

## A2 ACTIVITY 5: THE ENERGY OF BOUNCE

### Background

This activity is a great way to open a discussion about the energies involved in **bouncing**, and to demonstrate the principle of the **Conservation of Energy**.

Before the ball is dropped, it has **potential gravitational energy**, which will cause it to rebound when it hits the ground. Some of this energy is **converted** to **heat energy** and **sound energy**, so it loses **momentum** and will not rebound to the original height.

Students can film the action and then replay it in slow motion to observe bounce patterns. Following that, students could consider why in tennis, squash, rugby and basketball, the ball is often repeatedly bounced before the player uses it.

After the activity students can consolidate and further their learning by answering **A2.5 WORKSHEET D: THE ENERGY OF BOUNCE**.

### Equipment required:

- Two basketballs – one fully inflated and the other partially inflated
- A selection of smaller balls – table tennis ball, squash ball, tennis ball
- Measuring tape or supported screen marked at intervals, or a data logger and motion sensor
- Worksheet – **A2.5 WORKSHEET D: THE ENERGY OF BOUNCE**

### Suggested approaches:

- If the class has internet and viewing access, show [this short SEAI video](#) to inspire a class discussion before carrying out the activity. Alternatively, you could watch this video and replicate the presentation for your class.
- You might discuss with the class whether some balls bounce better than others, or what it is like to ride a bike with a flat tyre. Click [here](#) to view a useful webpage with information and ideas on teaching a class about air pressure and force.

### What to do:

1. Give the fully inflated ball to one student, and the partially inflated ball to another, and ask them both to drop the balls from the same height.
2. Compare the bounce of both balls by observing return bounce heights.
3. Bounce the balls and let them continue for a number of rebounds. By having a marked screen behind the balls, it should be possible to measure the successive rebounds. The activity could also be videoed and reviewed frame by frame.
4. Now move on to **A2.5 WORKSHEET D: THE ENERGY OF BOUNCE** – the class could complete the worksheet together or individually.

#### ALTERNATIVE

You might wish to use the worksheet during the activity, rather than after it. It could be used to guide the lesson, with actions carried out to find the answer to each question. In this way students can focus on the activity without needing as much teacher input.

#### FURTHER LEARNING

For teachers wishing to elaborate further on this theme, there is an appropriate activity on page 13 of *Physics on Stage 3: Demonstrations and teaching ideas*, and available free online by clicking [here](#).

In this more advanced lesson, a student is asked to demonstrate what happens when one small ball is placed on top of the basketball and both are dropped together. The class is asked to observe and consider the following questions:

- What happens on the rebound?
- Is there a difference depending on which of the small balls is placed on top of the basketball?