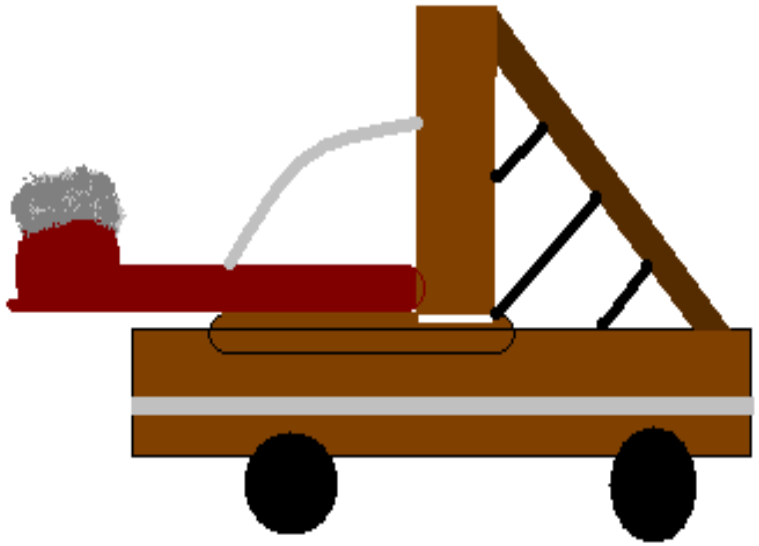
Define force, Newton, Joule, and Watts.

FORCE
NEWTON
JOULE
WATTS



MatchCard Science© Force and Motion - 8

Define force, Newton, Joule, and Watts.

FORCE
Push or Pull on an object

Mass X Acceleration

NEWTON
Measures amount of Force

1 kg X 1 m/s/s

JOULE
Measures amount of work done

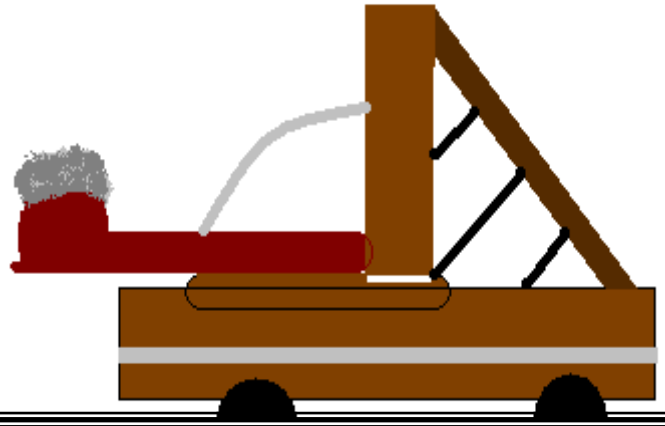
1 Newton X 1 meter

WATTS
Measures amount of work done over time

$$\frac{\text{Work}}{\text{Time}}$$

1 watt = 1 joule/second

Discuss "force" as the work done by a catapult hurling a boulder. Add the concepts of Newton, Joule, and Watts to your description. You can make a catapult using a toy construction kit. A simple catapult can be made by attaching a plastic spoon to a spring clothes pin with a hot glue gun. The spoon should be on the slanted edge, and the flat edge glued to a board. Use it to catapult marshmallows.



Go outside and throw a 1 kg weight (or 7 oz can.) One Newton would propel the 1 kg can so it accelerates 1 meter per second per second. One Joule would send it 1 meter at that rate of acceleration. One Watt would send it that far at that force in one second.

What other work can be done besides hurling rocks with a catapult? What work is done in your house by electric machines? How many watts do you use?

One horsepower equals 746 watts. If you had a generator powered by horses to do the electrical work in your house, how much work would your horse have to do? Horsepower is also defined as 33,000 lb/ft in one minute.

F&M - 8 Information Pieces

Push or Pull on an object F&M 8
Measures amount of Force F&M 8
Measures amount of work done F&M 8
Measures amount of work done over time F&M 8
Mass X Acceleration F&M 8
1 kg X 1 m/s/s F&M 8
1 Newton X 1 meter F&M 8
$\frac{\text{Work}}{\text{Time}}$ F&M 8
1 watt = 1 joule/second F&M 8

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