SWALLOW SCHOOL DISTRICT CURRICULUM GUIDE

Curriculum Area: **Science**	Course Length: Full Year
Grade: **4th**	Date Last Approved: June 2015

Stage 1: Desired Results

Course Description and Purpose:
In fourth grade science, we will be studying six units. In the first unit, Energy, students will study the Conservation of Energy include the transfer and forces. In the second unit, Waves and Technology, students will how waves reflect and transfer information. In the third unit, Molecules to Organisms, students will study the structure and function of living things. In the fourth unit, Earth's Place in the Universe, students will study rock formation patterns and landscape changes. In the fifth unit, Earth's Systems, students will study the topographical maps and how the Earth's landscapes weather and erode. Our final unit, Earth and Human Activity, students will study natural resources and natural hazards.

Enduring Understanding(s):
1. Energy can be transferred in various ways between objects.
2. Cause and effect relationships are identified and used to explain natural occurrences.
3. Cause and effect relationships are routinely identified and used to explain change.
4. A system can be described in terms of its components and their interactions.
5. Light has an effect on objects.
6. Similarities and differences in patterns can be used to sort and classify natural phenomena.

Essential Question(s):
1. How are energy and motion related?
2. How is energy transferred and used to solve a problem?
3. How do waves influence the motion of objects?
4. How does the shape of land change over time?
5. How can maps be used to understand Earth's features?
6. How does the structure of a plant and an animal help them to thrive and survive?
7. How does the reflection of light help us to see?
8. How do human created solutions reduce the impact of natural processes?

Learning Targets:
1. Students can implement and evaluate investigations utilizing the scientific process (skill)
3. Students can organize and communicate information (skill)
4. Students can examine the relationship between structure and function (reasoning)
6. Students can develop and interpret models (product)
7. Students can support a claim with evidence (reasoning)

Stage 2: Learning Plan

I. Energy
    A. Definitions of Energy
    B. Conservation of Energy
    C. Transfer of Energy
    D. Forces and Energy
    E. Energy in Chemical Processes

NGSS: 4-PS3-1, 4-PS3-2, 4-PS3-3, 4-PS3-4

Learning Targets Addressed:
Target 1
Target 3
Target 6
Target 7

Assessment Map:

Type	Level	Assessment Detail
Practice	Knowledge	● Vocabulary derived from nonfiction reading and other materials to gain knowledge about a topic.
Formative	Skill/Reasoning	● Provide evidence that energy can be transferred from place to place by sound, light, heat, and electric current.
Summative	Reasoning/ Product	● Design, test, and refine a device that diverts energy from one form to another.

II. Waves and Technology
   A. Properties of Waves
   B. Reflecting Light and Vision
   C. Waves for Transferring Information

NGSS: 4-PS4-1, 4-PS4-2, 4-PS4-3

Learning Targets Addressed:
Target 3
Target 7

Assessment Map:

Type	Level	Assessment Detail
Practice	knowledge	● Gain knowledge through non fiction text about light and the eye ● Gain knowledge of various communication systems
Formative		● Label a model of waves to describe wave patterns. ● Label the eye and their structure and function related to vision
Summative	Skill/Reasoning	● Develop a model to describe the light reflecting from objects and entering the eye which allows objects to be seen. ● Generate multiple solutions to transfer information (Morse code)

III. Molecules to Organisms
   A. Structure and Function to Support Characteristic of Living Things
   B. Senses for Information Processing

NGSS: 4-LS1-1, 4-LS1-2

Learning Targets Addressed:
Target 3
Target 4
Target 6

Assessment Map:

Type	Level	Assessment Detail

Practice	Knowledge	● Define the characteristics of living things ●
Formative		● Sort characteristics of different ecosystems into like groups ● Arrange cards into a functioning food-web and food chain
Summative	Skill/ Product	● Create a comparison of a food chain and a food web ● Compare and contrast 2 different types of ecosystems

IV. Earth's Place in the Universe
   A. Rock Formation Patterns to support landscape changes
   B. Fossil Patterns to support landscape changes

NGSS: 4-ESS1-1

Learning Targets Addressed:
Target 3
Target 7

Assessment Map:

Type	Level	Assessment Detail
Practice		● Describe the characteristics of various types of rock formation, layers, and fossils
Formative		● Show a rock layer and student can explain what has happened over time such as a river cut through the rock, change from land to water over time, or rock layers with plant fossils and no shells ● Label a diagram of rock layers, formations and landscapes
Summative	Skill/Reasoning/Product	● Construct a rock formation including rock layers to support an explanation for changes in a landscape over time ● Create a diagram demonstrating the rock cycle.

V. Earth's Systems
   A. Weathering and Erosion
   B. Topographic Maps
   C. Bio-geology
   D. Plate Tectonics and Large Scale System Interactions

NGSS: 4-ESS2-1, 4-ESS2-2

Learning Targets Addressed:
Target 3
Target 6
Target 7

Assessment Map:

Type	Level	Assessment Detail

	Practice	Knowledge	● Describe how weather impacts erosion. ● Create a list of how living things impact the geology of the Earth.
	Formative	skill	● Compare and contrast topographical maps ● Outline Earth's plate tectonic boundaries
	Summative	Product/ Reasoning	● Analyze and interpret data from maps to describe patterns of Earth's features.

VI. Earth and Human Activity
   A. Natural Resources
   B. Natural Hazards

NGSS: 4-ESS3-1, 4-ESS3-2

Learning Targets Addressed:
Target 3
Target 7

Assessment Map:

Type	Level	Assessment Detail
Practice	Knowledge	● Describe natural resources and their uses ● Describe the impact of natural hazards
Formative	Skill	● Compare and contrast renewable and nonrenewable resources. ● List natural resource and describe the energy/fuel it produces.
Summative	Product/ Reasoning	● Generate a list and compare solutions to reduce the impacts of Earth processes on humans. ● Describe how energy fuels derived from natural sources affect the environment.