

PS Physics: Chapter 5 Review Questions

Test Date: _____

Unscramble the following vocabulary words and match each word with the correct definition.

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|-----------------------------|--|
| ___ 1. luylpe | a. force acting over a distance to move an object |
| ___ 2. rvlle | b. an instrument that makes work easier |
| ___ 3. twta | c. force applied |
| ___ 4. maiclehnca dvtaangea | c. force applied to machine |
| ___ 5. oprwe | d. force that opposes the effort force |
| ___ 6. cfurmlu | e. amount of work done per unit time |
| ___ 7. cilendin nelpa | f. 1 newton-meter |
| ___ 8. gwdee | g. simple machine with a sloped surface |
| ___ 9. leewh adn xlae | h. the fixed point on a lever |
| ___ 10. cwsre | i. number of times a machine multiplies the effort force |
| ___ 11. chinmae | j. rope wrapped around a grooved wheel |
| ___ 12. krow | k. simple machine made up of two inclined planes |
| ___ 13. leuoj | l. 1 joule per second |
| ___ 14. feftro crofe | m. straight bar that moves about a fixed point |
| ___ 15. siscnatree fcore | n. inclined plane wrapped to make a spiral |
| | o. simple machine made up of two circular objects |

For the questions 16-30 decide which simple machine(s) that best fits the clue. Simple machine types can (and will) be used more than once.

- _____ 16. Two simple machines found in a pair of scissors
- _____
- _____ 17. A screw is actually one of these wrapped around a post
- _____ 18. This simple machine makes raising a flag up a flagpole much easier
- _____ 19. A ramp is an example of this type of simple machine

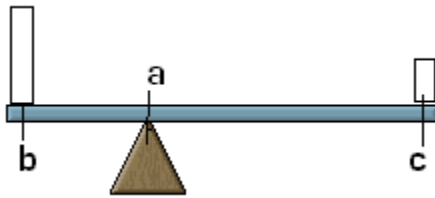
- _____ 20. This simple machine rolls and is found on cars, bikes and wheelbarrows.
- _____ 21. A rope, a wheel with a groove in it and a weight make up this simple machine.
- _____ 22. This simple machine has a fulcrum, or pivot point, which can be located in the center, near the end or at the end.
- _____ 23. This simple machine can be used to split things apart or hold a door open.
- _____ 24. This simple machine secures things together and is made up of an inclined plane wrapped around a cylinder.
- _____ 25. A heavy object could be rolled up this machine, instead of lifting it straight up.
- _____ 26. A knife is an example of this type of simple machine.
- _____ 27. The bottom of a light bulb would be considered this type of simple machine
- _____ 28. This machine is made up of two inclined planes that meet forming a sharp edge.
- _____ 29. The rope is attached to a load and can move the load up, down, or sideways with this simple machine.
- _____ 30. Two simple machines found in a wheelbarrow.
- _____

True/False. If false, change the statement to make it true.

- ___ 31. Simple machines are tools that make work easier.
- ___ 32. Simple machines have many complex parts.
- ___ 33. Simple machines require no energy to do work.
- ___ 34. Simple machines do work with one movement.
- ___ 35. Simple machines give us an advantage by changing the amount, speed or direction of forces.
- ___ 36. Simple machines require a much greater force to overcome a smaller force.
- ___ 37. The amount of effort saved when using a simple machine is called the simple equilibration equation.
- ___ 38. Reducing friction increases the ideal mechanical advantage of a machine.
- ___ 39. When a machine is used to do work, the force applied by the machine is called the effort force.

___ 40. A device made up of more than one simple machine is called a complex machine.

Multiple Choice.



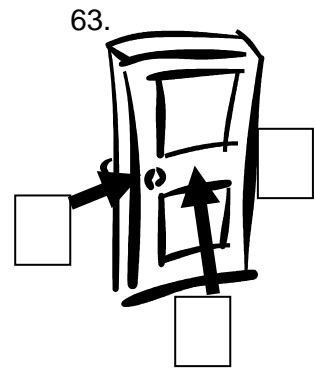
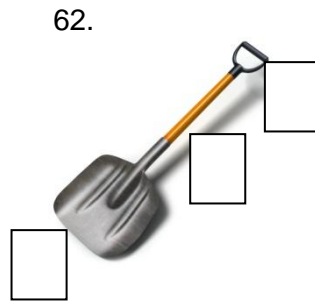
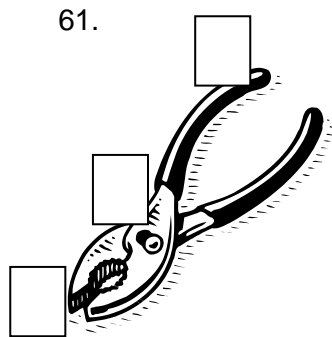
- ___ 41. The diagram above is an example of a(n)
A) Inclined Plane B) Pulley C) Screw D) Lever
- ___ 42. Which of the following statement is true for the diagram above?
A) b is the fulcrum, c is the resistance, a is the effort
B) b is the resistance, c is the fulcrum, a is the effort
C) b is the fulcrum, a is the effort, c is the resistance
D) b is the resistance, a is the fulcrum, c is the effort
- ___ 43. Given that the mass at **b** is 1 kilogram. What mass would the block at **c** have to be to lift block **b**?
Note: Use the distance values given in question 44.
A) 1000 grams B) 250 grams C) 80 grams D) 400 grams
- ___ 44. In the diagram above, if the distance from **a** to **b** is 20cm, and the distance from **a** to **c** is 80 cm, then the mechanical advantage of the system is.
A) 20 B) 80 C) 4 D) 1/4
- ___ 45. If the mechanical advantage of a simple machine is 4, then the
A) output force is 4 times the effort
B) effort is 4 times the output force
C) efficiency is 4%
D) the work output is 4 times the input
- ___ 46. A simple machine that is actually a kind on inclined plane is a
A) pulley B) wedge C) gear D) lever
- ___ 47. A pulley system has 3 sections of ropes that lift the load. The mechanical advantage of the system is
A) 1 B) 2 C) 3 D) 6
- ___ 48. The efficiency of a simple machine
A) always less than 100%
B) is equal to 100%
C) is always 50%
D) is always more than 100%
- ___ 49. Decreasing the slant of an inclined plane increases its
A) effort force B) Mechanical Advantage C) power D) work output
- ___ 50. An example of work being done is
A) pushing against a stationary wall
B) a person pushing against a closed door that remains closed

- C) a person pushing a lawn mower and cutting grass
- D) a person carrying a bag of groceries to your car

Which class of lever best describes each of the following devices?

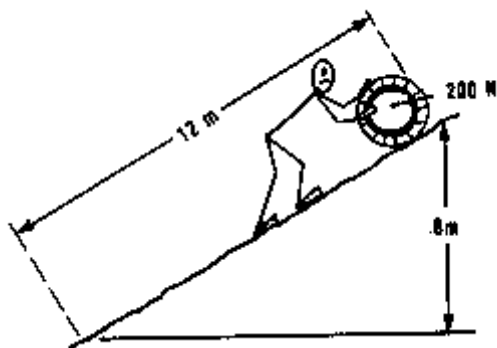
- | | |
|--|-------------------------------------|
| ___ 51. hockey stick | ___ 56. bottle cap opener |
| ___ 52. nutcracker | ___ 57. baseball bat |
| ___ 53. wheelbarrow | ___ 58. winding mountain road |
| ___ 54. scissors | ___ 59. fishing pole |
| ___ 55. screwdriver prying off a paint lid | ___ 60. hammer head removing a nail |

Below are three devices, each a different class lever. First, identify the class of each lever. Then label (fill in the box) the fulcrum, resistance and effort by using the letters F, R, and E.



64. A crow bar (lever) is often used to lift a large object. If the crowbar is 100 cm long and the object is 20 cm from the fulcrum, what is the mechanical advantage of the crowbar?
65. The wheel of a small dirt bike has a radius of 30 cm. The axle has a radius of 20 cm. What is the mechanical advantage of the wheel and axle?
66. You are using a ramp to move a heavy box into a moving truck. If the mechanical advantage of the ramp is 2 and the ramp is 2.5 meters long, how high is the slope of the ramp?

67. The mechanical advantage of a steering wheel is 15. If the radius of the steering column (axle) is 5 cm, what is the radius of the steering wheel?



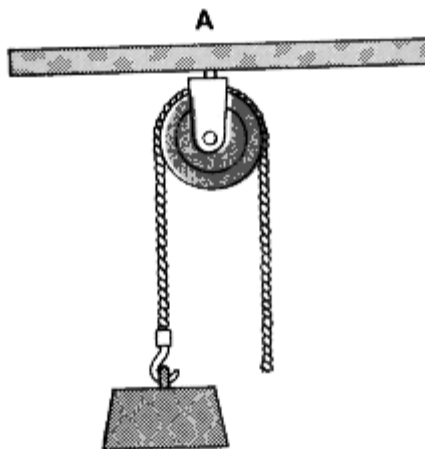
68. You need to lift a barrel that weighs 200 N up 6 meters in height. Instead of lifting it straight up, you decide to roll the barrel up a ramp 12 meters long.

A) Calculate Mechanical Advantage.

B) Is the Mechanical Advantage you calculated ideal or actual?

C) If it takes 125 N of force to roll the barrel up the 12 meter ramp, what is the efficiency of the ramp?

69. What is the mechanical advantage of the pulley seen below? Is this ideal MA or actual MA?



70. If the above pulley system can lift a 50 kg mass with 400N of force, what is the MA?