

SWALLOW SCHOOL DISTRICT CURRICULUM GUIDE

Curriculum Area: Science

Course Length: Full Year

Grade: 8th Grade

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

Stage 1: Desired Results

-Earth Science - *How is the Earth Changing?* Geological processes. This includes plate tectonics, seafloor spreading, creation and recycling of earth plates, earthquakes, and volcanoes.

-Life Science - *Why do Organisms Look the Way They Do?* Heredity, genetics and natural selection. This includes the cell cycle, the structure of DNA and its replication, inheritance of traits, Mendelian genetics, and the genetic rules of inheritance involved in genetic mutations and human inherited disorders.

-Physical Science - *How Will it Move?* Force and motion. This includes force, motion, and energy, balanced and unbalanced forces. It also includes forces that change motion when it already exists.

-Chemistry - *How Does Food Provide My Body With Energy?* Chemical reactions in living things. This includes the molecular nature of food, how organisms use food for energy and building materials, how plants produce food during photosynthesis, and how organisms use food during cellular respiration.

Enduring Understanding(s):

Plates move on Earth's surface in a variety of ways, including toward each other, away from each other, and alongside each other.

When two plates interact, the geologic features and events common on Earth occur (e.g., volcanoes, mountains, trenches, and earthquakes).

Due to the principle of conservation of matter, no new rock material is created or destroyed; rock is recycled as a result of moving plates.

Offspring can get instructions for a trait from either parent.

It is possible for offspring to have a trait that neither parent shows.

Changes in a population can occur when there is a change in the environment that affects the organism's survival; one variation of a trait has an advantage for survival.

All forces always come in pairs in opposite directions.

Newton's Laws of Motion.

The start and end of motion is always caused by forces.

Unbalanced forces acting on an object change its speed or direction of motion, or both.

Essential Question(s):

Unit 1: Earth Science

- a) How is the Earth's surface changing?
- b) What causes the features on Earth's surface?
- c) How are plates changing?
- d) How does plate tectonics explain Earth's features?

Unit 2: Life Science

- a) Why do I look the way I do?
- b) How do genes affect my physical traits?
- c) Why does variation matter?

Unit 3 Physical Science

- a) What makes objects start and stop?
- b) Why do some things stop?
- c) What is the difference between forces and energy?

Unit 4 Chemistry

- a) How do food molecules compare to each other?
- b) What do organisms do with food?
- c) Where does the energy in food come from?
- d) How is food used for energy?

Food (carbohydrates, proteins, and fats) provides energy and building materials for the cells.

Different types of food molecules, when reacting with oxygen, produce different amounts of energy.

An ecosystem needs a constant input of light energy.

Middle School Science Learning Targets:

1. Students can plan, implement and evaluate investigations utilizing the scientific process. (Skill/Reasoning)
2. Students can apply mathematics and computational thinking. (Skill)
3. Students can assess the relationship between structure and function. (Skill/Reasoning)
4. Students can assess key issues in nonfiction texts. (Skill/Reasoning)
5. Students can develop and analyze models. (Skill/Reasoning)
6. Students can analyze scientific issues and communicate and support their claims with evidence. (Reasoning)

Stage 2: Learning Plan

I. Unit 1, Earth Science: Earth Changes

- A. How is the Earth’s surface changing?
- B. What causes the features on Earth’s surface?
- C. How are plates changing?
- D. How does plate tectonics explain Earth’s features?

Standards Referenced: Each activity is tied to relevant:

- NGSS standards
- Disciplinary core ideas
- Science & Engineering practices
- Crosscutting concepts

Learning Targets Addressed: All 6

Key Unit Resources:

- IQWST Science program from Activate Learning
- IXL Science

Assessment Map:

Type	Level	Assessment Detail
Practice	Knowledge	<ul style="list-style-type: none"> • Lab implementation and write-ups • applying math and computational thinking • assessing the relationship between form and function • analyzing and assessing key issues in nonfiction science text • creating and analyzing 2D, 3D, and digital models • analyzing scientific issues in the Claim, Evidence, Reasoning (CER) format
Formative	Skills/Reasoning	<ul style="list-style-type: none"> • Lab implementation and write-ups • applying math and computational thinking • assessing the relationship between form and function • analyzing and assessing key issues in nonfiction science text • creating and analyzing 2D, 3D, and

			<ul style="list-style-type: none"> digital models analyzing scientific issues in the Claim, Evidence, Reasoning (CER) format Exit tickets responses in the online science book written & digital assessments
	Summative	Product	<ul style="list-style-type: none"> Lab implementation and write-ups applying math and computational thinking assessing the relationship between form and function analyzing and assessing key issues in nonfiction science text creating and analyzing 2D, 3D, and digital models analyzing scientific issues in the Claim, Evidence, Reasoning (CER) format Responses in the online science book written & digital assessments

II. Unit 2, Life Science: Heredity & Genetics

- A. Why do I look the way I do?
- B. How do genes affect my physical traits?
- C. Why does variation matter?

Standards Referenced: Each activity is tied to relevant:

- NGSS standards
- Disciplinary core ideas
- Science & Engineering practices
- Crosscutting concepts

Learning Targets Addressed: All 6

Key Unit Resources:

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|---|
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III. Unit 3, Physical Science: Physics

- A. What makes objects start and stop?
- B. Why do some things stop?
- C. What is the difference between forces and energy?

Standards Referenced: Each activity is tied to relevant:

- NGSS standards
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Learning Targets Addressed: All 6

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IV. Unit 4, Chemistry of the Human Body

A. How do food molecules compare to each other?

B. What do organisms do with food?

C. Where does the energy in food come from?

D. How is food used for energy?

Standards Referenced: Each activity is tied to relevant:

- NGSS standards
- Disciplinary core ideas
- Science & Engineering practices
- Crosscutting concepts

Learning Targets Addressed: All 6

Key Unit Resources:

<ul style="list-style-type: none"> IQWST Science program from Activate Learning IXL Science

Assessment Map:

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Practice	Knowledge	<ul style="list-style-type: none"> Lab implementation and write-ups applying math and computational thinking assessing the relationship between form and function analyzing and assessing key issues in nonfiction science text creating and analyzing 2D, 3D, and digital models analyzing scientific issues in the Claim, Evidence, Reasoning (CER) format.
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			<p>form and function</p> <ul style="list-style-type: none"> ● analyzing and assessing key issues in nonfiction science text ● creating and analyzing 2D, 3D, and digital models ● analyzing scientific issues in the Claim, Evidence, Reasoning (CER) format ● Exit tickets ● responses in the online science book ● written & digital assessments
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