



## Development of the Online Practical Component of the Essential Secondary Science Assessment (ESSA)

The inclusion of an Online Practical Component (OPC) for ESSA to assess the skills employed in performing first-hand investigations was part of the original brief for the new science assessment program. The development and trialling of an online interactive component to achieve this purpose occurred in 2006.

### Concept and technical trialling

Up to six tasks are used in the test process but each student completes only one task. Each task consists of a similar set of items or questions. However, the context for the investigation in each task is entirely different. This provides some flexibility in the administration of the OPC.

Although most of the items within each task are multiple choice or free response and marked electronically, the scripts from the extended item for each task are marked by teachers.

The OPC was trialled in twelve schools in November 2006. Some technical problems were encountered and some students from ten schools completed the trial. As a result, only limited information from the trial was usable. It is for this reason that a second trial occurred in March 2008.

Feedback from the trialling schools, teachers involved in panelling the items and those involved in the 2006 marking process was overwhelmingly positive in relation to the concept of the OPC. The tasks were accepted as being obviously related to the *Science Years 7–10 Syllabus* and appropriate for Year 8 students.

The clarity of the videos and the screen resolution was an issue in 2006 and this was part of the content review for the 2008 trials. The animation for one of the tasks from 2006 was deemed inferior to the rest and this task has been replaced.

Six tasks were trialled in fourteen schools in March 2008. The teacher survey from the 2008 trial suggests that administrative problems experienced by teachers related to school organisation of students, rooms and computers and the efficient use of passwords and the school network. The delivery of the OPC application was a very smooth process. It is therefore anticipated that sufficient critical data has been obtained for analysis.

## Structure of the OPC test

The OPC tasks contain similar components, which provide information for students to use when responding to items. One of the tasks developed for the 2006 trialling was called 'Sand ripples', and it is used below to provide examples.

Each task begins with a video (with audio) such as that shown. The video sets the scene for a real-life problem or situation from which a testable question is derived.

A continuous storyline (with audio) then takes the student through an investigation. The student is asked to give responses at certain points along the way.



For example, one item in 'Sand ripples' asks the student to take readings of the height of the sand ripples and enter them in a table.

Play the animation and observe the effect of the different water speeds on the sand ripples.

**Question 5**  
For each speed take a reading and enter it into the table.

Speed cm/s	Height of sand ripple (cm)
0	
35	
55	
120	

The tasks make extensive use of animation so that investigating aspects of the problem and collecting observations can be interactive and controlled by each student.

Each task concludes with students being asked to draw conclusions and discuss their findings by typing into the spaces provided. When they have done this, the screen shown below appears which enables students to consider their responses and edit as appropriate.

This is a summary of your responses to Question 11 for checking. You can change or add to any of your responses.

**Question 11a: Describe what the line in the graph tells us.**

**Question 11b: Draw a conclusion based on the information/data from the investigation.**

**Question 11c: Discuss the possible consequences of increases in water temperature on a coral reef and explain their significance.**

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A pilot of the OPC involving approximately 80 schools was conducted 5 November 2008. The ESSA team is currently adapting the pencil-and-paper style of test to an online environment and trial online tests were undertaken in November 2008. ESSA online is anticipated to replace the current ESSA test in the future. It will be an integration of the current mandatory pencil and paper test and the OPC referred to in this report.