**ACTIVITY: Invention or innovation?**

We hear the word ‘innovation’ used a lot today, but it is often used to mean different things. In this activity, students clarify their understanding of innovation by exploring how it is different from invention. The YikeBike is used as an example, but the activity can be easily adapted to use other examples that have particular relevance or interest for your students.

By the end of this activity, students should be able to:

* identify characteristics of inventions and innovations
* discuss and support their view on whether the YikeBike (or another example) is an invention or an innovation.

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**Introduction/background**

In today’s world, there’s widespread use of the word ‘innovation’. It’s become a common term. A Google search will produce lots of definitions for innovation and lots of discussion about what it is.

So, how do we come to a common understanding of what innovation is? And how do we distinguish it from invention, as often innovation and invention are used interchangeably. One way is to create a list of characteristics that define invention and innovation and use these as criteria to assess a product.

In this activity, we use the YikeBike as our example product. Using video clips and innovation key terms, students are asked to identify characteristics that define an invention and an innovation. The YikeBike is then assessed against these criteria, and students are asked to decide whether it’s an invention or an innovation.

This is an activity for developing understanding of the concept of innovation and how it differs from invention. The aim is for students to be able to apply this understanding when looking at or reading about items described as being innovations or inventions. This activity involves thinking, reasoning and explaining and can be adapted to fit class ability or interests.

**What you need**

* Access to the video clips [The YikeBike Story](http://link.sciencelearn.org.nz/videos/770-the-yikebike-story), [Discussing innovation – Alistair Mowat](http://link.sciencelearn.org.nz/videos/1019-innovation-definition-alistair-mowat)
* Access to the article [Radical bike redesign](http://link.sciencelearn.org.nz/resources/1467-radical-bike-redesign)
* Access to the [key terms for innovation](http://link.sciencelearn.org.nz/resources/1698-innovation-key-terms)
* Access to the websites [*TIME* magazine 50 Best Inventions of 2009](http://www.time.com/time/specials/packages/article/0%2C28804%2C1934027_1934003_1933960%2C00.html), [www.yikebike.com](http://www.yikebike.com) and [www.minifarthing.com](http://www.minifarthing.com)

**What to do**

***Part 1: Introducing terms and defining characteristics***

1. Watch the video clip [Discussing innovation – Alistair Mowat](http://link.sciencelearn.org.nz/videos/1019-innovation-definition-alistair-mowat) and ask students to note down some of the terms he uses to describe innovation and invention (for example, end-user focus, consumer, solution for situation, need or issue, team skills for innovation, idea generated from own resource, alone, focus on themselves for inventor).
2. Ask students to read the [key terms for innovation](http://link.sciencelearn.org.nz/resources/1698-innovation-key-terms) and list more characteristics of an innovation and an invention.
3. As a class, agree on three characteristics for an invention and three for an innovation. As the terms ‘innovation’ and ‘invention’ are widely used, the idea is to reach a common understanding in your class of the characteristics that define innovations and those that define inventions. Be sure that the characteristics you agree on are as clear and unambiguous as you can make them. These are the criteria your students will assess the YikeBike against.

***Part 2: Introduce the product***

1. Introduce the YikeBike as a product – you might like to show the [YikeBike](http://link.sciencelearn.org.nz/videos/770-the-yikebike-story) video clip here and also to have some still images of the [folded](http://link.sciencelearn.org.nz/images/1787-yikebike-folded) and [unfolded](http://link.sciencelearn.org.nz/images/1786-yikebike-unfolded) bike.
2. Ask your class to identify the features of the YikeBike. How is it the same as or different to other bicycles? Refer to the [Bicycle designs over time](http://link.sciencelearn.org.nz/images/1785-bicycle-designs-over-time) image to help promote thinking, or you could Google ‘bicycle images’ to create an image gallery of different types of bicycles and compare the YikeBike to these.
3. Read the article [Radical bike redesign](http://link.sciencelearn.org.nz/resources/1467-radical-bike-redesign), which explains some of the design detail of the YikeBike. More information on the design and technical detail can be found on the YikeBike website ([www.yikebike.com](http://www.yikebike.com)).
4. The YikeBike has won many awards including, shortly after it was released, being listed in *TIME* magazine’s 50 Best Inventions of 2009. In [this article](http://www.time.com/time/specials/packages/article/0%2C28804%2C1934027_1934003_1933960%2C00.html), it is named as an invention and then described as innovative bicycle design.

***Part 3: Introduce the problem***

1. Pose the question: Is the YikeBike best described as an invention or an innovation?
2. Working in small groups, ask your students to assess the YikeBike against their previously agreed characteristics for innovations and inventions. Which set of criteria does it more clearly meet? Use the YikeBike articles [Radical bike redesign](http://link.sciencelearn.org.nz/resources/1467-radical-bike-redesign) and [Composite materials](http://link.sciencelearn.org.nz/resources/1466-composite-materials) and information from the YikeBike website ([www.yikebike.com](http://www.yikebike.com)) to make decisions.
3. Each group of students needs to decide what they think – is the YikeBike best described as an innovation or an invention? Be clear that there is no right answer here. It is the explanation and the reasoning that is important.
4. Each group of students presents their findings back to the class and justifies their conclusions.