COURSE: Earth and Space Science **GRADE(S):** 8 **UNIT:** Introduction to general Science

This unit is aligned to the following…

Departmental Goals (#):

Using science skills to improve world
Promote Scientific Literacy
Linking science fields.

PA Academic/Core Standards:

3.4.8.A.2-Explain how controls are steps that people perform using information about the system that causes systems to change.
3.4.8.C.1-Evaluate the criteria and constraints of a design.
3.4.8.C.2-Explore the design process as a collaborative endeavor in which each person in the group presents his or her ideas in an open forum.
3.4.8.D.1-Test and evaluate the solutions for a design problem.
4.3.8.C-See Science as Inquiry in the Introduction for grade level

National Standards:

Applicable Disciplinary Thinking or Media Literacy Skills

DESIRED OUTCOMES

Established Unit Goals:

Students will be able to use scientific equipment we will be needing for the rest of the year.
Students will be able to set up given an observation

Big Ideas/Themes:

Scientific Method
Importance of Science on global, national, local and personal level

Essential Questions:

Why Does Science Matter?
What is science (theory, vs. content vs. process)

Students will know:

Scientific method,
Quantitative vs. qualitative data
What a hypothesis is
Dependent vs. independent variable.
Importance of science on a global, national local and personal level

Students will be able to:

Create hypothesis based on research,
Set up an experiment, based on a hypothesis.
Distinguish between quantitative and qualitative data
Distinguish between independent and dependent variables.
Come to conclusion based on evidence.
Back conclusions up with data / observations
Identify careers that science directly impacts/ require the use of scientific method.

ASSESSMENT/EVIDENCE

Performance Tasks:

Students will have a lab where they are required to form a hypotheses and set up an experiment
Students will have small introduction quiz
Bean Quiz

Other Evidence:

Group open ended discussions

Key Assessment Criteria:

students recording proper observations, drawing pictures, detailed notes ext.\
Students being able to set up and perform experiment after receiving observations and data, experiment makes sense and is carried out appropriately

COURSE: Earth Space Science **GRADE(S):** 8 **UNIT:** Skills unit

This unit is aligned to the following…

Departmental Goals (#):

Using science skills to improve world
Promote Scientific Literacy
Linking science fields.

PA Academic/Core Standards:

Explore the design process as a collaborative endeavor in which each person in the group presents his or her ideas in an open forum.
3.4.8.C.3-Analyze how a multidisciplinary (STEM) approach to problem solving will yield greater results.

National Standards:

Applicable Disciplinary Thinking or Media Literacy Skills

Problem Solving
Critical Thinking skills
Computer skills

DESIRED OUTCOMES

Established Unit Goals:

Students will be able to comprehend data from basic graphs and maps
Students will be able to gain basic measurement skills for length volume, mass, and density

Big Ideas/Themes:

Measuring
Graphing /graph analysis

Essential Questions:

Why is it important to know how to read a graph / map
Why is it important to be able to measure the length, mass, volume, and density of objects.

Students will know:

X axis vs. y axis
Three different types of graphs
The density of water
how density impacts fluids

Students will be able to:

Differentiate mass, volume length, and density
Plot data on graph given the data
Determine / understand a graph
Measure length, volume and mass
Calculate density

ASSESSMENT/EVIDENCE

Performance Tasks:

Mass lab
volume lab
Density lab
Density challenge
Graph creation Quiz

Other Evidence:

Key Assessment Criteria:

Ability to accurately measure mass of an object with triple beam balance
Ability to find volume of an object in two different ways
Able to make a film canister perfectly float in water

COURSE: Earth and Space Science **GRADE(S):** 8 **UNIT:** Rocks and minerals/ Composition

This unit is aligned to the following…

Departmental Goals (#):

Using science skills to improve world
Promote Scientific Literacy
Linking science fields.

PA Academic/Core Standards:

3.5.7 A describe earth features and processes.

National Standards:

Applicable Disciplinary Thinking or Media Literacy Skills

DESIRED OUTCOMES

Established Unit Goals:

Students will be able determine the composition of a given material using a graphic organizer and critical thinking.
Students will be able to describe the relationship of Earth's layers.

Big Ideas/Themes:

Earth's composition
Mapping

Essential Questions:

Why is it important to know how to read / create a map?
Why is it important to know the geology of an area where you live or work?

Students will know:

Layers of Earth
How to identify rocks
How to identify Minerals
Read topographic map

Students will be able to:

Differentiate between felsic, mafic, and intermediate minerals
Differentiate between sedimentary, igneous and metamorphic rocks

ASSESSMENT/EVIDENCE

Performance Tasks:

Mineral lab
Rock lab
Map project
Layers of the Earth model

Other Evidence:

Key Assessment Criteria:

Ability to distinguish between minerals based on their characteristics
Ability to identify mineral characteristics
Ability to distinguish between rocks based on characteristics

COURSE: Earth and space Science **GRADE(S):** 8 **UNIT:** Plate Tectonics

This unit is aligned to the following…

Departmental Goals (#):

Using science skills to improve world
Promote Scientific Literacy
Linking science fields.

PA Academic/Core Standards:

3.5.7 A describe earth features and processes.

National Standards:

Applicable Disciplinary Thinking or Media Literacy Skills

DESIRED OUTCOMES

Established Unit Goals:

Students will be able to analyze data from seismographs to determine when an earthquake hit.
Students will be able to identify signs of a natural disaster in order to prepare themselves.

Big Ideas/Themes:

Plate Tectonics
Mountain building
Earthquakes
Volcanoes

Essential Questions:

What causes natural disasters?
How do we best prepare for earthquakes?

Students will know:

How to prepare for a tsunami
The location of tectonic plates
The effect of shifting tectonic plates

Students will be able to:

Create an earthquake proof building
Create a week long earthquake report

ASSESSMENT/EVIDENCE

Performance Tasks:

Tectonics Map
Earthquake project
Building project

Other Evidence:

Key Assessment Criteria:

Ability to assess a seismogram
Ability to develop a logical design to outstand an earthquake

COURSE: Earth Science **GRADE(S):** 8 **UNIT:** Water

This unit is aligned to the following…

Departmental Goals (#):

Using science skills to improve world
Promote Scientific Literacy
Linking science fields.

PA Academic/Core Standards:

Explain the behavior and of Earth's water cycle

National Standards:

Applicable Disciplinary Thinking or Media Literacy Skills

DESIRED OUTCOMES

Established Unit Goals:

Gain an appreciation and learn about the special qualities of water
Understand the Water Cycle

Big Ideas/Themes:

Hydrogen Bonding
Specific Heat
Expanding Ice

Essential Questions:

How does water impact the Earth
Why is water so special

Students will know:

That water expands once it Freezes
The difference between cohesion and adhesion.

Students will be able to:

Explain why water as a naturally tendency to stick to substances
Create an image or act of the water cycle

ASSESSMENT/EVIDENCE

Performance Tasks:

Penny Lab
Water quiz

Other Evidence:

Key Assessment Criteria:

Completion and quality of data

COURSE: Earth Science **GRADE(S):** 8 **UNIT:** Weather

This unit is aligned to the following…

Departmental Goals (#):

Using science skills to improve world
Promote Scientific Literacy
Linking science fields.

PA Academic/Core Standards:

Describe basic elements of meteorology

National Standards:

Applicable Disciplinary Thinking or Media Literacy Skills

DESIRED OUTCOMES

Established Unit Goals:

Learn to read weather maps
Learn how to make educated predictions of weather
Create a hurricane proof structure

Big Ideas/Themes:

atmosphere
pressure
temperature
weather related disasters.

Essential Questions:

How do we predict the weather,
How do we hurricane proof buildings
What does the weather say about the atmosphere
How is weather changing

Students will know:

Difference between weather and climate
How pressure and temperature drive the weather

Students will be able to:

explain weather forecasts by interpreting weather data
Create a hurricane proof structure

ASSESSMENT/EVIDENCE

Performance Tasks:

Weather map lab
hurricane lab
weather quiz

Other Evidence:

Key Assessment Criteria:

quality of data assessment
logic of hurricane structure

COURSE: Earth Sciencce **GRADE(S):** 8 **UNIT:** Space

This unit is aligned to the following…

Departmental Goals (#):

Using science skills to improve world
Promote Scientific Literacy
Linking science fields.

PA Academic/Core Standards:

National Standards:

Applicable Disciplinary Thinking or Media Literacy Skills

DESIRED OUTCOMES

Established Unit Goals:

Discuss the benefits and negatives of space exploration
Describe how stars and planets form

Big Ideas/Themes:

Space exploration
solar system creation

Essential Questions:

How can we explore space?
Is there extra terrestrial life

Students will know:

How planets and stars form
Students be able to differentiate extra terrestrial objects.

Students will be able to:

Create a rocket based of given supplies
differentiate between meteors comets and satellites.

ASSESSMENT/EVIDENCE

Performance Tasks:

Rocket lab
space test

Other Evidence:

Key Assessment Criteria:

Students ability to logically build a rocket