

SWALLOW SCHOOL DISTRICT CURRICULUM GUIDE

Curriculum Area: Science

Course Length: Full Year

Grade: 5K

Date Last Approved: March 15, 2018; **Reviewed:** Spring 2021

Stage 1: Desired Results

Course Description and Purpose:

In Kindergarten science, there are 5 units. Three of the units are Full Option Science System (FOSS) units, and two of the units are Project Lead the Way (PLTW) units. In the *Material and Motion* unit, students will study different materials (wood, paper, fabric), evaluate their uses, and create structures to examine energy transfer. *Animals*, and the *Plants and Animals* unit, students observe and care for animals over time. Students will study, compare, and contrast structures and behaviors. In the next unit, Structure and Function- The Human Body, students examine major organs within the body and investigate how the structure of each is related to its function. In the last unit, Animals and Algorithms, students explore the nature of computers and the way humans use and control technology.

Enduring Understanding(s):

- Matter can be described and classified by its observable properties.
- Pushes and pulls can have different strengths and directions.
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
- When objects touch or collide, they push on one another and can change motion.
- A bigger push or pull makes things speed up or slow down more quickly.
- Air is everywhere.
- Air can move things.
- Scientists and engineers use standard practices to explain the world or solve problems
- The shape and stability of structures of natural and designed objects are related to their function
- Mathematical thinkers apply complex thinking and reasoning strategies where thinking is intentional and reflected upon.
- Professionals function effectively and efficiently on multidisciplinary teams to be successful
- Professionals communicate effectively with a variety of audiences using multiple modalities to be successful
- Professionals conduct themselves so as to maximize benefits for society and minimize harm
- Living things are anything that is alive or was once alive
- Computational thinkers systematically develop solutions through computational methods.
- Structures of animals serve functions in growth, survival, and reproduction

Essential Question(s):

- What in our world is made of wood and what properties make wood useful?
- What in our world is made of paper and what properties make paper useful?
- What in our world is made of fabric and what properties make fabric useful? How can we use materials in engineering a structure?
- How can we change the motion of an object?
- Where is air?
- How can we show that air takes up space?
- What is compressed air?
- What are the characteristics of clouds that help to classify them?
- How does air resistance affect an object's movement?
- What weather patterns can we observe over time?
- What are the patterns of the moon?
- How are structure and function related?
- How would we function if our bodies were structured differently?
- How can a step-by-step process help you design or improve a solution to a problem?
- How do you use algorithms in your daily life?
- How can you use computer programming to complete a task?
- Why should a step-by-step process be followed to solve a problem?
- What are animals, and what do they need to live?
- How do animal structures and behaviors help meet their needs?
- What are some ways that animals are similar, and how can they be different (in appearance and behavior)?

- Animals need matter and energy to live and grow.

Learning Targets:

1. Students can apply the scientific process to evaluate investigations or the design process to create design solutions to solve a problem. (Skill/Product)
2. Students can organize and communicate information. (Skill)
3. Students can develop and interpret models. (Skill/Product)
4. Students can support a claim with evidence. (Skill/Product/Reasoning)

Stage 2: Learning Plan

I. Materials and Motion

- A. Wood
- B. Fabric
- C. Paper
- D. Motion

Standards Referenced: 3-PS2-2 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
 3-PS2-3 Ask questions to determine cause-and-effect relationships of electric or magnetic interactions between two objects not in contact with each other.

Learning Targets Addressed: 1, 2, 3, 4, 5, 6

Key Resources Used:

- FOSS

Assessment Map:

Type	Level	Assessment Detail
Practice	Knowledge	• Science journal
Formative	Skills/ Reasoning	• Science journal
Summative	Product	• Science journal

II. Plants and Animals

1. Anchor phenomenon 1—Grassy lawn changing into a field
2. Problem to solve 2—Rescued injured duckling
3. Problem to solve 3—Design a way to work on a roof safely
4. Students learn about the basic needs of plants and animals (food, water, shelter) and how they interact with their environment.

Standards: K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive
 K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
 K-ESS3-1. Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

Learning Targets Addressed: 1, 2, 3, 4, 5, 6

Key Resources Used:

- FOSS

Assessment Map:

Type	Level	Assessment Detail
Practice	Knowledge	• The driving question for the module is how do young plants and animals survive in their habitat?
Formative	Skills/ Reasoning	• Students explore structure and function relationships as they sort different kinds of animal and plant structures. They use that understanding of structure and function, including animal sensory structures, to invent solutions to human problems.

	Summative	Product	<ul style="list-style-type: none"> Students engage in science and engineering practices by collecting and interpreting data to build explanations and designing and using tools to answer questions.
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III. Animals Two by Two

A. Goldfish and Guppies
 B. Big and Little Worms

Standards: LS1-1:Use evidence to support the explanation that plants and animals have internal and external structures that function to support survival, growth, and reproduction.LS1-2: Design and build a model of a plant or animal structure to show how it functions to support survival, growth, and reproduction.LS1-3: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, and reproduction.LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on populations in an ecosystem.LS2-2: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, and reproduction.LS2-2: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, and reproduction.

- Learning Targets Addressed:**
- Students can make predictions during the scientific process
 - Students can make observations during the scientific process
 - Students can classify items by like characteristics

Key Resources Used:

<ul style="list-style-type: none"> FOSS
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Assessment Map:

Type	Level	Assessment Detail
Practice	Knowledge	<ul style="list-style-type: none"> Teacher Modeling of Skills Observation and Evaluation
Formative	Skills/ Reasoning	<ul style="list-style-type: none"> Observation and Evaluation
Summative	Product	<ul style="list-style-type: none"> Observation and Evaluation

IV. Structure and Function- The Human Body

- A. Zoom Into the Body
- B. Exploration Centers
- C. Bone Puzzle
- D. Why So Many Bones?
- E. Design a Cast

Standards: K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Learning Targets Addressed: 1, 2, 3, 4, ,5, 6

Key Resources Used:

- Launch

Assessment Map:

Type	Level	Assessment Detail
Practice	Knowledge	<ul style="list-style-type: none">• PLTW Launch Logs
Formative	Skills/ Reasoning	<ul style="list-style-type: none">• PLTW Launch Logs• Observations• Classroom Dialogue/Questioning
Summative	Product	<ul style="list-style-type: none">• Model of a cast• PLTW Structure & Function Human Body Assessment

V. Animals and Algorithms

- A. Animal Maze
- B. Meet Scratch Jr.
- C. Scratch Jr. Puzzles
- D. Animals in Action

Standards: K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs

Learning Targets Addressed: 2, 3, 4, 5, 6

Key Resources Used:

- Launch
- Scratch Jr.

Assessment Map:

Type	Level	Assessment Detail
Practice	Knowledge	<ul style="list-style-type: none">• PLTW Launch Logs• Scratch Jr.
Formative	Skills/ Reasoning	<ul style="list-style-type: none">• PLTW Launch Log• Scratch Jr.• Classroom Dialogue/Questioning
Summative	Product	<ul style="list-style-type: none">• Coding Project• PLTW Animals & Algorithm Assessment