Work & Machines

Name _____ Class _____ Date _____

Work is the exertion of **force** on an object that causes the object **to move** in the **same direction** in which the force is applied. If the object **does not move** as a result of the **force** applied, **no work** is done.

Calculating Work

To determine the **amount** of **work**, you multiply **force** times **distance**.

Newton (**N**) is the **unit of measure** for **force**, and **meter** (**m**) is the basic unit for **distance**.

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120 N

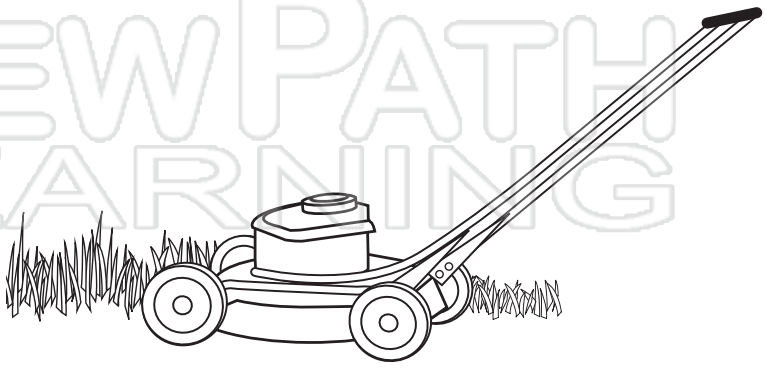
120 J

Calculating Power

Power is the **rate** at which **work** is done or the rate at which energy is transferred.

$$\text{Power (P)} = \frac{\text{Work (W)}}{\text{Time (t)}}$$

The **unit of measure** for **power** is expressed in **joules** per second (**J/s**) also known as the **Watt** (**W**).

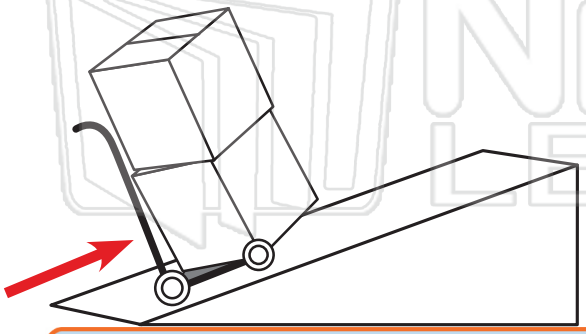


Work & Machines

Name _____ Class _____ Date _____

Work is the ability to **move an object**. An object must move in order for work to have been done. **Simple machines** make doing work **easier** but they never decrease the amount of work that needs to be done. There are many different kinds of simple machines.

Inclined Plane



A pla… or
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incline
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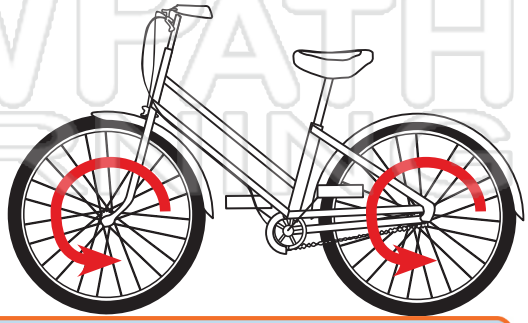
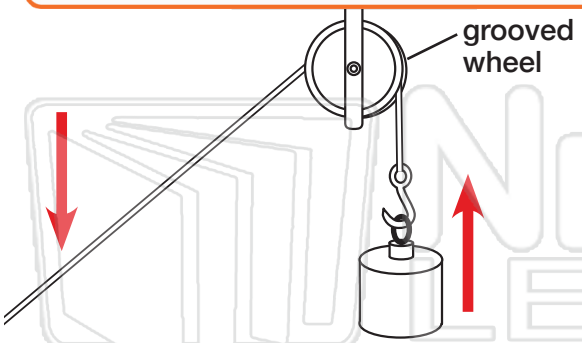
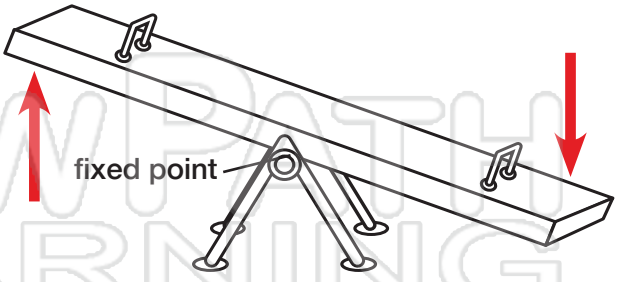
Wheel & Axle





Made up of a wheel with a grooved rim in which a rope can move around in order to help lift a load.

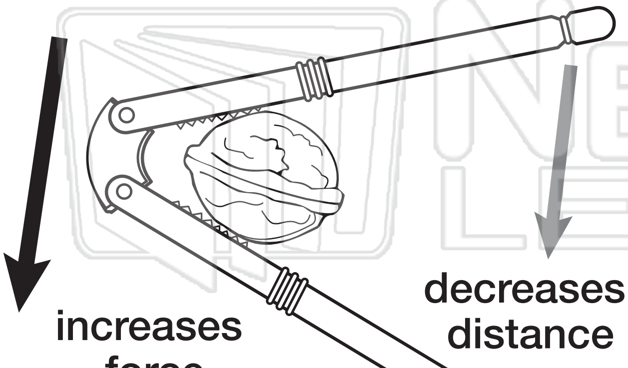


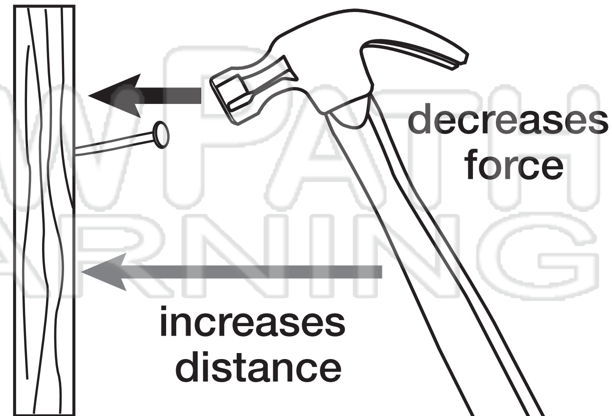
A bar which rests and moves on a fixed point, used to raise an object on the other side.

Work & Machines

Name ______________________ Class ____________ Date ____________

Simple machines are devices designed to make work easier by **changing** the **amount of force** you exert, the **direction of the force** or the **distance** over which you exert the force.





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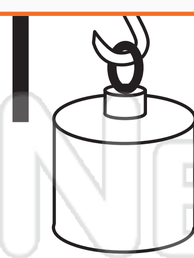


A **simple pulley** changes the direction of the input force, but the amount of input and output force remain the same.

A **screwdriver** used as a **lever**, increases the force and decreases the distance.

Work & Machines

Name _____ Class _____ Date _____

Fill in the blanks. **Answer** the questions below.

_____ is the exertion of _____ on an object that causes the object **to move** in the _____ **direction** in which the _____ is applied. If the object **does not move** as a result of the _____ applied, **no** _____ is done.

Work = Force x _____ **Power (P) =** _____ / _____

1. W

2. W

3. A
H

How much **power** is used?

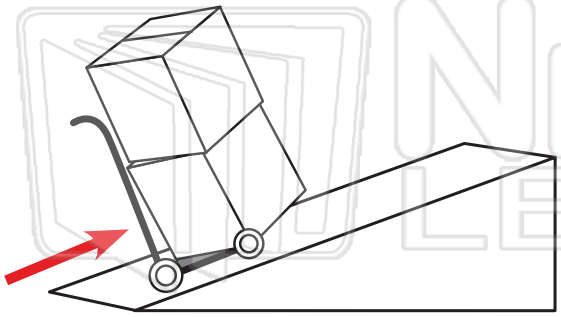
4. A football player uses **200 N** to push training equipment **25 m**. How much **work** is done?

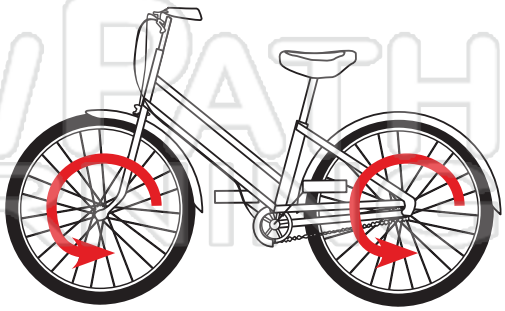
Work & Machines

Name _____ Class _____ Date _____

Simple machines make doing **work** **easier** but they never **decrease** the amount of work that needs to be done.

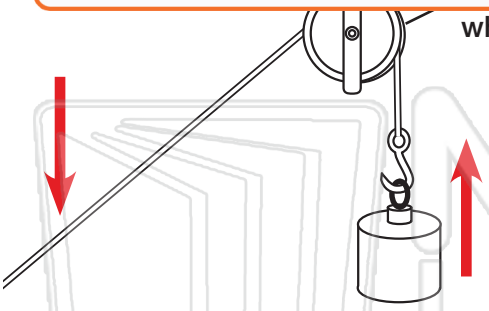
Name and describe the simple machines shown below.

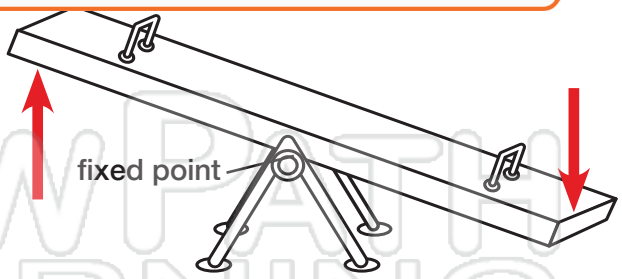




incline plane

wheel





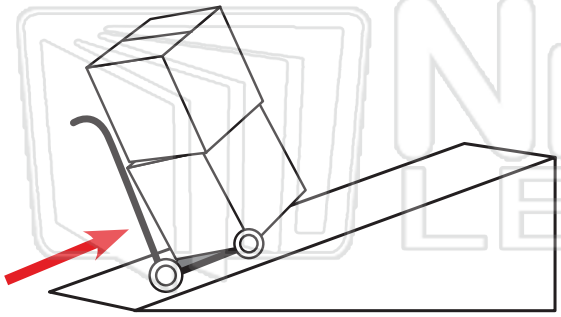
Work & Machines

Answer Key - Sample

Simple machines make doing **work** **easier** but they never **decrease** the amount of work that needs to be done.

Name and describe the simple machines shown below.

Inclined Plane

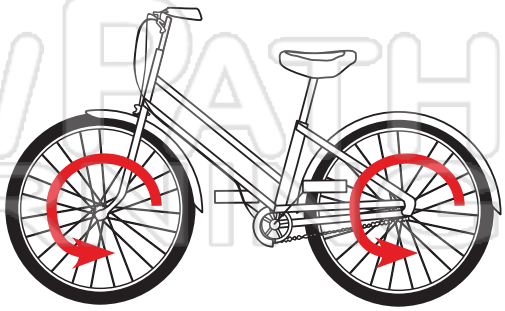


A plane or ramp used to move an object up or

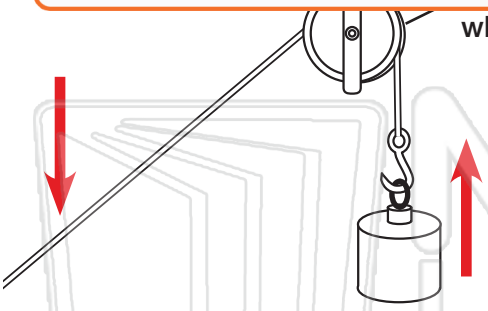
incline plane

An in often mainl

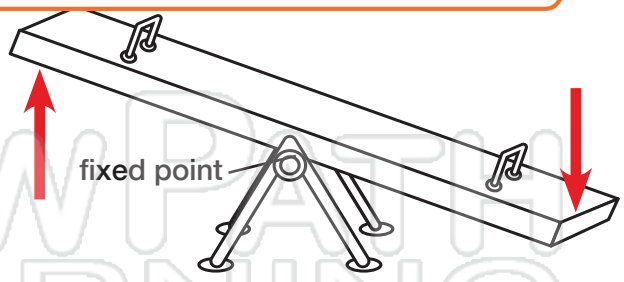
Wheel & Axle



A pole and a wheel that revolves or



Made up of a wheel with a grooved rim in which a rope can move around in order to help lift a load.



A bar which rests and moves on a fixed point, used to raise an object on the other side.

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Answer Key - Sample

Fill in the blanks. **Answer** the questions below.

Work is the exertion of **force** on an object that causes the object **to move** in the **same** **direction** in which the **force** is applied. If the object **does not move** as a result of the **force** applied, no **work** is done.

Work = Force x Distance **Power (P) = Work / Time**

1. W
   W
   d

2. W
   W es.
   P s.

3. A
   H
   w

   How much **power** is used?

   power = work (J)/time (s) so 35000 J/ 20 s = 17,500 J/s

4. A football player uses 200 N to push training equipment 25 m. How much **work** is done?

   work = force x distance so 200 N x 25 m = 5,000 J