

## Reading guide 'Scientific breakthroughs in the classroom!'

The book series 'Scientific breakthroughs in the classroom!' is an initiative by the Science Education Hub Radboud University (WKRU). The WKRU is a regional partnership between the Radboud University, the Radboudumc, the Hogeschool van Arnhem en Nijmegen (HAN; pre-service teacher education) and primary and secondary education.

### Aim of the book series

With the book series, the WKRU aims to inform teachers, pre-service teachers and students from upper primary education about scientific research conducted at Radboud University. This involves alpha, beta and gamma research. The books are intended to provide (upcoming) teachers with ideas on how they can get started with scientific themes in the classroom according to the pedagogy of inquiry-based learning. The books provide guidance to shaping a project, but are also meant as a source of inspiration and example for those teachers who want to introduce science into the classroom.

### How is the book series realised?

Every year, three prestigious awards are presented to three top scientists from the Radboud University: the Radboud Science Award. The awarded researchers and their teams get together in a project team with teachers, pre-service teachers and the WKRU to translate their research into activities for Grade 4-6. The project team works together for the duration of a year. At the end of that year, the project's substantive background, along with the experiences and activities in the classroom, are compiled into a book chapter.

To date, many projects have already been carried out which resulted in the following books:

- Book 1: Fear, Graphene and Ideas about the begin (2012);
- Book 2: DNA, Behaviour and Infections (2013);
- Book 3: Perception and movement, Under influence and Dangerous ideas (2014);
- Book 4: The Higgs particle, Networks in the brain and The wonder child David Gorlaeus (2015);
- Book 5: Typical Dutch, Understanding each other and The eye (2016);
- Book 6: Molecule Collisions, Stress and Language of the senses (2017).

The book series is linked to a Dutch website, [www.wetenschapdeklasin.nl](http://www.wetenschapdeklasin.nl), where various materials, videos and worksheets can be found for each project. Key materials have been translated and can be found on the English website of the WKRU. If you wish to see an impression of a project Inquiry-based learning by the WKRU, watch the following film: Impression project WKRU. This film can be found on our website: [www.wkru.nl/english/videos](http://www.wkru.nl/english/videos)

### Definition of inquiry-based learning

The WKRU defines inquiry-based learning as a way of teaching 'in which students actively formulate a research question based on their own interests, set up a research plan, collect data, process results and draw conclusions with which they can answer their research question.'

We only speak of inquiry-based learning when students are actively involved and have ownership in one or more parts of the research process. The different phases of inquiry-based learning are described in the chapter Guide for a project inquiry-based learning. It is also reported what student activities belong to each phase. In addition, what we, as WKRU, like to emphasise, is that not only should the students be actively involved, but the teachers just as much. A teacher is no longer the expert who passes on knowledge, but is rather the one that guides his or her students during the research process in order to allow students to make knowledge their own. Many teachers will have to get accustomed to this new role, but growth is inevitable as they gain more experience with inquiry-based learning.

### How can I get started with inquiry-based learning?

The book series 'Scientific breakthroughs in the classroom!' offers many guides to setting up a project inquiry-based learning. To get started, as a teacher you will require the following:

1. The guide for implementing the projects inquiry-based learning in the classroom, which describes how to approach a project. Step by step the pedagogy of inquiry-based learning is explained. Attention is also paid to the role of the teacher.
2. A thematic chapter in which a project is described which was developed by a team of scientists, teachers and pre-service teachers. Each chapter starts with an explanation of the theme written by the researchers. What follows is a range of activities that can be performed in the classroom.