

Saint Patrick High School

Curriculum Guide

Department:	Science	Grade and Level:	11 & 12
Class:	Earth Science	Term (Semester or Year):	Semester course

Required Text:	Glencoe Science: Earth Science (McGraw Hill) (Chapters posted onto class website by Unit)
Additional Resources (i.e. texts, materials, apps, etc.):	<u>iPad Apps</u> GoodReader Pages Keynote Nearpod cK-12 Study Now Khan Academy iTunes

Course Description

This course is open to juniors and seniors interested in deepening their understanding of the world and universe around them. This level focuses on the life of our planet including planetary cycles, plate tectonics, and earthquakes, volcanoes, the atmosphere and weather. Socially current relevant issues such as a global warming and alternative energy sources will be investigated. The course will focus on graphical analysis and inquiry-based approach to student learning.

Use of Pilot Units:

As part of our push into the new STEM curriculum for the coming years, we may be piloting one or more units this year that will focus on Nature of Science and Inquiry based instruction. This may include but is not limited to student led initiatives surrounding the topics of Ecology and Environmental Science, especially in regards to invasive species and the health of local ecosystems.

Academic Standards Addressed (NGSS):

- HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.
- HS-ESS2-1. Develop a model to illustrate how Earth's internal and surface

processes operate at different spatial and temporal scales to form continental and ocean-floor features

- HS-ESS2-3. Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection.
- HS-ESS2-7. Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.
- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

Unit Themes (Table of Contents)

Theme 1:	Introduction to Earth Science
Theme 2:	Cartography
Theme 3:	Geology (Minerals & Rocks)
Theme 4:	Plate Tectonics
Theme 5:	Earthquakes & Volcanoes

Agreed Upon Assessments

Forms of assessments may include but are not limited to....

- Objective tests
- Lab activities
- Lectures/Discussions
- Group Projects/Presentations
- Research Papers/ Projects
- Homework Assignments
- Supplemental Readings

Unit:	Intro Unit	Duration:	1 week
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- What is the nature of science?
- What is Earth Science?

Affirmation Statements:

Students will be able to...:

- Identify where emergency help & first aid kit are located
- Explain lab and classroom procedures & etiquette
- Explain how science is conducted
- Compare/Contrast Theory and Hypothesis
- Define Earth Science and the branches of ES

Labs:

- Make a Thing Lab

Quizzes:

- Lab Safety Quiz

Common Assessments:

- Unit 1 Mini-Test

Unit:	Cartography	Duration:	3 Weeks
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- What is cartography?
- When are the pros & cons of the different maps?

Affirmation Statements:

Students will be able to...:

- Explain what cartography is.
- Identify & explain the 3 different types of maps
- Draw a topographic profile
- Identify & explain the various components of a topographic profile

Labs:

- Make a map lab
- Using a topographic map lab

Quizzes:

- Mapping Quiz

Common Assessments:

- Unit 2 Test

Unit:	Geology	Duration:	5 weeks
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- What are minerals?
- How are minerals identified?
- What are the 3 types of rocks? How/Where do they form?

Affirmation Statements:

Students will be able to...:

- Identify the most common minerals in earth's crust
- Classify minerals by their characteristics
- Define and identify igneous rocks, and how/where they form
- Define and identify sedimentary rocks, and how/where they form.
- Explain the environments where different sed. rocks form.
- Define and identify metamorphic rocks, and how/where they form

Labs:

- Launch Lab (pg. 85) Mineral Shapes
- Minerals Field Guide Lab
- Identifying minerals lab

Quizzes:

- Minerals
- Rock Cycle Quiz

Common Assessments:

- Unit 3 Test

Unit:	Plate Tectonics	Duration:	3 weeks
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- What are Plate Tectonics?
- How has Earth Changed over time?
- How will Earth Change in the Future?
- What are the mechanisms that cause this change?
- What are expressions of this change on Earth's surface?
- What types of faults are produced at each of the three plate boundaries?

Affirmation Statements:

Students will be able to...:

- Identify the scientists that developed the theory of PT.
- Identify and describe the evidence supporting plate tectonics.
- Describe how Earth's continents have moved/changed over time.
- Explain how scientists study parts of the earth they cannot see, and the equipment they use.
- Explain what types of faults are produced at each of the three plate boundaries?

Labs:

- Plate Tectonics Web quest
- Plate Boundaries Lab

Quizzes:

- Plate Tectonics Quiz

Common Assessments:

- Unit 4 Test

Unit:	Earthquakes & Volcanoes	Duration:	3 weeks
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- How are the types of volcanoes linked to types of magma?
- How is the type of magma linked to the type of plate boundary?
- How is the type of volcano/eruption linked to type of plate boundary?
- What types of faults are produced at each of the three plate boundaries?
- Where, why, and how do earthquakes form?

Affirmation Statements:

Students will be able to...:

- Explain the relationship between convection currents in the mantle and Plate Tectonics
- Explain how scientists study parts of the earth they cannot see, and the equipment they use
- Describe how plate tectonics influences formation of volcanoes
- Identify the parts of a volcano
- Explain how magma type influences volcanic activity
- Define stress and strain
- Distinguish between the three types of movement of faults
- Contrast P-Waves and S-Waves
- Explain how seismic waves have been used to determine the structure of Earth's interior.
- Compare magnitude and intensity and the scales used to measure each

Labs:

- Volcano Movie Project
- Plate Tectonics, Volcanoes, Faults & Earthquakes Project

Quizzes:

- Earthquake Quiz
- Volcano Quiz

Common Assessments:

- Unit 5 Test