

Simple Machines Pre-Assessment

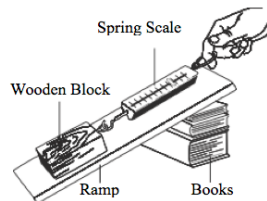
Name: _____

Matching:

1. A grooved wheel that has a rope or chain passing through it. ____
 2. A bar that turns or pivots on a fixed point. ____
 3. Is a straight-slanted surface. ____
 4. A spiral staircase. ____
 5. A ramp a person in a wheelchair would use. ____
- a. Lever
 - b. Wedge
 - c. Screw
 - d. Inclined Plane
 - e. Pulley

Multiple Choice:

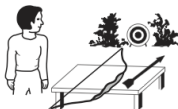
6. In which of the following situations would a person be doing work on an object?
 - a. A school crossing guard holds a stop sign that weighs 10N.
 - b. A student walks while wearing a backpack that weighs 15N.
 - c. Two movers carrying bed with a force of 350N.
 - d. A worker pushes a couch forward with 90N of force.
7. This occurs when a force causes an object to move in the direction of the force.
 - a. Power
 - b. Force
 - c. Input force
 - d. Work
8. The diagram below shows a student using a spring scale to pull a wooden block up a ramp that is resting on a stack of books.



Which change would require more force to pull the wooden block up the ramp?

- a. Student uses two hands.
 - b. Decrease the block's mass.
 - c. Restack the books.
 - d. Place sandpaper on the ramp's surface.
9. Which statement best describes the energy changes that occur while a child is riding on a sled down a steep, snow-covered hill?
 - a. Kinetic energy decreases and potential energy increases.
 - b. Kinetic energy increases and potential energy decreases.
 - c. Both potential energy and kinetic energy decrease.
 - d. Both potential energy and kinetic energy increase.
 10. A person uses a bow to shoot an arrow at a target. In which diagram does the bow and arrow have the greatest amount of potential energy?

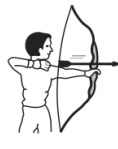
a.



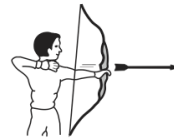
b.



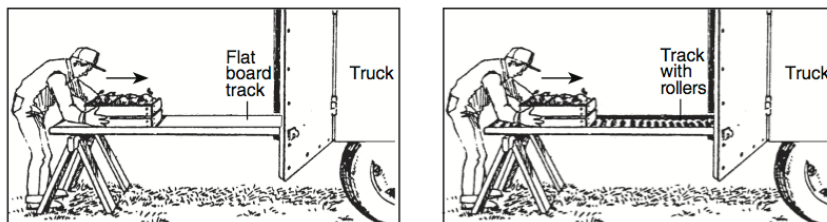
c.



d.



11. The person using the track with the rollers uses less energy to load the box because the rollers reduce the

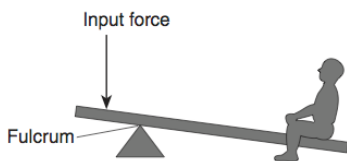


- a. Mass of the box
- b. Force of gravity

- c. Distance traveled by the box
- d. Force of friction

Short Answer

12. The diagram below shows a lever that can be used to lift a person. The fulcrum is the point on which the lever pivots.



Describe *one* change that could be made to the lever to *decrease* the input force needed to lift the person.

Problem-Solving - use the correct formula to determine the answers. Show your work!

13. If you exert 20N of force on a screwdriver and it exerts 40N of force on a paint can lid, what is the screwdriver's mechanical advantage?

14. A squirrel is harvesting acorns for the winter. He has an acorn that weighs 2 N in his mouth. He travels 20 meters. How much work does the squirrel produce?