

This assessment is based on a now-expired version of the achievement standard and may not accurately reflect the content and practice of external assessments developed for 2024 onwards.

**92046Q**



Mana Tohu Mātauranga o Aotearoa  
New Zealand Qualifications Authority

## Level 1 Physics and ESS RAS 2023

**92046 Demonstrate understanding of the effect  
on the Earth of interactions between the Sun  
and the Earth-Moon system**

Credits: Five

# PILOT ASSESSMENT

## ASSESSMENT TASK

Check that this booklet has pages 3–6 in the correct order and that none of these pages is blank.



This report is about how interactions between the Sun and the Earth-Moon system affects Earth. There are three parts that cover three different effects. Use specific evidence from the resources and your own knowledge to answer all parts of the report.

## **PART ONE: LUNAR PHASES**

In a lunar month, the Moon passes through different phases.

Discuss the different phases of the moon shown in the Resource Book.

In your answer, you should explain:

- Why we see these different phases of the Moon.
- Why the lunar cycle (new moon to new moon) takes 29.5 days.
- Why the Moon rises at different times each day.

## **PART TWO: TIDES**

From time-to-time Aotearoa/New Zealand experiences king tides (perigean spring tides) in addition to the normal high and low tide cycle.

Discuss the different types of tides experienced in Aotearoa/New Zealand.

In your answer you should explain:

- How normal high and low tides form.
- Why two high and two low tides occur every day.
- Why spring and neap tides occur every 14 days. Refer to the data in the table.
- Why Aotearoa/New Zealand experiences king tides (perigean spring tides) at irregular intervals of time.

## **PART THREE: SEASONS**

Aotearoa/New Zealand experiences four seasons every year – spring, summer, autumn, winter – whereas other parts of the Earth do not.

Discuss how seasons vary across the Earth.

In your answer you should explain:

- Why Aotearoa/NZ experiences four different seasons.
- Why the United Kingdom in the Northern Hemisphere experiences the same four seasons, but at different times of the year.
- Why the Equator experiences little seasonal variation compared to Aotearoa/New Zealand.

**PART ONE: LUNAR PHASES****Figure 1: Lunar Phases Southern Hemisphere**

Adapted from: [www.sciencelearn.org.nz/images/684-moon-phases-from-the-southern-hemisphere](http://www.sciencelearn.org.nz/images/684-moon-phases-from-the-southern-hemisphere)

**Table 1: Moonrise times for four consecutive days in Aotearoa/New Zealand**

<b>Date</b>	18 July 2023	19 July 2023	20 July 2023	21 July 2023
<b>Time</b>	07:59 AM	08:37AM	09:08 AM	09:35 AM

## PART TWO: TIDES

**Figure 2: Tides**

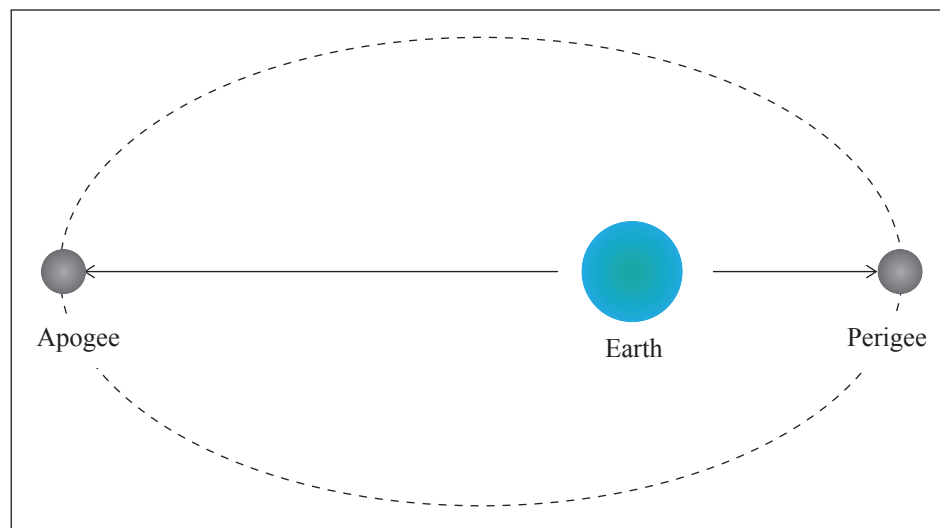


Adapted from: [www.tigermarinecharter.com/tides-where-does-the-water-go-when-the-tides-go-out/](http://www.tigermarinecharter.com/tides-where-does-the-water-go-when-the-tides-go-out/)

**Table 2: Time between tides**

Type of tide	Time between times
High	12 hours 25 minutes
Spring	14–17 days
Neap	14–17 days
King (perigean spring tide)	Approx. 7 months

**Figure 3: The Moon's orbit**



**PART THREE: SEASONS****Figure 4: The Earth's Orbit**

Adapted from: [www.timeanddate.com/calendar/aboutseasons.html/](http://www.timeanddate.com/calendar/aboutseasons.html/)

Seasons indicated are for the Southern Hemisphere.

**Figure 5: World map showing New Zealand and the United Kingdom**

Adapted from: <https://worldmapblank.com/labeled-map-of-world/>