# Force Test Review Answers

| Integrated Science Word | Definition |
|---|---|
| 1. acceleration | The change in speed over time |
| 2. friction | Any force that resists motion |
| 3. net force | The sum of all forces on an object |
| 4. inertia | a property of matter by which it resists changes in motion |
| 5. weight | The pull of gravity on a mass |
| 6. kilo- | 1000 |
| 7. hecto- | 100 |
| 8. deka- | 10 |
| 9. deci- | 0.1 |
| 10. centi- | 0.01 |
| 11. milli- | 0.001 |
| 12. mass | he amount of matter contained in a body |
| 13. terminal velocity | the highest velocity attainable by an object as it falls through air |

14. In a direct relationship, as the independent variable increases, what happens to the dependent variable?
As the independent variable increases the dependent increases. (ex. Increasing the acceleration increases the force)

15. In an indirect relationship, as the independent variable increases, what happens to the dependent variable
As the independent variable increases the dependent decreases. (ex. the more I paint the walls, the less wall space is left to paint)

16. Would your mass change if you went to the Moon? Explain your answer.
No, your mass does not change. Mass is how much matter is contained in an object.

17. Would your weight change if you went to the Moon? Explain your answer.
Yes, your weight would change. Weight is the pull of a gravity on the mass of an object. Different gravity = different weights.

18. What affect does air resistance have on the acceleration of an object?
It resists an object in free fall. Once the object reaches its terminal velocity it cannot accelerate any more towards the Earth.

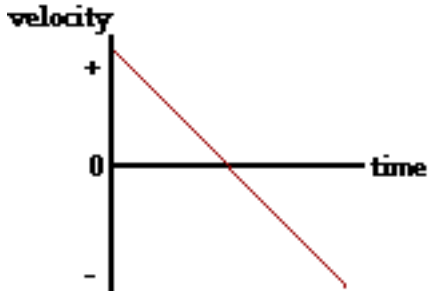
19. If a car has a weight of 2,500 N, what is the normal force applied by the road?
2,500 N

20. Provide three examples of Newton's First Law.
Blood rushes from your head to your feet while quickly stopping when riding on a descending elevator.
The head of a hammer can be tightened onto the wooden handle by banging the bottom of the handle against a hard surface.
To dislodge ketchup from the bottom of a ketchup bottle, it is often turned upside down and thrusted downward at high speeds and then abruptly halted.
While riding a skateboard (or wagon or bicycle), you fly forward off the board when hitting a curb or rock or other object which abruptly halts the motion of the skateboard.

21. Provide three examples of Newton's Second Law.
Newton's second law basically states that the acceleration and speed of an object, animate or inanimate, depends on the net force acting upon the object and the mass of the object.
For example, it is easier for a strong adult to push a full shopping cart than it is for a baby to push the same cart. (This is depending on the net force acting on the object.)
Also, it is easier for a person to push an empty shopping cart than a full one. (This is depending on the mass of the object.) Another example is a train wreck.
If a train hits another train of equal force and speed, they will both go the same distance and feel the same force. But if the first train is hooked to a second, the single train will go twice the distance of the double train and will feel twice the force. (This example pertains to both net force and mass.)

22. How is acceleration shown on a velocity-time graph?
As a straight line slope (positive or negative)

23. Sketch a velocity-time graph showing negative acceleration.



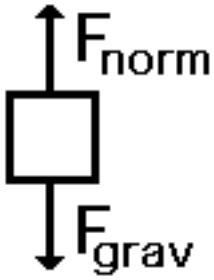

24. If you have a pencil and textbook, which one has more inertia? How do you know that?
The textbook, it has more mass therefore it has a greater resistance to movement (inertia)

25. Provide three situations of objects with balanced forces.
A book on a table (gravity vs. normal force)
A skydiver that has reached terminal velocity (gravity vs. air resistance
A car with it cruise control set to 80 lm/hr (applied force vs. friction)

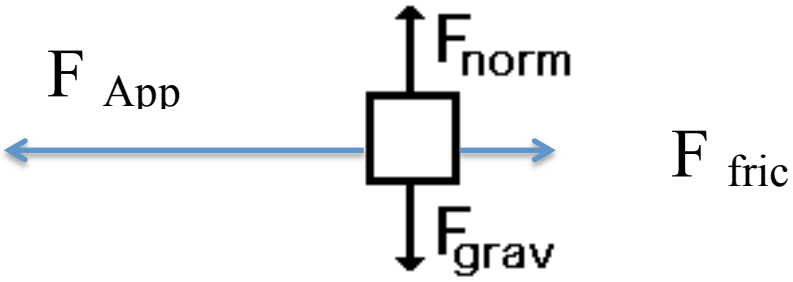
26. Provide three situations of objects with unbalanced forces.
A car speeds up from a stop (applied force> friction)
A ball rolls to a stop (friction > applied force)
A rocket ship blasts off its Launchpad. (applied force > gravity)

27. List two variables that affect the friction.
Weight and surface type
28. List one variable that does not affect friction.
Surface area

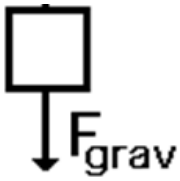
29. Draw a free body diagram for a cat sleeping in a tree.



30. Draw a free body diagram for a cat as it runs along a branch to the left.




31. Draw a free body diagram for a cat as it is in the air after it jumped out of the tree.




32. A baseball is thrown at 40m/s it weighs 1.5 kg. How much force does it exert when it is caught?
60N

33. A car that weighs 2000kg is traveling 50 m/s crashes into a wall. What was its momentum?
10,000N

34. What does it mean that momentum is conserved?
For a collision occurring between object 1 and object 2 in an isolated system, the total momentum of the two objects before the collision is equal to the total momentum of the two objects after the collision. That is, the momentum lost by object 1 is equal to the momentum gained by object 2.

35. What is normal force?
In mechanics, the normal force is the component, perpendicular to the surface (surface being a plane) of contact, of the contact force exerted on an object by, for example, the surface of a floor or wall, preventing the object to fall.

36. When do we need to worry about air resistance?
When the object is freefalling from a large distance, ex skydiver jumps out of a plane.