

# Report statements and Syllabus Outcome links

## INFORMATION FOR PARENTS ABOUT THE JUNIOR COURSE OF STUDY

**The things they know are not as important as the things they learn to do :** Science is a course that involves the students in activities unlike any other subject. The boys spend much of their time engaged in practical work (First hand investigations in Board of Studies speak) which requires them to get up out of their seats, work in small groups and make certain things happen through their own efforts. It is an active subject in which boys can only succeed well if they show initiative and have a self determination to achieve outcomes on their own.

There are many facts that they have to learn in this subject and learning them makes students much better informed members of society. Teachers are acutely aware that facts do not stay in a students' memory for very long and that the loss of these facts is not a measure of a persons' worth. Learning facts, committing them to memory and then remembering them for exam answers is an important mental exercise, not so much for the specific facts that they learn at the time but as training for their future lives. Doing this becomes essential for them to earn a living and organise a household using the things they can remember – it is a behaviour that can be improved through practice and this is why we do it. Consequently we have knowledge tests at the end of each unit but do not have major end of year exams that revisit this knowledge. It is important for us to find out how well students assimilate new understandings but it is fruitless to check how long they can hold them in memory. Recalling things involves quite a low level of mental ability; our emphasis is on how well they think about the things they learn. It is this ability that produces successful, functional adults.

Of great importance to us in Science are the skills that students learn, which transfer and build from year to year and across subject areas.

6 of the 10 reported areas are skill areas:

Ethics – thinking that shows honesty, respect for others and the environment

Investigations – the skills necessary to do practical work in a laboratory

Information – the ability to find and process information from various sources

Communication – presentation of scientific information in numerous ways

Problem Solving - the ability to think through solutions to problems

Teamwork – working well as an individual and in a group

About half of class time is invested in the pursuit of these skills.

The other 4 areas are content based and probably more familiar.

They have sentence like descriptions on the report but basically are what would be recognised as Chemistry, Physics, Biology and Earth.

These tests look similar to the tests that you may have done at school but they are constructed in quite a different manner. Questions are designed to meet different levels of thinking ability and the grades a student receives are directly related to the level of questions answered for that outcome area.

## Outcomes

### **Chemistry - Preliminary (mid year)**

- 1 Trends and relationships between elements in terms of structure and bonding (6)
- 2 \*\*Implications for Society and the Environment (4) *not at end yr*
- 3 Factors that influence chemical reactions (8)
- 4 History of Chemistry (1) *not at end yr*

**Content  
Skills**

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- 5 Planning and organising Key Competency (11.1-3)
  - 6 Undertakes first hand investigations (12.1-2)
  - 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
  - 8 Communicating ideas and information Key Competency (13.1)
  - 9 Problem solving Key Competency (14.2-3)
  - 10 Mathematical ideas and techniques Key competency (10)

### **Chemistry - Preliminary (end year)**

- 1 Trends and relationships between elements in terms of structure and bonding (6)
- 2 \*\*Chemical reactions in terms of energy changes (7)
- 3 Factors that influence chemical reactions (8)
- 4 \*\*The nature of carbon chemistry (9)

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- 5 Planning and organising Key Competency (11.1-3)
  - 6 Undertakes first hand investigations (12.1-2)
  - 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
  - 8 Communicating ideas and information Key Competency (13.1)
  - 9 Problem solving Key Competency (14.2-3)
  - 10 Mathematical ideas and techniques Key competency (10)

### **Chemistry - HSC (mid and end year)**

- 1 Reactions between elements in terms of structure and bonding (6)
- 2 Energy transformations in chemical reactions (7)
- 3 Factors that influence chemical reactions (8)
- 4 Reactions involving carbon chemistry (9)

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- 5 Planning and organising Key Competency (11.1-3)
  - 6 Evaluates and modifies first hand investigations (12.1-2)
  - 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
  - 8 Communicating ideas and information Key Competency (13.1)
  - 9 Problem solving Key Competency (14.2-3)
  - 10 Mathematical ideas and techniques Key competency (10)

The PFA content outcomes 1 – 5 are cross content items that are assumed to be included within each of the knowledge content outcomes 6 – 10. Task grids indicate where these are located.

## Outcomes

### Physics - Preliminary (mid year)

- 1 \*\*Physics models, theories and laws (2)*not carried to end yr*
- 2 Effects of energy transfers and transformations (7)
- 3 Wave motions and their energy sources (8)
- 4 Relationship between force and potential energy (9)
- 5 \*\*Undertakes first hand investigations (12.1-2)*combined at end of yr*
- 6 Planning and organising Key Competency (11.1-3)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Mathematical ideas and techniques Key Competency

**Content  
Skills**

### Physics - Preliminary (end year)

- 1 \*\*Forces acting on an object causing changes in motion (6)*not in mid yr*
- 2 Effects of energy tranfers and transformations (7)
- 3 Wave motions and their energy sources (8)
- 4 Relationship between force and potential energy (9)
- 5 \*\*The origin of matter and the related forces (10)*not in mid yr*
- 6 Planning and organising Key Competency (11.1-3, 12.1-2)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Mathematical ideas and techniques Key Competency

### Physics - HSC (mid and end year)

- 1 Newton's Law, Law of conservation of momentum and relativity (6)
- 2 The effects of energy transfers and transformations (7)
- 3 Wave interactions and their effects (8)
- 4 Explains the effect of electric, magnetic and gravitational fields (9)
- 5 \*\*Describes electromagnetic radiation and matter in terms of particles and forces (10)*carry grade from yr 11 at mid year*
- 6 Planning and organising Key Competency (11.1-3, 12.1-2)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Mathematical ideas and techniques Key Competency

The PFA content outcomes 1 – 5 are cross content items that are assumed to be included within each of the knowledge content outcomes 6 – 10. Task grids indicate where these are located.

## Outcomes

### **Biology - Preliminary (mid year)**

- 1 How different cells contribute to the function of an organism (6)
- 2 Adaptation of organisms to their environment (7)
- 3 Interaction of organisms with their environment (8)
- 4 How organisms inherit characteristics through reproduction (9)

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- 5 **\*\*Undertakes first hand investigations (12.1-2) *combined with planning at end yr***
- 6 Planning and organising Key Competency (11.1-3)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Working in Teams Key Competency (15)

### **Biology - Preliminary (end year)**

- 1 How different cells contribute to the function of an organism (6)
- 2 Adaptation of organisms to their environment (7)
- 3 Interaction of organisms with their environment (8)
- 4 How organisms inherit characteristics through reproduction (9)

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- 5 **\*\*Evidence for evolution (10) *not in mid yr***

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- 6 Planning and organising Key Competency (11.1-3, 12.1-2)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Working in Teams Key Competency (15)

**Content  
Skills**

### **Biology - HSC (mid and end year)**

- 1 Processes in cells and how they bring about changes in organisms (6)
- 2 The impact of nature and human activity upon the variety of organisms (7)
- 3 Human activity and its impact upon organisms and their environment (8)
- 4 The principles of genetic inheritance (9)

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- 5 Evolution and how it has been affected by humans (10)

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- 6 Planning and organising Key Competency (11.1-3, 12.1-2)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Working in Teams Key Competency (15)

**Content  
Skills**

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## Outcomes

### Senior Science - Preliminary (mid)

- 1 \*\* Historical development of Science (1) *not at end yr - what content ones could be done instead of pfa's*
- 2 \*\*Scientific laws used during investigations (2)
- 3 \*\*Impact of technological advances (3)
- 4 \*\*How science affects society and the environment (4)
- 5 \*\*Current scientific research (5)

**Content  
Skills**

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- 6 Planning and organising Key Competency (11.1-3)
  - 7 Undertakes first hand investigations (12.1-2)
  - 8 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
  - 9 Communicating ideas and information Key Competency (13.1)
  - 10 Problem solving Key Competency (14.2-3)

### Senior Science - Preliminary (end)

- 1 \*\*Earth's resources (6) *not at mid yr*
- 2 \*\*Changes to the body caused by the environment and pharmaceuticals (7) *not at mid yr*
- 3 \*\*How the property of a chemical affects its use (8) *not at mid yr*
- 4 \*\*Body organs and the function of body systems (9) *not at mid yr*
- 5 \*\*Varied forms and use of energy (10) *not at mid yr*

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- 6 Planning and organising Key Competency (11.1-3)
  - 7 Undertakes first hand investigations (12.1-2)
  - 8 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
  - 9 Communicating ideas and information Key Competency (13.1)
  - 10 Problem solving Key Competency (14.2-3)

### Senior Science - HSC (mid and end year)

- 1 Earths resources (6)
- 2 Changes to the body caused by the enviroment and pharmaceutical's (7)
- 3 How the property of a chemical affects its use (8)
- 4 Body organs and the function of body systems (9)
- 5 Varied forms and use of energy (10)

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- 6 Planning and organising Key Competency (11.1-3)
  - 7 Undertakes first hand investigations (12.1-2)
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  - 9 Communicating ideas and information Key Competency (13.1)
  - 10 Problem solving Key Competency (14.2-3)

The PFA content outcomes 1 – 5 are cross content items that are assumed to be included within each of the knowledge content outcomes 6 – 10. Task grids indicate where these are located.

## Outcomes

### **Earth & Environment - Preliminary (mid and end year)**

- 1 Origins of the Earth's resources (6)
- 2 Features of the Earth's environment (7)
- 3 Changes in the earth's surface (8)
- 4 Australian resources (9)
- 5 Human impact on the environment (10)

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- 6 Planning and organising Key Competency (11.1-3, 12.1-2)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Working in Teams Key Competency (15)

**Content**  
**Skills**

### **Earth & Environment - HSC (mid year)**

- 1 Origins of the Earth's resources (6) (carry yr 11 grade/no assessment)
- 2 Evidence for the evolving Australian and world environment (7)
- 3 The changing Australian and world environments (8)
- 4 Australian resources (9) (carry yr 11 grade/no assessment)
- 5 Effects of living things and human activities on the environment (10)

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- 6 Planning and organising Key Competency (11.1-3)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Working in Teams Key Competency (15)

### **Earth & Environment - HSC (end year)**

- 1 Origins of the Earth's resources (6) (*not at mid yr*)
- 2 Evidence for the evolving Australian and world environment (7)
- 3 The changing Australian and world environments (8)
- 4 Australian resources (9) (*not at mid yr*)
- 5 Effects of living things and human activities on the environment (10)

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- 6 Planning and organising Key Competency (11.1-3, 12.1-2)
- 7 Collecting, analysing, and organising Key Competency (12.3, 12.4, 14.1)
- 8 Communicating ideas and information Key Competency (13.1)
- 9 Problem solving Key Competency (14.2-3)
- 10 Working in Teams Key Competency (15)

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## Outcomes

PFA's 4/5.1-4/5.5 are to be linked appropriately with the 4 content areas and included in the tests for these units.

### **Stage 5**

#### **content**

- \* Understands situations that involve technology, forces, energy and motion  
(5.6, 5.12) **Physics**
- \* Understands chemical substances, the impact of using resources, their conservation and protection  
(5.7, & part 5.11) **Chemistry**
- \* Understands about humans, other living things and the impact humans have on the environment  
(5.8, 5.10) **Biology**
- \* Relates the changing earth its resources and the universe to the influence of time  
(5.9 & part 5.11) **Earth**

#### **skills**

- \* Develops positive attitudes and values towards themselves, others, learning, science and the environment (5.23-27) **Ethics**
- \* Gains the skills needed to plan and conduct investigations (appropriate key competency statement)  
(5.13-14) **Investigations**
- \* Gains skills needed to collect and organise information (appropriate key competency statement)  
(5.15-17) **Information**
- \* Gains skills in analysing and communicating information and understandings (appropriate key competency statement)(5.18) **Communicating**
- \* Gains skills in problem solving and scientific thinking (appropriate key competency statement)  
(5.19-21) **Problem Solving**
- \* Gain skills in working (individually and) in teams (appropriate key competency statement)  
(5.22) **Teamwork**

### **Stage 4**

#### **content**

- \* Identifies and describes situations that involve simple devices, forces and energy  
(4.6, 4.12) **Physics**
- \* Describes properties of chemical substances, identifies resources and how they are used by humans  
(4.7, & part 4.11) **Chemistry**
- \* Describes features of living things and identifies factors that affect their survival in nature  
(4.8, 4.10) **Biology**
- \* Describes the changing structure of the earth and its resources, relating them to the solar system and the universe(4.9 & part 4.11) **Earth**

#### **skills**

- \* Develop positive attitudes and values towards themselves, others, learning, science and the environment (4.23-27) **Ethics**
- \* Gain the skills needed to plan and organise investigations (appropriate key competency statement)  
(4.13-14) **Investigations**
- \* Gain skills needed to collect, analyse and organise information (appropriate key competency statement) (4.15-17) **Information**
- \* Gain skills in analysing and communicating information and understandings (appropriate key competency statement)(4.18) **Communicating**
- \* Gain skills in problem solving and scientific thinking (appropriate key competency statement)  
(4.19-21) **Problem Solving**
- \* Gain skills in working (individually and) in teams (appropriate key competency statement)  
(4.22) **Teamwork**