**Work and Power Notes Name \_\_\_\_\_\_\_\_\_\_\_\_**

**Work** is defined as the product of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ through which that force is exerted.

The formula for **Work** is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the units are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( \_\_\_\_ ).

The variables stand for: F = \_\_\_\_\_\_\_\_\_\_\_\_\_ ( \_\_\_ ), d = \_\_\_\_\_\_\_\_\_\_\_\_ ( \_\_\_ )

*Example…*

How much work is done lifting a 3N cabbage 2 meters into the air?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Given | Unknown | Equation | Substitute | Solve |

How much work is done by holding it there for 5 seconds?

List the two conditions necessary for work to be done on an object:

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Example…*

Pete fills a pitcher full of Pepsi and pushes the 5 N pitcher forward with a 10 N force over a distance of 0.5 m to a customer at the end of the counter. The coefficient of friction between the pitcher and the counter is 0.4. Draw a free body diagram

a. Determine the work done by Pete on the pitcher.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Given | Unknown | Equation | Substitute | Solve |

b. Determine the work done by friction upon the pitcher.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Given | Unknown | Equation | Substitute | Solve |

c. Determine the total work done upon the pitcher.

**Power** is defined as \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ divided by the \_\_\_\_\_\_\_\_\_\_\_ used to do the work. The units are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_).

The formula for **Power** is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which can also be written \_\_\_\_\_\_\_\_\_\_\_\_\_

*Back to Pete…*

If Pete’s pitcher of Pepsi takes 2 seconds to reach the customer, what was Pete’s power output?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Given | Unknown | Equation | Substitute | Solve |

*Another example…*

A machine is capable of a power output of 1,000 watts. How far can it lift a 50N weight straight up in 3s?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Given | Unknown | Equation | Substitute | Solve |

*Putting it all together…*

How much work is done holding a 1,200 N piano at shoulder height for 120 seconds (your shoulder is 1.5m above the ground)?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Given | Unknown | Equation | Substitute | Solve |

What if we lifted the piano straight up 1m over that time?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Given | Unknown | Equation | Substitute | Solve |

How much power was exerted?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Given | Unknown | Equation | Substitute | Solve |