

Lesson 2.18: Physical Science – Energy & Physical Science Review

Weekly Focus: Test-Taking Strategies

Weekly Skill: Review of Physical Science Lessons 2.8 – 2.17

Lesson Summary: This week students will have the opportunity to review physical science from lessons 2.8 to 2.17. They will then use test-taking strategies on a physical science test.

Materials Needed:

- Review lessons 2.8 – 2.17: **Unit 2.18 Handout 1**
- Review Quiz: **Unit 2.18 Handout 2**
- Post Self-Evaluation: **Unit 2.18 Handout 3** (use the bottom part of Unit 2.1 Handout 1 or use Unit 2.18 Handout 3)
- **Extra Work/Homework: Unit 2.18 Handout 4** (Spectrum Science, Grade 8, pages 6-7)

Objectives: Students will be able to...

- Activate prior knowledge in physical science from previous lessons
- Demonstrate knowledge with GED 2014-like questions
- Self-evaluate their knowledge in physical science

College and Career Readiness Standards: RI, RST, WHST

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

Notes: Please review and be familiar with classroom routine notes for: summarizing techniques (**Routine 4**), and self-management skills (**Routine 1**). 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 two short answer portions (suggested 10 minutes each) 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: Review Notes

Time: 5 - 10 minutes

As students enter the class, have the following written on the board or overhead **“We will review lessons 2.8 – 2.17 before taking a test on physical science.”** While students enter the room, ask them to take out the notes from the lessons listed on the board. This is the time they should review their notes. If there are new students, you may want to give them handouts from the lessons covered on the test, **or they can work on a previous reading from any of the units.**

Activity 1: Unit Review 2.18 Handout 1

Time: 30 - 40 minutes

- 1) Distribute the handout to students.
- 2) Have students work independently or together to fill in the blanks with what they remember of the lessons.
- 3) Ask students to try to fill in the blanks with information they recall without looking at their notes.
- 4) After they have filled in the information from what they remember, encourage them to look at their notes to fill in more information.
- 5) While students are reviewing the lessons, circulate the class to answer questions or prompt them as needed.
- 6) If there is time, review some of the key concepts from each lesson (listed in parenthesis) as a whole class.
- 7) This may be a good opportunity for students to get information from lessons they may have missed.

Break: 10 minutes

Activity 2: Unit Test: Unit 2.18 Handout 2

Time: 45 - 50 minutes

- 1) Hand out **Unit 2.18 Handout 2** to students.
- 2) Explain that over the past 10 weeks, they have studied various aspects of Physical Science as it relates to parts of the 2014 GED Science module.
- 3) Discuss with students that 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 that 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).
- 4) 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.
- 5) Review answers as a whole class.
- 6) Ask 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. There will also be two written responses on the 2014 GED Science module.
- 7) Have students circle the questions they didn't have correct. They should note this is an area they may need to study further. They should refer back to their handouts for the lessons that

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covered that content area.

Wrap-Up: Fill out Self Evaluation (post) Unit 2.18 Handout 3

Time: 5 - 10 minutes

- 1) Hand out a self-evaluation sheet (**Unit 2.1 Handout 1 or Unit 2.18 Handout 3**) for students.
- 2) Have students rate their post-unit knowledge of physical 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 continue to work.
- 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) It may be useful for you to see how students evaluated themselves to determine what areas may need to be reviewed. If possible circulate to see how students evaluated their knowledge and take notes.
- 5) Ask students to discuss methods they can review and study some of the material on their own.

Extra Work/Homework: Unit 2.18 Handout 4

Time: 20 minutes outside of class

Students can continue with work on physical science inquiry. This handout is an opportunity for students to get an overview of scientific reasoning and processes.

Differentiated Instruction/ELL Accommodation Suggestions	Activity
If some students finish early, they can assist new students with getting the information from the units. Other students may wish to work with others to help them with the review. (Unit 2.18 Handout 1)	Activity 1
There may be some new concepts and/or vocabulary for new students. Please make sure they are comfortable with the vocabulary. If needed, have students work in groups of students who have been in class longer (Unit 2.18 Handout 2)	Activity 2

Online Resources:

If students have Internet connection, they should try to take the free practice test for 2014 GED Science Module. This test is not scored, but students can get an idea of what some of the questions are on the real test. If you have time, you may want to use the test as a teaching tool for the entire class. It could be a great opportunity to review the digital literacy skills needed for the test.

http://www.gedtestingservice.com/freepractice/download/GED_Science/GEDSciencePracticeTest.html

Students can also try an online test (click in the appropriate boxes (Science 8) (20 or 40 questions) and type in name. It is another good practice for online test taking.

<http://education.jlab.org/solquiz/>

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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
- ATLAS: ABE Teaching & Learning Advancement System: 2014 GED[®] Classroom: Science: Minnesota's state-wide website for resources for the science module
<http://atlasabe.org/resources/ged/science>

Unit 2.18 Handout 1 (2 pages total)

Lessons 2.8 – 2.17 Review

Write information you recall from each topic in physical science in the space provided below. If you were absent for one of the topics, check with the teacher to see about getting copies of the material(s).

Lesson 2.8 **Force and Motion** (net forces, gravity, friction)

Lessons 2.9 & 2.10 **Newton's Laws of Motion** (Law 1, Law 2, Law 3)

Lessons 2.11 & 2.12 **Energy & Work** (Potential, Kinetic, $W = F \times d$, Newtons, joule)

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Lessons 2.13 & 2.14 **Light & Sound Waves** (waves, spectrum, frequency, transverse)

Lessons 2.15 **Speed, Velocity & Acceleration** (formulas for problem solving)

Lessons 2.16 **Energy Transfer** (forms of energy, changes from one form to another)

Lessons 2.17 **Conservation of Energy** (law, pendulum, First Law of Thermodynamics)

Unit 2.18 Handout 2 (four pages) **End of Unit Review: Physical Science**

Name: _____ Date: _____

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

- Chose a phrase that best completes this statement. When a substance burns, _____.
 - a physical reaction takes place
 - the atoms of the original substance are rearranged
 - a new substance is produced that has different atoms
 - a solution forms
- Sound and light energy are carried by?
 - waves
 - pitch
 - color
 - decibel
- An object that does not conduct heat very well is a(n) _____.
 - conductor
 - insulator
 - radiator
 - elastomer
- The number of vibrations a wave goes through in a given time is its?
 - wavelength
 - frequency
 - shortness
 - amplitude
- Underline the correct word in bold to make the statement true: **Thermodynamics**, **Electromagnetism** is the study of how energy moves through the universe.
- The weight of a pendulum is pulled back and released. As it swings back and forth, each complete swing is slightly shorter than the one before it. Although the distance of each swing decreases, the amount of time each swing takes remains the same. Which sentence correctly describes the weight's inertia (the resistance of an object to change its state of motion)?
 - The first swing has more inertia than the final swing.
 - The first swing has less inertia than the final swing.
 - The first and final swings have equal amounts of inertia.
 - The weight does not have any inertia until it has stopped moving.

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7. Describe one way that sunlight can be turned into electricity.

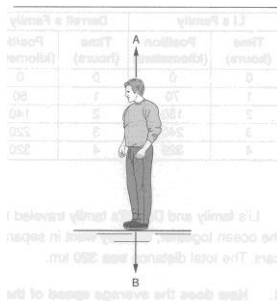
8. Why does a black jacket appear black?

- A. it emits all the colors of light B. it reflects all the colors of light
C. it refracts all the colors of light D. it absorbs all the colors of light

9. Solar energy reaches Earth through _____.

- A. conduction B. thermal
C. fission D. radiation

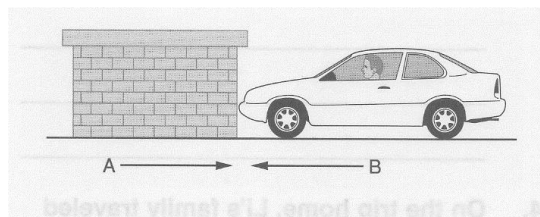
10. Which arrow below represents the force of gravity acting on the man?



A.

B.

11. What do the arrows A and B represent?



Lesson 2.18: Physical Science – Energy & Physical Science Review

12. When a ball rolls down a hill, _____.
- A. kinetic energy changes to potential energy B. potential energy changes to kinetic energy
C. chemical energy changes to electrical energy D. electrical energy changes to chemical energy
13. Which color of visible light has the longest wavelength?
- A. red B. orange C. green D. blue
14. Where does the energy for almost all ecosystems originate?
- A. from the producers B. from the consumers
C. from the soil D. from the sun
15. The tendency of an object at rest to stay at rest and an object in motion to continue moving is described by the law of _____.
- A. momentum B. friction C. inertia D. gravity
16. Dividing distance by time will help you estimate _____.
- A. acceleration B. speed C. density D. displacement
17. The momentum of an object can be determined if the mass of an object is multiplied by its:
- A. friction B. inertia C. velocity D. acceleration
18. The mass of objects and the distance between them affects the
- A. coefficient B. rolling friction C. newton D. gravitational force
19. Which of these is an example of the effect of gravity?
- A. A paperclip moves toward a magnet.
B. A soccer ball slows down while rolling through grass.
C. A race car speeds up when the driver pushes the gas pedal.
D. A baseball falls to the ground.

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20. What equation describes the second law of motion?
- A. Force = mass x inertia B. acceleration = force ÷ mass
- C. acceleration = force x mass D. acceleration = mass x velocity

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.

21. ____ An object must have motion in order to have momentum.
22. ____ Inertia is the tendency for an object to resist a change in its motion.
23. ____ Velocity measures only speed.
24. ____ Friction produces heat.
25. ____ Compounds are chemically bonded.
26. ____ All the forces acting on an object are called net forces.

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

27. Derrick gives his dictionary a quick shove across the table. The dictionary moves a short distance across the table, but quickly slows down and stops. Explain why the dictionary does not keep moving across the table. Then describe how Derrick could make the dictionary move farther across the table without changing the force he exerts on it.

28. Which force affects the oceans' tides? Briefly explain how this happens.

Unit 2.18 Handout 2 (four pages) **End of Unit Review: Physical Science**

TEACHER ANSWER KEY

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

- Chose a phrase that best completes this statement. When a substance burns, _____.
A. a physical reaction takes place
B. the atoms of the original substance are rearranged
C. a new substance is produced that has different atoms
D. a solution forms
- Sound and light energy are carried by ?
A. waves **B. pitch** **C. color** **D. decibel**
- An object that does not conduct heat very well is a(n) _____.
A. conductor **B. insulator** **C. radiator** **D. elastomer**
- The number of vibrations a wave goes through is a given time is its?
A. wavelength **B. frequency** **C. shortness** **D. amplitude**
- Underline the correct word in bold to make the statement true: **Thermodynamics**, **Electromagnetism** is the study of how energy moves through the universe.
- The weight of a pendulum is pulled back and released. As it swings back and forth, each complete swing is slightly shorter than the one before it. Although the distance of each swing decreases, the amount of time each swing takes remains the same. Which sentence correctly describes the weight's inertia (the resistance of an object to change its state of motion)?
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D. The weight does not have any inertia until it has stopped moving.

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7. Describe one way that sunlight can be turned into electricity.

Answers may vary: Possible answer – The photons in sunlight can be used by a solar cell in a solar panel to create electricity.

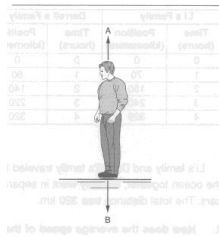
8. Why does a black jacket appear black?

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- D. **radiation**

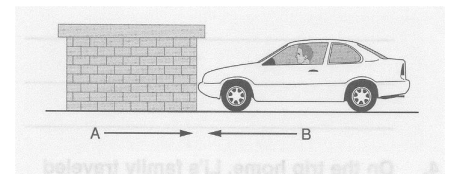
10. Which arrow below represents the force of gravity acting on the man?



A.

B.

11. What do the arrows A and B represent?



Arrow A represents the force of the wall pushing against the car. Arrow B represents the force of the care pushing against the wall.

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 - C. velocity**
 - D. acceleration
18. The mass of objects and the distance between them affects the
- A. coefficient
 - B. rolling friction
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19. Which of these is an example of the effect of gravity?
- A. A paperclip moves toward a magnet.
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B. **acceleration = force ÷ mass**
C. acceleration = force x mass
D. acceleration = mass x velocity

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21. T An object must have motion in order to have momentum.
22. T Inertia is the tendency for an object to resist a change in its motion.
23. F Velocity measures only speed.
24. T Friction produces heat.
25. F Compounds are chemically bonded.
26. T All the forces acting on an object are called net forces.

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

27. Derrick gives his dictionary a quick shove across the table. The dictionary moves a short distance across the table, but quickly slows down and stops. Explain why the dictionary does not keep moving across the table. Then describe how Derrick could make the dictionary move farther across the table without changing the force he exerts on it.

Friction between the dictionary and the table acts against the applied force, which make the dictionary slow down and stop. To make the dictionary move farther, Derrick could apply some sort of lubricant such as oil to the surface of the table or the dictionary.

28. Which force affects the oceans' tides? Briefly explain how this happens.

Gravity affects the oceans' tides. Tides are the rising and falling of the ocean level due to the gravitational forces between the Earth, sun, and moon. The gravitational force on our planet has a large impact on our oceans. As the Earth spins on its axis, one side of it faces the moon. Because of this portion of the Earth is closest, the gravitational forces is the strongest. Water in the oceans on the side of the Earth that faces the moon is drawn towards the moon. This creates a high tide.

Unit 2.18 Handout 3

Pre- and Post- Self Evaluation**Pre-Evaluation – Physical Science**

Statement	Self-Rating				
	1	2	3	4	5
1. I can define basic vocabulary in the building blocks of matter: matter, atom, molecule, nucleus, element, and compound.	strongly agree	agree	somewhat agree	disagree	strongly disagree
2. I can describe chemical properties and reactions related to living systems.	strongly agree	agree	somewhat agree	disagree	strongly disagree
3. I can describe forms of energy and the conservation, transition, and flow of energy.	strongly agree	agree	somewhat agree	disagree	strongly disagree
4. I can describe work, motion, and forces in physical science.	strongly agree	agree	somewhat agree	disagree	strongly disagree
5. I can summarize and paraphrase the main idea in physical science passages.	strongly agree	agree	somewhat agree	disagree	strongly disagree

Post-Evaluation – Physical Science

Statement	Self-Rating				
	1	2	3	4	5
1. I can define basic vocabulary in the building blocks of matter: matter, atom, molecule, nucleus, element, and compound.	strongly agree	agree	somewhat agree	disagree	strongly disagree
2. I can describe chemical properties and reactions related to living systems.	strongly agree	agree	somewhat agree	disagree	strongly disagree
3. I can describe forms of energy and the conservation, transition, and flow of energy.	strongly agree	agree	somewhat agree	disagree	strongly disagree
4. I can describe work, motion, and forces in physical science.	strongly agree	agree	somewhat agree	disagree	strongly disagree
5. I can summarize and paraphrase the main idea in physical science passages.	strongly agree	agree	somewhat agree	disagree	strongly disagree

Unit 2.18 Handout 4

Teacher Answer Key

1. deductive
2. deductive
3. inductive
4. inductive
5. inductive
6. Answers will vary and should include an example of deductive reasoning – something that reasons from the general to the specific and is based on true statements.
7. Answers will vary and should include an example of inductive reasoning – something that