

Pulleys and Gears Science Review Answers

1. What is a pulley?

A pulley is a simple machine, which is a wheel with a grooved rim and rope, belt or chain that passes around it. It can make lifting a load easier.

2. Name 5 machines/devices that use a pulley system.

Flagpole

Water well

Crane

Elevator

Fishing Rod

Window Blind

Window Washer Ledge/scaffold

Weight Machine

Tow Truck

Clothes Line

3. What are gears?

Gears are simple machines. It is a wheel with teeth around its edge that interlocks with the teeth of other gears.

4. Name 5 machines/devices that use a gear system.

Clock

Bike

Mixing Beaters

Pencil Sharpener

Watch

Can Opener

Treadmill

5. Name and explain 4 different types of gears.

Spur Gears – has teeth that go straight up and down when the gear lies flat; can change the speed or direction of motion

Bevel Gears – has a sloped rim and the gears teeth are also sloped; they can change the speed and direction of motion

Worm Gears – it looks like a screw and can be linked to a spur gear; the system changes the speed and direction of motion

Herringbone Gears – has teeth that are shaped like a V;

6. Explain the following pulley systems:

a. Fixed Pulley System

A fixed pulley system is attached to a structure and does not move; changes the direction of the effort force used to lift a load; you must use the same amount of effort force to pull as you would if you were lifting the load without a pulley

b. Movable Pulley System

A moveable pulley system is where the pulley supports the load and is not fixed in place; reduces the amount of effort force need to pull to lift a load

c. Combined Pulley System

A combined pulley system uses both a fixed pulley and a moveable pulley. The fixed pulley changes the direction of the effort force, which allows you to pull down to lift the load. The moveable pulley lets you pull using only half the effort force

7. Would you use a fixed pulley or a movable pulley to lift a heavy load of roofing materials to the roof of a building? Explain

If you used a fixed pulley system to lift the roofing materials you would have to use your weight to help lift the load. If you used a moveable pulley system to lift the roofing materials you would use less effort to move it to the roof.

8. You have a system of two interlocking gears. If you turn one gear in a clockwise direction, what will happen to the other gear?

If you have two interlocking gears and one turns in a clockwise direction, the other gear will turn in a counterclockwise direction.

9. What is different about the way gears on a bike turn in comparison to standard spur gears?

The gears on a bike have teeth that are flat and on spur gears the teeth are on the side and go straight up and down.

10. Why do you put oil on the chain of a bike?

Oil is used on the chain of a bike to make it not rust, run smoother and quicker, and so that it does not fall off.