

DATE:

NAME:

CLASS:

TOPIC 3.1

## Activity: Energy Equation Calculation Problems

BLM 3.1-10

2. A satellite has a mass of 689 kg and travels at a speed of 27 000 km/h (7500 m/s). How much mechanical kinetic energy does the satellite have?

$$E_k = \frac{1}{2} m v^2$$

$$= \frac{(689 \text{ kg}) (7500 \frac{\text{m}}{\text{s}})^2}{2}$$

$$= 1.9 \times 10^{10} \frac{\text{kg m}^2}{\text{s}^2} \rightarrow \text{J}$$

3. A bowling ball is rolling down the lane at 2.8 m/s. If it has a mechanical kinetic energy of 25.5 J, what is its mass?

$$E_k = \frac{1}{2} m v^2$$

$$m = \frac{2 E_k}{v^2}$$

$$\frac{\text{kg m}^2}{\text{s}^2} \cdot \frac{\text{s}^2}{\text{m}^2}$$

$$= \frac{2 (25.5 \text{ J})}{(2.8 \frac{\text{m}}{\text{s}})^2} = 6.5 \frac{\text{J}}{\frac{\text{m}^2}{\text{s}^2}}$$

$$= 6.5 \text{ kg}$$