Work & Power

A Flipped Lesson by Ms. Logan

WORK

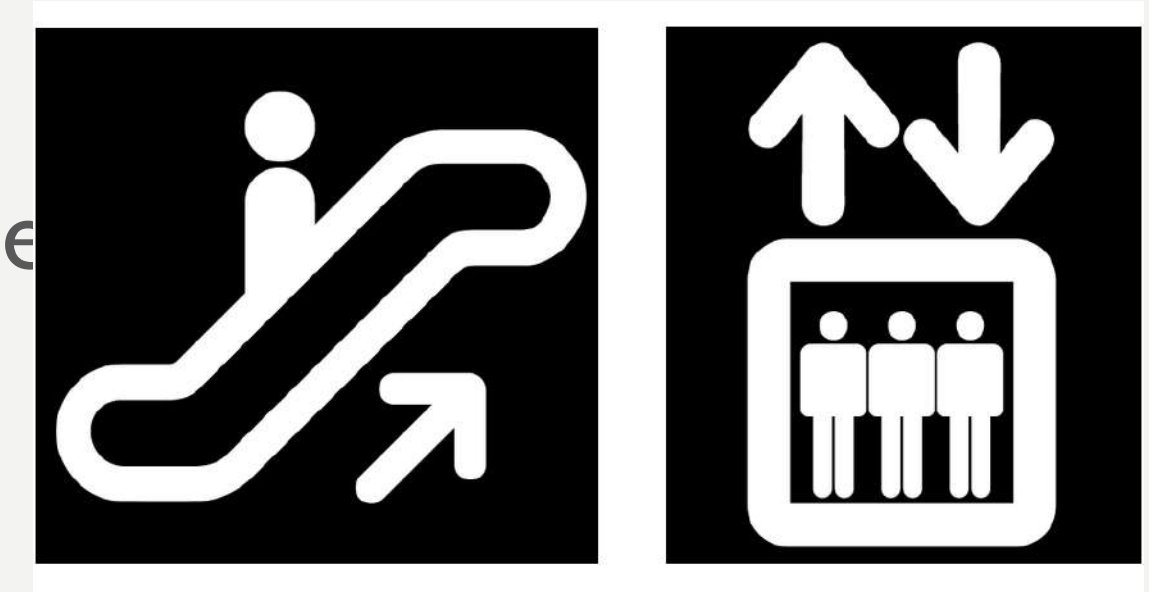
- Work is whenever a force causes a displacement. Work is also measured in Joules.

$$W = Fdcos\theta$$

θ is defined as the angle between the force and the displacement of the object.

PROBLEM

- How much work is done by an elevator lifting a mass of 84 kg up 30 meters?



PROBLEM

Erin pushes on a box with a force of 40 N at an angle of 25 degrees downwards. If she pushes the box for 20 meters, how much work did Erin do?

WORK-ENERGY THEOREM

PROBLEM

If a 5 kg ball is dropped from a height of 25 meters, how fast is the ball going right before it hits the ground if we neglect friction and air resistance?

If the ball only hits the ground with a speed of 19.6 m/s, how much work did air resistance do on the ball?

POWER

- Power is defined by how much work is done is a certain time frame. The faster you do the work, the more power you generate. Power is measured in Watts.

$$P = \frac{W}{t}$$

Power Problem

A crane moves a large rock with a force of 3000 N over a distance of 10 m over 30 seconds. How much power is exerted?

Follow Up Questions

1) What are the units for Work? Power?
2) What is the relationship between work and power?
3) A box is pushed with 600 N for 2 m. What is the work done?
4) If the same box from the previous problem is pushed for 4 seconds, how much power is exerted?