

Name:
Date:

Teacher:
Period:

NEWTON'S LAWS WORKSHEET

I. NEWTON'S FIRST LAW OF MOTION

1. Newton's first law of motion is also known as the LAW OF _____
2. Newton's first law says that
 - a. an object that IS NOT MOVING, or is at _____ will stay at _____ **AND**
 - b. an object that IS MOVING will keep moving with constant _____ which means at the same _____ and in the same _____ **UNLESS**
 - c. an _____ force acts on that object.
3. What is inertia?

4. What property of an object determines how much inertia it has?

5. Which of the following has more inertia?
 - a. Bowling ball or Tennis ball
 - b. Hammer or Feather
6. When traveling in a car and turning to the right, which way does your body go and why?

II. NEWTON'S SECOND LAW OF MOTION

7. Newton's second law of motion is also known as the LAW OF _____
8. Newton's second law says that when an _____ force is applied to a _____, it causes it to _____.
9. The greater the force that is applied, the _____ the acceleration.
10. The lesser the force that is applied, the _____ the acceleration.
11. If the same force is applied to an object with a large mass, it will have a _____ acceleration.
12. If the same force is applied to an object with a small mass, it will have a _____ acceleration.

13. The equation that is used to solve second law problems is **$F = ma$** .

a. What does each of the variables mean?

$F =$ _____ $m =$ _____ $a =$ _____

b. What **unit** of measurement must be used with each variable?

$F =$ _____ $m =$ _____ $a =$ _____

III. NEWTON'S THIRD LAW OF MOTION

14. Newton's third law of motion is also known as the LAW OF _____.

15. Newton's third law says that every time there is an _____ force, there is also a _____ force that is _____ in size and acts in the _____ direction.

16. Newton's third law states that forces must ALWAYS occur in _____.

17. Listed below are ACTION forces. **Tell the REACTION force.**

a. Your bottom pushing on your desk seat: _____

b. A bat hitting a baseball: _____

c. Your finger pressing on your phone screen while texting: _____

18. What is friction?

19. List the four types of friction and their definitions.

a) _____ friction: _____

b) _____ friction: _____

c) _____ friction: _____

d) _____ friction: _____

20. Friction that occurs in gases and liquids is called _____ friction.

21. True or False: Static friction prevents you from slipping when you walk on a sidewalk.

22. True or False: Sliding friction is stronger than static friction.

23. You use _____ friction when you leave marks on paper with a pencil "lead."

24. The weakest type of friction that occurs between solid surfaces is _____ friction.

25. Factors that affect the amount of friction against an object are _____ and _____

26. When you put on the brakes of your bike, the wheels stop turning. Friction between the wheels and the road slows your bike to a stop. Which type of friction is this?

- | | |
|--------------------|---------------------|
| a) fluid friction | c) sliding friction |
| b) static friction | d) rolling friction |

27. The factors that affect gravitational pull on an object are _____ and _____

28. Define mass:

29. Define weight:

30. What is acceleration due to gravity constant? Include units. (numeric value)

31. A) What would you observe if you drop a cotton ball and a rock at the same time? B) Would it be different if you did the same occur if performed in a vacuum tube? Explain your answer.

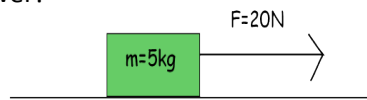
32. True or False: Your mass would be the same on the Moon as it is on the Earth. Explain your answer in complete sentences.

33. True or False: Your weight would be the same on the Moon as it is on the Earth. Explain your answer in complete sentences.

34. What happens to the gravitational pull between two bodies when the distance between them increases?

IV. UNDERSTANDING.....

Label each of the following images/descriptions below as being examples of 1st, 2nd, or 3rd law. Then EXPLAIN your answer!



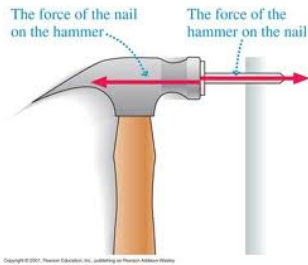
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$$F=m \cdot a$$
$$20\text{N}=5\text{kg} \cdot a$$
$$a=4\text{m/s}^2$$

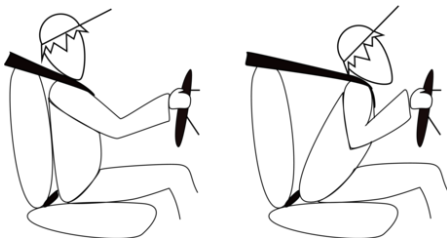
1st law 2nd law 3rd law

Explanation:



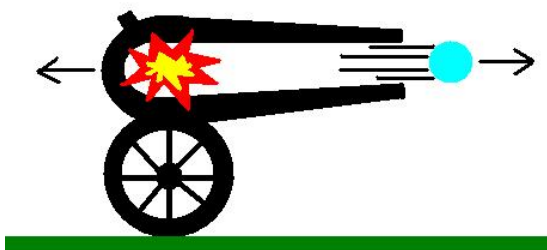
1st law 2nd law 3rd law

Explanation:



1st law 2nd law 3rd law

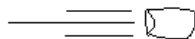
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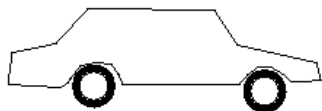
1st law 2nd law 3rd law

Explanation:

Same force small mass: large acceleration



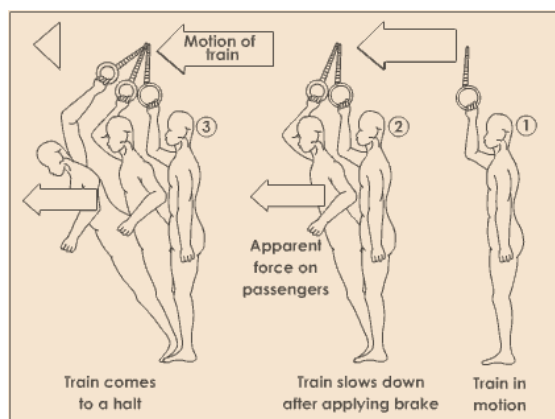
large mass: small acceleration



Force = mass x acceleration

1st law 2nd law 3rd law

Explanation:



1st law 2nd law 3rd law

Explanation:
