

uring the Power of Learning Unit 1.5: Earth and Space Science – Earth and Its Structure

Weekly Focus: Reading for Comprehension Weekly Skill: Finding Evidence

Lesson Summary: This week students will learn about Earth and its structure, specifically the theory of continental drift and its relationship to plate tectonics. Students will also continue work in the area of Scientific Method and its 5 steps.

Materials Needed:

- Unit 1.5 Earth Structure Video (Time: 2:24 min) & Note-taking Guide Unit 1.5 Handout 1
- Reading on Pangaea (2 pages) Unit 1.5 handout 2 (Spectrum Science, Gr. 6, pages 16-17)
- Reading on Scientific Method & Using Scientific Method (3 pages) <u>Unit 1.5 Handout 3 (6-way</u> Paragraph, Introductory Level, pages 144 – 145)
- Homework <u>Unit 1.5 Handout 4</u> (6-way Paragraphs Introductory Level, pages 40 41)
- Unit 1.5 Handout 5 Scientific Method Foldable Chart

Objectives: Students will be able to...

- Understand continental drift theory and its relationship to plate tectonics
- List the steps of the Scientific Method

College and Career Readiness Standards: RI, RST, WHST

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

Notes: Explain to students the importance of citing or finding evidence in reading passages to support theories and main ideas. The first activity is a video that lists evidence used in the theory of continental drift. The 2nd activity also cites evidence to support the theory. The 3rd activity has the students reading about the Scientific Method and searching for evidence. Remind students that searching for evidence from a reading passage is a skill needed on many modules or portions of the GED test as well as a college skill.

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.



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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.

Activities:

Wo	arm-Up: KWL – Continental Drift	(Pangaea)	Time: 10 minute	es
•	As students enter the class, ha	ve the following v	written on the bo	oard or overhead: "Continental
	Drift is the theory of one supercy years ago. It then broke apart	continent (called t and drifted to fo	Pangaea) that n rm the continent	nay have existed many millions of s that we know of today."
•	 Have students create a "KWL" chart on a piece of notebook paper (below). This helps to activate students' prior knowledge by asking them what they already Know (column 1); students (collaborating as a classroom unit or within small groups) set goals specifying what they Want to learn (column 2); and after reading students discuss what they have Learned (column 3). Students apply higher-order thinking strategies which help them construct meaning from what they read and help them monitor their progress toward their goals. 			
K٧	KWL Chart:			
Κ	- What (else) do I KNOW?	W - What do I W	ANT to know?	L - What did I LEARN?

K - What (else) do I KNOW?	W - What do I WANT to know?	L - What did I LEARN?
<u>.</u>		·

Activity 1: Unit 1.5 Handout 1 and Video Time: 15 minutes

1) Hand out (<u>Unit 1.5 Handout 1</u>) to students. 2) Explain to students they will watch a video and take notes and answer questions from the video, the notes are for their own information and background knowledge on continental drift and plate tectonics 3) ask students to write down questions they may have from the video 4) After watching video, review answers to questions as a whole class.

Activity 2: Reading for Comprehension (Unit 1.5 Time: 30 - 40 minutes Handout 2)

Distribute <u>Unit 1.4: Handout 2</u> to students. 2) discuss with students that when reading for comprehension, there are many strategies to use: <u>read the title</u> to predict what the reading is about; look at the <u>words in bold</u> and their definitions on the left side of page; if there are <u>images</u>, look at them to get a better understanding; while reading remember to ask "<u>What is this all about</u>?"
 Have students read the passage and answer the questions independently 4) circulate class while they are reading to make sure they understand the information presented and see if there are any questions 5) review answers as a whole class – note: some answers may vary – ask students with different answers to discuss theirs with the class. 6) Have students fill in the "L" part of their KWL chart to reinforce what was learned from the video. 7) If there is extra time, have students read passage in pairs to promote reading fluency.



Break: 10 minutes

Activity 3: Scientific Method & Using the Scientific Time: 50 minutes Method (Unit 1.5 Handout 3)

Activate student's prior knowledge from the last lesson and ask them what they remember about the Scientific Method – write their answers on board to review for those who may have been absent 2) Hand out <u>Unit 1.5: Handout 3</u> to students. 3) Explain to class they do not have to be a scientist to take the GED Science test, but they do have to know some parts of the Scientific Method. There may be a few questions on the test where students will read about a science experiment and then will have to understand or point out certain steps or parts of the experiment. This reading may be similar to what they will have to do on a GED Science test. 4) Have students read passages silently and answer questions. Circulate the room to make sure students are able to handle the material. Answer any questions they may have 5) Review answers as a whole class and make sure students understand correct answers 6) Teacher reads passage and students highlight new vocabulary 7) teacher reviews vocabulary 8) students read passage to each other in pairs if there is time Note: Classroom routine 3: "6-way paragraphs" is used in this activity. 9) if needed, make a copy of Unit 1.5 Handout 5 for students to study (foldable Scientific Method)

Wrap-Up: Summarize

Time: 5 minutes

Have students turn to a partner (or write in their journals) about what they have learned today about the Scientific Method. If the students seem to be a bit confused about it, ask them to write one question or wondering they have from the reading passage. Note: Can use summarizing notes from classroom routines.

Extra Work/Homework: Fossils (Unit 1.5 Handout 4)	Time: 30 minutes outside of class
Students can read and answer questions from the ((p. 40 - 41) "Fossils". This is an excellent opportunity format.	5-way Paragraphs (Introductory Level) reading #20 for students to review material in a different

Differentiated Instruction/ELL Accommodation Suggestions	Activity
If some students finish early, they can use the time to practice summarizing a	Unit 1.5 Handout 2
multi-paragraph reading.	or
There may be a lot of ideas with the Scientific Method. There is a handy	Unit 1.5 Handout 5
foldable chart for studying <u>Unit 1.5 Handout 5.</u> You may want to make a copy	
for all.	

Online Resources: The Scientific Method explained in detail:

http://teacher.nsrl.rochester.edu/phy_labs/appendixe/appendixe.html

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



^{The Power of Learning} Unit 1.5: Earth and Space Science – Earth and Its Structure

Unit 1.5 Handout 1

Continental Drift Video

While watching the video, try to answer some of the following questions. There is also space for you to write your own questions on the subject.

- 1. According to the video, which two continental coastlines look like they match up?
- 2. According to the video, how many years ago were the continents joined together in a single super continent?
- 3. What is some <u>additional evidence</u> German Scientist Alfred Wegener offered for proof of continental drift?
- 4. According to the video, what evidence did other scientists provide years later to support theory of continental drift?
- 5. What questions or wonderings do you have about Pangaea or continental drift?

6. List the seven continents in alphabetical order:

1.	5.
2.	6.
3.	7.
4.	

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Video Continental Drift Video – TEACHER ANSWER KEY

While watching the video, try to answer some of the following questions. There is also space for you to write your own questions on the subject.

1. According to the video, which two continental coastlines look like they match up?

(Africa and South America)

- 2. According to the video, how many years ago were the continents joined together in a single super continent? (200 million)
- 3. What is some additional evidence German Scientist Alfred Wegener offered for proof of continental drift?

(fossils of identical animals in both South America and Africa; plant fossils in cold arctic regions)

4. According to the video, what evidence did other scientists provide years later to support theory of continental drift?

(Scientists mapped the ocean floor)

- 5. What questions or wonderings do you have about Pangaea or continental drift?
- 6. List the continents in alphabetical order:
 - 1. Africa 5. Europe
 - 2. Antarctica 6. North America
 - 3. Asia 7. South America
 - 4. Australia

(Note: In some school systems around the world, students are taught there are 5 continents (no Antarctica and the Americas are one continent); however in the US, we go with 7.

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Unit 1.5 Handout 3 (or copy – 6-way Paragraph, Introductory – pages 144 – 145)

ANSWER KEY		
1.	Main Idea a. B b. N c. M	
2.	C	
3.	A	
4.	В	
5.	D	
6.	A	

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Sharing the Power of Learning Unit 1.5: Earth and Space Science – Earth and Its Structure

Unit 1.5 Handout 3

Using the Scientific Method

1. Read the passage and fill in the Scientific Method chart.

How Penicillin Was Discovered

In 1928, Sir Alexander Fleming was studying Staphylococcus bacteria growing in culture dishes. He noticed that a mold called *Penicillium* was also growing in some of the dishes. A clear area existed around the mold because all the bacteria that had grown in this area had died. In the culture dishes without the mold, no clear areas were present.

Fleming hypothesized that the mold must be producing a chemical that killed the bacteria. He decided to isolate this substance and test it to see if it would kill bacteria. Fleming transferred the mold to a nutrient broth solution. This solution contained all the materials the mold needed to grow. After the mold grew, he removed it from the nutrient broth. Fleming then added the nutrient broth in which the mold had grown to a culture of bacteria. He observed that the bacteria died.

1. What was the observation?	
2. What was the hypothesis?	
3. How was the hypothesis tested?	
4. What was the result of the experiment?	
5. What conclusion could be drawn?	

2. Answer the GED-type question based on the Scientific Method.

In 1887 a strange nerve disease attacked the people in the Dutch East Indies. The disease was beriberi. Symptoms of the disease included weakness and loss of appetite; victims often died of heart failure. Scientists thought the disease might be caused by bacteria. They injected chickens with bacteria from the blood of patients with beriberi. The injected chickens became sick. However, so did a group of chickens that were not injected with bacteria.

One of the scientists, Dr. Eijkman, noticed something. Before the experiment, all the chickens had eaten wholegrain rice, but during the experiment, the chickens were fed polished rice. Dr. Eijkman researched this interesting case. he found that polished rice lacked thiamine, a vitamin necessary for good health. Which of the following conclusions is based on the experiment described in the passage?

- (1) Humans can catch beriberi from diseased
- (2) Beriberi only occurs in the Dutch East Indies.
- (3) Scientists have not yet determined which bacteria cause beriberi.
- (4) Adequate intake of thiamine prevents beriberi disease.
- (5) Whole grain rice and polished rice have equivalent nutritional value.



Reading Selections: http://www.biologycorner.com/worksheets/scientificmethodstories.html This work is licensed under a <u>Creative Commons Attribution-NonCommercial-ShareAlike 3.0 United States License</u>.



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Unit 1.5 Handout 3 ANSWER KEY

1. What as the observation ?	Where there was <i>Penicillium</i> mold, there were also dead bacteria.
2. What was the hypothesis ?	The mold must produce a chemical that kills the bacteria.
3. How was the hypothesis tested ?	Grow more of the mold separately and then return it to the bacteria.
4. What was the result of the experiment?	When the material is returned to the mold, the bacteria died.
5. What conclusion could be drawn?	Penicillium kills bacteria.

2. Choice (4) is correct because the doctor saw that when the chickens ate whole-grain rice with thiamine, they did not have the disease.

Choice (1) is incorrect because the chickens were used in the experiment; they had nothing to do with the disease.

There is nothing to support choice (2); the passage only mentions the conditions in the Dutch East Indies and the beriberi was widespread.

Choice (3) is incorrect because the passage points out that before the experiments, scientists incorrectly thought beriberi was caused by bacteria.

Choice (5) is incorrect because the doctor found that the polished rice lacked thiamine, so the two types of rice don't have the same nutritional value.



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Unit 1.5 Handout 5

	Scientific N	Method Foldable for Studying	
	Fc	old paper on black line and quiz yourself	
	A step-by-ste <u>p method for solv</u> ing problems		
1	State the Problem	State the problem in the form of a question	
2	Research the problem	Gather information on your problem	
3 Propose a Hypothesis Propose an educated guess as to the		Propose an educated guess as to the answer to the	
•		problem. MUST be an if/then statement	
4	Experiment	Experiment or test should contain these elements:	
	Independent Variable (IV)	The variable changed on purpose	
	Dependent Variable (DV)	The variable that responds to the change	
	Constants	All factors that are kept the same and can not change	
	Control Group	No tests are performed on the control group so you can compare results with the experimental group.	
5	Record Observations	Create a Data Table	
	Collect Data	GRAPH Results	
	Analyze Results		
6	Conclusion	What was the purpose of the experiment?	
		What were the findings?	
		What neesible explanations can you offer for your finding?	
		What recommendations do you have to improve your	
		experiment or recommendations for further study?	
		If hypothesis is incorrect, you must create a new one.	

Theory	An explanation that has been proven correct so far by repeate tests.	
Law	Basic fact describing the behavior of a natural phenomenon. Ex: Newton's Law of Gravity – What goes up – must come down	

H. Turngren, Minnesota Literacy Council, 2013