

Name: _____

Date: _____

Newton's Laws Assessment

Multiple Choice – Select the best answer.

1. A person's body is forced back into their seat when an airplane suddenly accelerates during takeoff. Which law of motion does this demonstrate?
 - a. Newton's 1st Law
 - b. Newton's 2nd Law
 - c. Newton's 3rd Law
 - d. Newton did not have cars in his time so he was not able to observe this kind of motion.
2. When rockets launch they use thrusters which apply a force against the ground. This force then pushes the rocket up into space. What law does this demonstrate?
 - a. Newton's 1st Law
 - b. Newton's 2nd Law
 - c. Newton's 3rd Law
 - d. All of the above
3. Which of the following formulas best represents Newton's 2nd Law of Motion?
 - a. $F = M/A$
 - b. $F = M \times d$
 - c. $F = M/d$
 - d. $F = M \times A$
4. Which of the following best represents inertia?
 - a. When paddling a canoe, you push the oar backward and the canoe moves forward.
 - b. A balloon playing around the room when the air is let out of it.
 - c. A motorcycle requires less force to accelerate than a truck.
 - d. Moving forward when your bicycle suddenly stops moving due to hitting a curb.
5. Which of the following is an example of Newton's 1st Law?
 - a. Using a force to push a grocery cart
 - b. Pulling back a rubber band to shoot it forward
 - c. A chair remains motionless in a room
 - d. None of the above
6. Which of the following is an example of Newton's 2nd Law?
 - a. A basketball requires more force to roll than a tennis ball
 - b. A picture hanging on the wall
 - c. A rocket blasting off from the launch pad
 - d. All of the above
7. Which of the following is an example of Newton's 3rd Law?
 - a. A child on a swing requires less force to move than an adult
 - b. Pushing water backward in order to move forward while swimming
 - c. A pencil resting on a desk
 - d. None of the above

8. Your neighbor has a lawn sprinkler that spins quickly as water shoot out of the top. Which principle best explains why the sprinkler spins?
- Objects in motion remain in motion unless acted upon by an unbalanced force
 - Objects at rest remain at rest unless acted upon by an unbalanced force
 - For every action there is an equal and opposite reaction
 - The force of an object is equal to its mass multiplied by its acceleration

Fill in the Blank – Each answer choice will be used once.

1 st Law	2 nd Law	3 rd Law
Force	Inertia	Acceleration

9. Newton's _____ of motion states that the force of an object is equal to its mass multiplied by its acceleration.
10. A push or a pull on an object that may change the motion of the object is known as a _____.
11. Newton's _____ of motion states that an object at rest will remain at rest and an object in motion will remain in motion until acted upon by an unbalanced force.
12. _____ is the rate of change of velocity which includes speeding up, slowing down, or changing direction.
13. Newton's _____ of motion states that for every action there is an equal and opposite reaction.
14. An object's tendency to resist a change in motion is known as _____.

True or False – Write "T" for True and "F" for False.

15. _____ The Earth orbits the Sun continuously without stopping because of inertia.
16. _____ Forces come in pairs and one force is always greater than the other.
17. _____ Objects that are motionless do not have inertia.
18. _____ A more massive object has more inertia than a less massive object.
19. _____ Fast moving objects have more inertia than slow moving objects.
20. _____ The only way to slow down a moving object is to apply a force to the object.

Matching – Identify which law each statement represents. Write "A" for 1st Law, "B" for 2nd Law, or "C" for 3rd Law.

21. _____ It takes less force to pull an empty wagon than a wagon with someone in it.
22. _____ The law of action – reaction.

Matching - continued

23. _____ A person's body is thrown outward when turning a corner quickly in a car.
24. _____ The law of inertia.
25. _____ Sitting in a chair you exert a force on the chair and it exerts an equal force on you.
26. _____ The law of acceleration.

Short Response – Answer each question in detail.

27. How do Newton's Laws act simultaneously with vehicle restraints in a car?
28. Explain why it requires more force to push an adult on a swing than a child on a swing.
29. Explain what happens when you blow up a balloon and then let it go without tying the end. Be sure to use one of Newton's Laws in your answer.
30. List and describe an example of each of Newton's Laws that you observe on a daily basis.