



# Land, water and bees – don't take us for granted:

## Hydroponics in the lab

### Student activity sheet

#### Plant science at Sheffield Hallam University

Watch the video 'Hydroponics in the lab' (available on The Crunch website, [thecrunch.wellcome.ac.uk/schools](https://thecrunch.wellcome.ac.uk/schools)), an interview with Cally, who is a plant scientist at Sheffield Hallam University. Then answer the following questions.

#### Questions

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1. Cally tells us that using hydroponics gives her complete control of the growing conditions of the plants she is working with. Why is this important for her scientific research?
2. Cally is particularly interested in the element selenium (Se in the Periodic Table). Why is selenium important in medical research?
3. Cally can spray seeds with water containing any element she wants to study. The seeds germinate and grow into seedlings, which she can then dry and analyse. She has access to state-of-the-art machines to do this analysis, including a mass spectrometer. This machine has many uses in science. Use a variety of resources to find out how a mass spectrometer works and what it is used for.
4. The research Cally does is intended to produce better fertilisers. She may be able to tailor a fertiliser to a particular plant so that it grows really well. This technique will help to provide **food security** in the future. What do scientists mean by 'food security', and why do they think it will be a problem in years to come?

#### Further reading

An easy-to-understand explanation of how a mass spectrometer works:  
[www.explainthatstuff.com/how-mass-spectrometers-work.html](http://www.explainthatstuff.com/how-mass-spectrometers-work.html)