Lesson 2.7: Physical Science – Chemical Reactions & Matter Review

Weekly Focus: Comprehension
Weekly Skill: Unit 2.1 – 2.6 review

Lesson Summary: This week students will continue with chemical reactions and the pH scale in the form of a comprehension reading. There will also be a review of Units 2.1 – 2.6.

Materials Needed:

- Reading with comprehension questions **Unit 2.7 Handout 1**
- Unit 2.1 – 2.6 Review Quiz **Unit 2.7 Handout 2**
- Extra Work **Unit 2.7 Handout 3**: "Carbon Is Everywhere"(6-way Paragraphs, Middle Level #60, pages 120-121)

Objectives: Students will be able to…

- Activate prior knowledge in physical science related to chemical reactions
- Complete a review of Unit 2.1 - 2.6 to assess overall comprehension

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

ACES Skills Addressed: EC, LS, ALS, CT, SM

Notes: Please review and be familiar with classroom routine notes for: reading for fluency strategies (**Routine 2**), summarizing techniques (**Routine 4**), and self-management skills (**Routine 4**). 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: Journal Writing	Time: 5 - 10 minutes
As students enter the class, Write on the board "*What is the importance of knowing the pH of a substance?*" Ask students to write about this in their notebooks or journals. Remind them this is a review of some of the fundamental information from the previous lesson and it is a way to engage students to think back to the experiments conducted in the last unit. Circulate while students are writing and give prompts. If there are new students or students who missed the previous lesson, ask them to discuss the topic with a student who conducted the experiment. It is an excellent opportunity to demonstrate their knowledge.	

Activity 1: Acid or Base? (Unit 2.7 Handout 1)	Time: 35- 40 minutes
1) Hand out **Unit 2.7 Handout 1** to students. **2)** Discuss with students that when reading, they should pay close attention to what all of the passage is about. This passage has a connection to ideas and information from Unit 2.6. **3)** Ask students to read the passage and answer the questions that follow. Circulate the class while students are working independently to help as needed. Remind students to review the guide words in bold on the left to help with new vocabulary. **4)** When students are finished, review answers as a whole class. **5)** Ask for students to share their answers if they would like. If there is time, you may have students practice reading for fluency and read the passage to each other in pairs.	

Break: 10 minutes

Activity 2: Review (Unit 2.7 Handout 2)	Time: 40 – 50 minutes (~2 minutes per question)
1) Hand out **Unit 2.7 Handout 2** to students. **2)** Explain that over the past 6 weeks, they have studied various aspects of Physical Science as it relates to parts of the GED Science module. **3)** Ask students to recall some of the areas they have studied and write their answers on the board. Point out that this is one strategy to do prior to a test: overall review of information covered. **4)** Discuss with students although this is not a "timed" test as the GED test will be, it is important to review some test taking strategies. Explain to them they can use the same strategies for many different tests they may have to take, such as the TABE, GED, or Accuplacer (college entrance exam) tests. Strategies include: 1. Read instructions first 2. Read question and possible answers 3. Make sure you understand what the question is asking 4. Skim and scan for information 5. Mark an answer for every question 6. Keep an eye on the clock (for a timed test) **5)** Have students begin the review. Circulate as needed to help struggling or newer students with the material. Remind students the questions may be worded differently from the study materials,	

similar to what they can expect on a test.
6) Review answers as a whole class.
7) Ask for students to share their answers and what evidence or information helped them find the answer. Remind students that there can be different possible answers for some questions and the writing portion on the GED Science module. What is important is that they cite evidence to support their answer.
8) Have students circle the questions they didn't have correct. They should note this is an area they may need to study further.

Wrap-Up: Summarize	**Time: 5 minutes**
Have students turn to a partner (or write in their journals) about what they have learned today as a review of Units 2.1 – 2.6 in Physical Science. They may want to discuss some of the areas that they would like to do further study on in the future. Ask them to tell a partner what matter is in one or two sentences. *Note: Use Routine 4*	

Extra Work/Homework: Unit 2.7 Handout 3	**Time: 30 minutes outside of class**
Students can read and answer questions from the **6-way Paragraphs** (Middle Level # 60, pages 120-121) "Carbon Is Everywhere". Copy the pages for the student directly from the book. This is an excellent opportunity for students to review previous material in an independent manner.	

Differentiated Instruction/ELL Accommodation Suggestions	**Activity**
If some student groups finish early, they can turn their paper over and summarize the reading passage.	**Handout 1**

Online Resources:

American Physical Society - http://www.aps.org/studentsandeducators/index.cfm

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 2014 GED Classroom: **ATLAS** (ABE Teaching and Learning Advancement System)

  http://atlasabe.org/resources/ged/science

Unit 2.7 Handout 1 (three pages)

Section: Acid Precipitation

Read the passage below and answer the questions that follow.

Thousands of lakes throughout the world are victims of acid precipitation, which is also known as acid rain. Acid precipitation is precipitation such as rain, sleet, or snow that contains a high concentration of acids. When fossil fuels are burned, they release oxides of sulfur and nitrogen. When the oxides combine with water in the atmosphere, they form sulfuric acid and nitric acid, which fall as acid precipitation. This acidic water flows over and through the ground, and into lakes, rivers, and streams. Acid precipitation can kill living things, and can result in the decline or loss of some local animal and plant populations.

A **pH** (power of hydrogen) number is a measure of how acidic or basic a substance is. The lower the number on a pH scale, the more acidic a substance is; the higher a pH number is, the more basic a substance is. Each whole number on the pH scale indicates a tenfold change in acidity.

IDENTIFYING MAIN IDEAS

One reading skill is the ability to identify the main idea of a passage. The main idea is the main focus or key idea. Frequently, a main idea is accompanied by supporting information that offers detailed facts about main ideas.

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

_____ 1. In which of these forms does acid precipitation reach the surface of Earth?
a. light
b. energy
c. precipitation
d. oxides

_____ 2. What is harmed by acid precipitation?
a. lakes, rivers, and streams
b. plant populations
c. animal populations
d. all of the above

_____ 3. What does acid precipitation contain that is harmful to living things?
a. particulate matter
b. fossil fuels
c. sulfuric acid and nitric acid
d. calcium carbonate

VOCABULARY DEVELOPMENT

Read each question and write the answer in the space provided.

4. What three forms can acid precipitation take?

_____

5. When an author puts something in parentheses, he or she is often explaining the word or term that came just before. How does this author use parentheses to explain pH?

_____

_____

6. What does a pH number tell you?

_____

_____

SEQUENCING INFORMATION

One reading skill is the ability to sequence information, or to logically place items or events in the order in which they occur.

Sequence the statements below to trace the path of acid precipitation. Write "1" on the line in front of the first step, "2" on the line in front of the second step, and so on.

_____ 7. The oxides combine with water in the atmosphere.

_____ 8. Acid precipitation falls.

_____ 9. Sulfuric acid and nitric acid are formed.

_____10. The decline or loss of plant and animal populations can occur.

_____11. Fossil fuels are burned, releasing sulfur and nitrogen oxides.

_____12. Acidic water runs over and through the ground, and into lakes, rivers, and streams.

RECOGNIZING SIMILARITIES AND DIFFERENCES

One reading skill is the ability to recognize similarities and differences between two phrases, ideas, or things. This is sometimes known as comparing and contrasting.

Read the question and write the answer in the space provided.

13. What does it mean when something has a high pH level? a low pH level?

_____

_____

_____

RECOGNIZING CAUSE AND EFFECT

One reading skill is the ability to recognize cause and effect.

Read each question and write the answer in the space provided.

14. What is the basic cause of acid precipitation? What are some effects?

_____

_____

_____

Extra Challenge: Write the main idea of the reading passage:

_____

_____

_____

Unit 2.7 Handout 2 (four pages)

Mid-Unit Review: Physical Science

Name: _____ **Date:** _____

Directions: Read each question carefully and choose the best answer. Circle the answer.

1. What is an atom?

A. a molecule **B.** a proton

C. a neutron **D.** smallest pieces of matter on Earth

2. What is an electron-cloud atom?

A. electrons located in clouds **B.** a model of the atom

C. a model of a molecule **D.** a model of a nitrogen atom

3. What are elements made of?

A. different types of atoms **B.** the same types of atoms

C. different types of chemicals **D.** all of these

4. If an atom has 18 protons, how many electrons does it have?

A. 8 **B.** 32

C. 18 **D.** 2

5. What is an atomic number?

A. the number of protons in an atom **B.** the number of electrons in an atom

C. the number of neutrons in an atom **D.** the number of neutrons and protons in an atom

6. How is a compound different from a mixture?

A. One is a solution the other is not.

B. Compounds are chemically bonded, mixtures are not.

C. Mixtures are chemically bonded, compounds are not.

D. Compounds have more atoms than mixtures.

7. What information does a chemical formula provide?

A. The number of atoms in a compound **B.** The number of protons in a compound

C. how many atoms of each elements make up the compound **D.** none of these

8. What is a solution?

A. a compound **B.** a solute

C. a solvent **D.** a kind of mixture

9. What is a substance that dissolves called?

A. a solution **B.** a solute

C. a solvent **D.** a mixture

10. What is a solvent?

A. a substance that a solute dissolves into **B.** a substance that s solution dissolves into

C. an acid solvent **D.** a base solvent

11. What does the pH scale measure?

A. bases **B.** acids

C. toxins **D.** acids and bases

12. If a solution is a 2 on the pH scale, it is?

A. a strong acid **B.** a strong base

C. neutral **D.** none of these

13. What are the columns in the periodic table called?

A. periods **B.** types

C. liquids **D.** families

True-False Assessment

Directions: Read each statement carefully. If the statement is true, put a **T** on the line provided. If the statement is false, put an **F** on the line provided.

14. _____ Atoms are the smallest pieces of matter on Earth.

15. _____ There are one thousand different kinds of elements.

16. _____ An element can be a metal, nonmetal, or metalloid.

17. _____ An electron-cloud model is model of an atom.

18. _____ Compounds are chemically bonded.

19. _____ A concentration measures how much solute can dissolve in a solvent.

20. _____ A chemical formula tells how many neutrons are in a compound.

Short Answer Assessment

Read each question or statement carefully. Write a short response of a few sentences in the space provided.

21. Explain why the air Earth's atmosphere is a mixture, not a compound.

_____

_____

_____

_____

22. What effect does heat have on the atoms and molecules in matter?

_____

_____

_____

_____

23. Explain the difference between a mixture and a solution. Provide examples.

_____

_____

_____

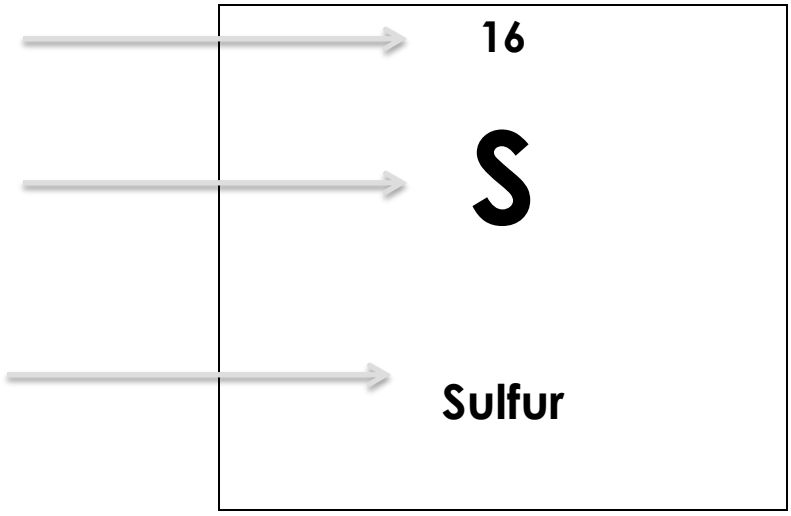
_____

24. Label the parts of the element symbol:

_____

_____

_____



What are some areas that you may need to review from Units 2.1 – 2.6 in Physical Science?

_____

_____

_____

_____

_____

_____

Unit 2.7 Handout 2 (four pages for students to complete)

TEACHER ANSWER KEY:

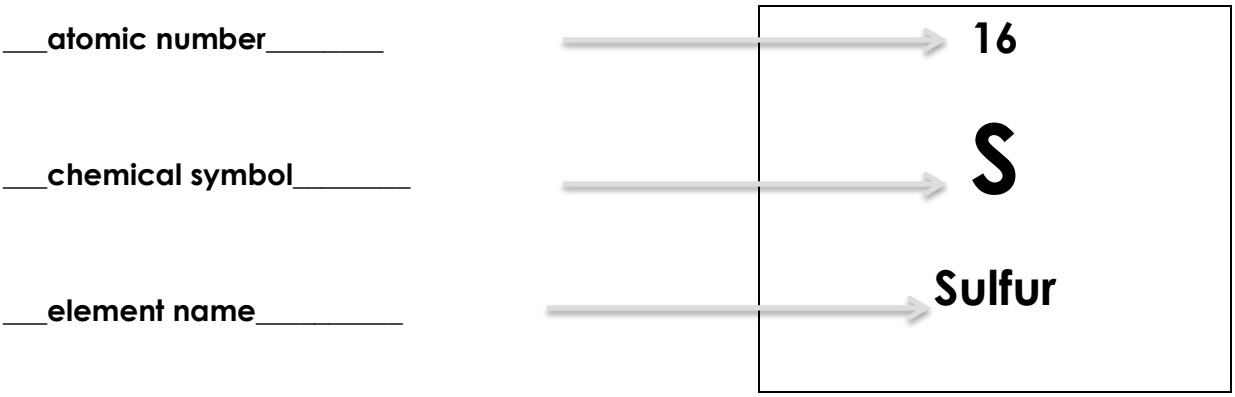
1.	D	2.	B	3.	B	4.	C
5.	A	6.	B	7.	C	8.	D
9.	B	10.	A	11.	D	12.	A
13.	D	14.	T	15.	F	16.	T
17.	T	18.	T	19.	T	20.	F

21. Answers may vary. Possible answer: *The different substances in the air can be easily separated because they aren't chemically bonded.*

22. Answers may vary. Possible answer: *The heat gives the molecules more energy, so they move around more quickly.*

23. Answers may vary. Possible answer: *Mixtures are substances that are not chemically bonded. For example, a fruit salad could be called a mixture. In such a mixture, it would be easy to separate the parts (the grapes, strawberries, pineapple, etc.) that make up the mixture. Solutions are mixtures in which you can't see the individual materials that make up the mixture. An example could be a glass of salt water. It would be difficult to the see the salt once you stirred it into the s=water and it dissolved.*

24. Label the parts of the element symbol:



Unit 2.7 Handout 3 ANSWER KEY

1. a. M (main)
   b. B (broad)
   c. N (narrow)
2. b
3. a
4. d
5. b
6. a