



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



HUMAN BIOLOGY

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

- identify, research and construct questions for investigation; propose hypotheses; and predict possible outcomes
- plan, select and use appropriate investigation methods, including pre-testing, to collect reliable data; assess risk and address ethical issues associated with these methods
- represent data in meaningful and useful ways; organise and analyse data to identify trends, patterns and relationships; qualitatively describe sources of measurement error and use evidence to make and justify conclusions

Science Understanding

- receptors detect stimuli which include light, sound, changes in position, chemicals, touch, pressure, pain and temperature
- reflex actions are automatic and rapid, which involve sensory neurons, interneurons and motor neurons
- the structures of the brain facilitate coordination of responses, including the central nervous system (brain, cerebellum, cerebrum, brainstem and spinal cord) and the peripheral nervous system

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.

Human Biology

Externally set task

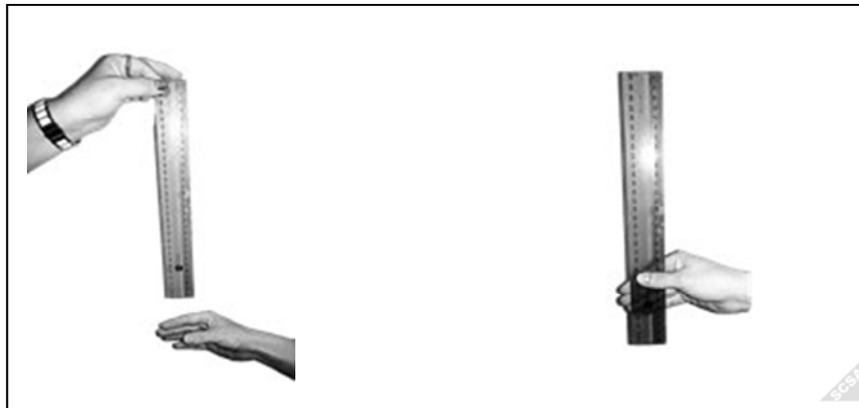
Working time for the task: 60 minutes

Total marks: 35 marks

Weighting: 15% of the school mark

1. Lucy and Phillip wanted to investigate the effect of distractions on a person's reaction time. They selected some students in their class to use as their test subjects and conducted the ruler drop test. **(29 marks)**

Ruler drop test



They converted the measurements to time using the following formula.

$$t = \frac{\sqrt{2d}}{a}$$

They recorded their results in the table on the following page.

Student	Reaction time without distraction (sec)				Reaction time with distraction (sec)			
	Trial 1	Trial 2	Trial 3	Average	Trial 1	Trial 2	Trial 3	Average
Darren	0.16	0.14	0.12	0.14	0.22	0.28	0.25	0.25
Stephanie	0.20	0.21	0.20	0.203	0.34	0.26	0.26	0.287
Pieter	0.18	0.22	0.16	0.187	0.35	0.28	0.32	0.28
Braxton	0.20	0.15	0.18	0.177	0.38	0.28	0.22	
Rohan	0.22	0.18	0.18		0.28	0.34	0.30	0.307
Suzie	0.25	0.25	0.23	0.243	0.43	0.39	0.40	0.407

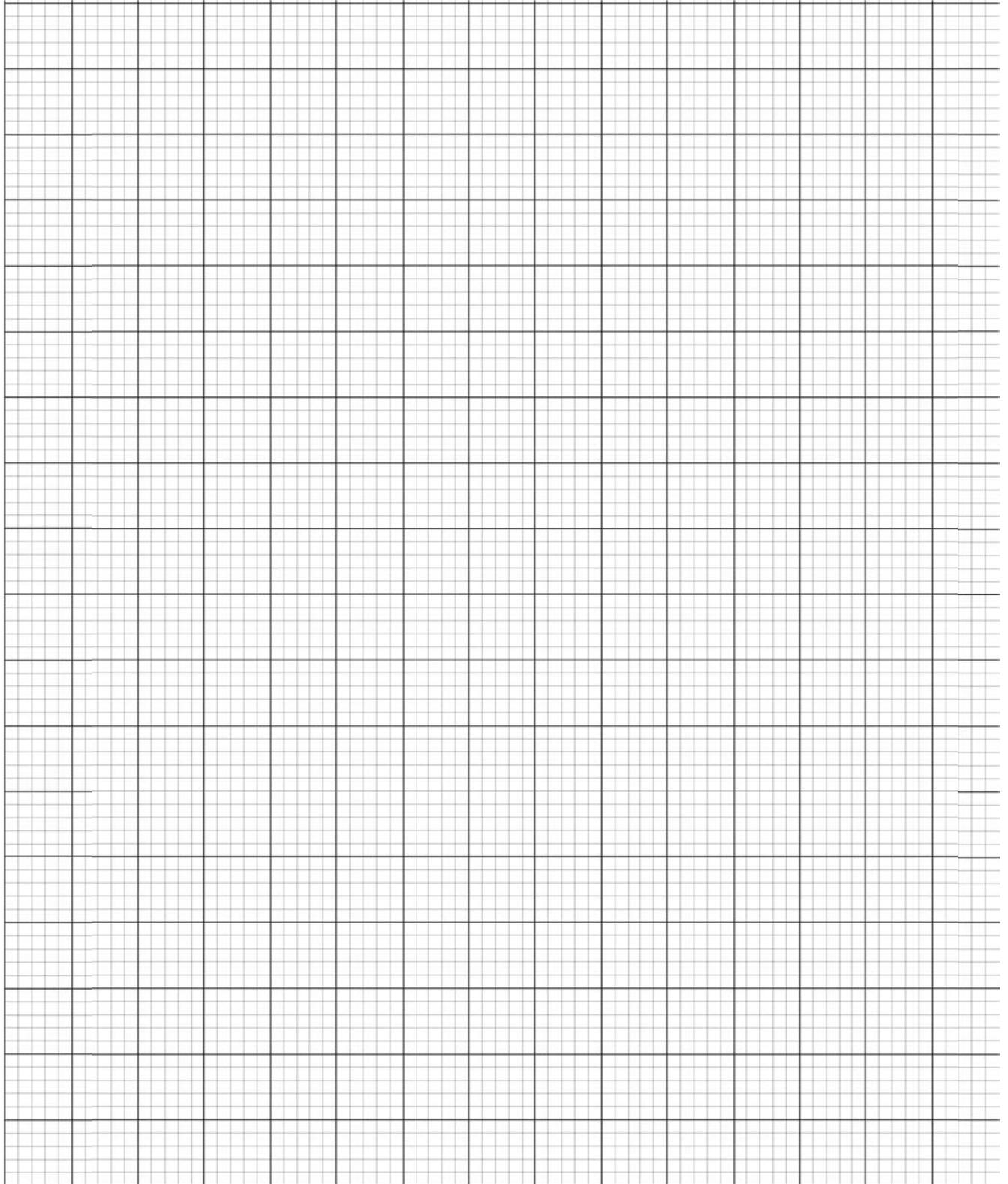
(a) Write an hypothesis for this experiment. (1 mark)

(b) i What is the independent variable? (1 mark)

ii What is the dependent variable? (1 mark)

iii List **three (3)** variables that Lucy and Phillip kept the same. (3 marks)

- (e) Draw a graph showing the average results from the table. Put the students on the x-axis and the reaction time on the y-axis. (6 marks)



- (f) How could this experiment be improved to increase the validity of the results? (2 marks)

- (g) What could Lucy and Phillip do to investigate the difference between a visual distraction and a noise distraction? (2 marks)

2. Describe how the nervous system assists reactions. (5 marks)

3. Explain the difference between a reaction and a reflex action. **(2 marks)**

4. Describe the nervous pathway of a reflex arc. **(5 marks)**

End of questions

Additional grid: Use the grid below to answer Question 5 if you have cancelled your first attempt.

