

Name Key Date _____ Period _____

Forces Practice Test

Vocabulary Review:

If the left column is blank, give the correct term. If the right column is blank, give an example from real life.

Term	Example from Real Life
1. Acceleration	a ball speeding up as it falls to the ground
2. Centripetal force	The pull of a string on a yo-yo as the yo-yo spins in a circle
3. Force	The pull of a handle on a wagon
4. Inertia	The difficulty experienced moving a heavy table
5. Mass	The amount of matter in an object such as a brick.
6. Net force	The combined force of two people pushing on a box
7. Newton's first law	a still ball moves when kicked
8. Newton's second law	pulling harder to accelerate a full wagon
9. Newton's third law	When you're walking, you push backward on the ground pushes you forward with equal force.

Multiple Choice

Choose the letter of the best answer.

a 10. Newton's second law states that to increase acceleration, you

- a. Increase force
- b. Decrease force
- c. Increase mass
- d. Increase inertia

c 11. What units are used to measure force?

- a. Kilograms
- b. Meters
- c. Newton's
- d. Seconds

a 12. A wagon is pulled down a hill with a constant velocity. All of the forces on the wagon are

- a. Balanced
- b. Unbalanced
- c. Increasing
- d. Decreasing

b 13. An action force and its reaction force are

- a. Equal in size and direction
- b. Equal in size and opposite in direction
- c. Different in size but in the same direction
- d. Different in size and in direction

a 14. John pulls a box with a force of 4 N, and Jason pulls the box from the opposite side with a force of 3 N. Ignore friction. Which of the following statements is true?

- a. The box moves toward John
- b. The box moves toward Jason
- c. The box does not move
- d. There is not enough information to determine if the box moves

c 15. If you increase the force on an object, it will have

- a. Greater inertia
- b. Less inertia
- c. Greater acceleration
- d. Less acceleration

a 16. Any force keeping an object moving in a circle is known as

- a. Centripetal force
- b. Gravity
- c. Friction
- d. A vector

c 17. Acceleration is

- a. The speed of an object
- b. How fast an object moves
- c. A change in velocity over time
- d. A change in force over time

a 18. _____ is a force that resists motion between two surfaces that are in contact.

- a. Friction
- b. Acceleration
- c. Inertia
- d. Resistance

b 19. Forces that cancel each other are called _____ forces.

- a. Inactivated
- b. Balanced
- c. Null
- d. Neutral

d 20. The _____ is the combination of all the forces acting on an object.

- a. Direction of motion
- b. Force pair
- c. Inertia
- d. Net force

b 21. Balanced forces act on

- a. Two different objects
- b. The same object
- c. Balanced objects
- d. Unbalanced objects

a 22. Action/Reaction force pairs act on

- a. Two different objects
- b. The same object
- c. Balanced objects
- d. Unbalanced objects

d 23. _____ is the pull that all objects exert on each other.

- a. Resistance
- b. Friction
- c. Inertia
- d. Gravity

d 24. You are moving a dresser that has a mass of 36 kg; its acceleration is 0.5 m/s^2 . What is the force being applied?

- a. 72 N
- b. 35.5 N
- c. 1.8 N
- d. 18 N

$$F = ma$$
$$F = (36 \text{ kg})(0.5 \text{ m/s}^2)$$
$$18 \text{ N}$$

C 25. Gravity causes all objects near Earth's surface to fall with an acceleration of _____.

- a. $a = F \times m$
- b. 9.8 m/s
- c. 9.8 m/s^2
- d. $98 \text{ m}^2/\text{s}$

Short Answer

Write a short answer to each question.

26. List the following objects in order, from the object with the least inertia to the object with the most inertia: feather, large rock, pencil, book. Explain your reasoning.

Feather, pencil, book, large rock; the more mass an object has, the more inertia it will have.

27. Explain how an object can have forces acting on it but not be accelerating.

The forces are balanced.

28. A sea scallop moves by shooting jets of water out of its shell. Explain how this works.

3rd Law: The scallop pushes water out of its shell in one direction (action) and the water pushes on the shell in the opposite direction (reaction) to move the animal backward.

29. Complete the chart.

Cause	Effect
Balanced forces act on an object	no change in motion
Unbalanced forces act on an object	change in motion
No force acts on an object	no change in motion

30. A baseball is three times more massive than a tennis ball. If the baseball and the tennis ball are accelerating equally, what can you determine about the net force on each?

The net force on the baseball must be three times the net force on the tennis ball.

31. What force should Lori apply to a 5 kg box to give it an acceleration of 2 m/s²?

$$F = ma$$
$$F = (5 \text{ kg})(2 \text{ m/s}^2)$$
$$F = 10 \text{ N}$$

32. If a 10 N force accelerates an object 5 m/s^2 , how massive is it?

$$F = ma$$
$$10\text{N} = (m)(5\text{m/s}^2) \quad \frac{10\text{N}}{5\text{m/s}^2} = 2\text{kg}$$

33. Ravi applies a force of 5 N to a wagon with a mass of 10 kg. What is the wagon's acceleration?

$$F = ma$$
$$5\text{N} = (10\text{kg})(a) \quad \frac{5\text{N}}{10\text{kg}} = 0.5\text{m/s}^2$$

34. A man is using a cart to move furniture onto a truck. Why is the cart harder to accelerate when loaded with furniture than when it is empty?

According to the 2nd law; Acceleration decreases with increased mass, so the cart with furniture will have more mass therefore be harder to push.

35. If the same force is applied to two objects with different masses, how will the objects accelerate?

The object with the smaller mass will accelerate faster.

36. As Ted drags a couch across the floor, he feels the couch "pull back" on him. Is this an example of action/reaction forces or balanced forces? Which object is each force working on?

Action/Reaction

Action: Ted pushing on the couch.

Reaction: The couch pushing back on Ted.