures of the land snail and crayfish alike and how do they differ?	• An **organism's structures** have **functions** that help it survive in its **habitat**. • The **structures** found on different kinds of **organisms** show some similarities and some differences.

Water Unit Design - Grade 3

Water is the most important substance on Earth. Water dominates the surface of our planet, changes the face of the land, and defines life. These powerful, pervasive ideas are introduced here. The **Water Module** consists of four investigations in which students explore properties of water, changes in water, interactions between water and other earth materials, and how humans use water.

RI Statements of Enduring Knowledge - (Established Goals):

ESS1 - The earth and earth materials as we know them today have developed over long periods of time, through continual change processes.

PS1 - All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size or amount of substance)

PS 2 Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.

PS 3 The motion of an object is affected by forces.

Related Rhode Island GSE's (Understandings)	**RI Assessment Targets** Assessment Evidence high emphasis assessment target**
ESS1 (K-2) –2 **Students demonstrate an understanding of processes and change over time within earth systems by …** **2a** conducting tests on how different soils retain water (e.g., how fast does the water drain through?). **ESS1 (3-4)–2** **Students demonstrate an understanding of processes and change over time within earth systems by …** **2a** conducting investigations and using observational data to describe how water moves rocks and soils. **ESS1 (3-4) –5** **Students demonstrate an understanding of processes and change over time within earth systems by …** 5b describing water as it changes into vapor in the air and reappears as a liquid when it's cooled. 5c explaining how this cycle of water relates to weather and the formation of clouds.	**ESS1 (K-4) INQ –2 **** *Use results from an experiment to draw conclusions about how water interacts with earth materials (e.g., percolation, erosion, frost heaves)* Investigations 1-3 Science Stories, pp. 1-2, 4-9, 12-17 ***ESS1 (K-4) POC –5*** *Based on data collected from daily weather observations, describe weather changes or weather patterns.* Investigation 3, Parts 1-4, pp. 8-26 Science Stories, p. 13-16 FOSS Web, Activity: Evaporation

Related Rhode Island GSE's (Understandings)	**RI Assessment Targets** Assessment Evidence high emphasis assessment target**
Students demonstrate an understanding of physical changes by … **1c** observing and describing physical changes (e.g. freezing, thawing, torn piece of paper).	**PS1 (K-4) INQ –1 **** *Collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility)* Investigation 2, Part 3, pp. 19-24 Investigation 3, Parts 1-4, pp. 8-26 Foss Web, Activity: Evaporation
PS1 (3-4) –2 **Students demonstrate an understanding of states of matter by …** **2a d**escribing properties of solids, liquids, and gases. **2b i**dentifying and comparing solids, liquids, and gases. **2c** making logical predictions about the changes in the state of matter when adding or taking away heat (e.g., ice melting, water boiling or freezing, condensation/evaporation).	***PS1 (K-4) POC –2*** *Make a prediction about what might happen to the state of common materials when heated or cooled or categorize materials as solid, liquid, or gas.* Investigation 1, Part 1, pp. 8-13 Investigation 2, Part 3, pp. 19-24 Science Stories, pp. 1-3, 8-9, 13 Investigation 1, Part 1, pp. 8-13 Investigation 2, Part 3, pp. 19-24 Science Stories, pp. 1-3, 8-9, 13 Investigation 2, Part 3, pp. 19-24 Investigation 3, Parts 1-4, pp. 8-26 FOSS Web, Activity: Evaporation

Related Rhode Island GSE's (Understandings)	**RI Assessment Targets** Assessment Evidence high emphasis assessment target**
PS2 (3-4)–6 **Students demonstrate an understanding of energy by…** **6a** Describing how heat moves from warm objects to cold objects until both objects are the same temperature. **6b** Showing that heat moves from one object to another causing temperature change (e.g., when land heats up it warms the air).	***PS2 (K-4) SAE+INQ –6*** *Experiment, observe, or predict how heat might move from one object to another.* Investigation 2, Parts 2-3, pp. 14-24 Science Stories, pp. 14-16 Investigation 1, Part 3, pp. 19-23 Investigation 4, Part 2, pp. 14-18

Investigation-Time (45 min. periods)	Focus-Essential Questions	Big Ideas
1.1 Looking at Water-(2)	• What happens when water gets spilled, splashed or dropped on something? • Does water do the same thing on all surfaces?	• Water has observable **properties**, including **transparency**, **shapelessness**, and movement or flow • Water beads up on some materials and is absorbed by other materials
1.2 Surface Tension-(2)	• What shape does water make on a flat surface? • Why does water forma dome on a flat surface? • How can you change the surface tension of plain water?	• **Surface tension** is the skinlike surface of water that pulls it together into the smallest possible volume • Drops of water form domes on pennies because of **surface tension** • **Surface tension** can be disrupted by the addition of some other substances
1.3 Water on a Slope-(2)	• What happens to beads of water when they are placed at the top of a slope? • How does changing the amount of water in a bead change the speed at which water flows downhill? • How does changing the slope change the speed at which water flows downhill?	• Water flows downhill • Larger amounts of water flow more quickly • Increasing the slope over which the water flows makes it flow more quickly
2.1 Build a Thermometer-(2)	• What happens to water when it is heated? • What happens to water when it is cooled?	• Water **expands** when heat is added • Water **contracts** when heat is taken away
2.2 Sinking and Floating Water-(2)	• Is hot water denser or less dense than room temperature water? • Is cold water denser or less dense than room temperature water?	• Warm water is less **dense** than room-temperature water • Cold water is more **dense** than room-temperature water. Cold water is **denser** than warm water • A material that floats in water is less **dense** than the water; a material that sinks is more **dense**

Investigation-Time (45 min. periods)	Focus-Essential Questions	Big Ideas
2.3 Water as Ice-(3)	• What happens to water when it freezes? • What happens to ice when it is heated? • How do the masses of equal volumes of ice and water compare?	• Water begins to **expand** when its temperature reaches 4 degrees C • Water is densest at 4 degrees C • Ice is less **dense** than liquid water • A solid has definite **volume** and **shape**; a liquid has only definite **volume**
3.1 Evaporation-(2)	• What happens when two paper towels are allowed to dry, one in a cup with a lid, and the other in an open cup?	• **Evaporation** is the process by which liquid water changes into water vapor, a gas
3.2 Evaporating Locations-(1)	• What effect does air temperature have on evaporation?	• **Temperature** effects the rate of evaporation
3.3 Surface Area-(2)	• What effect does surface area have on the rate of evaporation?	• The **surface area** of a **volume** of water affects the rate of **evaporation**
3.4 Condensation-(1)	• What happens when the surface area of an object or material is cooler than the air surrounding it?	• **Condensation** occurs when water vapor touches a cool surface and changes into a liquid • **Evaporation** and **condensation** contribute to the movement of water through the water cycle
3.5 Water Cycle Game-(2)	• What happens to a water molecule during the water cycle?	• The *water cycle* is the endless sequence of condensation and evaporation of water on Earth.

Investigation-Time (45 min. periods)	Focus-Essential Questions	Big Ideas
4.1 Water in Earth Materials-(2)	• What happens when you pour water through different earth materials?	• Some **earth materials**, like soils, **absorb** more water than other **earth materials** • Water flows more easily through some **earth materials** that through others
4.2 Waterwheels-(2)	• How does a waterwheel work? • What is the best design for a waterwheel that will efficiently lift objects?	• Flowing water can be used to do work • Waterwheels are a kind of a machine powered by flowing water
4.3 Water from Home-(2)	• What are some of the properties of water that affect its quality?	• Water contains different materials that affect its quality • **Evaporation** can be used to detect materials dissolved in water
4.4 Choosing Your Own Investigation-(3)	• Students ask their own questions and plan investigations or research to answer them	• Apply concepts developed concerning water, its properties and its uses

Ideas & Inventions Unit Design - Grade 3

The **Ideas and Inventions Module** consists of four sequential investigations promoting the inquiry process that promote student creativity and inventiveness. Each investigation provides valuable science content while introducing a conventional technique for revealing the unseen.

RI Statements of Enduring Knowledge - (Established Goals):
ESS2 – The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships.

PS1- All living and nonliving things are composed of matter having characteristics properties that distinguish one substance from another (independent of size or amount of substance).

PS2 – Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

PS3 – The motion of an object is affected by forces.

Related Rhode Island GSE's (Understandings)	**RI Assessment Targets** (Assessment Evidence) High Emphasis Targets**
ESS2 (3-4)-7 **Students demonstrate an understanding of temporal or positional relationships between or among the Earth, sun, and moon by …** 7a observing that the sun, moon, and stars appear to move slowly across the sky. 7b observing that the moon looks slightly different from day to day, but looks the same again in about 4 weeks.	Local Level Only (No further ESS Targets K-4)
ESS3 (3-4)-9 **Students demonstrate understanding of processes and change over time within the system of the universe (Scale, Distances, Star Formation, Theories, Instrumentation)** **by…** 9a recognizing that throughout history people have identified patterns of stars that we call constellations.	Science Stories, pp. 33-34, 37 **Science Stories, pp. 34-36**
PS1 (3-4)-1 **Students demonstrate an understanding of characteristic properties of matter by…**	**Science Stories, p. 37**

Related Rhode Island GSE's (Understandings)	**RI Assessment Targets** (Assessment Evidence) High Emphasis Targets**
1a identifying, comparing, and sorting objects by similar or different physical properties (e.g., size, shape, color, texture, smell, weight, temperature 1b citing evidence (e.g., prior knowledge, data) to support conclusions about why objects are grouped together.	**PS1 (K-4) – INQ–1**** Collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility). **Investigation 2, Parts 1-2, pp. 8-19**
Students demonstrate an understanding of physical changes by… 1c observing and describing physical changes (e.g., freezing, thawing, torn piece of paper).	**Investigation 2, Parts 1-2, pp. 8-19**
PS2 (3-4)-5 **Students demonstrate an understanding of energy by…** 5a investigating observable effects of light using a variety of light sources (e.g., light travels in a straight line until it interacts with an object, blocked light rays produce shadows). 5b predicting, describing and investigating how light rays are reflected, refracted, or absorbed.	**Investigation 1, Parts 1-2, pp. 8-17** **Investigation 3, Parts 1-2, pp. 8-17** **PS2 (K-4) – SAE–5** Use observations of light in relation to other objects/substances to describe the properties of light (can be reflected, refracted, or absorbed). **Investigation 4, Parts 1-3, pp. 8-21** **Investigation 4, Parts 1-3, pp. 8-21** **Science Stories, pp. 28-32**
PS3 (3-4)-7 **Students demonstrate an understanding of motion by…** 7b describing change in position relative to other objects or background	**PS3 (K-4) – INQ + SAE–7**** Use data to predict how a change in force (greater/less might affect the position, direction of motion, or speed of an object (e.g., ramps and balls) **Investigation 3, Parts 1-2, pp. 8-17**

Investigation- **Time (45min. periods)**	**Investigation**	**Focus Questions** (Essential Questions)	**Big Ideas** (Understandings Words in **bold** are important for science vocabulary development, and should be used for **word walls**.
1-(2)	Leaf Rubbings	Can you use rubbing techniques to learn about objects? What can leaf rubbing tell you about a leaf?	• **Texture** refers to the surface of a material. • **Pattern** is a design or arrangement of objects • Veins transport materials in a leaf • Leaf-venation **patterns** can be organized into three types: parallel, palmate, and pinnate
2-(3)	Carbon Printing	How can we look for patterns on finely textured objects like fingers? How are fingerprints alike and different? Can you solve a mystery using fingerprints?	• Carbon printing is a technique used to make fine textures visible • Fingerprints can be stored into three groups based on patterns: whorl, arch, and loop • No two people have the same fingerprints
3-(3)	Color Writing	How could we find out what pigments are used in different color markers? Can you solve a mystery using paper chromatography?	• Chromatography uses water to carry pigments from one place to another • Paper chromatography reveals pigments in watercolor inks • The process of water moving through paper is called wicking

Investigation- Time (45min. periods)	Investigation	**Focus Questions** (Essential Questions)	**Big Ideas** (Understandings Words in **bold** are important for science vocabulary development, and should be used for **word walls**.
4-(4)	Reflecting	What can you see with mirrors that you cannot see without one? How can a mirror be used to find a line of symmetry? Can you make a rear view mirror for your desk? How can you see through a book using a mirror? How does a periscope work?	• **Light** travels in a straight line • Symmetry is an arrangement in which the parts on the opposite sides of a center line are the same • Mirror images are a result of light **reflected** from a surface • An image produced by something that **reflects**, such as a mirror, is always reversed right to left • Mirrors can be used to determine symmetry in objects • always reversed right to left • Mirrors can be used to determine symmetry