

'Language-friendly' Assessment Design



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Example of an assessment item (exam) designed using the concepts of accessible written instructional language

Year 7 Science – Earth & Space Sciences

This example includes the following:

Unit Analysis Table

The unit analysis table outlines the curriculum content being covered in the unit of study drawn from Year 7 Earth and Space Sciences. The table identifies the curriculum intent – what students need to know, do, and think about in order to address the satisfactory requirements of the Achievement Standard from the Australian Curriculum with context.

Further information about the process of gaining curriculum clarity through the unit analysis processes can be found here:

- School Inclusion – From Theory to Practice (Teaching and Learning):
<https://school-inclusion.com/inclusion-in-action/teaching-and-learning/>
- Inclusive Education Café Recording (Inclusive Curriculum Provision – three-part series):
<https://school-inclusion.com/inclusive-ed-cafe/>

Summative Assessment

The exam has been designed using the concepts of 'language-friendly' written instruction. The concepts utilised in the exam would have been taught and utilised throughout the unit of study prior to assessment. Additional concepts such as explicit vocabulary instruction would have also formed part of the teaching and learning process. There would have been an overall focus on universally designing accessible oral and written instructional language across the unit of study.

This 'language-friendly' assessment design would be administered to all students in the class. The concepts used maintain the rigour of the curriculum intent, and therefore do not alter the complexity of the knowledge and skills that students are required to demonstrate.

The concepts used include:

- Clear learning objective and success criteria
- Advanced organiser
- Important information is easy to find
- Visual prompts/cues
- Accessible font size and spacing
- Student friendly definitions (glossary)
- Colour coding to match tasks with associated questions
- Enough space to respond on the assessment item
- Clear instructions
- Sentences are short and simple

To draw comparison, the original assessment task has also been included. It highlights the significant improvement in the design and written instructional language that has occurred.

In addition, students may access further adjustments to the task during its administration (eg. accessing via assistive tech or utilising a scribe), and/or have personalised adjustments made to the task itself (eg. adjustment to the complexity for a student engaging with an alternate access point on the sequence of achievement). However, an assessment of this nature reduces common barriers from the outset, and therefore minimises the need for additional adaptation. To further enhance the accessibility of this task, pairing it with Universal Design for Learning (UDL) concepts (eg. providing choice in the ways students demonstrate their learning) would further enhance its design.

Further information about the concepts of 'language-friendly' instruction and assessment design can be found here:

- Links Resources: <https://linksresources.com.au/>
- Graham, L.J., Tancredi, H., Willis, J. et al. (2018). Designing out barriers to student access and participation in secondary school assessment. *The Australian Educational Researcher*. 45, 103–124. Retrieved from: <https://link.springer.com/article/10.1007/s13384-018-0266-y>
- Inclusive Education Cafe Recording (Remote Learning – Providing 'language-friendly' instruction): <https://school-inclusion.com/inclusive-ed-cafe/>

Unit Analysis Table

| I must know... | be able to do... | and think about... | Differentiation: | Supplementary Adjustments: |
|--|---|---|--|---|
| <p>Relative positions of Earth, the sun and moon</p> <ul style="list-style-type: none"> • Size and distance • Direction of orbit of the Earth and moon • Length of orbit times for the Earth and moon | <p>Create a labelled diagram of the Earth, moon and sun system with the direction of rotation, revolution, and length of revolution.</p> | <p>What information do I need to show in this diagram?</p> <p>Have I included labels and label lines?</p> | <p>Provide lists of what is to be included</p> <p>Step-by-step demonstration</p> <p>Think Alouds</p> <p>Concrete representations</p> <p>Strong and weak examples</p> <p>Modelled and guided practice</p> | <p>Provide cut-outs of the components for students to arrange into a diagram</p> <p>Provide a list of key vocabulary for students to apply to diagram</p> |
| <p>Movement of Earth affects:</p> <ul style="list-style-type: none"> • Tides (spring and neap) • Eclipses (lunar and solar) • Phases of the moon | <p>Calculate differences in tide heights.</p> <p>Compare similarities and differences between neap and spring tides.</p> | <p>What math operation is used to find the difference?</p> <p>When I look at the graph, what information can I see about the moon phases?</p> | <p>Provide formulas</p> <p>Enlarge and improve clarity of graphs</p> <p>Use of graphic organiser (Venn Diagram)</p> <p>Use of multimodal representations of tides</p> | <p>Provide calculations</p> <p>Provide cut-outs of the components for students to arrange into a diagram</p> |

| | | | | |
|--|---|---|---|---|
| <p>Relationship between different eclipses</p> | <p>Draw (use) on evidence to support conclusions about tides through referencing trends in data.</p> <p>Creates an annotated diagram to explain how the relative positions of Earth, the sun and moon affect tides and solar eclipses.</p> <p>Agree/disagree with statements and explain why</p> | <p>What characteristics are the same about spring and neap tides?</p> <p>What characteristics are different?</p> <p>What tide is represented in the graph?</p> <p>What evidence supports my thinking? How does it support my thinking?</p> <p>Where are the Earth and moon (relative to the sun) during a solar eclipse?</p> <p>How can I demonstrate this in a diagram?</p> <p>Have I included labels?</p> <p>What important information needs to be annotated to explain my thinking?</p> <p>Do I agree with this statement about_____? Why/why not?</p> <p>What evidence supports my thinking?</p> | <p>Scaffolded levels of complexity (Blooms questioning and Critical and Creative Thinking sequence)</p> <p>Graphic organisers to capture thoughts and ideas</p> | <p>Provide a list of key vocabulary for students to apply to diagram</p> <p>Reduce the number of statements to respond to</p> |
|--|---|---|---|---|

| | | | | |
|---|--|--|--|--|
| Differences between labelled and annotated diagrams | Label and annotate diagrams | What are the similarities and differences between labelled and annotated diagrams? What do annotations provide? | Modelled and worked examples in class | Scaffolds and prompts Printed cloze annotations |
| | Communicate ideas using scientific language and appropriate representations | Have I used scientific vocabulary? Do my responses make sense? Have I answered the question? | Explicit vocabulary instruction: <ul style="list-style-type: none"> • Student friendly definitions • Word recall/use games • Word walls • Freyer models • Semantic mapping • Visual representations Paragraph construction: <ul style="list-style-type: none"> • Modelled responses • Co-construction • Modelled and guided practice • Scaffolds – sentence starters, use of SWEEP structure | Use of assistive technology Use of a scribe Video recording/discussing response with the teacher Using concrete models to support communication of ideas through movement of objects Short/dot-point responses |

NB: Differentiation and Supplementary Adjustment examples are general. These practices require application to a class context and personalisation for students.



My Learning Goal:

I am learning to explain phenomena experienced on Earth due to the relative positions of the Earth, the moon and the sun. I will do this using scientific language and appropriate representations.



I will be successful when I can:

- **Explain** how the relative positions of the Earth, the sun and the moon affect phenomena on Earth
- **Use** evidence to support conclusions
- **Communicate** ideas using scientific language and appropriate representations

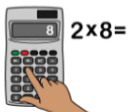
Tasks:

What I have to do



create

1. **Create** a scientific diagram of the Earth, sun and moon system



calculate

2. **Calculate** differences in tide heights



explain

3. **Compare** spring and neap tides. **Explain** why observations represent neap and spring tides



create

4. **Create** and **annotate** a diagram to demonstrate a total solar eclipse





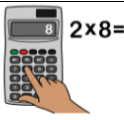








agree disagree

5. **Agree/disagree** with statements about a lunar eclipse. **Explain** why you agree or disagree using scientific knowledge and evidence



explain

Assessment Glossary

| Term | Visual | Definition |
|----------------------------|---|--|
| Agree |  agree | Think the same thing or have the same opinion |
| Annotate |  annotation | Add notes or comments |
| Calculate |  calculate | Find the answer using maths |
| Coherent |  easy to understand | Logical, well-organised, clear and easy to understand |
| Communication |  communication | Share your ideas and thoughts |
| Concise |  concise | To the point, not using unnecessary information |
| Conclusions |  conclusion | A final decision or opinion |
| Disagree |  disagree | Think something different or have a different opinion |
| Explain |  explain | To tell or show why something happens, what causes it |
| Justify |  proof | To provide a good reason for something. Prove something is right |
| Scientific Language |  language | Technical words used in science with specific meanings about the topic |

Marking Guide

| Assessable Elements | | Aspects of Task | A | B | C | D | E |
|-----------------------|--------------------------|---|--|---|--|---|---|
| SCIENCE UNDERSTANDING | Earth and space sciences | Explains how the relative positions of Earth, the sun and moon affect phenomena on Earth. | Creates an annotated diagram to explain how the relative positions of Earth, the sun and moon affect tides and solar eclipses. Agree or disagree with statements about lunar eclipses and explain why by using scientific evidence. | Creates an annotated diagram to explain how the relative positions of Earth, the sun and moon affect tides and solar eclipses. Agree or disagree with statements about lunar eclipses and explain why. | Creates an annotated diagram to explain how the relative positions of Earth, the sun and moon affect tides and solar eclipses. Agree or disagree with statements about lunar eclipses. | Explains the relative positions of the Earth, the moon and sun using an annotated diagram. | Explains the relative position of the Earth, the sun and moon using a diagram. |
| | SCIENCE INQUIRY SKILLS | Processing and analysing data and information | Draw on evidence to support conclusions. | Draws on two or more pieces of evidence to support conclusions about tides by referencing relevant trends and relationships in data. | Draws on evidence to support a conclusion about tides by referencing relevant trends and relationships in data. | Draws on evidence to support a conclusion about tides by referencing data. | Draws on evidence to support a conclusion about tides. |
| Communicating | | Communicate ideas using scientific language and appropriate representations. | Concise and coherent communication of ideas, using scientific language and appropriate and accurate representations. | Coherent communication of ideas using scientific language and appropriate and accurate representations. | Communication of ideas using scientific language and appropriate representations. | Communication of ideas using inconsistent scientific language and appropriate representations. | Fragmented communication of ideas using some scientific language. |

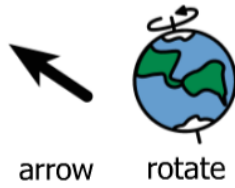
Question 1

Create a scientific diagram of the Earth, moon and sun system.

What to include:



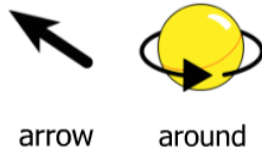
Sun



Arrows showing direction of **rotation (spin)** of the Earth and Moon



Earth

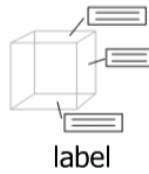


Arrows showing direction of **revolution (around)** of the Earth and Moon

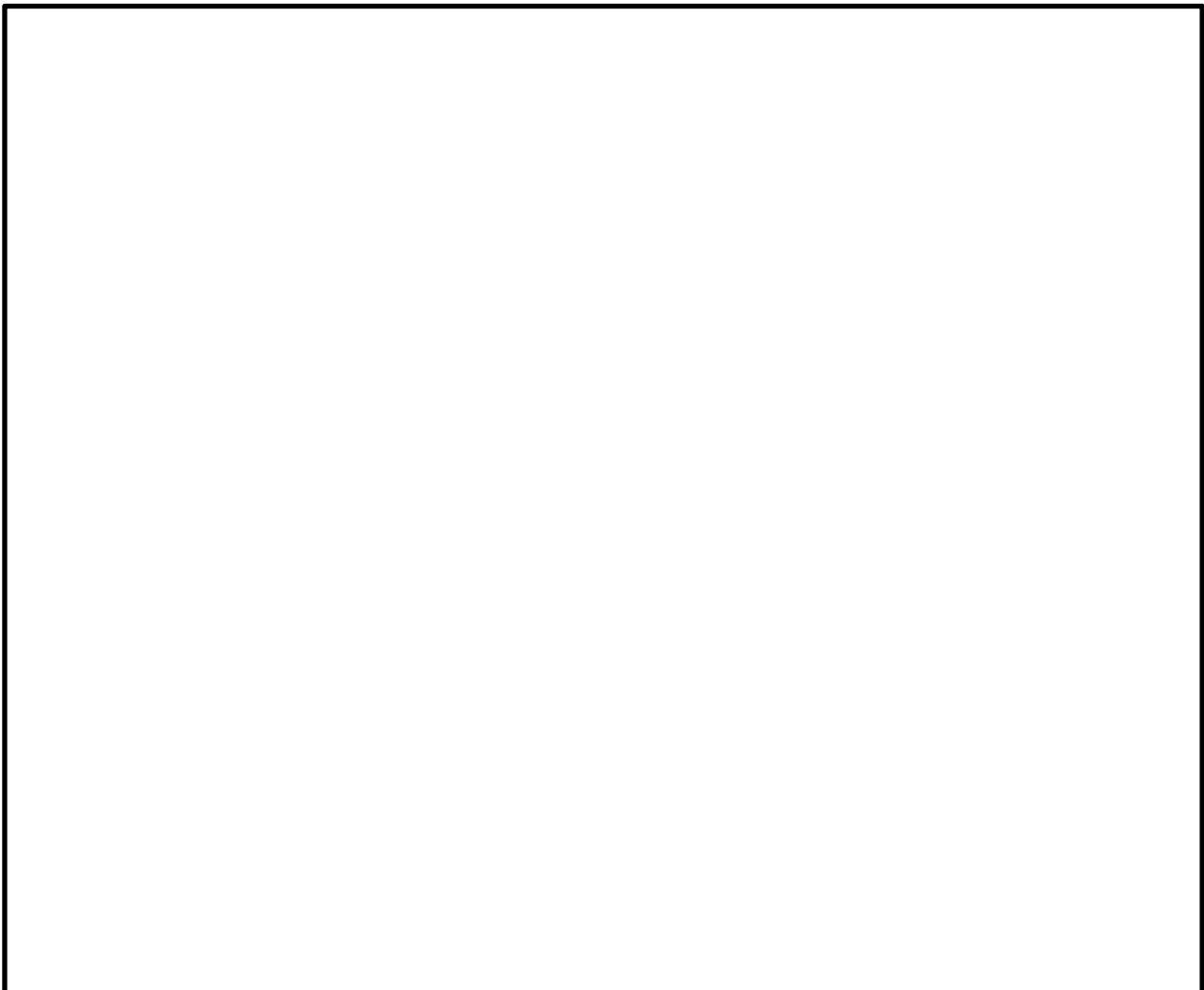
Earth



Moon



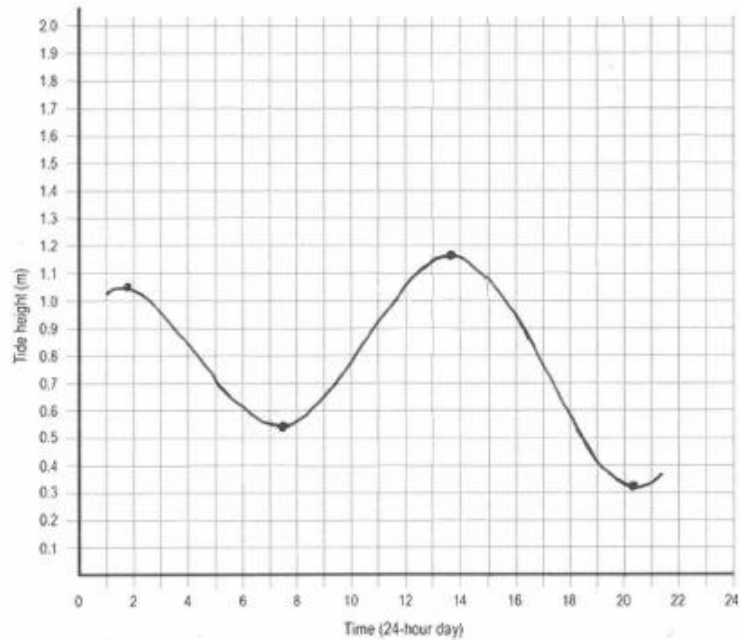
Label the parts of your diagram



Question 2

Tidal data for two separate days has been graphed below:

Observation A – Neap Tide



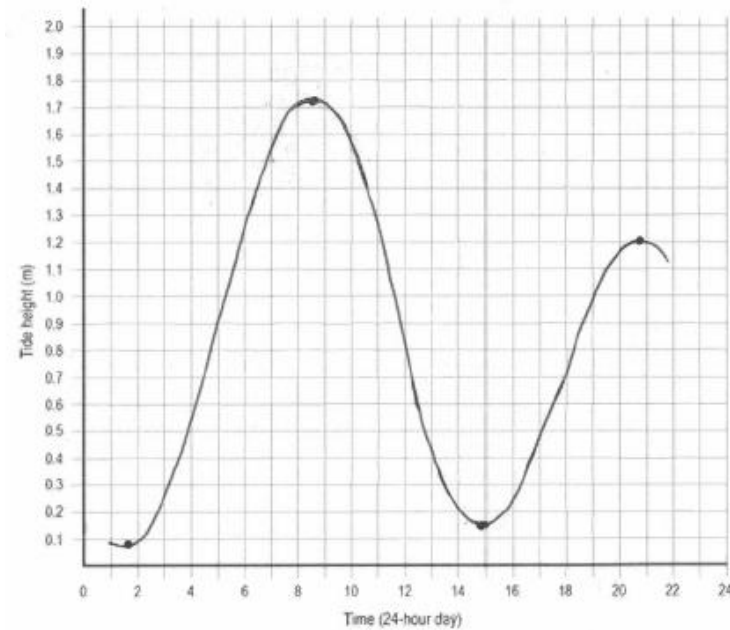
- a) **Calculate** and **record** the difference in height between the highest and lowest tides recorded for the day.

| Observation A June 1 | |
|-----------------------------------|-----------------|
| Moon Phase Last Quarter | |
| Time (24hr) | Tide Height (m) |
| 01:59 | 1.04 |
| 7:30 | 0.55 |
| 13:40 | 1.18 |
| 20:17 | 0.32 |

Difference in tide heights:

Highest Tide – Lowest Tide =

Observation B – Spring Tide



- b) **Calculate** and **record** the difference in height between the highest and lowest tides recorded for the day.

| Observation B June 22 | |
|---------------------------------|-----------------|
| Moon Phase New Moon | |
| Time (24hr) | Tide Height (m) |
| 01:48 | 0.07 |
| 08:34 | 1.72 |
| 14:57 | 0.15 |
| 20:48 | 0.32 |

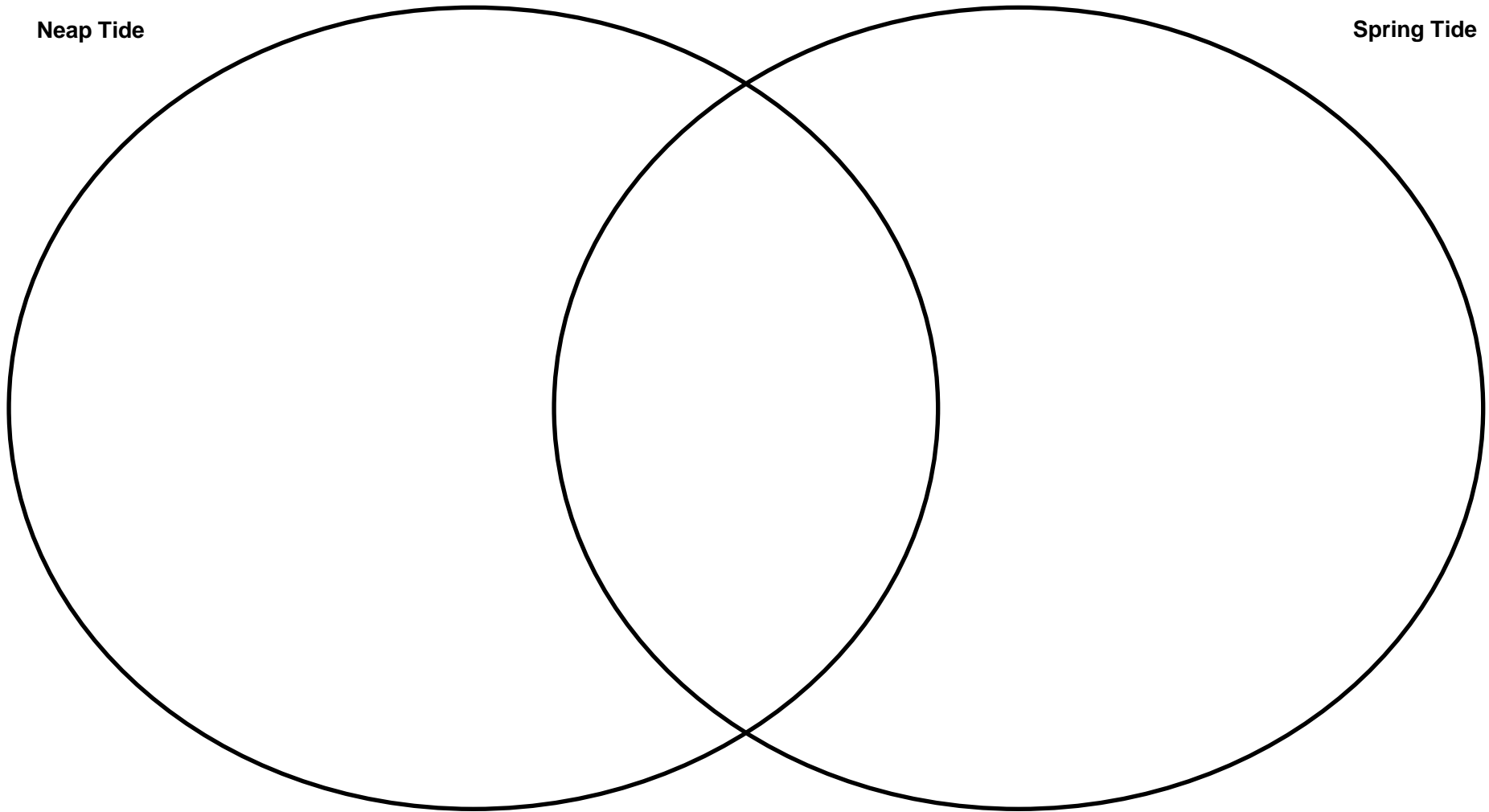
Difference in tide heights:

Highest Tide – Lowest Tide =

c) Compare the similarities and differences of neap and spring tides

Neap Tide

Spring Tide



d) **Observation A** represents a Neap Tide.

Apply (show) scientific understanding and reasoning to **explain** why.

- **Explain** relationships and trends from the data.
- **Use** two or more pieces of evidence to support your reasoning
- **Create** a labelled diagram to support your explanation.

Labelled Diagram:

e) **Observation B** represents a **Spring Tide**.

Apply (show) scientific understanding and reasoning to **explain** why.

- **Explain** relationships and trends from the data.
- **Use** two or more pieces of evidence to support your reasoning
- **Create** a labelled diagram to support your explanation.

Labelled Diagram:

Question 3

Create an **annotated diagram** to show the relative positions of Earth, the moon and the sun, during a total solar eclipse.



sun

Sun



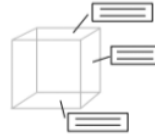
annotation

Annotations – short sentence about the parts of your diagram and what they are showing



Earth

Earth



label

Label the parts of your diagram



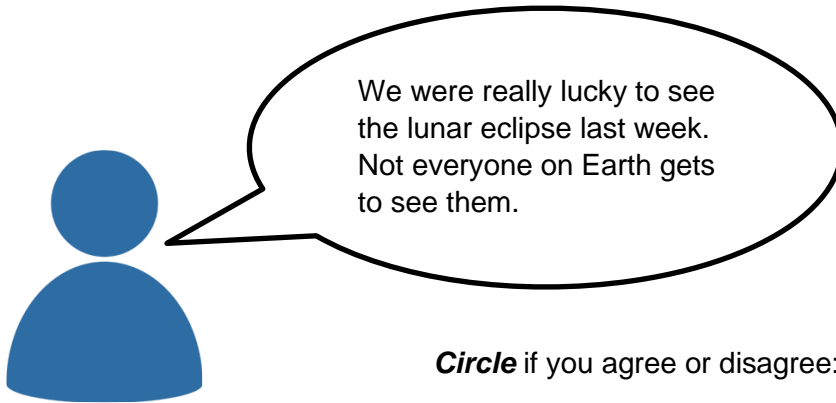
moon

Moon

A large empty rectangular box with a black border, intended for the student to draw their annotated diagram of a total solar eclipse.

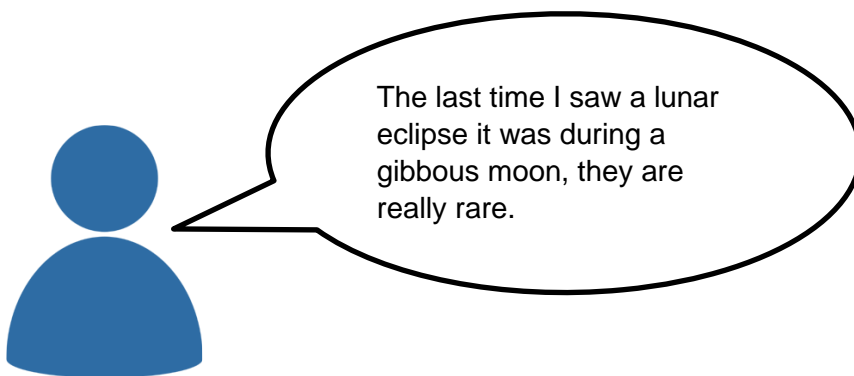
Question 4

Look at the statements below. State whether you agree or disagree with each statement. Explain why you agree or disagree, and justify your decision using scientific knowledge.



Circle if you agree or disagree: Agree / Disagree

Explain why you agree or disagree. **Justify** your decision using scientific knowledge.



Circle if you agree or disagree: Agree / Disagree

Explain why you agree or disagree. **Justify** your decision using scientific knowledge.



The lunar eclipse on Monday was way cooler than the one on Friday. I can't believe you only saw one eclipse last week.

Circle if you agree or disagree: Agree / Disagree

Explain why you agree or disagree. **Justify** your decision using scientific knowledge.

Original Exam

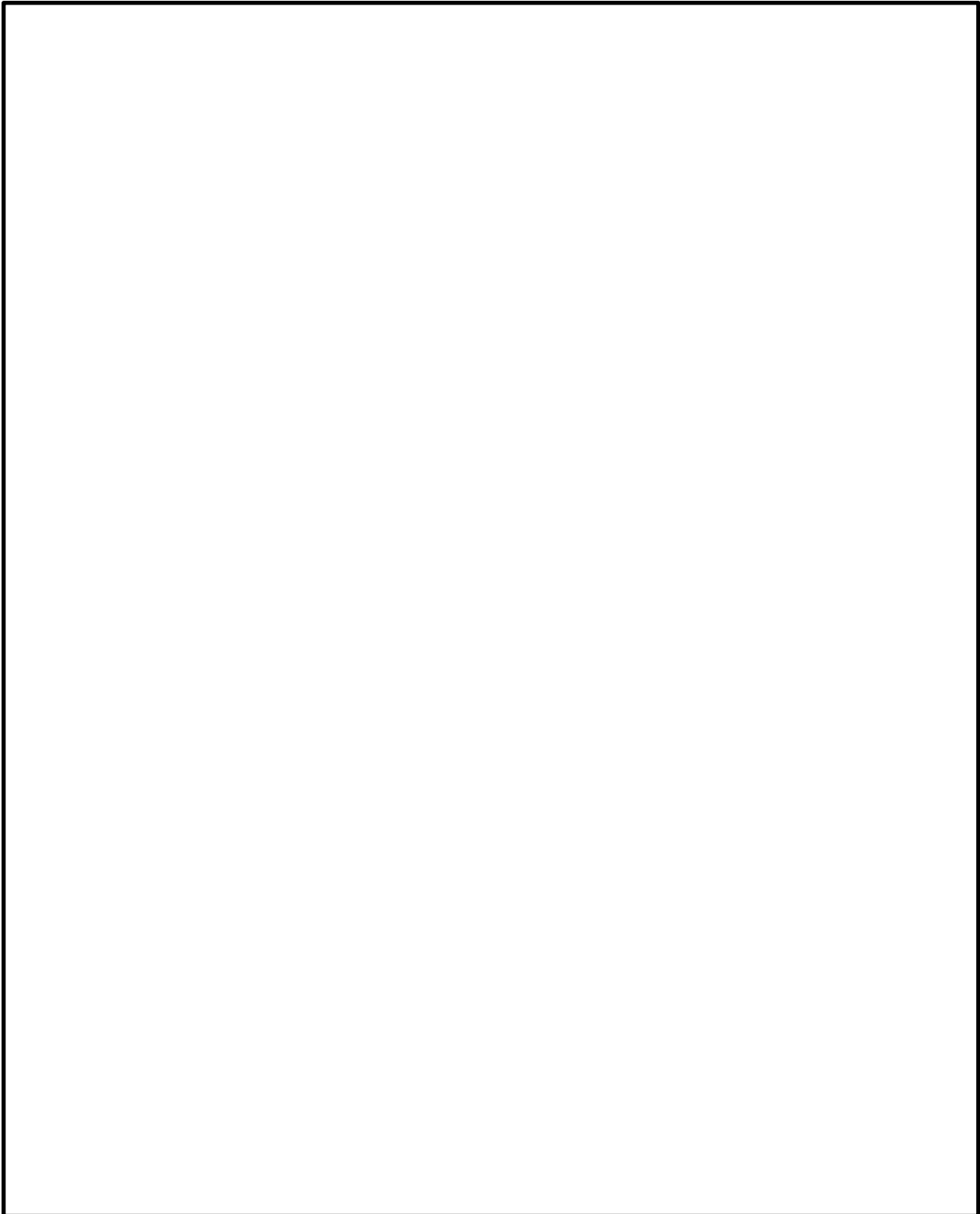
Science Understanding and Science Inquiry Skills

Question 1

Draw an **annotated scientific diagram** of the Earth, moon and sun system.

The diagram should include:

- arrows showing the direction of rotation and revolution of Earth and the moon
- how long each takes.



Question 2

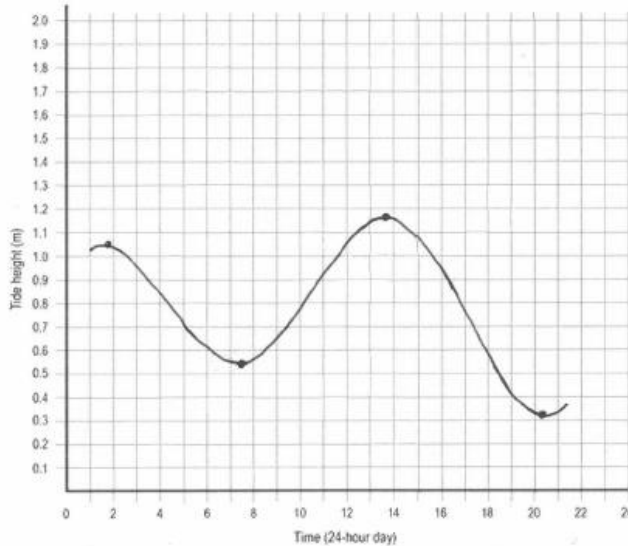
Tidal data for two separate days have been graphed below.

Interpret the graphed data to complete **Questions (a) to (g)** for **Observations A and B**.

(**Hint:** When reading the tidal graph, you will need to make estimates to calculate the heights of the tides.)

Observation A

b) **Complete** the missing tide heights on the table below, using the information presented in the tidal graph.



| Observation A | |
|---------------|-------------|
| June 1 | |
| Moon phase | |
| Last quarter | |
| Time | Tide height |
| 24 h | m |
| 01:59 | 1.04 |
| 07:30 | _____ |
| 13:40 | 1.18 |
| 20:17 | _____ |

c) **Calculate** and **record** the difference in height between the lowest and highest tides recorded for the day.

d) Observation A represents a neap tide. **Apply (show)** scientific understanding and reasoning to **justify** why.

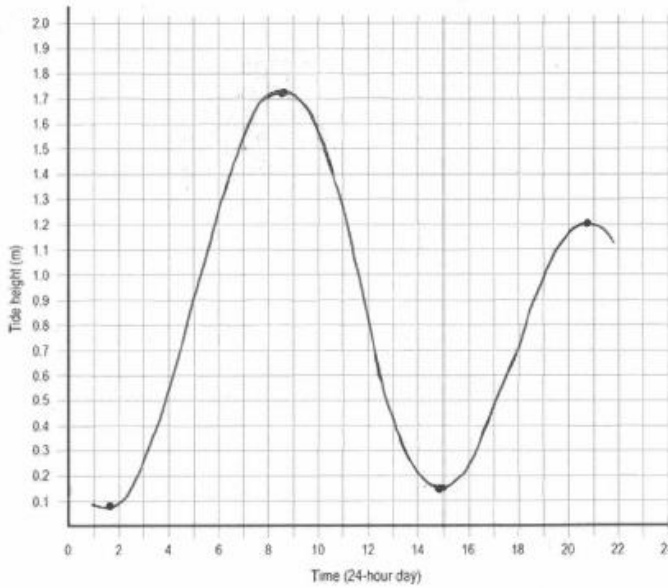
- **Draw on (use)** two or more pieces of evidence to support your reasoning by explaining relationships and trends from the data.
- **Include (draw)** a labelled diagram to support your explanation.

Question 2 cont.

Observation B

Further observations were taken approximately three weeks after Observation A.

e) **Record** the moon phase that matches the data profile: _____

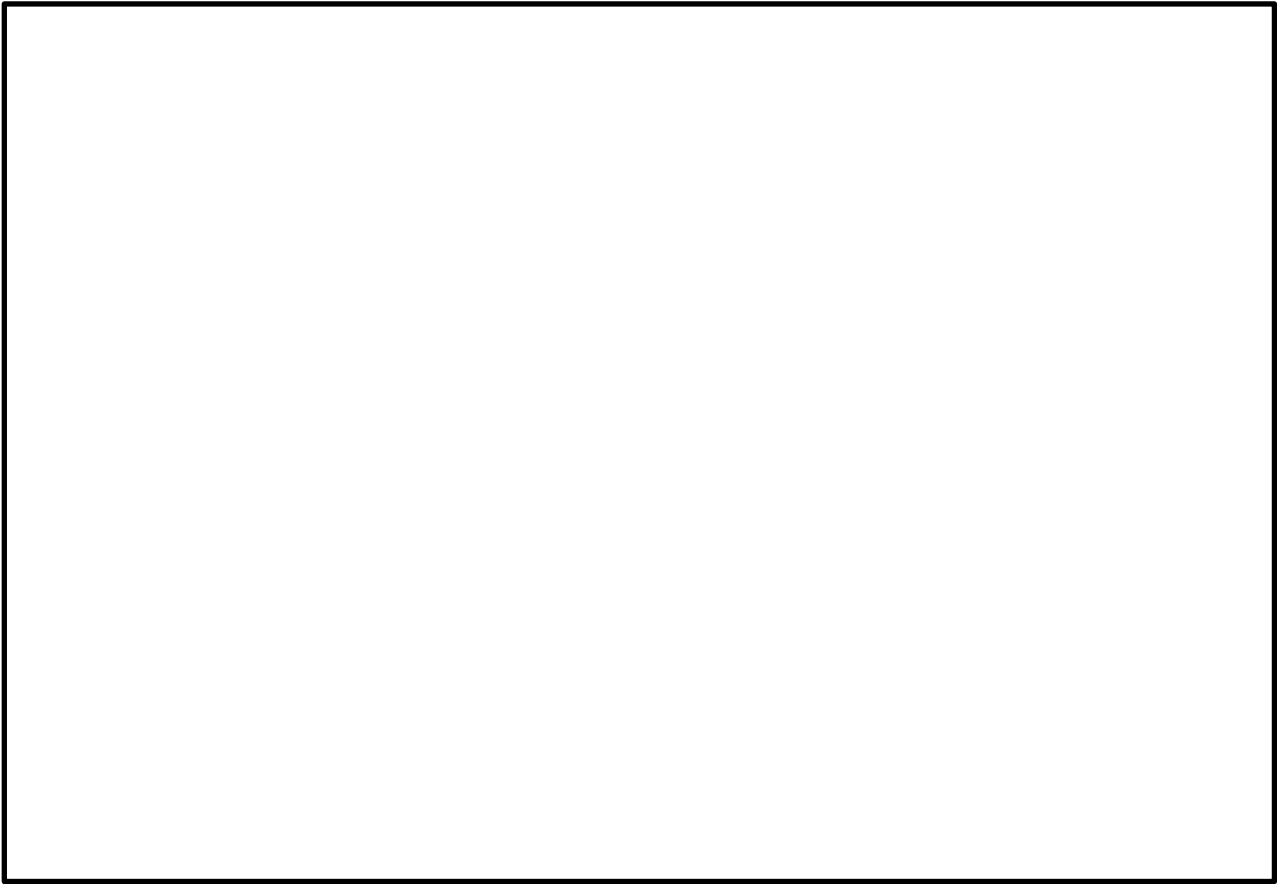


| Observation B | |
|---------------|-------------|
| June 22 | |
| Moon phase | |
| _____ | |
| Time | Tide height |
| 24 h | m |
| 01:48 | 0.07 |
| 08:34 | 1.72 |
| 14:57 | _____ |
| 20:48 | 1.20 |

- f) **Complete** the missing tide height on the table above, using the information presented in the tidal graph.
- g) **Calculate** and **record** the difference in height between the lowest and highest tides recorded for the day.
- h) Observation B represents a spring tide. **Apply (show)** scientific understanding and reasoning to **justify** why.
- **Draw on (use)** two or more pieces of evidence to support your reasoning by explaining relationships and trends from the data.
 - **Include (draw)** a labelled diagram to support your explanation.

Question 3

Draw an annotated diagram to show the relative positions of Earth, the moon and the sun, during a total solar eclipse.



Question 4

Look at the cartoon below, which shows three students, Noah, Rika and Alvar, discussing eclipses.



Answer questions on the next page:

- show** whether you agree or disagree with each student by circling agree OR disagree,
- apply** your knowledge of moon phases and eclipses to **explain** why you agree or disagree with each student's statement and **justify** your decisions using scientific knowledge.

Read each statement below and complete the questions:

Noah states: *“we were really lucky to see the lunar eclipse last week. Not everyone on Earth gets to see them”*

Circle if you agree or disagree: Agree/Disagree

Explain why you agree or disagree with Noah’s statement and **justify** your decision using scientific knowledge.

Rika states: *“the last time I saw a lunar eclipse it was during a gibbous moon, they are really rare.*

Circle if you agree or disagree: Agree/Disagree

Explain why you agree or disagree with Rika’s statement and **justify** your decision using scientific knowledge.

Alvar states: *“the lunar eclipse we saw on Monday was way cooler than the one we saw on Friday. I can’t believe you only saw one lunar eclipse last week.*

Circle if you agree or disagree: Agree/Disagree

Explain why you agree or disagree with Alvar’s statement and **justify** your decision using scientific knowledge.
