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90192

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 1 Science, 2003

90192 Describe spatial relationships in astronomy and their effects on space exploration

Credits: Two
2.00 pm Thursday 13 November 2003

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

Show ALL working.

If you need more space for any answer, use the page provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

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Achievement Criteria		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe spatial relationships in astronomy and their effects on space exploration.	Explain spatial relationships in astronomy and their effects on space exploration.	Analyse spatial relationships in astronomy and their effects on space exploration.
Overall Level of Performance		

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You are advised to spend 20 minutes answering the questions in this booklet.

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QUESTION ONE

Our solar system consists of nine known planets orbiting our sun.

Below is a table showing the distance from the sun in astronomical units (AU) of the 4 inner planets of our solar system.

One astronomical unit is 150 million kilometres (the mean distance from the centre of the Earth to the centre of the sun).

Planet	Astronomical unit
Mercury	0.4
Venus	0.7
Earth	1.0
Mars	1.5

(a) (i) Name the planet nearest to Earth.

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_____

(ii) Calculate how many million kilometres this planet is away from Earth.

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(b) Describe ONE feature of the surface of the planet nearest to Earth that makes exploration difficult.

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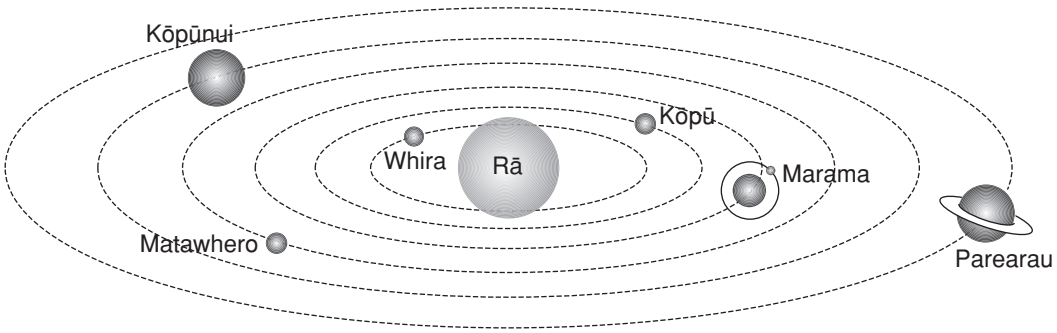

The sun and the first six planets with their Māori names.

Source: Oliver, Dewsnip & Whitney, *Understanding Science Book 2,* Longman Paul, Auckland, 1990

(c) (i) Tohunga kōkōrangi (Māori astronomers) named all the planets except the outermost three (not shown above).

Name these THREE outermost planets.

(1) _____

(2) _____

(3) _____

(ii) Use the relationship between Earth and the three outermost planets to discuss why tohunga kōkōrangi did not name these three planets.

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(d) Some planets in our solar system are unlikely to ever be landed on by either manned spacecraft or unmanned space probes. Name ONE of these planets and discuss why.

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QUESTION TWO

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In 2003, Mars was closer to Earth than it has been for about 73 000 years.

(a) What is the colour of Mars when seen with the naked eye?

(b) Some features of Mars can only be seen with a telescope. Describe ONE of these features.

(c) Discuss why Mars will probably be the first planet on which humans land.

(d) A manned mission to Mars will take at least six months to reach there. Discuss why it is very important that astronauts spend as little time as possible travelling to Mars.

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Extra paper for continuation of answers if required.
Clearly number the question.

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Question Number