**Force or momentum?**

To really understand what a force is you need to know about momentum.

**To do**

Fill in the gaps to describe what happens.

*You should only use the words* ***force*** *and* ***momentum****.*

**To answer**

1. **Hitting a rounders ball**

John was batting.

He hit the rounders ball with a lot of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

It flew quickly through the air with so much \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that James found it hard to stop.

James had to use a lot of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to stop it.



1. **Riding on a shopping trolley**

After her shopping Jane liked to run with the trolley in the car park and jump on.

At the end of her shop it was heavy so she needed a lot of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to make it move.

It was hard to stop because it had a lot of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

She needed a lot of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to stop it.

*Physics > Big idea PFM: Forces and motion > Topic PFM1: Forces > Key concept PFM1.1: What forces do*

|  |
| --- |
| **Response activity** |
| **Force or momentum?** |

**Overview**

|  |  |
| --- | --- |
| Learning focus: | A force makes things change: the speed, direction and/or shape of an object. |
| Observable learning outcome: | * Recognise that the motion of objects that are heavier and/or moving faster are harder to change. |
| Activity type: | Response, focused cloze |
| Key words: | force, momentum |

This activity can help develop students’ understanding by addressing the sticking-points revealed by the following diagnostic question:

* Diagnostic question: Momentum

**What does the research say?**

Forces are often linked to movement and students see force as a property of something that is moving. A property that keeps it moving and which runs out when a moving object comes to rest. In other words students often confuse momentum with force. The idea that force is something within an object that keeps it moving is a widely held view (Driver *et al*, 1994).

**Ways to use this activity**

Students complete this pencil and paper task to check they understand that a force causes a change to motion and is not an intrinsic property of an object. It might be done by individual students or by students working in pairs to agree their answers.

*Differentiation*

It may be appropriate to read the text to some students, so they can focus on the science ideas.

**Equipment**

For each student/pair/group:

* ‘Force or momentum’ student worksheet (The large font allows this to be used when printed A5. It will then stick easily into a standard exercise book)

**Expected answers**

Hitting a rounders ball

John was batting. He hit the rounders ball with a lot of **force**. It flew quickly through the air with so much **momentum** that James found it hard to stop. James had to use a lot of **force** to stop it.

Riding on a shopping trolley

After her shopping Jane liked to run with the trolley in the car park and jump on. At the end of her shop it was heavy so she needed a lot of **force** to make it move. It was hard to stop because it had a lot of **momentum**. She needed a lot of **force** to stop it.

**Acknowledgments**

Developed by Peter Fairhurst (UYSEG).

Images: UYSEG

**References**

Driver, R., Squires, A., Rushworth, P. and Wood-Robinson, V. (1994) Making sense of secondary science, research into children’s ideas, Routledge, London, England.