

6

SCIENCE

SAMPLE RESPONSES



Moon phases

This booklet is designed to help teachers make overall, on-balance judgments by providing examples of student responses. The responses are not an exhaustive set.

D samples

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D Sample: Response 1

Overall grade

The purpose of this QCAT is for students to demonstrate understanding and interpretation of the causes of day and night, and of moon phases. This response demonstrates a limited level of knowledge and understanding of the topic, and of the variable application of processes. On balance this is an overall D.

Guide to making judgments — Year 6 Science

Student the causes of day and night, and of Moon phases.

Knowledge and understanding

[Q 1–4, 6]
Some moon phases are linked to matching images, even though Q 1, 4 and 6 are mostly incorrect; Overall there is little evidence of understanding the motion of Moon and Earth, the causes of day and night, or forces.

Investigating

[Q 5, 8, 10]
This response links conclusions to visual information and has some success in Q 5 by identifying night time, although the phase is named incorrectly and no moon view is shown. A partial explanation with one scientific concept “reflection” is given for Q 8, with diagram labelled correctly but showing Sun and Moon on same orbit. Q 10 has minimal explanation with one scientific concept “Moon moves all the time”.

Communicating

Communicates information, explanations and conclusions using diagrams and scientific terminology.
Q 2–10

Reflecting

Reflects on learning to evaluate ideas.

Reflecting

[Q 7, 9]
Identifies one scientific understanding (that the earth moves —Q 7 and 9). Other ideas are based on preconceptions, and there is little evidence of reflecting on relevant learning to evaluate ideas.

Communicating

Uses everyday language to present scientific ideas with reasonable clarity and provides one simple, labelled diagram.

Correctly identifies and classifies a force. Correctly identifies or classifies a force.	Links conclusions to visual information.	Uses everyday language. Draws rudimentary diagrams.	Reflections are based on preconceptions rather than evidence presented.
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Feedback

D Sample: Response 1

1. Choose words from the word list to complete the paragraphs below.

Word list					
Sun	Earth	Moon	orbit	in shadow	phases
sunrise	reflecting	28 days	24 hours	day	night



- Use Diagram 1 to help you.
- Not all of the words are used.

Earth rotates once every day..... On the side facing the Sun,
it is reflecting.... and on the other side it is night.....
because it is orbit.....

Moonrise, sunrise..... and the appearance of the Sun and Moon
moving across the sky are actually caused by the rotation of the Earth.

The Moon is in 28 days..... around the Earth, taking about 24 hours.....
for one revolution.

As it moves around the Earth, the Moon appears to go through changes in shape,
called phases....., as we see more or less of the side that is in shadow
light from the Sun.

While orbiting the Earth, the Moon also rotates slowly, almost exactly one turn during
each orbit, so the same side is always facing the Sun.....

D Sample: Response 1

Diagram 2: Phases of the Moon

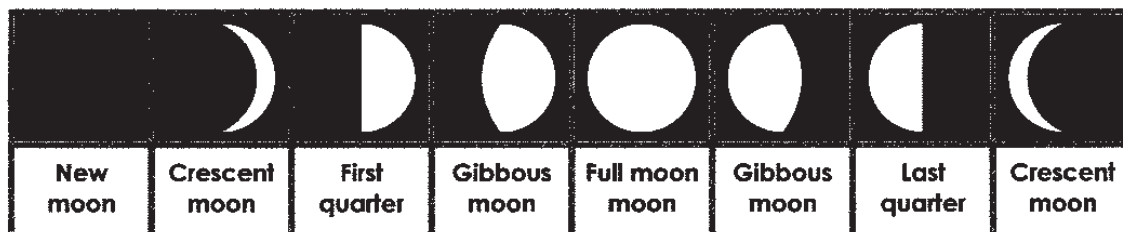
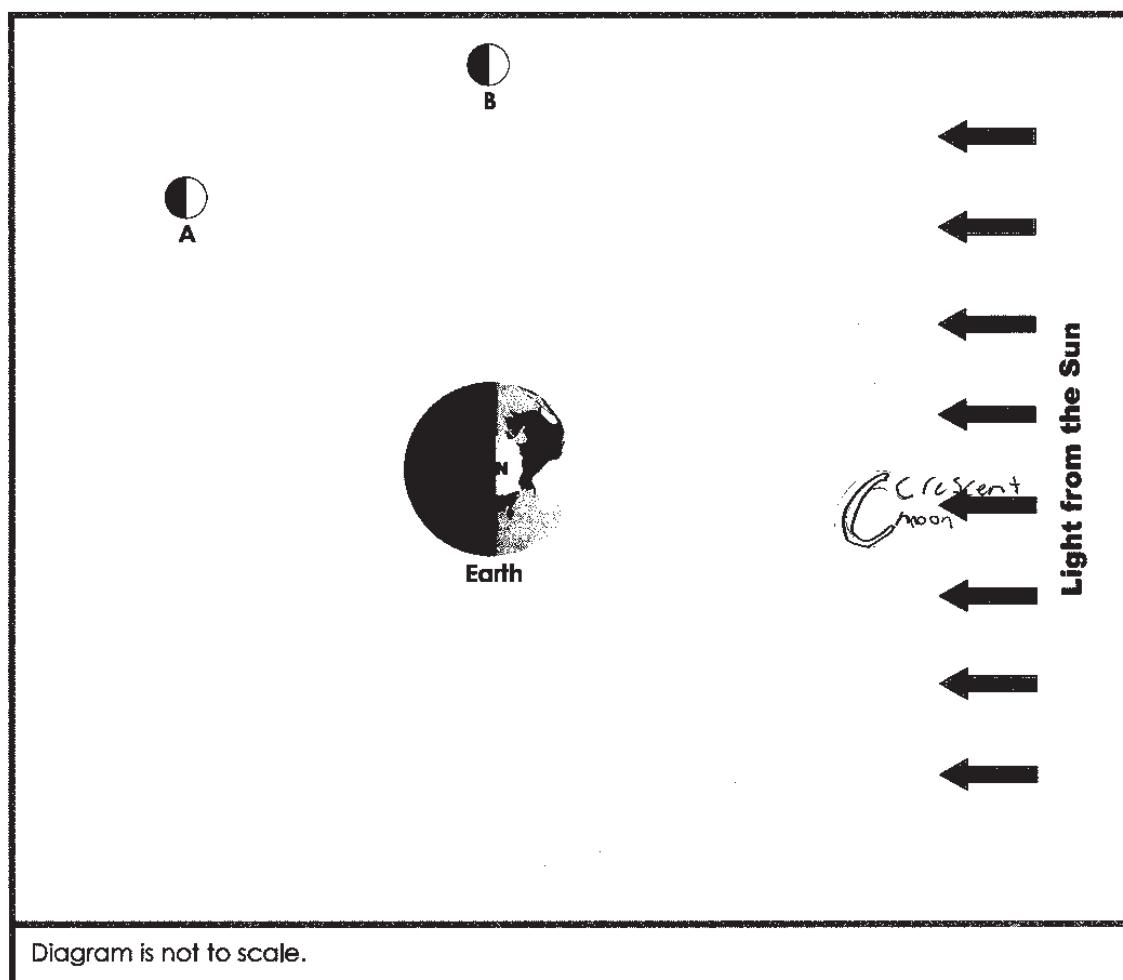



Diagram 3: Earth with the Moon in two different positions




D Sample: Response 1

Use Diagrams 2 and 3 to help you complete the following questions.

2. Shade in the shape and name the phase of the Moon when it is in position A.


View from Earth	Name of phase
	first quarter

3. Shade in the shape and name the phase of the Moon when it is in position B.

View from Earth	Name of phase
	Last quarter

4. Draw another moon in Diagram 3, according to the following instructions:

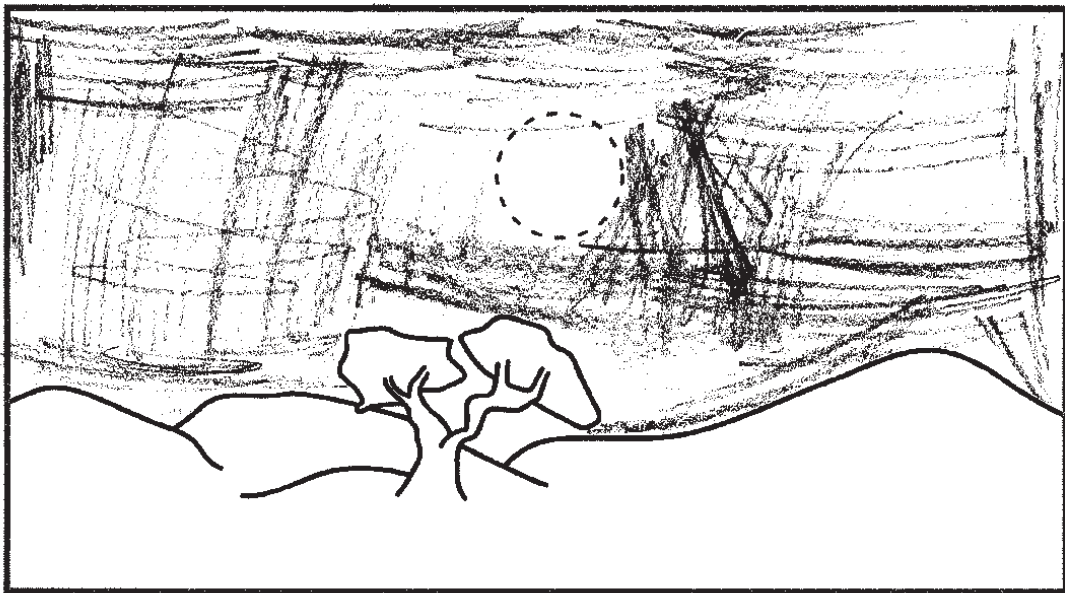
- draw the Moon in a position to show the phase below
- label it C
- shade the dark side.

View from Earth	Name of phase
	Crescent moon

D Sample: Response 1

5. In the box below:

- a) draw the phase of the Moon you would see from the position shown in Diagram 4
- b) colour the sky to show whether it is day (blue) or night (black)
- c) name the phase of the Moon: *first quarter*



D Sample: Response 1

6. Compare the ball and string with the actual Earth and Moon, by completing this table.

	The boy with the ball and string	The Earth and Moon
What are the forces stopping the Moon and ball from moving away? Choose from this list: <ul style="list-style-type: none"> • magnetism • gravity • reflection • string pulling in • string pulling out 	string pulling out	String pulling in
Is the force a contact force or a force acting at a distance? Circle one in each case.	a contact force or a force acting at a distance	a contact force or a force acting at a distance
Does the same side of the Moon (or ball) always face Earth (or boy)? Circle one in each case.	Yes or No	Yes or No

7. Think about using the ball and string to explain the motion of the Moon.

What is useful about the ball and string?	What is not useful about the ball and string?
<ul style="list-style-type: none"> • is the string demonstrating the Earth or moon 	<ul style="list-style-type: none"> • the Boy holding it isn't moving

STOP HERE: WAIT FOR YOUR TEACHER'S DIRECTIONS

D Sample: Response 1

Look at the photo of the Earth.

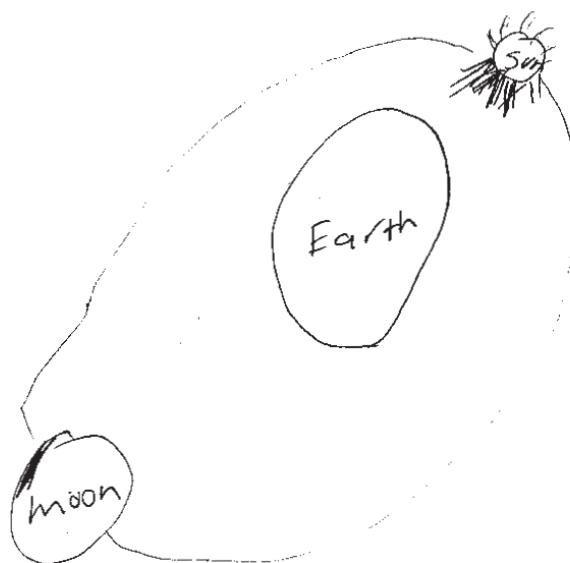
8. Explain why the Earth has that shape in the photo.



Think about what causes
Moon phases.

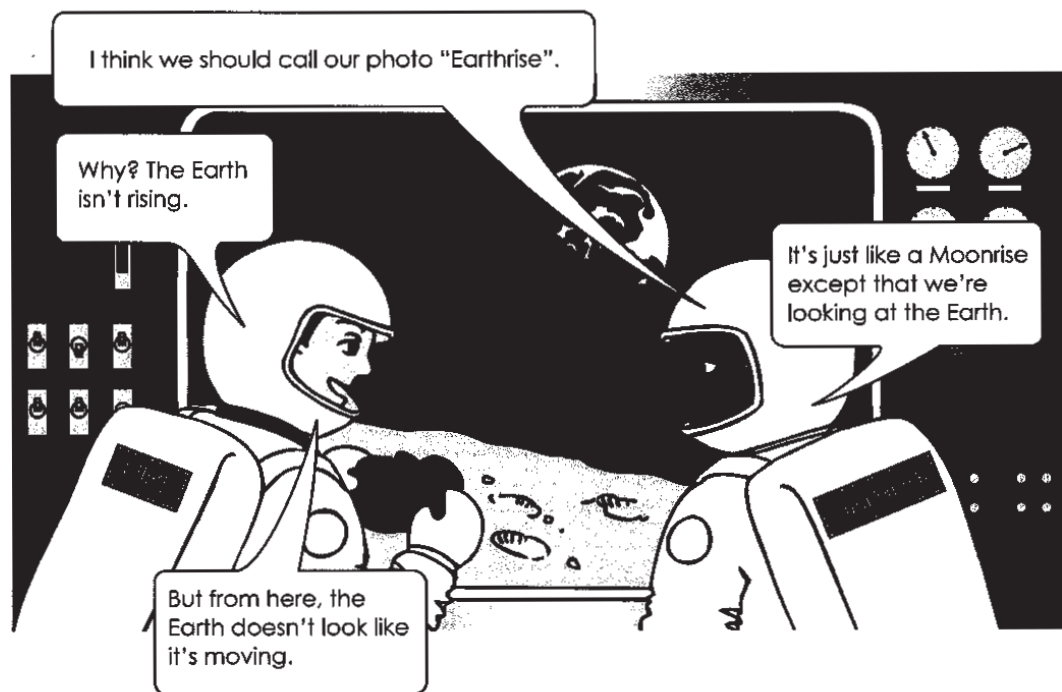
because the sun is reflecting of the
Earth

Draw a diagram to show what you mean.



D Sample: Response 1

Here are two astronauts who have taken a similar photo.
The astronauts discussed what they should call it.



The Pilot and Commander disagree about whether "Earthrise" is a correct title.

9. List some science ideas they could use to support their opinions about "Earthrise".



- List all the evidence you can find to support one or both astronauts
- Look back over pages 4–11 for ideas.

Pilot: "The Earth isn't rising"	Commander: "Earthrise"
<ul style="list-style-type: none"> • you don't see the earth rising. 	<ul style="list-style-type: none"> • the earth was rising because the sun stays still • and the earth moves

D Sample: Response 1

10. Decide which astronaut you agree with.

Give scientific reasons to explain your opinion. You may use a diagram.

I agree with the commander because the moon does
rise it moves all off the time.

.....

.....

and

.....

.....

.....

D Sample: Response 2

Guide to making judgments — Year 6 Science

Purpose: To demonstrate understanding and interpretation of the causes of day and night, and of Moon phases.

Student

Overall grade

Knowledge and understanding of forces is sound, but responses related to Earth, Moon and Sun are less accurate. Limited evidence of the processes of investigating, communicating and reflecting processes indicates that on balance, this is an overall D response.

Knowledge and understanding [Q 1–4, 6]		Investigating [Q 5, 8, 10]		Communicating	Reflecting
Correctly identifies and classifies forces. Q 1–4 have multiple omissions and errors but provide some evidence of understanding Moon phases and the motion of Moon and Earth.		Some success in interpreting a view of Moon with a drawing, but Q 5 is otherwise incorrect. Uses everyday language and a rudimentary diagram in Q 8 to interpret the photo as an eclipse, which is a reasonable response. Includes scientific ideas and a simple diagram in Q 10 but does not link to a clear conclusion.		Communicates information, explanations and conclusions using diagrams and scientific terminology. Q 2–10	Reflects on learning to evaluate ideas. Q 7, 9
<p>Describes the motion of the Earth and Moon with minor errors and omissions. Correctly represents Moon phases in simple situations. Correctly identifies and classifies a force.</p> <p>Correctly identifies or classifies a force.</p> <p>Links motion of Earth and Moon to day and night.</p>		<p>Interprets visual information with partial success to present a view of the Moon. Makes a connection to relevant scientific concepts when evaluating the title of the photo.</p> <p>Links conclusions to visual information.</p>		<p>Uses simple, labelled diagrams and everyday language to provide disjointed communication.</p> <p>Uses appropriate scientific terminology in explanations, conclusions and justifications. Draws clear diagrams.</p> <p>Uses everyday language.</p> <p>Draws rudimentary diagrams.</p>	<p>Partially explains one scientific idea in Q 7 and another in Q 9, providing minimal evidence of reflecting on learning to evaluate ideas.</p> <p>Considers scientific understandings when evaluating the ball-and-string analogy and the title of the photo.</p> <p>Reflections are based on preconceptions rather than evidence presented.</p>
A		B		C	
D		E		D	

Feedback

D Sample: Response 2

1. Choose words from the word list to complete the paragraphs below.

Word list					
Sun	Earth	Moon	orbit	in shadow	phases
sunrise	reflecting	28 days	24 hours	day	night



- Use Diagram 1 to help you.
- Not all of the words are used.

Earth rotates once every 24 hours. On the side facing the Sun, it is sunrise and on the other side it is night because it is in shadow.

Moonrise, and the appearance of the Sun and Moon moving across the sky are actually caused by the rotation of the Earth.

The Moon is in around the Earth, taking about for one revolution.

As it moves around the Earth, the Moon appears to go through changes in shape, called, as we see more or less of the side that is light from the Sun.

While orbiting the Earth, the Moon also rotates slowly, almost exactly one turn during each orbit, so the same side is always facing the

D Sample: Response 2

Diagram 2: Phases of the Moon

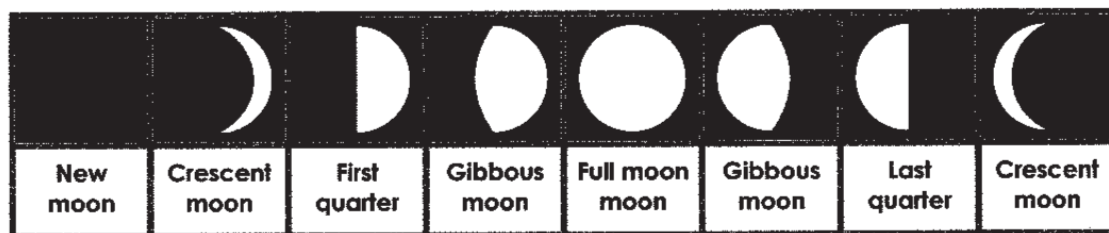
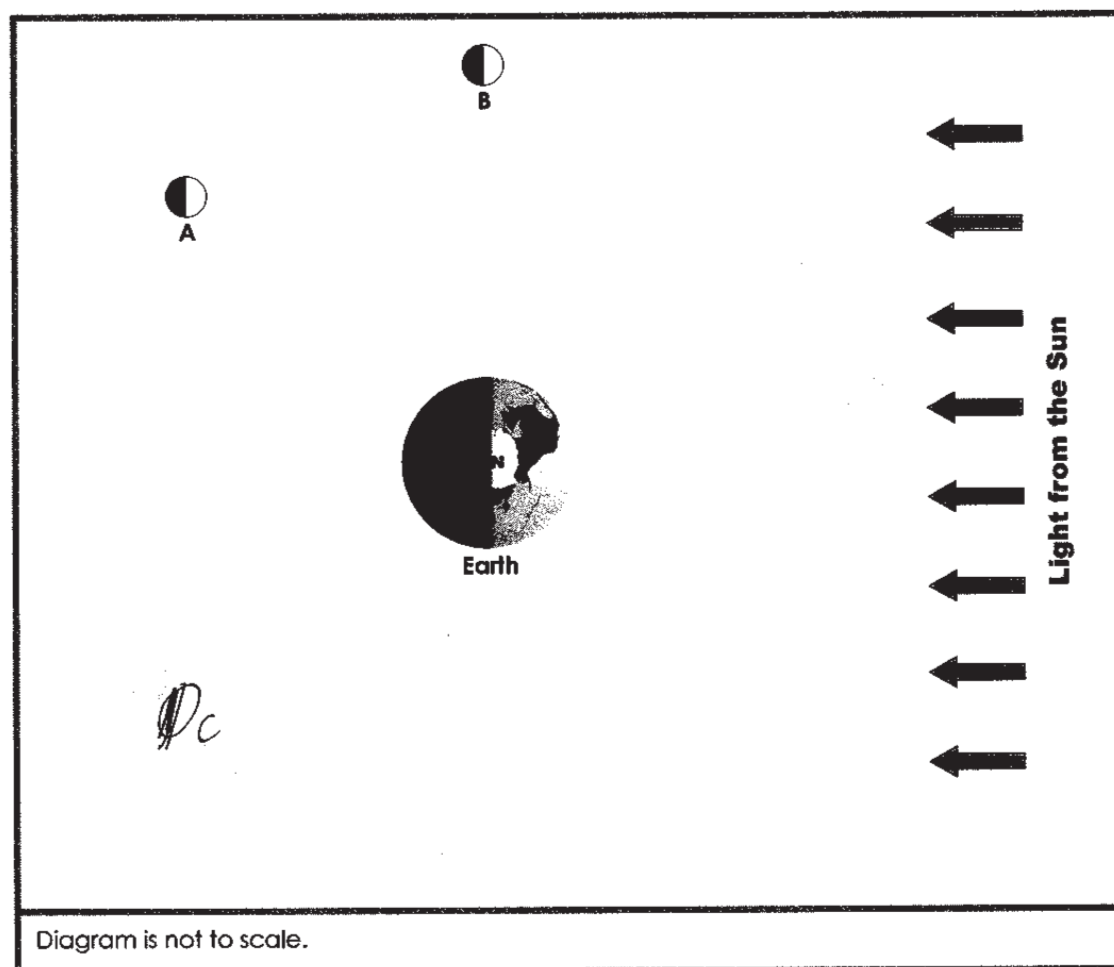



Diagram 3: Earth with the Moon in two different positions




D Sample: Response 2

Use Diagrams 2 and 3 to help you complete the following questions.

2. Shade in the shape and name the phase of the Moon when it is in position A.


View from Earth	Name of phase
	<u>gibbous moon</u>

3. Shade in the shape and name the phase of the Moon when it is in position B.

View from Earth	Name of phase
	<u>First quarter</u>

4. Draw another moon in Diagram 3, according to the following instructions:

- draw the Moon in a position to show the phase below
- label it C
- shade the dark side.

View from Earth	Name of phase
	Crescent moon

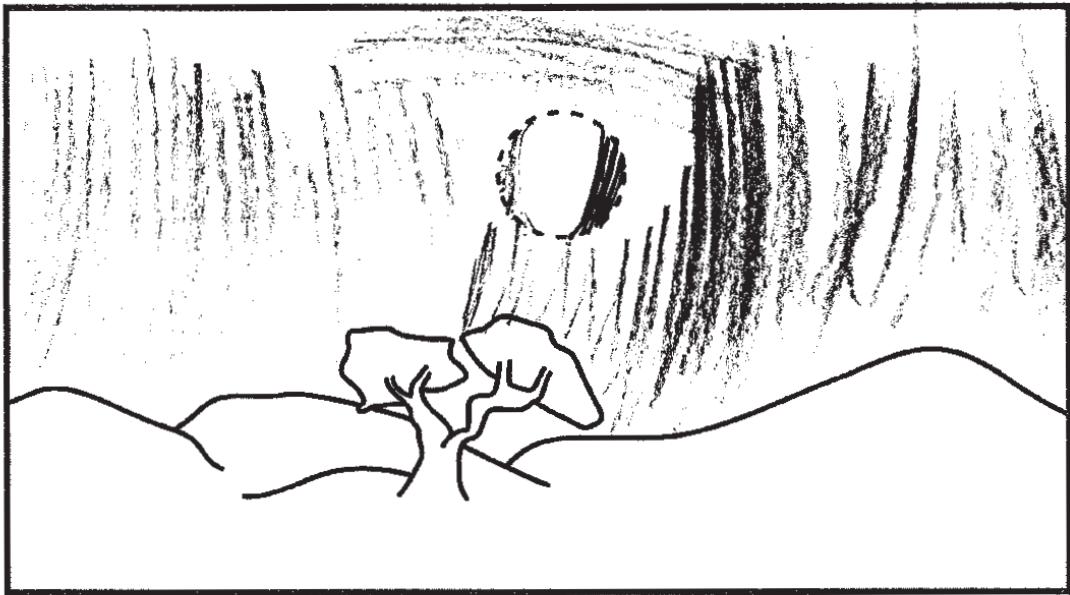
D Sample: Response 2

5. In the box below:

a) draw the phase of the Moon you would see from the position shown in Diagram 4

b) colour the sky to show whether it is day (blue) or night (black)

c) name the phase of the Moon: crescent moon



D Sample: Response 2

6. Compare the ball and string with the actual Earth and Moon, by completing this table.

	The boy with the ball and string	The Earth and Moon
What are the forces stopping the Moon and ball from moving away? Choose from this list: <ul style="list-style-type: none"> • magnetism • gravity • reflection • string pulling in • string pulling out 	string pulling in	gravity
Is the force a contact force or a force acting at a distance? Circle one in each case.	a contact force or a force acting at a distance	a contact force or a force acting at a distance
Does the same side of the Moon (or ball) always face Earth (or boy)? Circle one in each case.	Yes or No	Yes or No

7. Think about using the ball and string to explain the motion of the Moon.

What is useful about the ball and string?	What is not useful about the ball and string?
It demonstrates how one side is always showing	

STOP HERE: WAIT FOR YOUR TEACHER'S DIRECTIONS

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D Sample: Response 2

Look at the photo of the Earth.

8. Explain why the Earth has that shape in the photo.



Think about what causes
Moon phases.

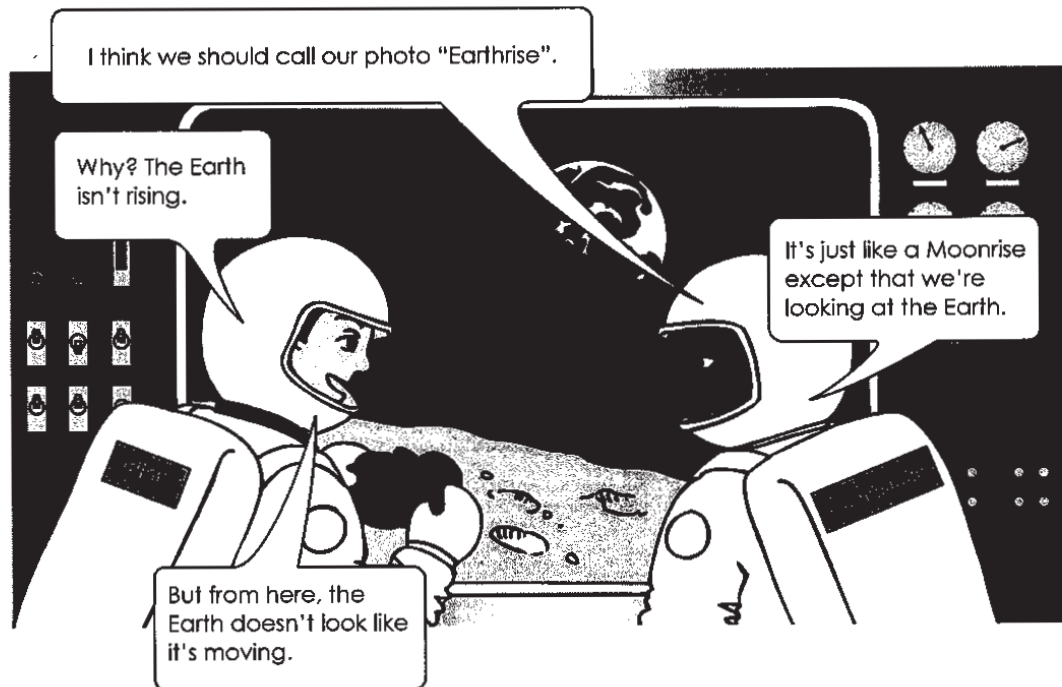
because the moon is
in the way

Draw a diagram to show what you mean.



D Sample: Response 2

Here are two astronauts who have taken a similar photo.
The astronauts discussed what they should call it.



The Pilot and Commander disagree about whether "Earthrise" is a correct title.

9. List some science ideas they could use to support their opinions about "Earthrise".



- List all the evidence you can find to support one or both astronauts
- Look back over pages 4–11 for ideas.

Pilot: "The Earth isn't rising"	Commander: "Earthrise"
the moon is moving around the earth	

D Sample: Response 2

10. Decide which astronaut you agree with.

Give scientific reasons to explain your opinion. You may use a diagram.

I agree with the pipt because the moon is
orbiting the earth the earth is
not orbiting the moon the earth
is rotating.

and

.....

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