**VCE Algorithmics (HESS) 2017−2022**

School-based assessment report

This report is provided for the first year of implementation of this study and is based on the School-based Assessment Audit and VCAA statistical data.

All official communications regarding the Victorian Certificate of Education (VCE) Algorithmics Study Design are provided in the *VCAA Bulletin*. It is recommended that teachers subscribe to the VCAA Bulletin to receive updated information regarding the study. Schools are required to alert teachers to information in VCAA Bulletins, especially concerning assessment schedules. Important Administrative Dates and assessment schedules are published on the School administration page of the VCAA website.

Unit 3

GENERAL COMMENTS

The Unit 3 Audit Questionnaire required schools to respond to a mixture of questions relating to VCAA assessment practices, such as the assessment timeline, moderation and authentication practices, and study-specific questions relating to the nature of the assessment tasks used and teacher’s understanding of the study design.

The questionnaire responses indicated that schools had a good understanding of the structure of the VCE Algorithmics SAT and the use of the assessment criteria. Overall, schools used varied and engaging contexts as the basis for assessment tasks. All schools were using the 2017–2019 VCE Algorithmics Study Design.

When asked in the questionnaire what students are required to do in each component of the SAT, teachers are encouraged to include as much detail as possible about the tasks or prompts given to students. Often schools were required to submit further evidence because the information provided in the questionnaire was inadequate.

The audit panel had concerns regarding authentication practices in several schools. These concerns related to the types of tasks students were given to complete without supervision, the use of classic algorithmic problems as the basis for tasks, and the use of tasks supplied by teacher networks without modification. Where classic algorithmic problems are used as the basis for tasks, schools should take measures to ensure it is possible to authenticate student work, such as conducting the task in class under teacher supervision or making sufficient modifications to the context. Tasks acquired through teacher networks should not be used without modification.

The audit panel had concerns regarding the use of tasks supplied by teacher networks. Schools had used tasks prepared for the 2015–2016 VCE Algorithmics Study Design without modification. While teacher networks can be a good source of sample tasks, it is the responsibility of schools to ensure that tasks used as part of their school-based assessment comply with current VCE Algorithmics assessment requirements.

Several schools indicated a misunderstanding of the phrase “algorithm design pattern”. This phrase is used to describe the general algorithm design strategies stated in the study design. In Unit 3 this includes brute-force search, greedy, and decrease and conquer. In Unit 4 this includes divide and conquer, dynamic programming, heuristics, and randomised meta-heuristics. Is does not describe specific algorithms, such as Prim’s algorithm or Dijkstra’s algorithm.

Specific information

In Unit 3, students complete a School-assessed Task (SAT) comprised of three components: a folio, two written explanations, and a project. The SAT assesses all three outcomes.

Outcome 1

On completion of this unit the student should be able to devise formal representations for modelling various kinds of information problems using appropriate abstract data types, and apply these to a real-world problem.

Outcome 2

On completion of this unit the student should be able to design algorithms to solve information problems using basic algorithm design patterns, and implement the algorithms.

Outcome 3

On completion of this unit the student should be able to evaluate and document algorithms and data representations, and solve a real-world problem, the solution for which requires the integration of algorithms and data types.

Folio component

Schools required students to submit two to four tasks for each section of the folio. A diverse and engaging range of prompts were used, with most schools using tasks based on classic algorithmic problems, sample problems supplied by teacher networks, or online resources. All of the audited schools used the relevant Algorithmics SAT assessment criteria and provided these to students.

Folio tasks may be completed in class, or outside of class time with appropriate considerations for the authentication of student work.

It is suggested that at least one of the folio tasks be based around the implementation of an algorithm.

Written explanation component

Schools provided students with two written explanation tasks, drawing on elements from Outcome 1 and Outcome 2. All of the audited schools completed these tasks in class, in test conditions. The written explanation tasks were usually composed of a mixture of question types, including the recall of facts, short explanations of concepts, the analysis or evaluation of examples given in context, and detailed elaborations of principles from the study.

All of the audited schools used the relevant Algorithmics SAT assessment criteria and provided these to students.

Schools should be aware that the Algorithmics SAT assessment criteria change from year-to-year. Consequentially, tasks produced for use in earlier years may not be appropriate for use. Some schools used tasks shared through teacher networks in previous years without modification. Where this was done, the Audit panel had concerns relating to both the suitability of the task to assess the 2017 assessment criteria and the authentication of student work.

It is suggested that tasks should be designed with components at varying levels of cognitive demand. Tasks composed entirely of short response, factual recall questions are not likely to allow students to demonstrate the higher levels of the assessment criteria adequately.

Project component

The project component of the SAT consists of students producing a data model and an algorithm to solve a real-world problem and an evaluation of a solution. Most schools asked students to evaluate the solution they had produced. The project was completed over several months, usually introduced to students in late Term 1 and completed in the middle to latter half of Term 2. A variety of problems contexts were used by the four audited schools. Students were supported to write their written reports by an appropriate level of scaffolding, with schools usually giving students an outline of the elements required in their final written report.