# Year 11 Science: Kinetic energy, potential energy and work

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

## Practice

1. Calculate the kinetic energy of a 1200 kg car travelling at 15 m/s.

2. A 0.5 kg book is lifted from the floor onto a shelf 1.8 m high. How much Ep does it gain?

3. A shopper pushes a trolley 25 m along an aisle with a force of 80 N. How much work is done?

4. A diver steps off a 5.0 m platform. Ignoring air resistance, how fast is she going when she reaches the water?

5. A 55 kg student runs up stairs with a total height of 12 m in 20 s. Find the Ep gained and her power.

## Exam-style question: the playground slide

**Aroha has a mass of 40 kg. She climbs to the top of a playground slide 2.5 m above the ground and slides down from rest. Use g = 10 N/kg.**

6. Describe the energy changes as Aroha goes down the slide.

7. Calculate the greatest speed Aroha could have at the bottom, and state the assumption you made.

8. Her real speed at the bottom is 6.0 m/s. Discuss what happened to the rest of her energy, using calculations, and explain why the slide feels slightly warm afterwards.

## Fix the mistake

9. Correct this statement: "$v^2 = 64$, so the apple lands at 64 m/s."

10. Correct this statement: "Energy is lost when the object hits air resistance, so the total energy goes down."

11. Correct this statement: "A 500 g ball dropped 2 m has Ep = 500 × 10 × 2 = 10 000 J."

12. Correct this statement: "Doubling the speed doubles the kinetic energy."