The Sun's Effect on Climate and Seasons
Lesson 5: Long Days and Short Days

Grade: 5	Length of lesson: 65 minutes	Placement of lesson: 5 of 6 lessons
Anchoring Phenomena: Earth's Northern and Southern Hemispheres experience repeating, predictable seasonal changes in average temperatures.		
Unit Learning Goal: Earth's curved surface and consistent tilt and its orbit around the Sun result in uneven heating across the planet. This difference in the sunlight's intensity causes different locations on Earth to experience different seasons at the same time of the year, as well as varying average yearly temperatures.		
Main learning goal: Earth's tilted axis results in differing amounts of daylight in an area over the course of the year. The differences in how long the Sun shines affects how much the area gets heated up by the Sun and, thus, its temperature. **Science and Engineering Practices:** Analyzing and Interpreting Data: Analyze and interpret data to provide evidence for phenomena; Developing and Using Models: Evaluate limitations of a model for a proposed object or tool. **Crosscutting Concepts:** Patterns: Graphs and charts can be used to identify patterns in data; Cause and Effect: Cause and effect relationships may be used to predict phenomena in natural systems.		
Unit Central Question: Why are some places on Earth hotter than others at different times of the year?		**Lesson Focus Questions:** Why is there more daylight in the summer days than in the winter days? How does the amount of daylight affect the temperature of the area?
Science content storyline: The Sun's light striking Earth's curved surface at different angles causes differential heating and temperatures. As Earth orbits, half the planet is always in sunlight and half is always in darkness. During the Northern Hemisphere's summertime, the North Pole points toward the Sun, resulting in the Northern Hemisphere getting more hours of daylight compared to the Southern Hemisphere, which gets more hours of darkness. In the height of summer in the Northern Hemisphere, the North Pole has 24 hours of sunlight and no darkness at all. As Earth orbits the Sun, the North Pole points away from the Sun in the winter, resulting in the North Pole being entirely in darkness in the wintertime with no daylight hours at all. Other areas in the Northern Hemisphere have longer periods of darkness compared to daylight hours. Longer periods of daylight allow for greater warming from the Sun. Longer periods of darkness create cooler temperatures. Earth's tilt results in two different things happening on Earth. Each factor impacts how hot it gets at different times of year in different places on the planet. The tilt causes the angle that the Sun's light hits Earth to be different at different times of year, and that impacts how intense the sunlight is. The tilt also causes the Sun to shine for longer or shorter periods during a day. If the Sun shines longer, it has more time to heat up that area of the planet. Temperatures are affected by the number of hours of sunlight in a location, as well as how direct the sunlight is in that area.		
Ideal student response to the Lesson Focus Questions: Summer days are longer than winter days because Earth's axis is tilted. When it is summer in the Northern Hemisphere, it points toward the Sun. This results in the Northern Hemisphere being in daylight longer than in darkness in the summertime. It is the		

opposite when it is winter in the Northern Hemisphere because it points away from the Sun. We have longer hours of darkness and fewer hours of daylight. If you get more daylight hours, you get more of the Sun's energy, so the temperature rises.

Preparation

MATERIALS NEEDED	AHEAD OF TIME
Sun's Effect on Climate and Seasons PowerPoint (by lesson) **Teacher Resources:** • TE3.2 North Star • TE5.4 *Earth's Orbit around the Sun* **Student Handouts** • HO5.1 *Daylight Hours on December 21* (1 per student) • HO5.2 *Approximate Number of Daylight Hours: December 21* (data table) (1 per student) • HO5.3 *Discussion Questions* (one per student or displayed for class) **Other Materials** • chart paper, markers • Earth-Sun model from Lesson 3 (1 per 4-5 students)	• Review the background information on the Sun's energy and Earth's shape pages 4-13 in the *Content Background* document. • If you have taken the North Star, Polaris, down repost it in the same position as before. • Arrange the Earth-Sun model stations around the classroom, 1 setup per group of 4-5 students. • Prepare all handouts.

Lesson 5 General Outline

Time	Phase of lesson	How the science content storyline develops
7min	**Link to the Last Lesson:** Students are asked to recall the one reason for differential temperatures.	The Sun's light striking Earth's curved surface at different angles causes differential heating and temperatures.
5 min	**Lesson Focus Questions:** The teacher introduces the Lesson Focus Questions: *Why is there more daylight in the summer days than in the winter days? How does the amount of daylight affect the temperature of the area?*	
10 min	**Setup for Activity 1:** Students use the Earth-Sun model to see that half of Earth is always in daylight and half is in darkness and explore their ideas about longer days and shorter days in the summer and winter.	As Earth orbits, half the planet is always in sunlight and half is always in darkness.
15 min	**Activity 1:** Students use the Earth-Sun model to think about the length of day as Earth orbits the Sun.	During the Northern Hemisphere's summertime, the North Pole points toward the Sun, resulting in the Northern Hemisphere getting more hours of daylight compared to the Southern Hemisphere, which gets more hours of darkness. In the height of summer in the Northern Hemisphere, the North Pole has 24 hours of sunlight and no darkness at all.
10 min	**Follow-up to Activity 1:** Students use a visual representation of Earth in the winter along with a data table of daylight hours at different latitudes to make sense of different hours of heating from the Sun.	As Earth orbits the Sun, the North Pole points away from the Sun in the winter, resulting in the North Pole being entirely in darkness in the wintertime with no daylight hours at all. Other areas in the Northern Hemisphere have longer periods of darkness compared to daylight hours. Longer periods of daylight allow for greater warming from the Sun. Longer periods of darkness create cooler temperatures.

Time	Phase of lesson	How the science content storyline develops
15 min	**Summarize and Synthesize:** Students connect the ideas about length of daytime and angle of the Sun's incoming rays.	Earth's tilt results in two different things happening on Earth. Each factor impacts how hot it gets at different times of year in different places on the planet. The tilt causes the angle that the Sun's light hits Earth to be different at different times of year, and that impacts how intense the sunlight is. The tilt also causes the Sun to shine for longer or shorter periods during a day. If the Sun shines longer, it has more time to heat up that area of the planet. Temperatures are affected by the number of hours of sunlight in a location, as well as how direct the sunlight is in that area.
2 min	**Link to Next Lesson:** In the next lesson, we will use what we have learned by applying it to different scenarios and to respond to our Unit Central Question, *Why are some places on Earth hotter than others at different times of year?*	

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
7 min	**Link to the Last Lesson** Synopsis: Students are asked to recall the one reason for differential temperatures. Main Science Ideas: The Sun's light striking Earth's curved surface at different angles causes differential heating and temperatures.	Link science ideas to other science ideas.	In our last investigation we came up with *one critical factor* that would help us explain why there are different temperatures around the globe at the same time of year. Take 4 minutes to refer to your notes from our last lesson and discuss with your group the best explanation you have *so far* to our question, *Why are some places on Earth hotter than others at different times of the year?* ***NOTE TO TEACHER:*** *Allow 3 to 4 minutes for teams to discuss. As they do, you should be listening carefully to the conversations. Do you hear them mention* ***Earth's tilt****? Are they able to go beyond the tilt to describe the* ***angle of incoming light****? Do they mention the* ***orbit*** *of Earth around the Sun? Do they say that Earth's* ***tilt remains consistent*** *throughout its orbit? Keep track of misconceptions or incomplete explanations so that you can challenge their thinking during today's exploration of day length.* Are there any groups that would like to share your explanations so far?	
5 min	**Lesson Focus Questions** Synopsis: The teacher introduces the Lesson Focus Questions: *Why is there more daylight in the summer days than in the winter days? How*	Engage students in communicating	Today we'll see that the angle that sunlight hits Earth is only part of the answer to why we have different temperatures at different times of the year. Before we begin, let's take a minute to look at our CSW chart. We will be making meaning of data	

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
	does the amount of daylight affect the temperature of the area?	in scientific ways.	today, so choose one or two strategies that you will use when you share your thinking today. To get us started, let's think for a minute about how daytime and nighttime vary throughout the year. How long does it stay light on summer evenings compared to winter evenings? How late are you able to stay outside playing before you have to come inside because it gets dark in the summer compared to in the winter?	It stays light later into the evening in the summer and I can play outside after dinner, but in the winter, it gets dark by dinnertime. **Do you have any ideas why summer days are longer and winter days are shorter?** **Does anyone have an idea to share?**
		Set the purpose with a focus question.	***NOTE TO TEACHER:*** *Add the focus questions to your list of Lesson Focus Questions, which are posted so you and the students can easily refer to them throughout the lesson.* Our experience leads us directly to today's focus questions: *Why is there more daylight in the summer days than in the winter days? How does the amount of daylight affect the temperature of the area?* Record today's focus questions in your notebook. Take a few minutes to jot down your initial ideas.	
10 min	**Setup for Activity 1** <u>Synopsis</u> Students use the Earth-Sun model to see that half of Earth is always in daylight and half is in darkness and explore	Engage students in using content representations and models.	Let's see if we can get an idea about why the daytime is longer in the summer and nighttime is longer in the winter. Your Earth and Sun is at your station. Check that it is set up like last time and put Earth in position 1. ***NOTE TO TEACHER:*** *Place the illustration of all four positions on a document camera or display*	

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
	their ideas about longer days and shorter days in the summer and winter. <u>Main Science Idea</u> As Earth orbits, half the planet is always in sunlight and half is always in darkness.		*the PowerPoint slide for students to reference. Check to make sure each group has their axis pointed toward the North Star and also toward the Sun.* Now that you have it set up, can you tell me what season we are in in the Northern Hemisphere when we are in position 1? In a minute I'm going to turn down the overhead lights. When I do, I want you to focus on how the lightbulb Sun is shining on the Styrofoam Earth. How much of Earth is lit and how much of Earth is dark? OK, I'm turning down the lights. Let's move the Styrofoam Earth from position 1 to position 2. How much of Earth is lit and how much is dark? Check out positions 3 and 4. Is it the same or different? The lights are coming back on now. So are we agreed that no matter where we are in our orbit around the Sun, half of Earth is always in daytime while half is in nighttime?	This is the summer. **Why do you say that? What evidence do you have that this is summer?** **Does everyone on Earth experience summer in position 1?** Half of Earth is lit and half is dark. It's the same, half is lit and half is dark. In all the positions half of Earth is lit and half is dark Yes, that is what we saw.

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
			If that's correct, if half of Earth is always in daytime while half is in nighttime, why do you think we have more hours of sunlight in some seasons and fewer hours in other seasons? Everyone, take a minute to think quietly about this puzzler and then share your ideas with your partners. Who would like to share your ideas about what causes daytime to be shorter on some days than others?	Earth slows down and speeds up. **Are there any other possible ideas that might explain different lengths of daytime and nighttime?** It has something to do with Earth's tilt.
15 min	**Activity 1** Synopsis: Students use the Earth-Sun model to think about the length of day as Earth orbits the Sun. Main Science Idea: During the Northern Hemisphere's summertime, the North Pole points toward the Sun, resulting in the Northern Hemisphere getting more hours of daylight compared to	Engage students in using content representations and models.	Place your Styrofoam Earth back in position 1. How would you show a full day with our model, a full 24 hours with daytime and nighttime? Let's figure out why we have more hours of sunlight on some days by first looking only at the North Pole. I'm going to turn down the lights	You would spin Earth on its axis. **Does the tilt of the axis change at all when you spin Earth to represent day and night?** No, the axis stays the same—it always points toward the North Star. **How many times do you spin Earth to make a full day—24 hours?** Earth would spin just one time; one full rotation makes a day.

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
	the Southern Hemisphere, which gets more hours of darkness. In the height of summer in the Northern Hemisphere turn down the lights, the North Pole has 24 hours of sunlight and no darkness at all.		again, and I want you to observe what the daytime and nighttime might be like at the North Pole in position 1. OK, when I turn down the lights, spin the Styrofoam Earth slowly on its axis to make one full day. Focus just on the North Pole for now. As I turn on the lights, think about what you saw. What are the daytime and the nighttime like at the North Pole in position 1? Now let's focus our attention on the pin that represents about where we are. When I turn down the lights this time, spin the Styrofoam Earth to create another day and watch to see what happens here in our town. As I turn the lights back on, think about this: What did you observe? I'm not going to turn down the lights again. I want you to talk with your group about what you think daytime and nighttime might be like at the South Pole in position 1. Now shift your Styrofoam Earth to position 3. What time of year is it now for us?	Because of Earth's tilt toward the Sun, the North Pole never got dark—it was light for the entire 24 hours. We were in sunlight longer than we were in darkness. Our daytime was longer than our nighttime. It would be in darkness all the time in position 1—our summertime—at the South Pole. It's winter.

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
			Spin your Styrofoam Earth on its axis to make one full day. How much sunlight does the North Pole get in this position?	None—it's dark all the time at the North Pole in position 3.
10 min	**Follow up to Activity 1** Synopsis: Students use a visual representation of Earth in the winter along with a data table of daylight hours at different latitudes to make sense of different hours of heating from the Sun. Main Science Idea As Earth orbits the Sun, the North Pole points away from the Sun in the winter, resulting in the North Pole being entirely in darkness in the wintertime with no daylight hours at all. Other areas in the Northern Hemisphere have longer periods of darkness compared to daylight hours. Longer periods of daylight	Engage students in using content representations and models.	*Whole class:* Now, we will look at some additional data to see if they help us answer our focus questions, ***Why*** *is there more daylight in the summer days than in the winter days? How does the amount of daylight affect the temperature of the area?* *Distribute the handout* Daylight Hours on December 21 *and accompanying data table* Approximate Number of Daylight Hours: December 21. *Small groups:* What do you notice about this drawing? (What do you observe? What does this drawing represent?) *Give students a minute or so to discuss in their groups and then invite a few responses.*	It's winter because the Northern Hemisphere is pointed away from the Sun. **Is half of Earth in darkness and half in light, like we showed at the beginning of class today?** Yes, but the North Pole is always in darkness and the South Pole is always in sunlight. **Why doesn't every place on Earth have 12 hours of sunlight and 12 hours of darkness?** We would have 12 hours of darkness and 12 of light if Earth's axis lined up with the straight up-and-down line showing where darkness and light are, but since the axis is tilted, then

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
	allow for greater warming from the Sun. Longer periods of darkness create cooler temperatures.	Engage students in analyzing and interpreting data and observations.	***NOTE TO TEACHER:*** *Either display the slides with questions for students to refer to or distribute the* Discussion Questions *handout to each group.* Discuss the following in your group: ● How does length of daytime change with latitude? (Share evidence from the data table.) ● Are parts of Earth always dark? If yes, use latitude to describe where and include what time of year this is happening. ● Are parts of Earth always in light? If yes, use latitude to describe where and include what time of year this is happening.	different parts of Earth get different amounts of light. Daytime is shorter during winter north of the equator, like, latitude 30° N has only 9 hours, but 30° S has 15 hours. It is longer south of the equator, like, 45° S has 17 hours of daylight. Latitudes around the North and the South Pole have darkness for many days, but the time of year is opposite. North Pole is in its winter time and the South Pole is in its summer time. Yes, but it is opposite. Latitudes around the North and the South Pole have lightness for many days, but the time of year is opposite. North Pole is in its summer time and the South Pole is in its winter time.

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
			• At which latitude(s) are there equal lengths of daytime and nighttime? *Whole class:* How do you think more or less daylight in different parts of the world might affect how warm (with higher average temperatures) or how cold (with lower average temperatures) it is? Here is a question to consider: If the length of daytime makes it warmer, will the summer temperatures at the poles when they have 24 hours of daylight be higher than at the equator?	The equator has equal daytime and nighttime. Places that get more hours of sunlight probably get warmer than places that have fewer or no hours of sunlight. The poles are always colder than the equator, so no. Well, even though the daylight is longer, the sunlight is very spread out, not direct like at the equator. So the equator is always warmer.
15 min	**Summarize and Synthesize** <u>Synopsis</u> Students connect the ideas about length of daytime and angle of the Sun's rays. <u>Main Science Ideas</u>	Link science ideas to other science ideas.	In the past couple of lessons, we've seen that one reason there are higher average temperatures in the summer than in the winter is that … ***The Sun's rays hit certain parts of Earth more straight on and other places at more of an angle, more spread out.*** We learned that ***as Earth orbits the Sun, the angle that sunlight strikes the surface changes at different times of year***, hitting the Northern Hemisphere more directly during parts of the year	

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
	Earth's tilt results in two different things happening on Earth. Each factor impacts how hot it gets at different times of year in different places on the planet. The tilt causes the angle that the Sun's light hits Earth to be different at different times of year, and that impacts how intense the sunlight is. The tilt also causes the Sun to shine for longer or shorter periods during a day. If the Sun shines longer, it has more time to heat up that area of the planet. Temperatures are affected by the number of hours of sunlight in a location, as well as how direct the sunlight is in that area.	Engage students in analyzing and interpreting data and observations. Link science ideas to other science ideas. Highlight key science ideas and focus question throughout.	and the Southern Hemisphere more directly during the other parts of the year. How well does the pattern of daylight and nighttime match what we saw with the angle of the sunlight striking Earth? Let's check ourselves for understanding of today's lesson. Your diagram of the *Daylight Hours on December 21* model and data table represented winter in the Northern Hemisphere. What would the model look like when it is summer in the Northern Hemisphere? How do you think the data of sunlight hours would change? Why? Discuss these questions in your group for 2 minutes and then write your best answer in your science notebook. Include in your response a labeled diagram of a model of Earth and the Sun's rays (like the one for winter) when it is summer here in our town (Northern Hemisphere). Under your diagram respond to the following sentence stems: *Thi*s diagram is different from the winter model because …	It matches, because when the angle of sunlight gives us the most direct sunlight, we also get the most hours of daylight.

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
		Highlight key science ideas and focus question throughout.	The difference in the number of sunlight hours data will be … This is because ...  *Embedded assessment task* *Are students correctly connecting tilt, orbit, intensity of sunlight, and length of day with seasonal temperature differences?* Take a minute to revisit your initial thinking about our Lesson Focus Questions: *Why is there more daylight in the summer days than in the winter days? How does the amount of daylight affect the temperature of the area?* Underneath it, add any additional or different understanding that you have now. Now let's revisit our Driving Question Board to determine our progress throughout this lesson. • What questions have we answered? • What part of this lesson helped you answer the question? What is your answer? • What questions would you add as related to our Lesson Focus Question? To our Unit Central Question? ***NOTE TO TEACHER:*** *Point out to students that this is the last time will you will revisit the Driving Question Board. Use their responses to assess*	

Time	Phase of lesson and how the science content storyline develops	STeLLA strategy	Teacher talk and questions	Possible student and teacher dialogue
			their readiness to take the Team Challenge in Lesson 6.	
2 min	**Link to Next Lesson** <u>Synopsis</u> In the next lesson, we will use what we have learned by applying it to different scenarios and to respond to our Unit Central Question, *Why are some places on Earth hotter than others at different times of the year?*	Link science ideas to other science ideas. Engage students in communicating in scientific ways.	Who would like to share some important concepts you included in your response to the focus questions and/or from responding to the sentence stems? ***NOTE TO TEACHER:*** *Keep track of student ideas on chart paper so they can refer to these ideas in the Team Challenge task in the next lesson.* *Ask a question related to CSW 11: Let your ideas change and grow.* Who changed their mind about something we talked about so far today? Next time, you will work in groups to apply your knowledge about these concepts to four challenges.	**What idea changed? What helped you change your mind?**

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Lesson 5
The Sun's Effect on Climate and Seasons

1

Unit Central Question

Why are some places on Earth hotter than others at different times of the year?

2

Link to Previous Lesson

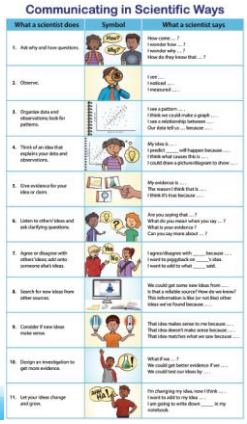
Talk with your teammates about our Unit Central Question.

- I think some places on Earth are hotter than others at different times of the year because _____.
- My evidence from our previous lesson is _____.

3

We'll make meaning of data today.

Choose one or two strategies that you will use when you share your thinking.



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Before We Begin

How long does it stay light on summer evenings compared to winter evenings?

How late are you able to stay outside playing before you have to come inside because it gets dark in the summer compared to in the winter?

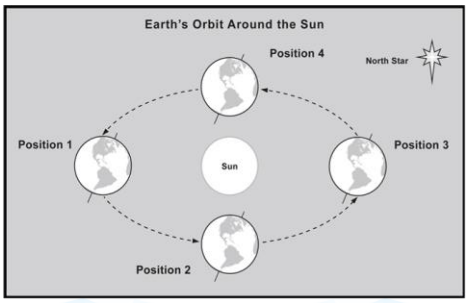
5

Lesson 5 Focus Questions

Why is there more daylight in the summer days than in the winter days? How does the amount of daylight affect the temperature of the area?

6

Investigation: Why is there more daylight in the summer days than in the winter days?



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Investigation: Why is there more daylight in the summer days than in the winter days?

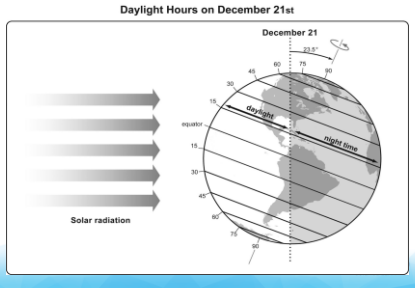
Now, let's look at some additional data to see if they help us answer our focus question: ***Why*** *is there more daylight in the summer days than in the winter days?*

We also want to know, *How does the amount of daylight affect the temperature of the area?*

8

Using Data and Representations

What do you notice about this drawing? What does this drawing represent?



9

Using Data and Representations

Discuss in your small groups:

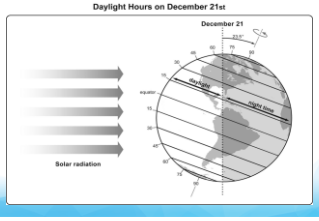
- How does length of daytime change with latitude?
- Are parts of Earth always dark? If yes, use latitude to describe where.
- Are parts of Earth always in light? If yes, use latitude to describe where.
- At which latitude(s) are there equal lengths of daytime and nighttime?

10

Using Data and Representations

Let's share our ideas:

- How do you think more or less daylight in different parts of the world might affect how warm (with higher average temperatures) or how cold (with lower average temperatures) it is?



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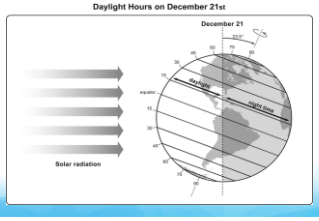
Using Data and Representations

Another question to consider

- If the length of daytime makes it warmer, will the summer temperatures at the poles when they have 24 hours of daylight be higher than at the equator?



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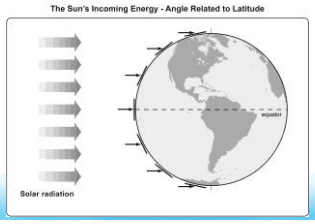
Lesson Summary: Key Science Ideas

We have seen one reason why it is warmer in the summer than in the winter:

- The Sun's rays hit certain parts of Earth more straight on and other places at more of an angle, more spread out.



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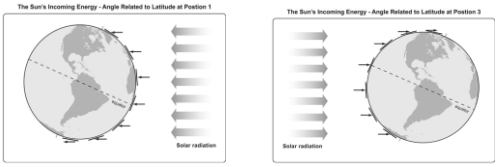
Making Connections

We also learned …

- As Earth orbits the Sun, the angle that sunlight strikes the surface changes at different times of the year.



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Lesson Summary: Key Science Ideas

Now, let's think about the pattern:

How well does the pattern of daylight and nighttime match what we saw with the angle of sunlight striking Earth?

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Lesson Summary

In today's lesson, your diagram (model) and data table represented winter in the Northern Hemisphere. Discuss these questions in your group.

- What would the model look like when it is summer in the Northern Hemisphere?
- How do you think the data of sunlight hours would change? Why?

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Lesson Summary

Your response should include the following:

1) A labeled diagram of Earth and the Sun's rays when it is summer in the Northern Hemisphere
2) Under your diagram, complete the following sentence stems:
   - *This diagram is different from the winter model because*_____.
   - *The difference in the number of sunlight hours data will be*_____.
   - *This is because*_____.

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Revisiting Lesson 5 Focus Questions

Why is there more daylight in the summer days than in the winter days? How does the amount of daylight affect the temperature of an area?

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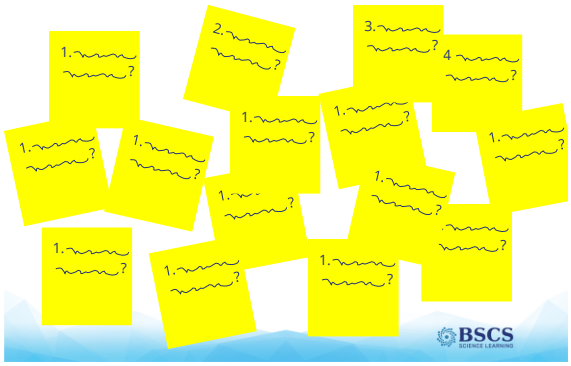
Driving Question Board (DQB)



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In the next lesson, you will think about …

How can you apply your knowledge about these concepts to four challenges related to our Unit Central Question: *Why are some places on Earth hotter than others at different times of the year?*

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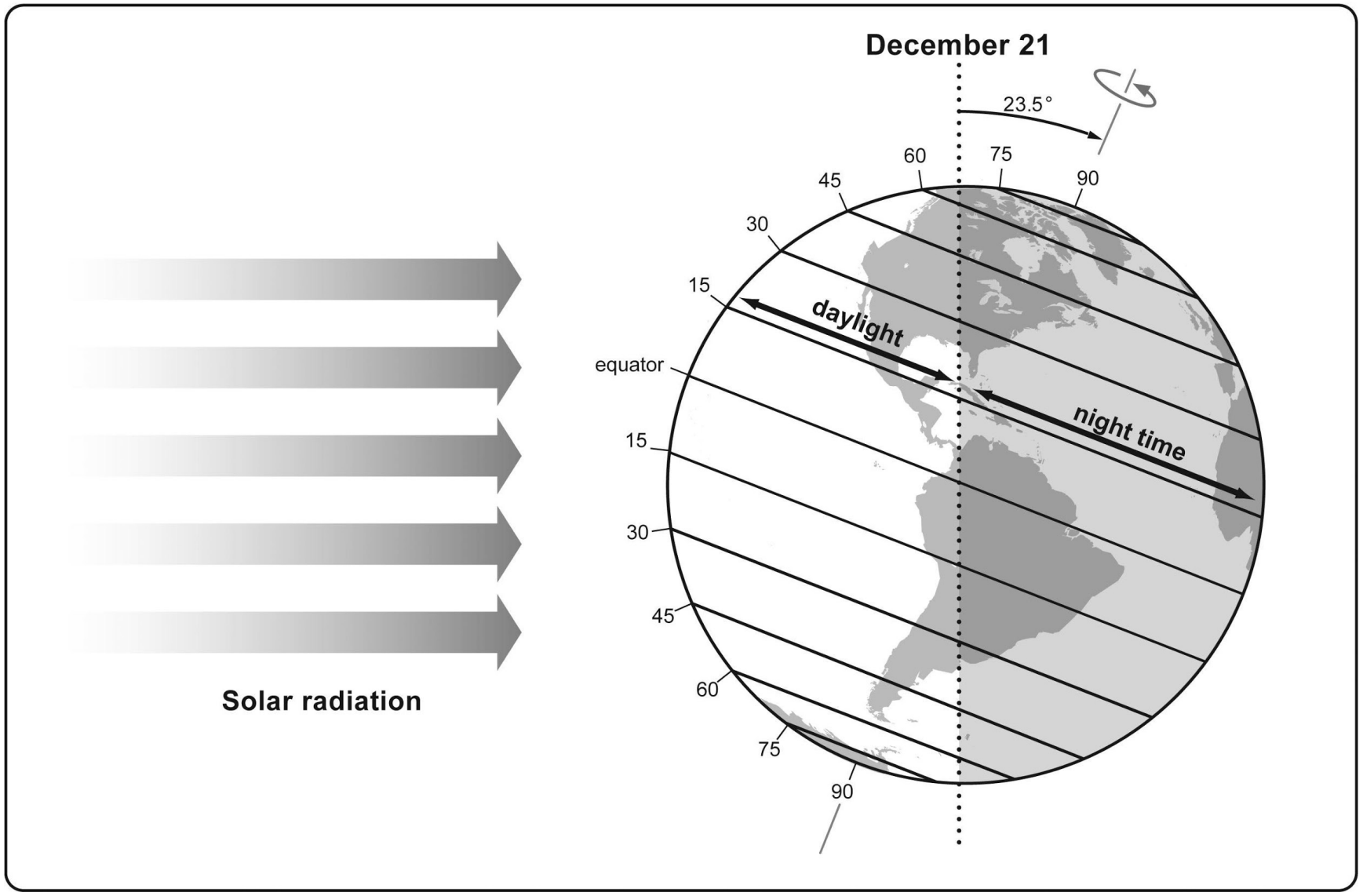
Daylight Hours on December 21st



Approximate Number of Daylight Hours
December 21

Latitude	*Length of daylight line (mm)	*Length of day + night line p(mm)	*Percent daytime	*Hours of daylight
75° N	0	27	0	0
60°N	8	50	16	4
45°N	20	70	29	7
30°N	30	82	37	9
15°N	42	94	45	11
0°	49	98	50	12
15°S	52	94	55	13
30°S	49	84	58	14
45°S	46	69	67	16
60°S	40	49	83	20
75° S	27	27	100	24

***Approximate data are given.**

Discussion Questions

- How does length of daytime change with latitude? (Share evidence from the data table.)

- Are parts of Earth always dark at certain times of the year? If yes, use latitude to describe where. What time of the year does this occur?
  .

- Are parts of Earth always in light at certain times of the year? If yes, use latitude to describe where. What time of the year does this occur?

- At which latitude(s) are there equal lengths of daytime and nighttime?

Whole class

How do you think more or less daylight in different parts of the world might affect how warm (with higher average temperatures) or how cold (with lower average temperatures) it is?

Here is another question to consider: If the length of daytime makes it warmer, will the summer temperatures at the poles when they have 24 hours of daylight be higher than at the equator?