



State of Texas Assessments of Academic Readiness

Grade 8 Science

Short Constructed-Response Scoring Guide

Spring 2024

General Information

Beginning with the 2022–2023 school year, science assessments include short constructed-response questions at every assessed grade level. Students are asked to provide a short response to a question. Responses are scored using a prompt-specific, two-point rubric.

This State of Texas Assessments of Academic Readiness (STAAR®) constructed-response scoring guide provides student exemplars at all score points for two short constructed-response questions from the STAAR grade 8 science operational test. The questions are presented as they appeared on the test, and responses were scored based on the two-point rubrics that were developed with the input of Texas educators. A response earns a specific score point based on the completeness of the response provided as measured against the rubric.

The responses in this guide are actual student responses submitted online during the testing window. To protect the privacy of individual students, all names and other references of a personal nature have been altered or removed. Otherwise, the responses appear as the students wrote them and have not been modified.

Grade 8 Science Short Constructed Response

Prompt

Which **TWO** body systems are **MOST DIRECTLY** responsible for students being able to feel rain on their skin?

Identify the body systems **AND** explain how these systems are responsible for creating a sensation on skin.

Enter your answers in the box provided.

Item-Specific Rubric

Score: 2

The response provides complete and correct understanding:

- Identify **TWO** body systems that are **MOST DIRECTLY** responsible for feeling rain on the skin.
 - Nervous system
 - Integumentary system

AND

- Explain how each of the two body systems are responsible for creating a sensation on skin.

Score: 1

The student answers half of the question correctly. The response provides partial understanding:

The student correctly identifies and explains one of the two body systems (nervous or integumentary).

OR

The student correctly identifies the two body systems with missing or incomplete explanations.

OR

The student correctly explains how the nervous and integumentary systems are responsible for creating a sensation on skin without identifying the body systems.

Score: 0

The response is incorrect or irrelevant. The response provides little to no understanding.

Sample Student Responses

Score Point 0

Response 1

Sensory neurons and our brain because the sensory neurons is how we feel things. The brain helps us feel that because the sensory neurons send a message to our brain to feel it.

The response is incorrect or irrelevant and demonstrates little to no understanding. It includes neither of the required elements.

The response does not identify the nervous system ("Sensory neurons and our brain") but does provide a valid explanation ("The brain helps us feel that because the sensory neurons send a message to our brain to feel it"). Neurons (nerve cells), nerves, and the brain are components of the body system, not valid identifications for the nervous system.

The response does not attempt to identify the integumentary system or provide an explanation. Neurons and the brain are part of the same body system.

Response 2

The excretory system is everthing on the outside like yor skin and your hair. That is part of what lets you feel the rai out side. The other part is the nervous system becuae that is where your nerves feel that is how you feel the rain outside.

The response is incorrect or irrelevant and demonstrates little to no understanding. It includes neither of the required elements.

The response correctly identifies the nervous system ("nervous system") but provides an incomplete explanation ("that is where your nerves feel that is how you feel the rain outside"). It insufficiently describes the role nerves play in the nervous system to explain how the system is responsible for creating a sensation on skin.

The response demonstrates a minimally valid explanation for skin ("system is everthing on the outside like yor skin and your hair. That is part of what lets you feel the rai [rain] out side") but incorrectly identifies the "excretory system" instead of the integumentary system. Note this does not receive credit as a valid explanation, even if a valid explanation for nervous system was also provided, as it is linked to an incorrect body system identification, showing no understanding of how a body system is responsible for feeling rain on the skin.

Response 3

Students are able too feel rain on their skin because they have 5 senses and one of them is touch meaning they can feel stuff.

The response is incorrect or irrelevant and demonstrates little to no understanding. It includes neither of the required elements.

The response does not attempt to identify the nervous system or provide an explanation for an additional body system.

The response does not attempt to identify the integumentary system, instead incorrectly identifying the sense of touch as a body system ("they have 5 senses and one of them is touch meaning they can feel stuff"). The sense of touch to "feel stuff," detecting touch stimuli, is a valid explanation for how the skin is responsible for creating a sensation on skin, not an identification of a body system.

Response 4

our skin cells help the brain detect what we are feeling on our body

The response is incorrect or irrelevant and demonstrates little to no understanding. It includes neither of the required elements.

The response does not attempt to identify the nervous system or provide an explanation for an additional body system.

While a minimal explanation for how skin is responsible for creating a sensation on skin is provided ("our skin cells help the brain detect what we are feeling on our body"), there is no attempt to identify a body system. Note that "skin cells" is not an acceptable identification for integumentary system, but more of an attempt in this response to describe skin and how it functions for the explanation.

Score Point 1

Response 1

The nervous system and the respreritory system. The nervous system sends signals to your brain explaining what is happening on your arm. The respreitory system brings oxygen to your brain so it can function.

The response addresses half of the question correctly and demonstrates partial understanding. The student correctly identifies and explains one of the two body systems (nervous or integumentary).

- Correctly identifies the nervous system (“nervous system”) and provides a valid explanation (“sends signals to your brain explaining what is happening on your arm”).

The response does not identify the integumentary system (“respreritory [respiratory] system”) or provide a valid explanation for a second valid body system (“brings oxygen to your brain so it can function”). Note that while it is true the respiratory system plays a role in the body receiving oxygen, the explanation focuses on incompletely describing one of the functions of the body system instead of how the body system is responsible for creating a sensation on skin.

Response 2

The integumentary system because it protects your skin. The nervous system because underneath your skin are nerves that go to your brain.

The response addresses half of the question correctly and demonstrates partial understanding. The student correctly identifies the two body systems with missing or incomplete explanations.

- Correctly identifies the nervous system (“nervous system”) and integumentary system (“integumentary system”), with no incorrect explanations to contradict the identifications.

Incomplete explanations of how the correctly identified systems are responsible for creating a sensation on the skin are provided. For the nervous system, the explanation only describes some of the components of the system (“underneath your skin are nerves that go to your brain”). For the integumentary system, the explanation is vague and incomplete (“it protects your skin”), as the system includes the skin that protects the body, not something that protects the skin. Additionally, it is unclear if the protection is related to creating a sensation on skin.

Response 3

There are two body systems that are responsible like the brain system and as well as the skin on the outside that allows to sense things like rain and more and the brain is responsible to control how we create a sensation.

The response addresses half of the question correctly and demonstrates partial understanding. The student correctly identifies and explains one of the two body systems (nervous or integumentary).

- Identifies the integumentary system (“There are two body systems . . . the skin on the outside”) and provides a minimally valid explanation for skin (“allows to sense things like rain”).

The response does not identify the nervous system (“brain system”) and provides an incomplete explanation for the brain (“the brain is responsible to control how we create a sensation”). “Brain system” is unclear and not acceptable as an identification for nervous system, and the explanation is insufficient to clarify how the system is responsible for controlling how we create sensation beyond identifying the organ (brain) in the system—the nervous system controls/regulates body systems and functions.

Response 4

Obviously when it’s raining and you go outside and you feel a raindrop fall on you it usually lands on your skin. Your skin can feel that wet, cold, raindrop and your brain also knows it’s raining. Your brain can send signals to your body.

The response addresses half of the question correctly and demonstrates partial understanding. The student correctly explains how the nervous and integumentary systems are responsible for creating a sensation on skin without identifying the body systems.

- Correctly provides **TWO** explanations, without identifying nervous and integumentary systems, for credit: a minimally valid explanation for the brain that describes a major organ in the nervous system and how the system interprets and responds to internal and external stimuli when it’s raining (“your brain also knows it’s raining. Your brain can send signals to your body”), AND a minimally valid explanation for skin that describes a major organ in the integumentary system and how the system detects touch stimuli when it’s raining (“you feel a raindrop fall on you it usually lands on your skin. Your skin can feel that wet, cold, raindrop”).

The response does not attempt to identify the body systems, as only explanations are provided.

Score Point 2

Response 1

We can feel rain mostly because of the integumary system and the nervous system. The integumary system controls the exterior of the body (skin, nails, hair) and all of the parts it needs to maintain, immunity, temperature, etc. The nervous system manages motion, thinking, and sensory input; it is essentially the "soul." As rain falls on your skin, the integumary system revieves the touch input and because the nervous system sends the signal to your brain, you can feel it. This is why these two body systems play the biggest roles in being able to feel rain on your skin.

The response demonstrates complete and correct understanding. It includes each of the two required elements: correctly identifies **TWO** body systems that are **MOST DIRECTLY** responsible for feeling rain on the skin, **AND** correctly explains how each of the body systems is responsible for creating a sensation on skin.

- Correctly identifies the nervous system ("and the nervous system") and provides two valid explanations—only one is needed ("The nervous system manages motion, thinking, and sensory input . . . because the nervous system sends the signal to your brain, you can feel it").
- Correctly identifies the integumentary system ("integumary system") and provides two valid explanations—only one is needed ("The integumary system controls the exterior of the body [skin, nails, hair] and all of the parts it needs to maintain . . . temperature, etc. . . . As rain falls on your skin, the integumary system revieves [receives] the touch input").

Response 2

The nervous system and the intergurmentary system are reponsible for students being able to feel rain on their skin. The nervous system controls the body and sends us impluses or feelings based on what's going on causing us to feel rain. The intergurmentary system is the system that inculdes skin and protects the body from stuff trying to get in our body which means it's part of the reason why we feel rain.

The response demonstrates complete and correct understanding. It includes each of the two required elements: correctly identifies **TWO** body systems that are **MOST DIRECTLY** responsible for feeling rain on the skin, **AND** correctly explains how each of the body systems is responsible for creating a sensation on skin.

- Correctly identifies the nervous system ("nervous system") and provides a valid explanation ("controls the body and sends us impluses or feelings based on what's going on causing us to feel rain").
- Correctly identifies the integumentary system ("intergurmentary system") and provides a valid explanation ("is the system that inculdes skin and protects the body from stuff trying to get in our body which means it's part of the reason why we feel rain"). While the description does not explicitly state the system is responsible for detecting touch stimuli (rain falling onto skin), it does describe the major organ that makes up the body system (skin) and its function for covering the body as a physical barrier. Note the integumentary system is also responsible for protecting the body from bacteria, infection, and injury, and describing this function is not a valid explanation for how the system is responsible for creating a sensation on skin.

Response 3

The integumentary system would be for the raindrops contacting the skin, and the nervous system would receive signals from the skin that rain is hitting it.

The response demonstrates complete and correct understanding. It includes each of the two required elements: correctly identifies **TWO** body systems that are **MOST DIRECTLY** responsible for feeling rain on the skin, **AND** correctly explains how each of the body systems is responsible for creating a sensation on skin.

- Correctly identifies the nervous system (“nervous system”) and provides a valid explanation (“would receive signals from the skin that rain is hitting it”).
- Correctly identifies the integumentary system (“integumentary system”) and provides a valid explanation (“for the raindrops contacting the skin”)—detecting touch stimuli (rain falling onto skin).

Response 4

the nerve system and the skin system the nerve system sends signals to the brain letting it know water or something is hitting the body so the nerves react to it while the skin gives the body to ability to feel if somethings touching it

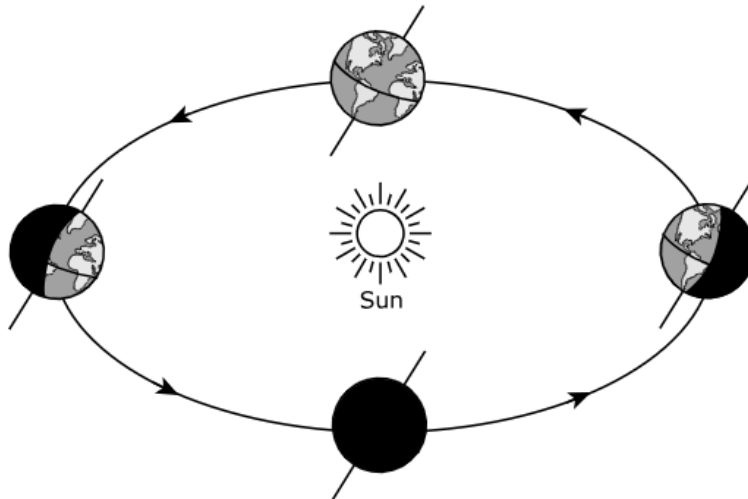
The response demonstrates complete and correct understanding. It includes each of the two required elements: correctly identifies **TWO** body systems that are **MOST DIRECTLY** responsible for feeling rain on the skin, **AND** correctly explains how each of the body systems is responsible for creating a sensation on skin.

- Identifies the nervous system (“nerve system”) and provides a valid explanation (“sends signals to the brain letting it know water or something is hitting the body so the nerves react to it”).
- Identifies the integumentary system (“skin system”) and provides a valid explanation for skin (“skin gives the body to ability to feel if somethings touching it”). The response describes the skin as identification of the body system and then explains the skin’s ability to detect touch stimuli for credit. Note that attempts to describe “skin” to identify the integumentary system are acceptable, as it is the largest organ in this body system.

Grade 8 Science Short Constructed Response

Prompt

The diagram shows Earth at different positions as it orbits the sun.



What differences between Earth's Northern and Southern Hemispheres are represented in the diagram, **AND** what causes these differences?

Look at the diagram and read the question carefully. Then enter your answers in the box provided.

Item-Specific Rubric

Score: 2

The response provides complete and correct understanding:

- Identify the difference between Earth's Northern and Southern Hemispheres represented in the diagram.
 - Seasons (or summer and winter or spring and fall) are opposite between the Northern and Southern Hemispheres.

AND

- Explain what causes the differences between the seasons
 - The reason for the differences in seasons between the hemispheres is because Earth is tilted on its axis.

OR

- The Earth's tilt is causing a difference in the amount of energy/heat/sunlight each hemisphere receives from the sun.

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Score: 1

The student answers half of the question correctly. The response provides partial understanding:

The student correctly identifies or describes the seasons (or summer and winter or spring and fall) are opposite between the Northern and Southern Hemispheres.

OR

The student correctly explains the reason for the differences in seasons between the hemispheres is because Earth is tilted on its axis.

OR

The student only correctly explains the Earth's tilt causes a difference in the amount of energy/heat/sunlight each hemisphere receives from the sun.

Score: 0

The response is incorrect or irrelevant. The response provides little to no understanding.

Sample Student Responses

Score Point 0

Response 1

At different locations around the sun the north and southern hemispheres are experiencing different climates. This is do to the tilt on Earths axis and the rotation around the sun.

The response is incorrect or irrelevant and demonstrates little to no understanding. It includes neither of the two required elements.

The response incorrectly identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("At different locations around the sun the north and southern hemispheres are experiencing different climates"). While including "different" is vague to identify a difference, addressing climates is a misconception, as climate only addresses long-term average weather conditions in a specific region, not seasons. Seasons are periods of the year marked by specific weather conditions or temperature changes resulting from Earth's changing position relative to the sun.

No attempt is made to explain what causes the differences between the seasons, as climates are addressed instead. While the response addresses the Earth's tilt ("This is do to the tilt on Earths axis and the rotation around the sun"), it incorrectly explains this is caused by climates rather than seasons. Additionally, the explanation includes the Earth's "rotation" which attributes the Earth spinning on its axis as a cause, not the Earth's revolution/orbit, which is an incorrect explanation without further clarification.

Response 2

The differences are: For example, The tilt towards the sun on the left shows the Northern Hemisphere getting daylight while the Southern is experiencing Night time. The differences caused by this is the tilt of 23.5 degrees on the axis and earth's rotation that causes day and night.

The response is incorrect or irrelevant and demonstrates little to no understanding. It includes neither of the two required elements.

The response incorrectly identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("The differences are: For example, The tilt towards the sun on the left shows the Northern Hemisphere getting daylight while the Southern is experiencing Night time"). The response addresses day/night, not seasons, where the difference depends on the locations being compared with a greater differentiation between Eastern and Western Hemispheres rather than Northern and Southern Hemispheres.

The response incorrectly explains what causes the differences between the seasons ("The differences caused by this is the tilt of 23.5 degrees on the axis and earth's rotation that causes day and night"), as a true explanation is provided for what causes the day/night cycle, not the difference between seasons.

Response 3

The difference between the Northern Hemisphere and the Southern Hemisphere is that is Northern Hemisphere is of course much more colder than the Southern Hemisphere. Which when the Northern Hemisphere faces away from the Sun it gets more colder than usual. These different things about the Northern Hemisphere and the Southern Hemisphere happen because the Earth revolves around the Sun making it shift temperatures, seasons, and day and night cycles.

The response is incorrect or irrelevant and demonstrates little to no understanding. It includes neither of the two required elements.

The response incorrectly identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("Northern Hemisphere is of course much more colder than the Southern Hemisphere. . . . These different things about the Northern Hemisphere and the Southern Hemisphere . . . shift temperatures, seasons, and day and night cycles"). Although the response mentions a shift in seasons, it only explains a vague comparative difference in temperature and not opposite seasons. Additionally, including day/night cycles is less accurate, as the difference depends on the locations being compared with a greater differentiation between Eastern and Western Hemispheres rather than Northern and Southern Hemispheres.

The response incompletely explains what causes the differences between the seasons ("These different things about the Northern Hemisphere and the Southern Hemisphere happen because the Earth revolves around the Sun making it shift temperatures, seasons, and day and night cycles"). While including the Earth's revolution in the explanation is correct, a complete and correct explanation includes identification of Earth's tilt or how the amount of energy/heat/sunlight each hemisphere receives from the sun makes a difference.

Response 4

The difference between earths northern and souther hemispheres is that they're directly the opposite and the reason for this is because it spins while it orbits around the sun.

The response is incorrect or irrelevant and demonstrates little to no understanding. It includes neither of the two required elements.

The response does not identify the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("The difference between earths northern and souther hemispheres is that they're directly the opposite"). "Opposite" is too vague and, without further explanation, seems to be referring to the physical location of the hemispheres on Earth.

The response incorrectly explains what causes the differences between the seasons ("reason for this is because it spins while it orbits around the sun"), as Earth's rotation and revolution are described but not clearly tied to a reason for seasons. Additionally, Earth's rotation is the reason for experiencing the day/night cycle, not seasons.

Score Point 1

Response 1

The difference in seasons is being shown in the diagram. On the left side of the sun, the Northern Hemisphere is experiencing summer, that is because of the Earth's tilt. The hemisphere tilted closer to the sun will experience summer.

The response addresses half of the question correctly and demonstrates partial understanding. It includes one of the two required elements.

- Explains what causes the differences between the seasons ("On the left side of the sun, the Northern Hemisphere is experiencing summer, that is because of the Earth's tilt. The hemisphere tilted closer to the sun will experience summer"). The student correctly attributes and explains the Earth's tilt as the cause for seasons for credit.

The response does not identify the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("The difference in seasons is being shown in the diagram. On the left side of the sun, the Northern Hemisphere is experiencing summer . . . The hemisphere tilted closer to the sun will experience summer"). While "difference in seasons" is noted, the actual difference, opposite seasons, is not identified or sufficiently described, as specific examples were started but not completed (Southern Hemisphere is experiencing winter or that the hemisphere tilted away from the sun will experience winter).

Response 2

The differences between the south and north hemisphere, is the north orbits and seasons go winter, spring, summer and then autumn and south goes summer, autumn, winter, spring.

The response addresses half of the question correctly and demonstrates partial understanding. It includes one of the two required elements.

- Identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("The differences between the south and north hemisphere, is the north orbits and seasons go winter, spring, summer and then autumn and south goes summer, autumn, winter, spring"). The student correctly describes the seasons are opposite between the Northern and Southern Hemispheres through specific examples.

The response does not attempt to explain what causes the differences between the seasons.

Response 3

The seasons are represented in this diagram, what causes these differences is the tilt in the Earth's axis

The response addresses half of the question correctly and demonstrates partial understanding. It includes one of the two required elements.

- Explains what causes the differences between the seasons ("The seasons are represented in this diagram, what causes these differences is the tilt in the Earth's axis"). The student correctly attributes the Earth's tilt as the cause of seasons for credit.

The response incompletely identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("The seasons are represented in this diagram"). While "seasons" are noted, it does not identify the difference—that they are opposite seasons—to receive credit.

Response 4

The differences between the Earth's Northern and Southern Hemisphere that are represented in the diagrams is how much sunlight each part gets at these 4 points and the change in position. These differences are caused because the Earth's axis tilt makes one side get more sunlight than the other.

The response addresses half of the question correctly and demonstrates partial understanding. It includes one of the two required elements.

- Explains what causes the differences between the seasons ("These differences are caused because the Earth's axis tilt makes one side get more sunlight than the other"). The student correctly explains that Earth's tilt causes a difference in the amount of energy, heat, and sunlight each hemisphere receives from the sun for credit.

The response incompletely identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("differences between the Earth's Northern and Southern Hemisphere . . . is how much sunlight each part gets at these 4 points and the change in position"), as it only attempts to describe the diagram or cause for a difference rather than the difference of opposite seasons.

Score Point 2

Response 1

The difference between the Earth's Northern and Southern Hemisphere are the seasons they are experiencing. For example, in the globe to the left, the Northern Hemisphere is experiencing summer while the southern hemisphere is experiencing winter. The thing that is causing each season is the tilt earth has on its axis, which is 23.5 degrees, and the revolution the Earth takes around the sun, which is around 365.25 days. The axis effects the seasons because the tilt of the Earth's axis is what makes one area have more direct sunlight than the other.

The response demonstrates complete and correct understanding. It includes each of the two required elements.

- Identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("The difference between the Earth's Northern and Southern Hemisphere are the seasons they are experiencing. For example, in the globe to the left, the Northern Hemisphere is experiencing summer while the southern hemisphere is experiencing winter"). The response clarifies the identification of the difference with a specific example to explain opposite seasons in the noted hemispheres for credit for the first element.
- Explains what causes the differences between the seasons ("The thing that is causing each season is the tilt earth has on its axis, which is 23.5 degrees, and the revolution the Earth takes around the sun"). Additional explanation about Earth's tilt is also provided ("The axis effects the seasons because the tilt of the Earth's axis is what makes one area have more direct sunlight than the other"). Note that Earth's axis alone as a cause is insufficient, as it is the tilt on the axis that makes a difference, which is clarified in this response. Only one explanation is needed, and either explanation would receive credit for the second element.

Response 2

The difference of the Earth's Northern and Southern Hemisphere is that they occur in opposite season. What causes these differences is tilt and revolution.

The response demonstrates complete and correct understanding. It includes each of the two required elements.

- Identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("The difference of the Earth's Northern and Southern Hemisphere is that they occur in opposite season"). The response succinctly identifies the difference between the noted hemispheres, opposite seasons; therefore, a specific example is not needed for clarification.
- Explains what causes the differences between the seasons ("What causes these differences is tilt and revolution"). The response sufficiently identifies the cause without adding any incorrect information.

Response 3

The Earth's Northern and Southern Hemisphere have Winter and Summer at different times because the tilt of the Earth doesn't allow one of the Hemispheres to get as much sunlight as the other.

The response demonstrates complete and correct understanding. It includes each of the two required elements.

- Identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("Earth's Northern and Southern Hemisphere have Winter and Summer at different times . . . doesn't allow one of the Hemispheres to get as much sunlight as the other"). While the wording of the specific example is a little unclear with "different times," the rest of the response clarifies and demonstrates understanding of opposite seasons.
- Explains what causes the differences between the seasons ("because the tilt of the Earth doesn't allow one of the Hemispheres to get as much sunlight as the other"). The response sufficiently identifies and explains the cause being the Earth's tilt.

Response 4

When the Southern hemisphere is in summer, the northern hemisphere is in winter. This is due to the radiant and thermal energy of the sun. When the southern hemisphere is in summer, it is receiving direct energy from the sun, and the northern hemisphere isn't receiving direct energy, so it is not as bright and warm. Same goes for the other way around

The response demonstrates complete and correct understanding. It includes each of the two required elements.

- Identifies the difference between Earth's Northern and Southern Hemispheres represented in the diagram ("When the Southern hemisphere is in summer, the northern hemisphere is in winter"). While not explicitly stated, a specific example is described to explain and demonstrate understanding of opposite seasons as the difference.
- Explains what causes the differences between the seasons ("When the southern hemisphere is in summer, it is receiving direct energy from the sun, and the northern hemisphere isn't receiving direct energy, so it is not as bright and warm. Same goes for the other way around"). The response does not explicitly state the Earth's "tilt," but rather accurately describes that it is tilted on its axis through a sufficient explanation of the amount of energy from the sun the Earth receives when each hemisphere is positioned during opposite seasons.