



Government of **Western Australia**
School Curriculum and Standards Authority



MARINE AND MARITIME STUDIES

GENERAL COURSE

Externally set task

Sample 2016

Note: This Externally set task sample is based on the following content from Unit 3 of the General Year 12 syllabus.

Science Inquiry Skills

- construct questions for investigation; propose hypotheses; and predict possible outcomes
- conduct investigations, including using ecosystem surveying techniques and line transects safely, competently and methodically for the collection of reliable data

Science Understanding

Oceanography

- construction and use of simple apparatus that can be used to measure abiotic factors of a marine ecosystem
- methods of measuring biotic factors, such as transects and quadrats

Safety equipment

- mandatory safety equipment – bilge pump, fire extinguisher, anchor, life jacket, flares, emergency positioning indicator radio beacon (EPIRB), parachute flares, marine radio (VHF, 27 MHz)
- distress signals – radio (mayday, pan-pan, securite), emergency positioning indicator radio beacon (EPIRB), flares and phone

In future years, this information will be provided late in Term 3 of the year prior to the conduct of the Externally set task. This will enable teachers to tailor their teaching and learning program to ensure that the content is delivered prior to the students undertaking the task in Term 2 of Year 12.

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Disclaimer

Any resources such as texts, websites and so on that may be referred to in this document are provided as examples of resources that teachers can use to support their learning programs. Their inclusion does not imply that they are mandatory or that they are the only resources relevant to the course.

Marine and Maritime Studies

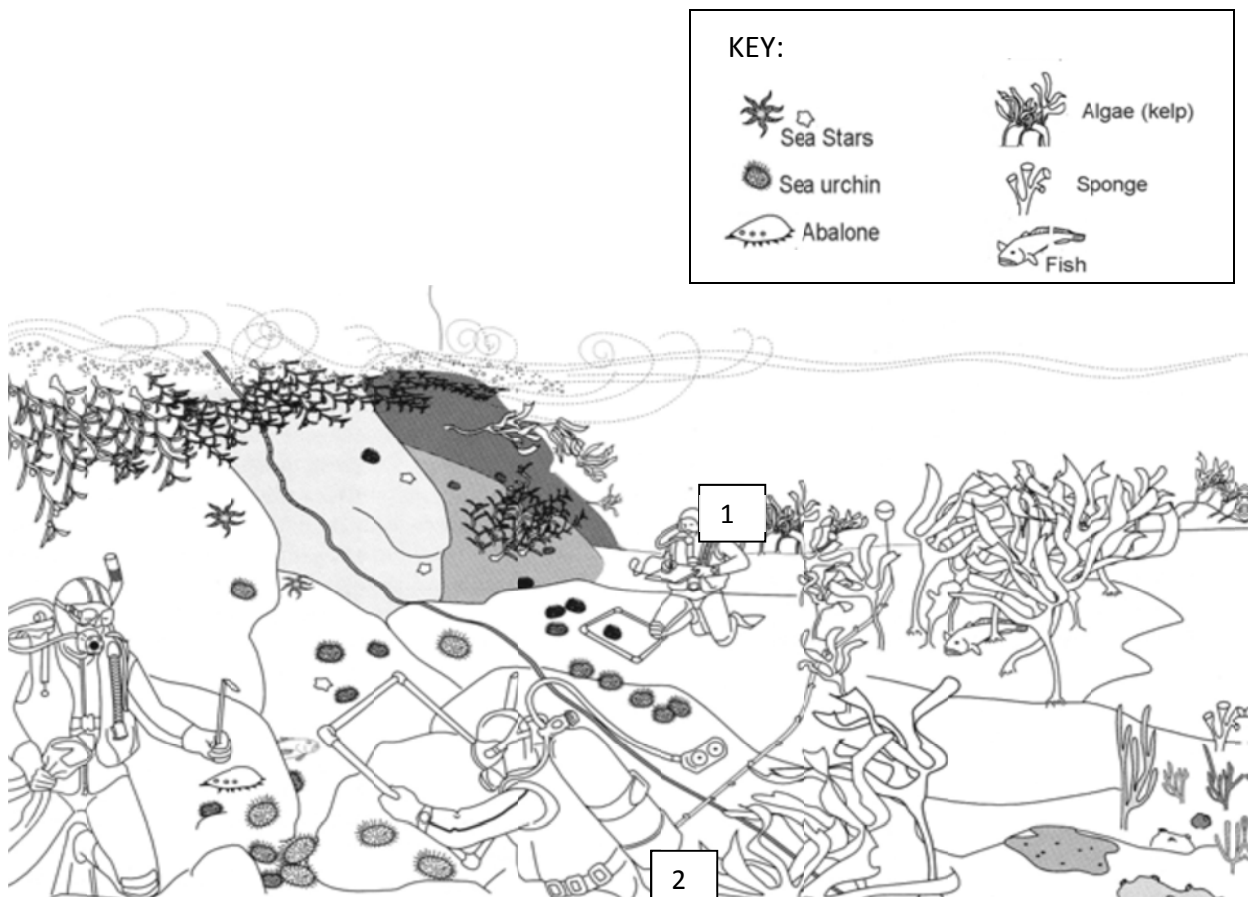
Externally set task

Working time for the task: 60 minutes

Total marks: 59 marks

Weighting: 15% of the school mark

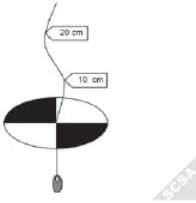

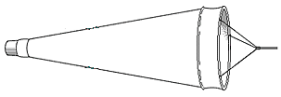
1. In the picture below, three marine biologists are conducting a survey of a sub-tidal rocky reef habitat. Examine the picture below carefully and then answer the questions that follow. **(26 marks)**



- (a) What type of surveying method is being used by the marine biologists numbered 1 and 2?

(1 mark)

- (b) The apparatuses below are used to measure factors in the marine environment. In the table below, name each piece of apparatus, state what it is used to measure, and indicate whether it is used to measure biotic or abiotic factors. (9 marks)

Apparatus	Name	Used to Measure	Biotic/Abiotic
(i) 			
(ii) 			
(iii) 			

- (c) Explain how to use the apparatus (i) and state what a low measurement reading would indicate. (3 marks)

- (d) Researchers in Western Australia investigating abalone, a marine invertebrate shellfish, could also use the research method being used by the marine biologists, numbered 1 and 2 in the diagram. Describe briefly the main information gathered when using this method of research and how this could be used to investigate the effect of recreational fishing on abalone. (3 marks)

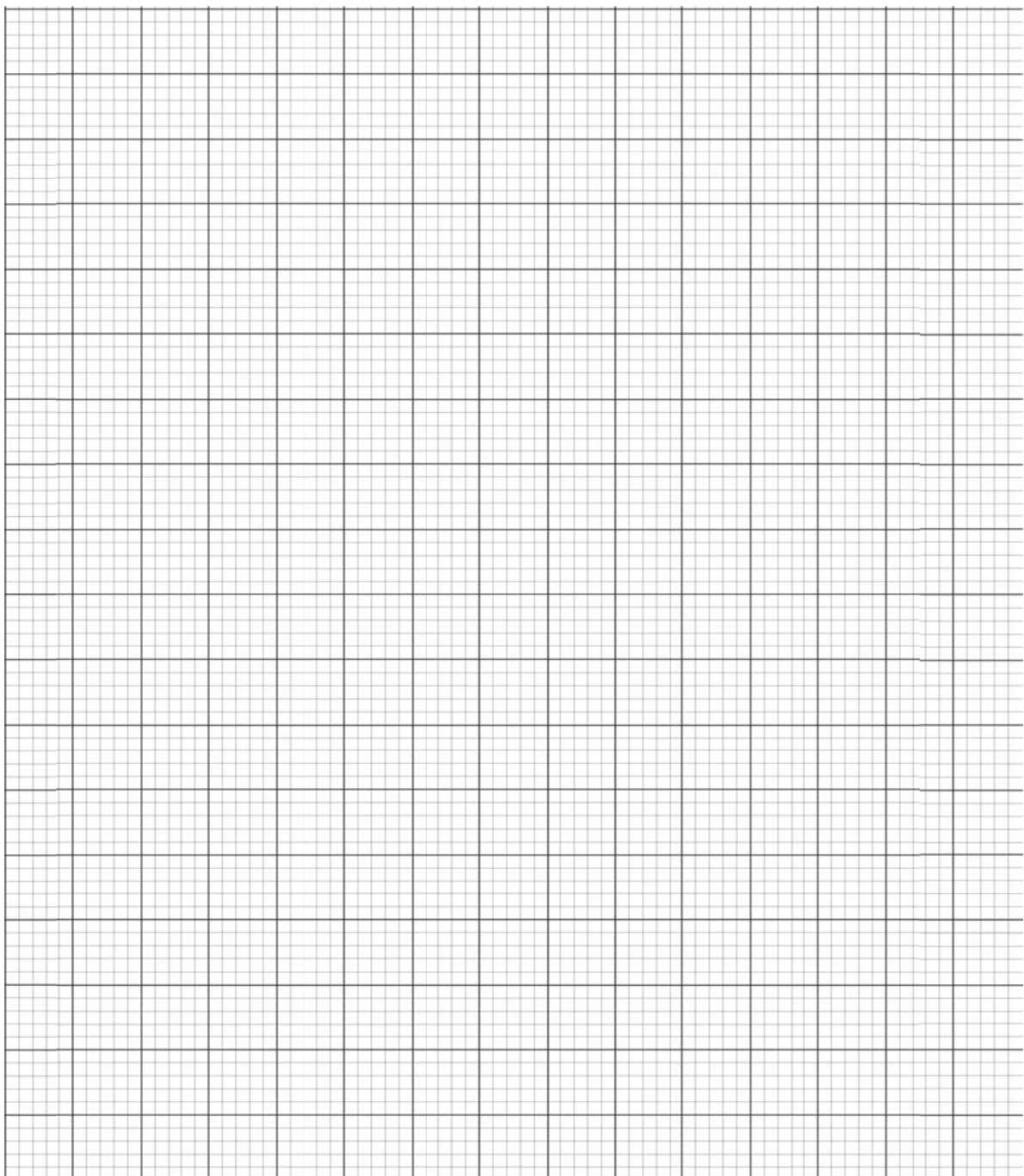
Researchers collected data of fish caught from boat-based recreational fishers. These samples were used to determine the age composition for stocks in each area of the West Coast Bioregion (Wise et al., 2007)

The table below is an adaptation of the pink snapper age samples collected from recreational fishers in the metropolitan zone between 2003 and 2006.

Ages (years)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Frequency (catch)	0	5	20	125	225	140	50	15	20	5	0	2	2	0	2	0

(e) Graph this data on the grid below.

(5 marks)



- (f) Describe the age composition of pink snapper stocks in the metropolitan zone between 2003 and 2006. (3 marks)

- (g) Give **two (2)** possible causes to explain the pattern in the data of the age composition of pink snapper between 2003 and 2006. (2 marks)

2. The data table below is the result of marine research into changes in water quality characteristics off the coast of south-western Australia over a period of 6 months. The measurements were taken at a depth of 0.5 m at the same location each time. (18 marks)

Month	Light intensity at 0.5 m depth (lux)	% Concentration of O ₂	Temperature (°C)	Amount of chlorophyll- α (algae) present ($\mu\text{g/L}$)
September	4500	83	16	7.6
October	4300	81	16.5	8.2
November	3900	76	17.6	8.9
December	1750	82	19	57.2
January	980	65	21	68.1
February	600	21	22	27.2

- (a) What technology could the researchers have used to ensure that they sampled water in the same location each time? (1 mark)

3. Safety at sea is a huge responsibility for the skipper of a recreational boat. Suppose you are the skipper of a recreational power boat that has become inoperable and is beginning to sink slowly. You are more than two nautical miles off shore. **(15 marks)**

- (a) List, in order of importance, **five (5)** actions you would take, using the correct nautical terms and give a brief description of your actions. **(10 marks)**

Action 1: _____

Action 2: _____

Action 3: _____

Action 4: _____

Action 5: _____

- (b) List **five (5)** pieces of equipment you would need to carry with you on a recreational power boat. **(5 marks)**
