

Lesson 1.1: Earth and Space Science - Introduction

Weekly Focus: Main Idea
Weekly Skill: Introduction

Lesson Summary: This week students will take a pre- self-evaluation to determine their background knowledge in Earth and space science. They will also work with readings related to this area of the GED science module in order to become more familiar with its content.

Materials Needed:

- Self-evaluation **Unit 1.1 Handout 1**
- Reading **Unit 1.1 Handout 2**
- Main Idea reading **Unit 1.1 Handout 3** (pages 1 & 2 from 6-way Paragraphs in the Content Areas – Middle Level)

Objectives: Students will be able to...

- Activate prior knowledge in Earth and space science
- Read passages with vocabulary related to the areas of study in Earth and space science

College and Career Readiness Standards: RI, RST, WHST, SL

ACES Skills Addressed: N, EC, DFP, LS, AL, CT, SM

Notes: Please review and be familiar with classroom routine notes for: 6-way Paragraphs reading techniques (**Routine 3 handout**), reading for fluency strategies (**Routine 2 handout**), summarizing techniques (**Routine 4 handout**), self-management skills (**Routine 4 handout**) The notes will help with making a smooth transition to each activity

GED 2014 Science Test Overview – For Teachers and Students

The GED Science Test will be 90 minutes long and include approximately 34 questions with a total score value of 40. The questions will have focus on three content areas: life science (~40%), physical science (~40%), and Earth and space science (~20%). Students may be asked to read, analyze, understand, and extract information from a scientific reading, a news brief, a diagram, graph, table, or other material with scientific data and concepts or ideas.

The online test may consist of multiple choice, drop down menu, and fill-in-the-blank questions. There will also be a short answer portion (suggested 10 minutes) where students may have to summarize, find evidence (supporting details), and reason or make a conclusion from the information (data) presented.

The work students are doing in class will help them with the GED Science Test. They are also learning skills that will help in many other areas of their lives.

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Activities:

Warm-Up:

Time: 15 minutes

As students enter the class, have students write in their journals, on a piece of notebook paper, or discuss with small groups the following: "What do you think is involved in the study of Earth and space science?" Note: write the question on the board or overhead. Circulate while students are writing. If students seem to be stuck with this question, try to prompt them with questions about what they already know about science and what science they have studied.

Activity 1: Pre- self-evaluation (Unit 1 Handout 1)

Time: 10 minutes

1) Hand out a self-evaluation sheet (Unit 1- Handout 1) for students. **2)** Have student rate their background knowledge of Earth and space science by using the Likert rating scale. Remind students this is a way for them to assess their own knowledge and determine which areas they may need to work on during this unit. **3)** Check to see if students are comfortable with sharing their self-evaluations, you can ask them how they answered each question, or they can share in pairs or table groups. **4)** Remind students to keep the evaluation in their folder/binder/notebook. Students will reassess with the bottom portion of the sheet (Unit 1.1 Handout 1) at the end of the unit.

Activity 2: Introduction to Earth & Space Science (Unit 1 Handout 2) Jigsaw Reading & Reporting

Time: 30 minutes

1) Put students into groups of 4 and label each group: A, B, C, D. **2)** Hand out one section of the reading in Unit 1.1 Handout 2 (labeled Group A, B, C, D) to appropriate group. **3)** Ask students to read their section individually and become experts of the material for their group. **4)** Have students turn their papers over and discuss with their group what their section is about. Tell students they should also discuss how they, as a group, will present the material to the class. Circulate to make sure students understand the objective and begin the discussion. **5)** Explain to students will present their portion of the reading to the class. While they are presenting, the other groups will take notes of the material. **6)** If time permits or for homework extension, students can do work on Page 2 of handout (to be printed on the back of Page 1). *Note: this may be an excellent opportunity for teacher to discuss Greek & Latin roots (geo = earth, ology = study of, astro = star, meteor = atmosphere, etc.)*

Break: 10 minutes

Activity 3: Main Idea Reading (Unit 1 Handout 3)

Time: 45 minutes

1) Hand out (Unit 1.1- Handout 3) for students. **2)** Explain how to use the 6-way Paragraph readings from Routine 3 Handout. **3)** Explain to students they should read passage silently and then answer questions. **4)** Review answers as a whole class **5)** Explain reading strategies from Routine 2 Handout and model fluent reading of passage while students highlight new vocabulary and read silently along **6)** teacher reviews vocabulary students highlighted **7)** Have students read passage to each other in pairs *Note: Classroom Routine 2 notes are used extensively in this activity.*

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Wrap-Up: Summarize	Time: 5 minutes
Have students turn to a partner (or write in their journals) about what they have learned today about Earth and space science. <i>Note: Use Routine 4 Handout</i>	

Extra Work/Homework:	Time: 30 minutes outside of class
Students can look at careers in Earth and space science: go to www.iseek.org - type in Earth science in the "search for careers" field to get information on careers in Earth science.	

Differentiated Instruction/ELL Accommodation Suggestions	Activity
If some student groups finish early, they can turn their paper over and brainstorm for reasons why their field of study topic in Earth and space science is important for society.	Handout 1.2
Teachers should be aware that ELLs could have some difficult time with pronunciation of some vocabulary during the group presentation.	

Online Resources: <http://geology.com/articles/what-is-earth-science.shtml>

Suggested Teacher Readings:

- GED Testing Service – GED Science Item Sample (to get an idea of what the test may be like)

<http://www.gedtestingservice.com/itemsamplerscience/>

- Assessment Guide for Educators: A guide to the 2014 assessment content from GED Testing Service:

<http://www.riaepdc.org/Documents/ALALBAASSESSMENT%20GUIDE%20CHAPTER%203.pdf>

- Minnesota is getting ready for the 2014 GED test! – website with updated information on the professional development in Minnesota regarding the 2014 GED.

http://abe.mpls.k12.mn.us/ged_2014_2

- Essential Education's 2014 GED Test Curriculum Blueprint (PDF)

<http://www.passged.com/media/pdf/educators/curriculum-blueprint.pdf>

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Unit 1.1 Handout 1 **Pre- and Post- Self Evaluation - Earth and Space Science Unit**

Pre-Evaluation

Question	Self-Rating				
1. I can state the main areas of study in Earth and space science.	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree
2. I can discuss the <i>Greenhouse Effect</i> .	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree
3. I can describe plate tectonics and their relationship to earthquakes.	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree
4. I can explain the basics of the <i>Big Bang</i> theory.	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree
5. I can understand some academic vocabulary related to Earth and space science.	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree

Post-Evaluation

Question	Self-Rating				
1. I can state the main areas of study in Earth and space science.	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree
2. I can discuss the <i>Greenhouse Effect</i> .	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree
3. I can describe plate tectonics and their relationship to earthquakes.	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree
4. I can explain the basics of the <i>Big Bang</i> theory.	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree
5. I can understand some academic vocabulary related to Earth and space science.	1 strongly agree	2 agree	3 somewhat agree	4 disagree	5 strongly disagree

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Unit 1.1 Handout 2

Earth Science Group Presentations – Page 1

Group A. You have approximately 5 minutes to read and prepare a presentation to the other groups on your subject matter: **Geology**. Some information on geology is listed below. You can add more information from a dictionary or the Internet if you would like.

The Four Earth Sciences

Many different sciences are used to learn about the earth, however, the four basic areas of Earth science study are: **geology**, meteorology, oceanography and astronomy. A brief explanation of these sciences is provided below.

Geology: Science of the Earth

Geology is the primary Earth science. The word means "study of the Earth". Geology deals with the composition of Earth materials, Earth structures, and Earth processes. It is also concerned with the organisms of the planet and how the planet has changed over time. Geologists search for fuels and minerals, study natural hazards, and work to protect Earth's environment.

Meteorology:

Oceanography:

Astronomy:

Unit 1.1 Handout 2 **Earth Science Group Presentations – Page 1**

Group B. You have approximately 5 minutes to read and prepare a presentation to the other groups on your subject matter: **Meteorology**. Some information on meteorology is listed below. You can add more information from a dictionary or the Internet if you would like.

The Four Earth Sciences

Many different sciences are used to learn about the earth, however, the four basic areas of Earth science study are: geology, **meteorology**, oceanography and astronomy. A brief explanation of these sciences is provided below.

Geology:

Meteorology: Science of the Atmosphere

Meteorology is the study of the atmosphere and how processes in the atmosphere determine Earth's weather and climate. Meteorology is a very practical science because everyone is concerned about the weather. How climate changes over time in response to the actions of people is a topic of urgent worldwide concern. The study of meteorology is of critical concern for protecting Earth's environment.

Oceanography:

Astronomy:

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Unit 1.1 Handout 2 **Earth Science Group Presentations – Page 1**

Group C. You have approximately 5 minutes to read and prepare a presentation to the other groups on your subject matter: **Oceanography**. Some information on oceanography is listed below. You can add more information from a dictionary or the Internet if you would like.

The Four Earth Sciences

Many different sciences are used to learn about the earth, however, the four basic areas of Earth science study are: geology, meteorology, **oceanography** and astronomy. A brief explanation of these sciences is provided below.

Geology:

Meteorology:

Oceanography: Science of the Oceans

Oceanography is the study of Earth's oceans - their composition, movement, organisms and processes. The oceans cover most of our planet and are important resources for food and other commodities. They are increasingly being used as an energy source. The oceans also have a major influence on the weather and changes in the oceans can drive or moderate climate change. Oceanographers work to develop the ocean as a resource and protect it from human impact. The goal is to utilize the oceans while minimizing the effects of our actions.

Astronomy:

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Unit 1.1 Handout 2 **Earth Science Group Presentations – Page 1**

Group D. You have approximately 5 minutes to read and prepare a presentation to the other groups on your subject matter: **Astronomy**. Some information on astronomy is listed below. You can add more information from a dictionary or the Internet if you would like.

The Four Earth Sciences

Many different sciences are used to learn about the earth, however, the four basic areas of Earth science study are: geology, meteorology, oceanography and **astronomy**. A brief explanation of these sciences is provided below.

Geology:

Meteorology:

Oceanography:

Astronomy: Science of the Universe

Astronomy is the study of the universe. Here are some examples of why studying space beyond Earth is important: the moon drives the ocean's tidal system, asteroid impacts have repeatedly devastated Earth's inhabitants and energy from the sun drives our weather and climates. A knowledge of astronomy is essential to understanding the Earth. Astronomers can also use a knowledge of Earth materials, processes and history to understand other planets - even those outside of our own solar system.

THE IMPORTANCE OF EARTH SCIENCE

Today we live in a time when the Earth and its inhabitants face many challenges. Our climate is changing and that change is being caused by human activity. Earth scientists recognized this problem and will play a key role in efforts to resolve it. We are also challenged to: develop new sources of energy that will have minimal impact on climate; locate new sources of metals and other mineral resources as known sources are depleted; and, determine how Earth's increasing population can live and avoid serious threats such as volcanic activity, earthquakes, landslides, floods and more. These are just a few of the problems where solutions depend upon a deep understanding of Earth science.

THINKING ABOUT SCIENCE

In each blank write the type of scientist (geologist, oceanographer, meteorologist, or astronomer) you would expect to find doing each of the following activities.

- _____ 1. Taking seismic measurements of Mount Pinatubo in the Philippines.
- _____ 2. Working for an oil exploration company in the Gulf of Mexico.
- _____ 3. Using information to predict where a hurricane may happen.
- _____ 4. Helping farmers with estimates of rainfall for next years' crops.
- _____ 5. Assisting with the prediction of solar flares.

What are some other work scenarios for:

Oceanographers:

Meteorologists:

Astronomers:

Geologists:

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Unit 1.1 Handout 1

Earth Science Group Presentations – Page 2 TEACHER ANSWER KEY

THE IMPORTANCE OF EARTH SCIENCE

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- oceanographer 2. Working for an oil exploration company in the Gulf of Mexico.
- meteorologist 3. Using information to predict where a hurricane may happen.
- meteorologist 4. Helping farmers with estimates of rainfall for next years' crops.
- astronomer 5. Assisting with the prediction of solar flares.

What are some other work scenarios for:

Oceanographers:

Answers may vary – explore ocean floors, study changes in oceans, study ocean animals and resources

Meteorologists:

Answers may vary – weather forecaster on TV, radio, newspaper, etc. , observe weather conditions with the military, airlines, electric companies (heat waves, ice storms, etc.), work with city and county officials to prepare for emergencies

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Astronomers:

Answers may vary – professors, NASA and other space exploration, observatories planetariums or science museums,

Geologists:

Answers may vary – professors, oil and natural resource exploration, study minerals and metals, study earthquakes and related natural occurrences.

TEACHER ANSWER KEY

(6-way Paragraphs – Middle Level #1 - pages 2 - 3)

Main Idea

- a. = B – broad idea
- b. = N – narrow idea
- c. = M – main idea
2. subject matter = b
3. supporting details = b
4. conclusion = a
5. clarifying devices = a
6. vocabulary in context = c