

Getting students to rethink their ideas: how can we challenge and build on students' misconceptions

Research taster

Students bring to their science lessons ideas and explanations they have picked up in their everyday lives. One example of a commonly held notion is that plants feed from the soil. Students' own ideas often act as barriers to proper science explanations but they also offer starting points for new learning. Students respond well to and enjoy approaches that build on their existing conceptions they also enjoy surprises if alternative, scientific, explanations are offered as intriguing discoveries rather than right answers which imply their ideas are 'wrong'.

Your evidence

You may find it helpful to analyse the extent to which students bring their own understandings to science lessons and how they express them. You will need to first identify some of the areas of science in which students' own conceptions are likely to feature, such as plant nutrition, forces and motion, and particles in chemical and physical and chemical change.

In this activity you could attempt to record, by audio tape or video, the involvement of your students in a discussion of one of these key areas. Ask yourself:

Are they participating?

How far are they using their own rather than scientific conceptions?

To what extent do conceptions offered by individual students find agreement among the other students?

Adapted from Reflective Activity 10-2a.

Moving forward

Would it be a good starting point to make explicit one or perhaps more alternative conceptions? Could you get the students to work in groups on a task that challenges an alternative conception and then share ideas during a plenary session?

Find out more

To find out more about students' alternative conceptions in science teaching and learning you may find the following useful:

Leach, L., Ametller, J., Hind, A., Lewis, J., Scott, P. Evidence-informed approaches to teaching science at junior high school level: outcomes in terms of student learning

Paper presented at the Annual Meeting of the National Association for Research in

Science Teaching, Philadelphia, March 2003. It can be accessed at:

<http://www.education.leeds.ac.uk/research/cssme/NARST2003Leeds.pdf>

Reports of the Towards Evidence-Based Practice in Science Education (2000-2003) project. They are accessible at:

<http://www.tlrp.org/proj/phase1/phase1bsept.html>