

**Learning Outcomes:**

Nature of Science	Students should be able to organise and communicate their research and investigative findings in a variety of ways fit for purpose and audience, using relevant scientific terminology and representations
Physical World	Students should be able to explain energy conservation and analyse processes in terms of energy changes and dissipation

**Investigation 1**

Imagine a snowboarder at the beginning of a half-pipe. He soars high into the air, pauses for an instant, and drops back onto the half-pipe. He then whizzes down the icy wall, reaches bottom, and zooms back upward. As he goes through these motions, his kinetic energy constantly changes.

The Olympic Council of Ireland are sending a snowboarder to the Winter Olympics for the first time. They have asked you to present an argument to the snowboarder to support the claim that their kinetic energy changes as they travel down the half pipe.

Conduct research to identify the relationship between the kinetic energy and potential energy of an object as it moves from one height above the ground to another.

- Consider what your research reveals about the energy changes that would occur as a snowboarder completes the half-pipe competition
- Draw sketches to support an argument that a snowboarder's kinetic energy would change during different stages of the halfpipe competition.
- Label your sketches in terms of the relationship between kinetic energy (KE) and potential energy (PE) at the different stages.

According to your sketches, when would kinetic energy be at a maximum? At a minimum?

During which part of the run would kinetic energy be increasing? When would it be decreasing?

Besides kinetic and potential energy transfer, what other energy transfer may be occurring?

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JC Science 2017 Specification

Use your sketch to present a 2-min argument to the snowboarder on the Irish Olympic team.

Your argument should support the claim that kinetic energy changes as you complete the half-pipe competition. If anyone disputes your argument, present scientific evidence to support it.

