Activity 6: Scaffolding individual learning in science

This activity was a computer-based learning activity using level 3 (i.e. A level) physics materials designed for student self-study

Overview of learning activity

The computer-based learning (CBL) activity was atypical compared with most of the ASCEND activities. It was not primarily related to the nature of science theme, but rather was an opportunity to work with some materials developed for independent learning of physics in the post-16 sector (see Chapter 6). It also allowed students to work independently, although they were allowed to work together if they preferred. Students were given the choice of working through a range of topics from the National Learning Network (NLN) Level 3 Physics CBL materials.

Figure 6.1: The CBL task was set up as an individual learning activity...

Rationale for the activity

This activity was provided to give the students a taste of Physics at A level. Physics is a highly abstract subject, involving a good deal of mathematical formalism (albeit largely limited to algebra at A level). These are features that readily deter many students, but can be attractive for more highly-attaining students.

The NLN materials were intended for use as independent computer-based learning resources in further education sector colleges. Materials used to introduce abstract concepts without the presence of a teacher have the potential to be confusing and frustrating unless they are well designed. The NLN materials were produced by a company (EPIC), which adopted a design based on ideas about how learning is supported and reinforced. The overall design of the units offered scaffolding in learning. This attention to pedagogic considerations made the materials suitable for providing introductions to aspects of advanced physics for able learners.

> ***'He was surprised to find out that g would also decrease when going down a mineshaft, and was able to follow the explanation using pendulum motion'***
>
> ***(****Observation note on ASCEND delegate working on A level Physics material****)***

Figure 6.2: …but support was never far away

Resources

The NLN (National Learning Network) independent learning materials were funded by BECTA (the government funded *British Educational Communications and Technology Agency*) to provide resources to the further education (including sixth form) sector (http://nln-materials.becta.org.uk/display.cfm?page=1630).

The level 3 physics units were designed to consist of introductory and more advanced units across a range of topics met in GCE A level and similar Physics courses. In the ASCEND project students were advised to select from the introductory units:

- **electricity** – conductivity and resistivity
- **fields and forces** – the gravitational field strength at different distances from the Earth's surface

- **quantum phenomena** – demonstration of the photoelectric effect
- **radioactivity** – properties of alpha, beta and gamma radiation
- **waves** – diffraction of water waves and light waves

Each of these units was considered to offer a taster of Physics study post-GCSE that would be accessible for more able students within the context of ASCEND. That is, given the structured approach of EPIC's design for CBL, and the presence of science graduates offering assistance, it was felt that these materials were more likely to challenge and interest, rather than challenge and frustrate, more able KS4 students.

The following resources are included on the CD:

Resource	**Description**	**Filename**
Introduction	Introduction to the activity, and list of suggested units to select from	Act 6 Introduction

The NLN materials are available on the web. Teachers can register to access the materials (http://www.nln.ac.uk/materials/).

