Name: Class:

Student worksheet

3.3 Moving objects have kinetic energy

Pages 46–47 and 171

Kinetic energy

1 What is kinetic energy?

2 Which types of objects have the greatest kinetic energy?

3 Give four examples of kinetic energy.

4 Which has greater kinetic energy? Explain your answers.

a A jogger or a sprinter?

b A car moving at 100 kilometers per hour or a train moving at 100 kilometers per hour?

c Electricity or flowing water?

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d A person on a bicycle moving at 5 kilometers per hour or a person on a motorcycle moving at 60 kilometers per hour?

5 When can our eyes not detect light energy?

6 What is the function of a solar cell?

7 How is thermal energy created?

8 How/where does thermal energy move?

9 What is sound made up of?

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Extend your understanding

10 Newton's second law of motion states that force is equal to the mass of an object multiplied by its acceleration. This means that heavier objects (mass) are harder to push (force), so they cannot move as fast (acceleration). On the other hand, lighter objects are easier to push, so they can move faster.

a An elephant and a mouse are on skateboards. If you were to push both at the same time using the same amount of force, which one would move further? Explain your answer using Newton's second law of motion.

Weight can also be explained using Newton's second law of motion. Your weight (the force) is equal to your mass multiplied by your acceleration. The unit used for weight is Newtons (N).

b What is the name that is given to your acceleration (9.8 m/s/s) on Earth?

c If acceleration is constant, what it the relationship between weight and mass?

d A person has a weight of 50 N on Earth. Calculate their mass in kilograms use the equation $F = m \times a$.

e What is the weight in Newtons of the same person on the Moon, if the Moon has $\frac{1}{6}$th of the Earth's acceleration?

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