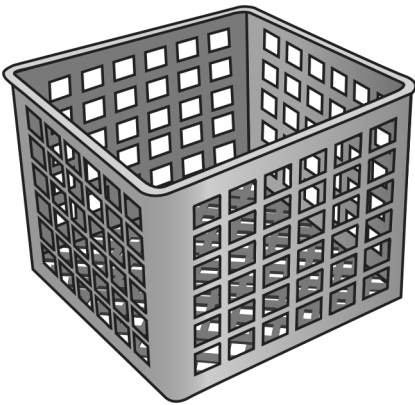


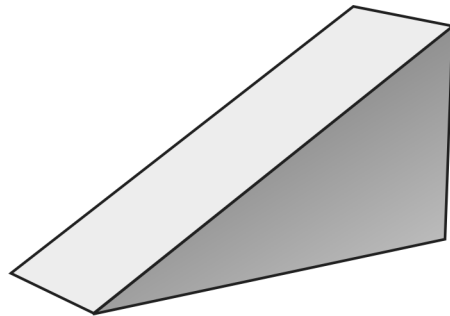
Work and Machines Packet

1. If 15 N of force are applied to a cart to move it a distance of 5 m, how much work is done on the cart?
A. 0.33 J B. 3 J C. 15 J D. 75 J
2. If a 6.0-N force is required to move a box through a distance of 2.0 m, how much work is done?
A. 3.0 J B. 4.0 J C. 8.0 J D. 12 J
3. A student exerts a force of 500 N pushing a box 10 m across the floor in 4 s. How much work does the student perform?
A. 50 J B. 1,250 J C. 2,000 J D. 5,000 J
4. A total of 750 J of work was done when a force of 125 N was exerted on a box to move it. How far was the box moved?
A. 6.00 m B. 600. m C. 850. m D. 906 m
5. Which of the following objects is an example of a simple machine?

A.



B.



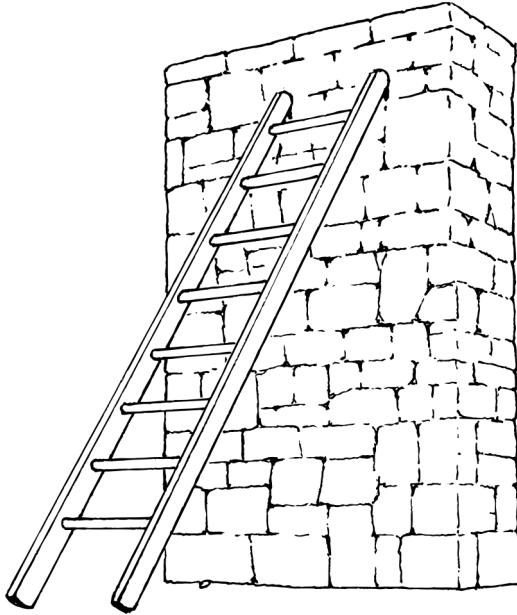
C.



D.

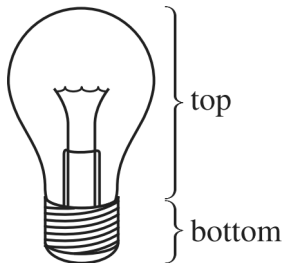


6. The picture shows a ladder leaning against a wall.



A person climbing this ladder is using the ladder as

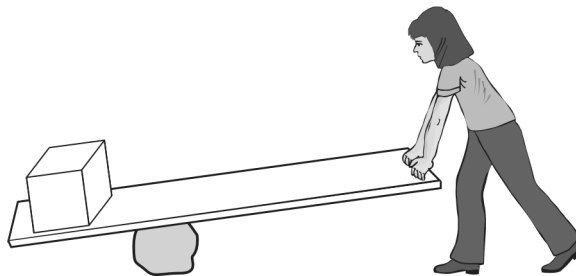
- A. a lever. B. a wedge. C. a simple gear. D. an inclined plane.
7. The picture below shows a light bulb.



The bottom of this light bulb is an example of what type of simple machine?

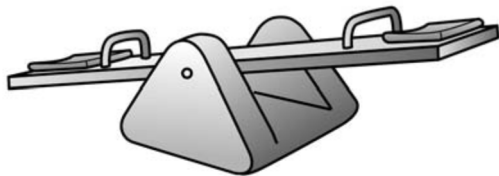
- A. a lever B. a pulley C. a screw D. a wedge
8. Often, the only way to get a large piano into a house or an apartment is to hoist it through a window. Piano movers use heavy ropes attached to a simple machine on the back of their delivery truck to get the piano into the house. What kind of simple machine do they *most likely* use?
- A. Pulley B. Lever C. Ladder D. Wedge

9. Look at the picture of Vanessa using a long wooden board with a rock underneath it to lift a box off the ground.



When she pushes down on one end of the board, the box at the other end lifts up. What type of simple machine is she using?

- A. Lever B. Pulley C. Inclined plane D. Wheel and axle
10. The picture below shows a seesaw.



A seesaw on a playground is an example of what type of simple machine?

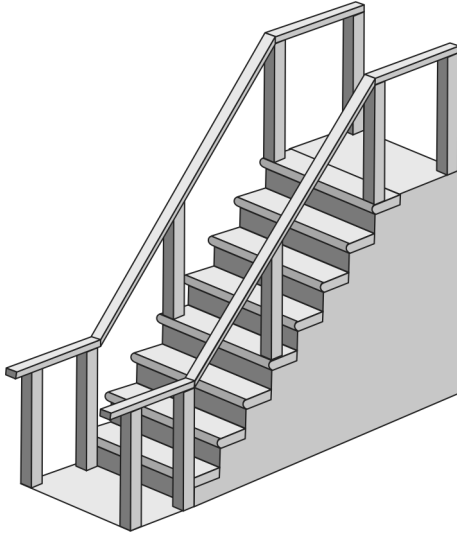
- A. lever B. screw C. wedge D. wheel and axle
11. This diagram shows a light bulb. The bottom of the light bulb is shaped so that the bulb fits securely into a light socket.



Which type of simple machine is the bottom of the bulb?

- A. lever B. pulley C. screw D. wedge

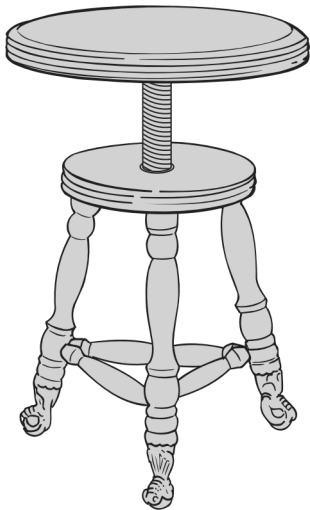
12. The picture below shows a staircase.



A staircase is *most* like what type of simple machine?

- A. lever B. wedge C. inclined plane D. wheel and axle

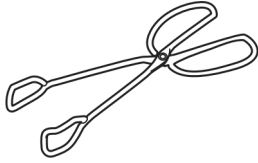
13. The picture below shows an antique piano stool.



This piano stool uses what type of simple machine to adjust the height?

- A. wedge B. screw C. pulley D. lever

14. The picture below shows tongs.



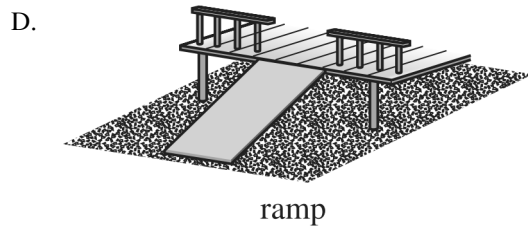
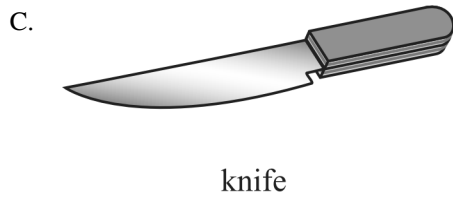
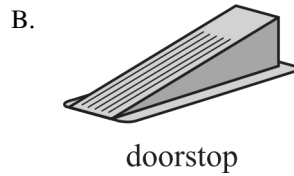
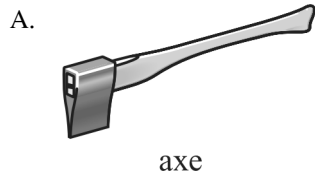
The tongs work as which of the following simple machines?

- A. inclined plane B. lever C. pulley D. wedge

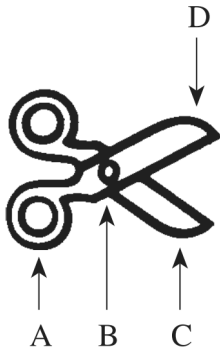
15. In order for a pulley to work properly, it must be able to overcome which force?

- A. electricity B. gravity C. light D. heat

16. Which of the following objects does *not* have a wedge?



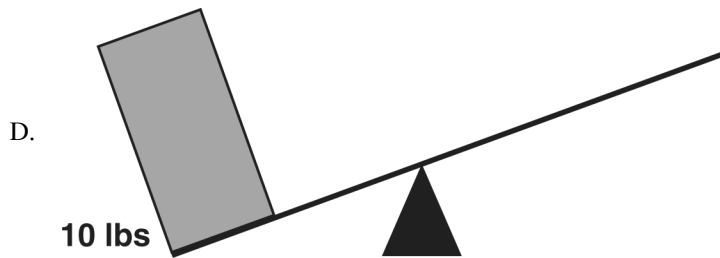
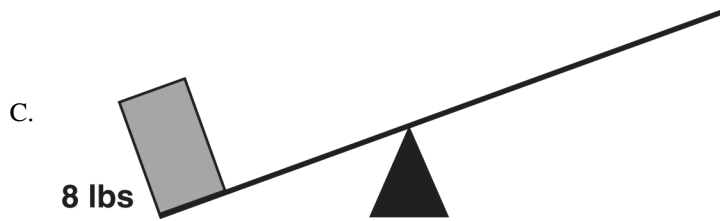
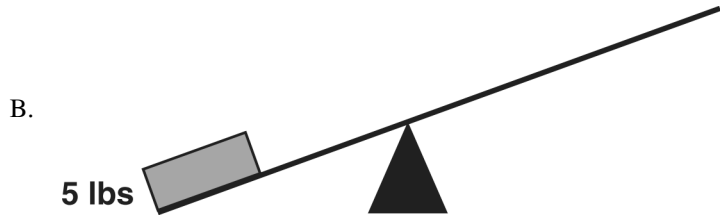
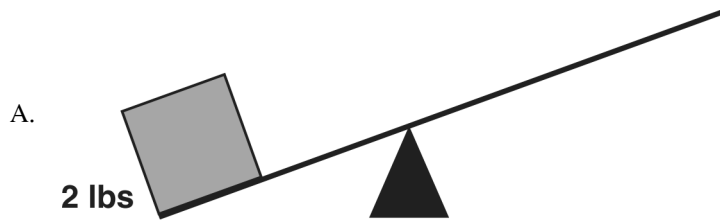
17. A lever is a bar that turns about a fixed point called a **fulcrum**. A pair of scissors is made of two levers that move in opposition (see the figure below).



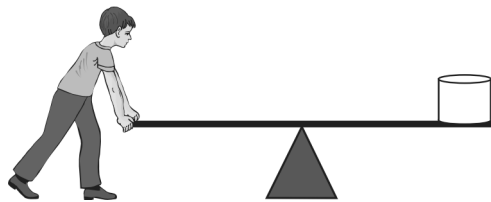
Which of the following points is the fulcrum for the two levers?

- A. point A B. point B C. point C D. point D

18. The lever length and fulcrum position are the same in each of the diagrams below. Which box will be easiest to lift?



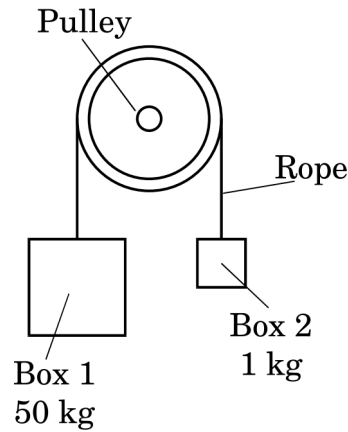
19. Casey is using a lever system to lift a box.



Which of the following should Casey do to make the box easier to lift?

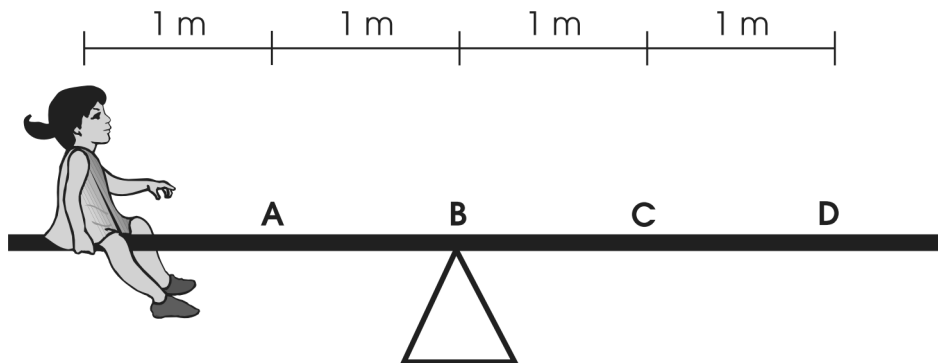
- A. Casey should move the fulcrum closer to the box.
- B. Casey should move the box on top of the fulcrum.
- C. Casey should move the fulcrum farther from the box.
- D. Casey should move the box closer to the edge of the lever.

20. This diagram shows two boxes hanging over a pulley. The boxes are fastened to the opposite ends of the same piece of rope. The rope does not stretch or break.



What will happen in this situation?

- A. Box 1 will move up, and Box 2 will move down. B. Box 1 will move down, and Box 2 will move up.
 C. Both boxes will not move. D. Both boxes will move down.
21. Gina wants to make something so that she can send her clothes down to the washing machine and save herself a trip down a flight of stairs. Which simple machine would complete the job and use the least amount of work?
- A. Lever B. Wedge C. Inclined plane D. Wheel and axle
22. An adult and a small child are at the playground. The child sits on the end of a seesaw, as shown. The adult weighs twice as much as the child.



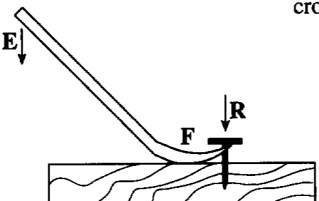
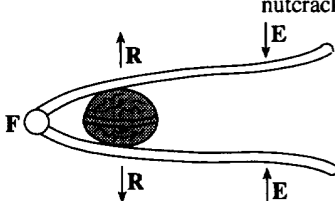
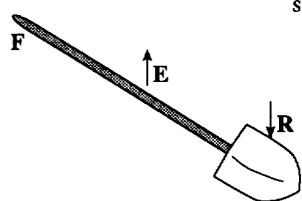
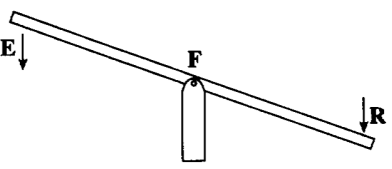
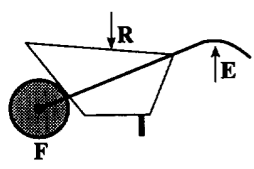
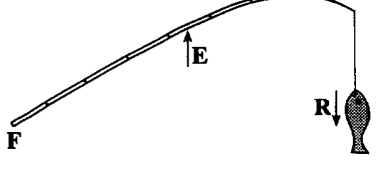
At which point on the seesaw will the adult need to sit in order to balance the child's weight?

- A. point A B. point B C. point C D. point D
23. Zavean wants a machine that will help him pry the top off a can of paint. Which of the following machines would work best?
- A. Lever B. Screw C. Large wedge D. Inclined plane

24. The following question(s) are based on the passage and diagrams below.

Levers are a commonly used form of simple machine. A lever rotates on a fulcrum. A lever has a point where an applied or *effort force* exists, and a point where a load or *resistance force* exists. For a lever to perform work, the effort force must overcome the resistance force.

Levers are divided into three classes. The figure below shows the characteristics used to classify levers, as well as examples of the three classes of levers.

First Class	Second Class	Third Class
F between E and R	R between F and E	E between F and R
 <p>crowbar</p>	 <p>nutcracker</p>	 <p>shovel</p>
 <p>seesaw</p>	 <p>wheelbarrow</p>	 <p>fishing pole</p>

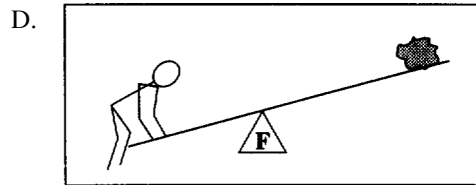
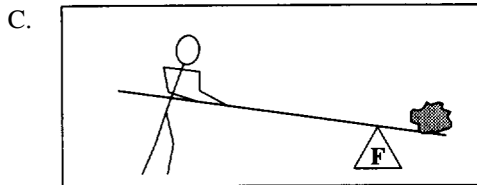
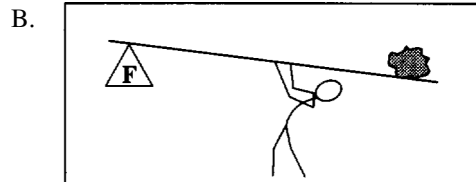
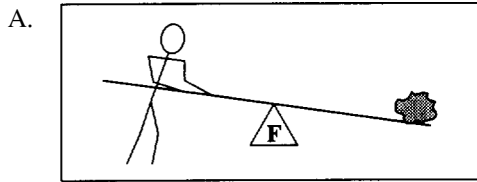
Key

E= effort force
 R= resistance force
 F= fulcrum

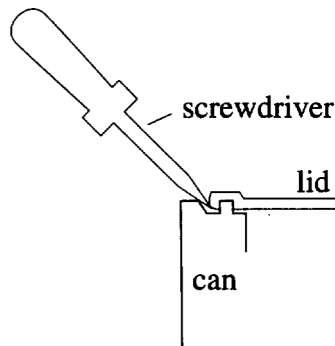
Which of the levers shown in the figure above actually consists of two levers that rotate, in opposite directions, around the same fulcrum?

- A. crowbar B. nutcracker C. shovel D. wheelbarrow

25. You want to move a rock. Where should you put the fulcrum to minimize the effort force needed to overcome the resistance force?



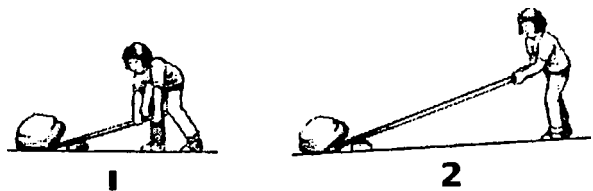
26. A screwdriver is often used as a first class lever to pry open lids (see figure below). Which of the following best supports this statement?



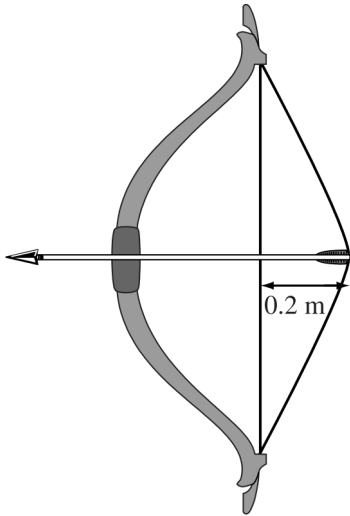
- A. The screwdriver is being used as a lever that has no fulcrum.
- B. The screwdriver is being used as a lever that has two fulcrums.
- C. The fulcrum is between the effort force and the resistance force.
- D. The effort force is between the fulcrum and the resistance force.

27. The pictures show two levers being used to lift the same rock to the same height. What is the advantage of using the lever in picture 2?

- A. Less energy is lost due to friction.
- B. Less force is required to lift the rock.
- C. More work is done while lifting the rock.
- D. More energy is transferred to the rock.



28. An archer pulls back the bowstring to prepare to shoot an arrow as shown below.



She uses an average force of 40 N, moving the bowstring 0.2 m. How much energy is stored in the bow?

- A. 8 J B. 16 J C. 24 J D. 36 J

29. A student moves a box across the floor by exerting 23.3 N of force and doing 47.2 J of work on the box. How far does the student move the box?

- A. 0.49 m B. 2.03 m C. 23.9 m D. 1,099.8 m

30. Look at the information and table below.

Power = Work/Time

The unit of power is the watt, when work is measured in joules and time is measured in seconds.

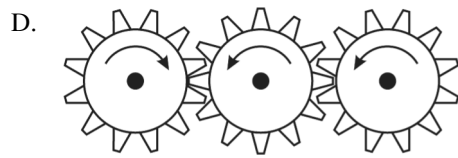
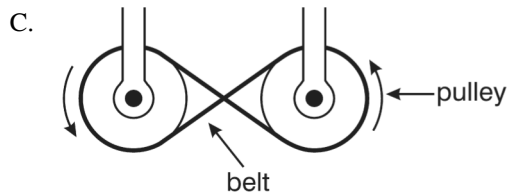
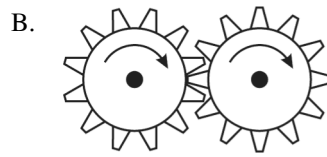
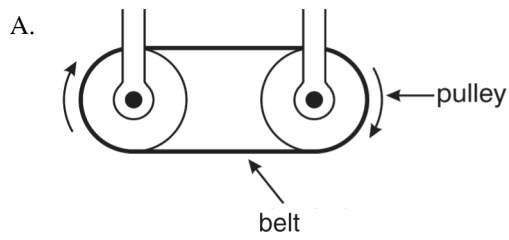
**Data Relating to Power
Generation by Students**

Student	Work (joules)	Time (seconds)
A	140	5
B	120	7
C	160	8
D	100	4

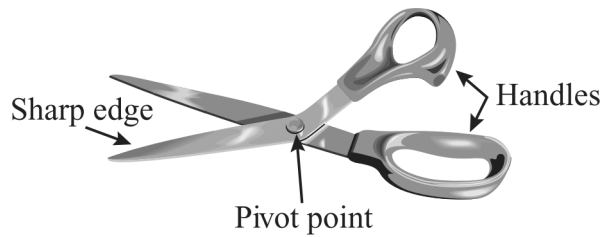
Which student in the table generated the most power?

- A. Student A B. Student B C. Student C D. Student D

31. Alexa wants to build a machine for her technology class. To think of ideas, she drew four sketches of moving parts for her machine. Which design will work?



32. The picture below shows a pair of scissors.



Scissors are an example of a complex machine. Which of the following simple machines are combined to make scissors?

- A. lever and gear B. gear and pulley C. lever and wedge D. wedge and pulley

Work and Machines Packet 11/19/2013

- | | | | |
|---------|---|---------|---|
| 1. | | 22. | |
| Answer: | D | Answer: | C |
| 2. | | 23. | |
| Answer: | D | Answer: | A |
| 3. | | 24. | |
| 4. | | 25. | |
| 5. | | 26. | |
| Answer: | B | 27. | |
| 6. | | Answer: | B |
| Answer: | D | 28. | |
| 7. | | Answer: | A |
| Answer: | C | 29. | |
| 8. | | Answer: | B |
| Answer: | A | 30. | |
| 9. | | Answer: | A |
| Answer: | A | 31. | |
| 10. | | Answer: | A |
| Answer: | A | 32. | |
| 11. | | Answer: | C |
| Answer: | C | | |
| 12. | | | |
| Answer: | C | | |
| 13. | | | |
| Answer: | B | | |
| 14. | | | |
| Answer: | B | | |
| 15. | | | |
| Answer: | B | | |
| 16. | | | |
| Answer: | D | | |
| 17. | | | |
| Answer: | B | | |
| 18. | | | |
| Answer: | A | | |
| 19. | | | |
| 20. | | | |
| Answer: | B | | |
| 21. | | | |
| Answer: | C | | |