

GED Science

Focus Sheet: Lesson 9

- FOCUS:
- Physical Science - Introduction to Physics
 - Properties of Motion: Newton's Law
 - Energy & Force: Lever & Fulcrum
 - Heat and forms of energy
- ISSUES/ACTIVITIES:
- Basic physics at work in the world around us
 - Lever & fulcrum demonstration
 - Newton's Laws of Motion
 - Laws of motion, force demonstrations
- MATERIALS:
- Worksheet - Laws of Motion and introduction to physics, vocabulary
- TEXTS:
- Contemporary's GED Science:
 - ❖ Motion, Force and Energy, pp. 289-314
 - Steck-Vaugh's GED Science:
 - ❖ Motion and Forces, pp. 184-189
 - ❖ Force and Distance, Work and Energy, pp. 190-197
- SKILLS AND STANDARDS:
- SCANS:
 - ❖ Workplace Competencies:
 - Information: C5-C7
 - Technology: C18
 - ❖ Foundation Skills:
 - Basic Skills: F1-F6
 - Thinking Skills: F7-F12
 - CASAS:
 - ❖ Consumer Economics
 - 1.1.4 select, compute, interpret standard units of measurement

GED Science Assignment Sheet: Lesson 9

<u>ASSIGNMENT</u>	<u>DATE DUE</u>	<u>DONE</u>	<u>SCORE</u>	<u>COMMENTS</u>
TEXTBOOKS:				
<i>CONTEMPORARY'S GED SCIENCE:</i>				
• Motion, Force and Energy, pp. 289-314				
<i>STECK-VAUGHN'S GED SCIENCE:</i>				
• Motion and Forces, pp. 184-189				
• Force and Distance, Work and Energy, pp. 190-197				
WORKSHEETS:				
• Worksheet: Laws of Motion and introduction to physics vocabulary				

RATINGS

1. I felt confident doing this assignment.
2. I was able to do the assignment, but it took a long time.
3. This assignment was very challenging to me
4. I need more explanation/practice in this area
5. I never want to do this again.

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Lesson 9: Physics Vocabulary and Newton's Laws of Motion

Vocabulary

physics:	the science of energy including the properties, interactions and changes of matter and energy
gravity:	the force of attraction that affects all matter, the degree of force between objects depends on their mass and distance apart
weight:	the gravitational pull on objects (the weight of an object can vary depending on the gravitational pull)
mass:	the amount of matter in an object (remains constant)
force:	a push or pull that acts on matter, changing an object's speed or direction of movement
acceleration:	any change in the speed of an object or its direction of motion
inertia:	the tendency of an object to keep moving or remain at rest

Newton's 3 Laws of Motion

1. Law of Inertia - If no force is applied, an object at rest will remain at rest, and an object in motion will continue to move in a straight line at the same speed unless it is acted upon by an unbalanced force.
2. Law of Acceleration - An object's speed will increase in proportion to the amount of force applied.
3. Law of Interaction: For every action, there is an equal and opposite reaction

Formula for force: $F = MA$

Mass, the amount of matter, times the acceleration or how fast an object changes speed, equals the force or the amount of push or pull on an object. Therefore, a smaller mass and greater acceleration results in greater momentum or faster acceleration.

Fill in the blanks with the correct term:

Isaac Newton proposed that the _____ exerted on an object can be determined by multiplying its _____ by the _____ or its speed. This formula for force implies that a baseball hit slowly and lightly with a bat will _____ as quickly as the same ball when it is hit fast and hard with the same bat. The ball responded differently, but did not change its _____.

Select the best answer for each of these questions from the Steck-Vaughn GED Science text, page 185

1. An engineer designs a racing car with a powerful engine and a lightweight body. What assumption is she making?
 - a. An object at rest tends to remain at rest.
 - b. An object in motion tends to remain in motion.
 - c. Large force and small mass yield rapid acceleration.
 - d. Large force and small mass yield constant motion.
 - e. Large force and small mass yield great inertia.

2. Football teams use large, heavy players in the defense lines and smaller, lighter players in the backfield to run and catch passes. What is the assumption behind this assignment strategy?
 - a. Small players accelerate quickly, while large players apply force to stop opponents.
 - b. Large players tend to remain at rest, while light players tend to remain in motion.
 - c. Light players can catch passes, while large players can tackle.
 - d. Large players tend to move in a straight line, while light players change direction easily.
 - e. The force needed to stop a large player is greater than that needed to stop a small one.

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Lesson 9: Physics Vocabulary and Newton's Laws of Motion

Answer Key

Answers:

Fill in the blanks: *force, mass, velocity or acceleration, not accelerate, mass*

Multiple choice questions:

- 1.) *c. Large force and small mass yield rapid acceleration. The engineer is assuming that a large engine will provide a large force, and a lightweight body will provide small mass. Application of Newton's Second Law of Motion means that the resulting acceleration will be very rapid.*
- 2.) *a. Small players accelerate quickly, while large players apply force to stop opponents. Therefore, the assignment of player positions relies on Newton's second law of motion.*