

Essential Secondary Science Assessment

Student report for parents 2006

Year 8

This report shows the results for:

Natalia Allenby
Local High School

What is ESSA?

Essential Secondary Science Assessment (ESSA) is a statewide program that complements the school-based assessment and reporting programs of NSW schools. The ESSA test assesses what Year 8 students know and can do in science; then students, parents and teachers can use the ESSA levels (see the table inside this report) to plan learning programs and activities so that students keep moving forward in their science knowledge and skills.

This report provides results from the pilot test that was held on Tuesday 28 November 2006 for approximately 58 000 students.

What was tested?

The test assessed a variety of Stage 4 outcomes from the Science Years 7-10 Syllabus.

Science:

Overall, a broad range of knowledge and skills in science were assessed using three extended response tasks and 75 short response and multiple choice tasks.

Extended response tasks are writing tasks that provided opportunities for students to demonstrate their integrated understandings and skills from various areas of the syllabus.

Short response and multiple choice tasks assessed syllabus outcomes that were organised into three interrelated strands:

Knowing and understanding:

Students responded to items that specifically assessed their knowledge and understanding of scientific concepts. Some items tested Prescribed Focus Areas, such as the nature and practice of science and the impact of science on society, technology and the environment.

Communicating scientifically:

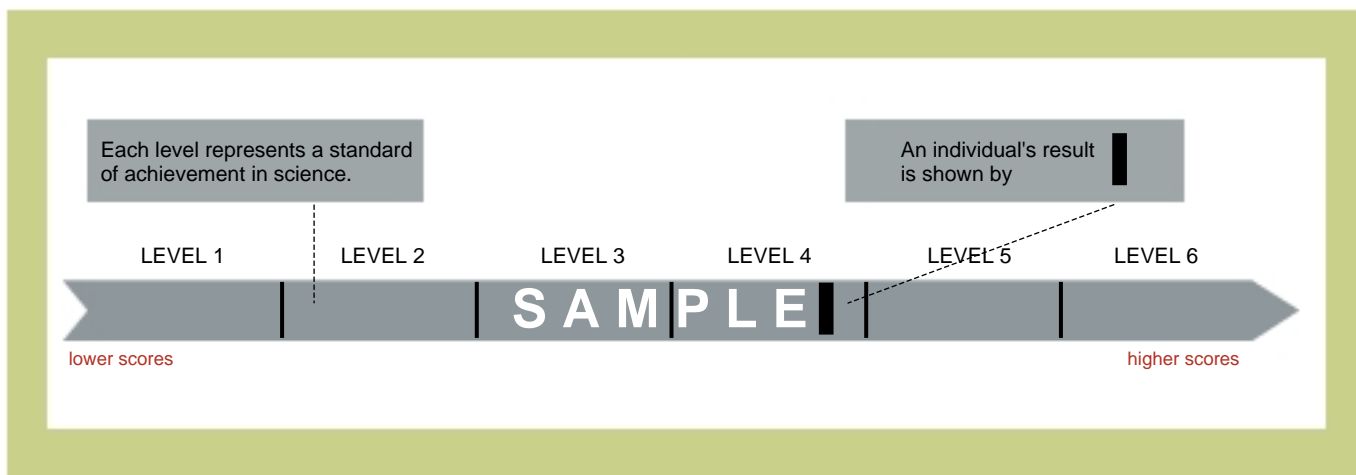
Students analysed and responded to a variety of texts that are typical of those used in Year 7 and Year 8 science. Some items required critical thinking.

Working scientifically:

Students had opportunities to demonstrate skills in critical thinking, making evidence-based conclusions and in planning, conducting and analysing investigations.

How to read this report

Results are shown on five reporting scales. Each reporting scale has six achievement levels, from Level 1 to Level 6. These levels are based on the requirements of the NSW Science Years 7-10 Syllabus. They represent a standard of what students know and can do in science. The levels in each strand are described in the table inside this report.

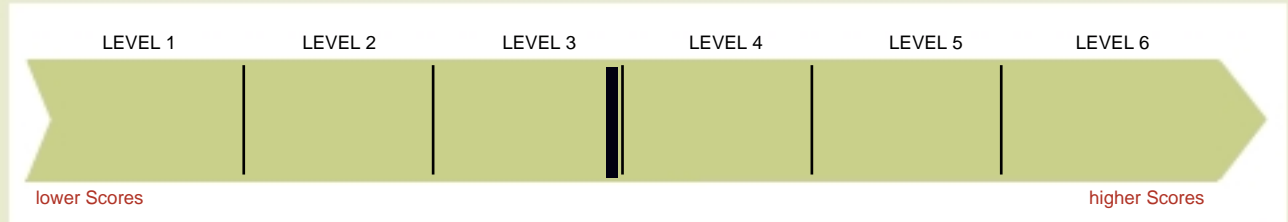


Summary of student results

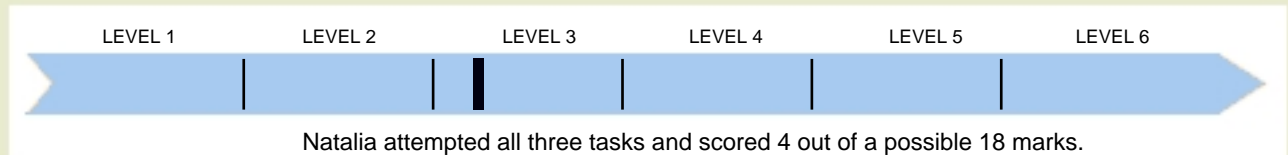
Natalia Allenby

The following scales summarise Natalia's performance in the ESSA test. This information takes account of the quality of Natalia's responses and the number of tasks in the strands of the test. Statements of typical achievement at each level and within each strand are provided in the table on the next page. There is additional data about Natalia's achievement on the back of this report.

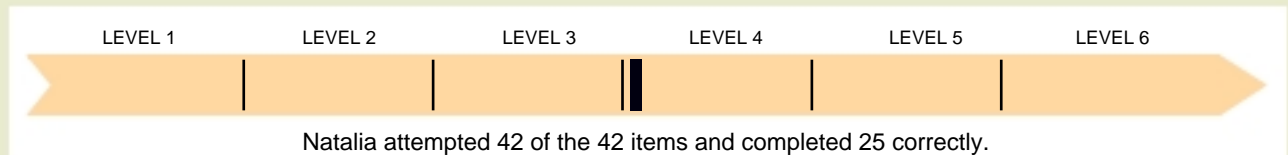
Science (overall result)



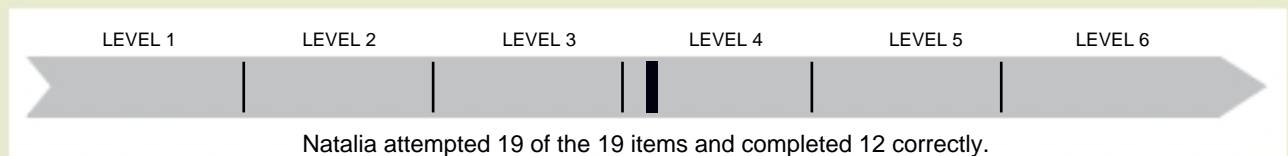
Extended response tasks



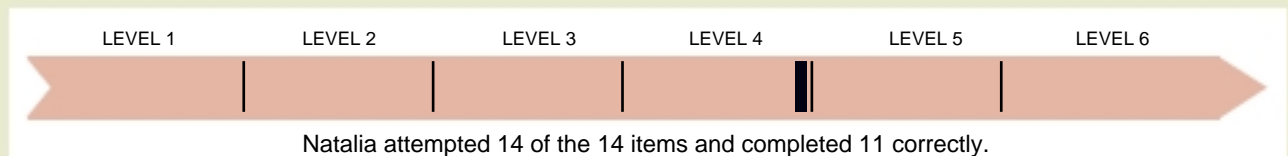
Short response and multiple choice tasks Knowing and understanding



Communicating scientifically



Working scientifically



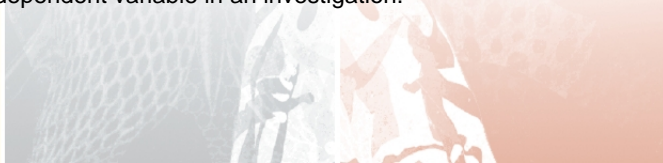
Overall, Natalia's responses in this test placed her in Level 3 for science.

In the extended response tasks, Natalia performed at Level 3. There are details about each task on the back of this report.

In the knowing and understanding strand, Natalia performed at Level 4. At this level, students could, for example, be expected to use the properties of tungsten to classify it as a metal.

In the communicating scientifically strand, Natalia performed at Level 4. At this level, students could, for example, be expected to formulate a cause and effect relationship.

In the working scientifically strand, Natalia performed at Level 4. At this level, students could, for example, be expected to identify the dependent variable in an investigation.



ESSA levels and reporting strands

The following table contains typical examples of knowledge, understanding and skills in science. In general, students at a particular level know and can do the examples for that level and for the levels below. Students, parents and teachers can use this table to identify what students need to learn so that they can move to a higher level within each strand.

	Knowing and understanding	Communicating scientifically	Working scientifically
Level 6	<ul style="list-style-type: none"> Explains physical phenomena using a model, theory or law Explains the interaction of complex systems (for example, relates the role of the circulatory system to the needs of cells) 	<ul style="list-style-type: none"> Explains the theme and function of a complex text Critically analyses the credibility of scientific information 	<ul style="list-style-type: none"> Relates the dependent and independent variables for a given problem Describes the wider significance of conclusions (for example, accounts for the differing amounts of water loss by plant cuttings by identifying plant processes)
Level 5	<ul style="list-style-type: none"> Describes examples where scientific understanding has changed Describes interactions of systems or within systems 	<ul style="list-style-type: none"> Extracts related information from diagrams, tables, graphs or other texts Compares two sets of information (for example, compares a table and graph and inserts information into the graph) 	<ul style="list-style-type: none"> Identifies ways to improve the reliability and accuracy of controlled investigations Applies mathematical models to data (for example, interpolates information from a line graph)
Level 4	<ul style="list-style-type: none"> Identifies scientific evidence (for example, identifies evidence that leads to change in a scientific theory) Describes a complex process of our world or space (for example, identifies requirements for photosynthesis) Identifies an interaction of systems or within a system (for example, identifies evidence that indicates that a chemical reaction has occurred) 	<ul style="list-style-type: none"> Identifies one piece of relevant scientific information Describes an effective solution to a problem with a science context 	<ul style="list-style-type: none"> Identifies a prediction, inference, conclusion, aim and hypothesis Selects one piece of appropriate scientific equipment for a task (for example, identifies a benefit of using a data logger to collect information in an investigation) Draws a conclusion based on scientific evidence
Level 3	<ul style="list-style-type: none"> Explains a link between technology and science Relates simple processes of our world or space (for example, identifies insects as consumers) Relates a model to an aspect of our world or space (for example, identifies kinetic energy acting in an activity) 	<ul style="list-style-type: none"> References information within a diagram, table, graph or other text (for example, summarises ideas across a text) Uses cause and effect to explain an observation (for example, identifies the effect of a change during a process) 	<ul style="list-style-type: none"> Relates equipment and appropriate use for a simple task (for example, identifies the correct use of a thermometer) Draws a simple conclusion
Level 2	<ul style="list-style-type: none"> Identifies experiences and events that have a scientific component (for example, identifies choices people make about resources) Describes simple processes of our world or space (for example, identifies the origin of igneous rocks) Identifies a structure and its function within a system 	<ul style="list-style-type: none"> Locates information in a complex table, graph or text (for example, describes one feature of tides from a tide chart) Identifies issues or themes in simple text 	<ul style="list-style-type: none"> Identifies features of a scientific test Makes simple observations (for example, identifies changes in water level for plant cuttings placed in water for four days) Identifies equipment for a simple task
Level 1	<ul style="list-style-type: none"> Identifies a technology Identifies a simple process of our world or space (for example, identifies water changing to ice as an example of freezing) 	<ul style="list-style-type: none"> Locates one piece of information in a simple table or graph Identifies an aspect of a problem 	<ul style="list-style-type: none"> Makes an observation Identifies an aspect of a trend in data

The percentages of Year 8 students in the test group (which in 2006 was a limited pilot group selected from across the state) who demonstrated achievement at each level were:

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Science(overall for the test)	1%	14%	38%	35%	10%	2%
Extended response tasks	6%	13%	37%	30%	11%	3%
Knowing and understanding	1%	16%	34%	33%	12%	4%
Communicating scientifically	4%	14%	33%	26%	19%	4%
Working scientifically	3%	19%	24%	41%	8%	5%

Additional information

Natalia Allenby

Extended response tasks



The first task, The human circulatory system, required students to explain the role of the human circulatory system.

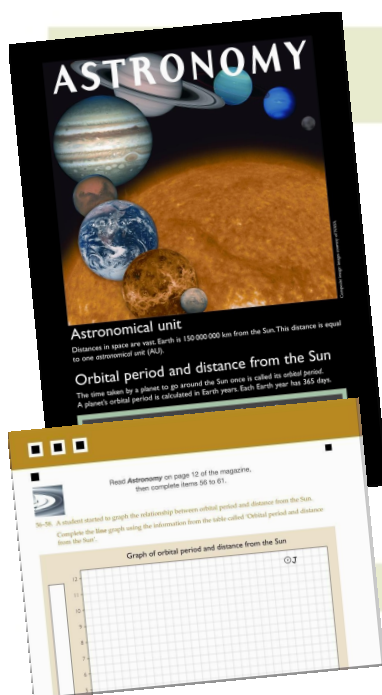
In this task, Natalia did not provide a relevant response.

The second task, Explaining tides, required students to interpret a tide chart and to explain the cause of tides on Earth.

In this task, Natalia described one feature of tides from the chart, such as identifying a high tide, but did not explain that the Moon's gravity causes tides on Earth.

The third task, Plants and water, required students to analyse the results of an experimental investigation and explain how plants use water.

In this task, Natalia provided a clear relationship between the water loss in the experiment and the vaseline on one plant's leaves but did not explain how the plants used water.



Short response and multiple choice tasks

Natalia attempted 75 of the 75 short response and multiple choice items and completed 48 correctly.

Overall, Natalia had similar results on items assessing (knowing and understanding) and on items assessing the skills of (communicating scientifically and working scientifically).

Within the short response and multiple choice tasks, there were 10 items about the Prescribed Focus Areas. Natalia attempted 10 items and completed 5 correctly.

There were also 11 items about critical thinking. Natalia attempted 11 items and completed 5 correctly.

If you would like to discuss this report or obtain more detailed information about Natalia's achievements in science, please contact her school. The student report held by the school has a detailed list of all the tasks in the test that Natalia attempted. The school also has other assessment information about Natalia's learning and progress.



Item map of individual student responses

Knowing and understanding			Communicating scientifically			Working scientifically		
Items that this student had correct	It %	Items that this student had incorrect	Items that this student had correct	It %	Items that this student had incorrect	Items that this student had correct	It %	Items that this student had incorrect
	27 26	generalises a scientific principle		55 28	draws conclusions from evidence		16 23	sequences processes in distillation
	50 27	distinguishes technology and science	interpolates information	59 29			66 32	draws conclusion from evidence
	70 28	identifies cellular requirements		47 32	uses data in text for calculation	identifies a hypothesis	48 42	
	15 32	identifies solute in a solution	draws a line graph	58 35			65 50	identifies benefit of data logger
defines a planet	41 33	classifies a compound		56 47	provides label/unit on graph axis	identifies dependent variable	64 52	
	75 38			74 47	draws a scientific conclusion	assesses use of practical equipment	63 53	
	38 42	identifies needs for photosynthesis		57 52	plots point on a graph	describes trend in data	32 57	
	8 43	identifies tin as an element	applies information from text	46 58		provides correct use of equipment	4 59	
	5 45	links energy and change of state	references information across text	67 58		identifies function of equipment	14 67	
	31 47	sequences energy transformations	summarises complex information	42 59		identifies aim of a fair test	30 71	
defines frictional force	33 48			71 59	deduces function of equipment	relates aspects in investigation	19 72	
identifies chloroplasts as 'green'	62 48		analyses data in a column graph	10 69		identifies aspects of an experiment	35 84	
uses properties to classify a metal	25 51		checks veracity of information	11 75		identifies unit for temperature	1 95	
	54 51	identifies narrative knowledge	extracts information from chart	22 76		identifies scientific equipment	12 96	
identifies evidence can alter ideas	49 52		identifies effect of a change	68 75				
	69 51	identifies transferable skills	summarises ideas in text	20 77				
identifies scientific process	21 52		references information across text	45 77				
identifies supporting evidence	73 52		locates information in text	18 85				
	43 53	identifies fossil fuels		6 90	extracts data from column graph			
identifies evidence of a reaction	26 56							
identifies kinetic energy	29 57							
explains why ice floats	3 58							
identifies symbols of elements	13 58							
	72 58	identifies gravity due to matter						
	44 61	identifies impact of greenhouse gas						
applies model of Earth to landform	53 61							
relates rotation and day length	61 61							
identifies appropriateness of units	60 62							
identifies adaptations	36 64							
applies definition of friction	28 65							
	40 68	lists renewable energy resources						
identifies insects as consumers	39 71							
identifies a geologist's work	51 72							
	24 72	accounts for lost energy						
relates greenhouse gas and burning	9 74							
sequences change in state	23 77							
	34 79	compares alternate viewpoints						
identifies role of plant root	37 81							
identifies origin of igneous rocks	52 86							
identifies a body system	17 86							
identifies change of state	2 90							
identifies choices people make	7 92							

It item number

% percentage of test population giving correct answer