

Study Guide/Answer Key- Forces and Energy-Chapter 2: Forces**Chapter 2, Lesson 1: The Nature of Force**

1. speed - _____
2. Velocity - _____
3. Acceleration - _____
4. Force - _____ Example: _____
 - 4a. Force is described by its _____.
 - 4b. Force cause _____.
 - 4c. Balanced forces _____.
5. newton (N) - _____
6. net force - _____
 - 6a. Net Force can cause _____.
 - 6b. Net Force determines how and if an object will _____.

Example of force: If Sam exerts a force of 10N to push a desk to the right at the same time Shannon exerts a force of 15N to push the desk to the left. In which direction will the desk move? _____

- When two forces act in opposite directions, the object will accelerate in the same direction as _____.

- A(n) _____ can be used to represent the direction and strength of a force.

Chapter 2: Lesson 2: Friction and Gravity

7. Friction - _____
 - 7a. Friction acts in a direction _____.
 - 7b. Friction occurs when the irregularities of one surface _____

 - 7c. The _____ required to push something across a surface increases/decreases as friction increases/decreases.

Name _____

DATE _____

8. sliding friction - _____

Examples: _____

9. static friction - _____

Examples: _____

10. fluid friction - _____

Examples: _____

11. rolling friction - _____

Examples: _____

12. Gravity - _____

13. gravitational force - _____

Examples: _____

14. law of universal gravitation - _____

15. mass - _____

15a. Instrument used to measure mass: _____

15b. SI unit of measurement for mass: _____

16. Weight - _____

16a. Instrument used to measure weight: _____

16b. Unit of measurement for weight: _____

Chapter 2, Lesson 3: Newton's Laws of Motion

17. acceleration - _____

17a. To increase acceleration of an object, _____

18. force - _____

18a. SI unit of measurement for force: _____

19. Inertia - _____

19a. All objects, moving or not, resist _____.

19b. The smaller the mass of an object, _____.

19c. The larger the mass of an object, _____.

20. Newton's First Law of Motion - _____

20a. An object will not experience a change in motion unless _____

21. Newton's Second Law of Motion - _____

21a. Acceleration = _____

21b. Net force = _____

22. Newton's Third Law of Motion - _____

22a. If you lean against a wall, the wall pushes _____

22b. _____ **and** _____ **forces** acting in opposite directions do/ do not cancel out because they act on different objects.

Chapter 2, Lesson 4: Momentum

23. momentum - _____

Momentum = _____

Example: 1000-kg car traveling at a velocity of 25 m/s

23a. Momentum = _____

23b. Momentum = _____

23c. Momentum = _____

23d. Total momentum of any group of objects remains the same unless

23e. The less momentum an object has, the easier it is to

_____.

24. law of conservation of momentum - _____

Interesting Fact: If outside forces such as friction are negligible, when two objects of the same mass collide and do not stick together, the objects _____.

Chapter 2, Lesson 5: Free Fall & Circular Motion(Defintions only):

25. Free Fall – _____

26. Centripetal Force – _____

27. Satellite – _____

Chapter 2: Forces and Energy Study Guide**Lesson 1: The Nature of Force**

1. A _____ is needed to change an object's state of motion.
2. The overall force on an object after all the forces are added together is called the _____.
3. The strength of a force is measured in the _____ unit called the _____.
4. Forces are described by their _____ and _____.

Lesson 2: Friction and Gravity

5. The force that one surface exerts on another when the two rub against each other is _____.
6. Friction depends on the _____ of surfaces involved and how hard the surfaces push _____.
7. _____ occurs when two solid surfaces slide over each other.
8. _____ acts between objects that aren't moving.
9. _____ occurs when a solid object moves through a fluid.
10. _____ is when an object _____ across a surface.
11. The law of _____ states that any two objects in the universe that have mass, _____ each other.
12. A _____ exists between any two objects in the universe.
13. The force of _____ on a person or object on the surface of a planet is called _____.
14. _____ and distance affect the gravitational attraction between objects.

Lesson 3: Newton's Laws of Motion

15. Resistance to change in motion is called _____.
16. The greater the mass of an object, the _____ its _____
17. Newton's first law of motion states that an object at rest will _____ at rest unless acted upon by a _____ net force.
18. _____ states that an object's acceleration depends on its mass and on the _____ acting on it.
19. Newton's third law of motion states that if one object exerts a force on another object, then the second object exerts a force of _____ strength in the opposite direction on the first object.

Lesson 4: Momentum

20. Momentum of a moving object can be determined by multiplying the object's _____ by its _____.
21. The law of conservation of momentum states that, in the absence of outside forces like friction, the total momentum of objects that interact _____.
22. The momentum of an object is in the same direction as its _____.

Chapter 2 - Lesson 5: Free Fall and Circular Motion

23. When the only force acting on an object is gravity, the object is said to be in _____.
24. A _____ is any force that causes an object to move in a circle.

Essay questions:

25. A book is sitting on the dashboard of a car that is stopped at a traffic light. As the car starts to move forward, the book slides backward off the dashboard. What happened?

26. A skydiver with a mass of 70 kg accelerates to Earth at a rate of 9.8 m/s² due to gravity. What is the force on the skydiver? Explain how you determined the answer and its units.
