Learning Activity

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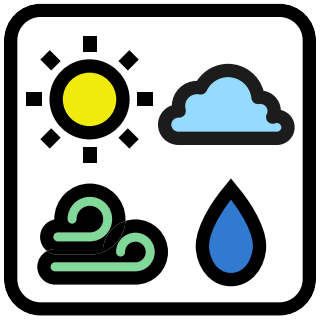
Science and technology
Grade 5 and 6

Seasonal Data

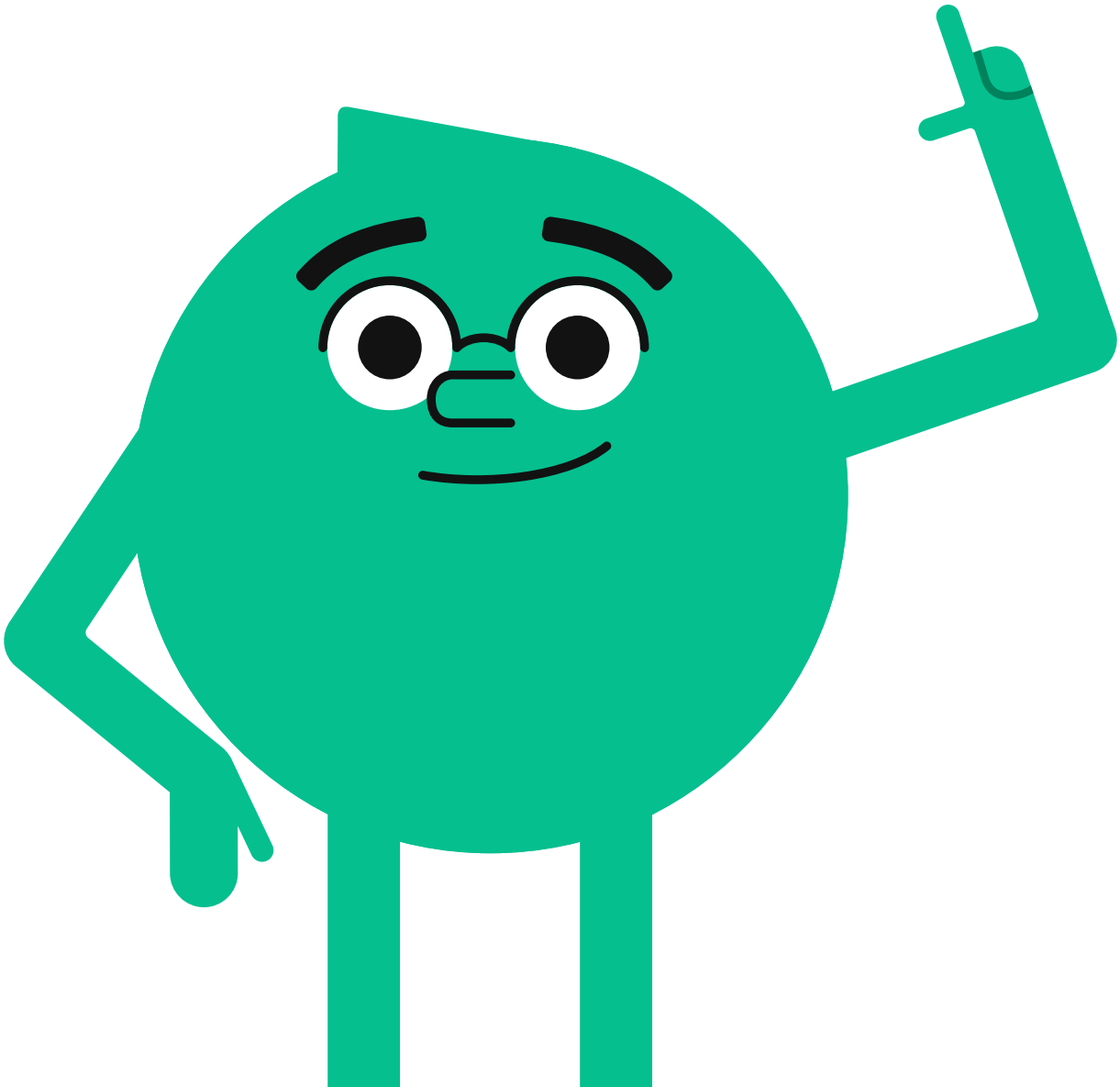


Teacher Booklet

Overview

How does the tilt of Earth's rotational axis affect daylight hours and the cycle of the seasons?

In this *Seasonal Data* activity Cycle 3 elementary students answer scientific questions by analyzing data and finding results. This activity will also teach them to distinguish between data and results and give them a chance to practise subtracting hours and minutes.



Objectives

Answer scientific questions by analyzing data and identifying results.

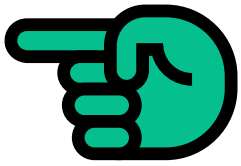
Duration

60 minutes

Materials

- 1 copy of the Teacher Booklet
- 1 copy of the Student Booklet for each student

Procedure



Introduction (10 minutes)

- Teach the Cycle of Seasons section.
- Present the context.
- Tell the students the goal of the activity: to answer scientific questions by analyzing data and finding results.

Activity (40 minutes)

- Explain the difference between data and results.
- Go through the sample calculation and the matching question.
- Have the students complete the data and results table.
  Note: To reduce the number of calculations each student has to do, this part can be done in teams. For example, each team member can calculate the data for one of the four locations, then share their results with the group.
- The students use their results to answer the questions.

Conclusion (10 minutes)

Here are some discussion points to wrap up the activity.

- By analyzing the data, we found that for the four locations studied:
  - June 21 has the longest daylight hours, which happens when the Northern Hemisphere is tilted toward the sun.
  - December 21 has the shortest daylight hours, which happens when the Southern Hemisphere is tilted toward the sun.
  - The amount of daylight hours is different in different locations.
- Kuujjuaq has the biggest variation in daylight hours (18 hrs 12 min on June 21, and 6 hrs 25 min on December 21). The closer you get to the North Pole, the greater the variation in daylight hours
- On March 21 and September 21, there are about 12 hours of daylight, because neither hemisphere is tilted toward the sun.

Answer Key

Example

On March 21 in Montreal, the sun rose at 6:54 a.m. and set at 7:08 p.m.
How many daylight hours were there?

To find the total daylight hours, calculate the amount of time between 6:54 a.m. and 7:08 p.m.

1. Add 12:00 to 7:08 p.m.

	7 :	08 p.m.
+		
	12 :	00
	19 :	08

2. Substract 6:54 from 19:08

	~~19~~ 18 :	~~08~~ 68
-		
	6 :	54 a.m.
	12 :	14

There were 12 hours and 14 minutes of daylight.

Now that you've calculated the daylight hours, draw a line to show whether each element is data or a result.

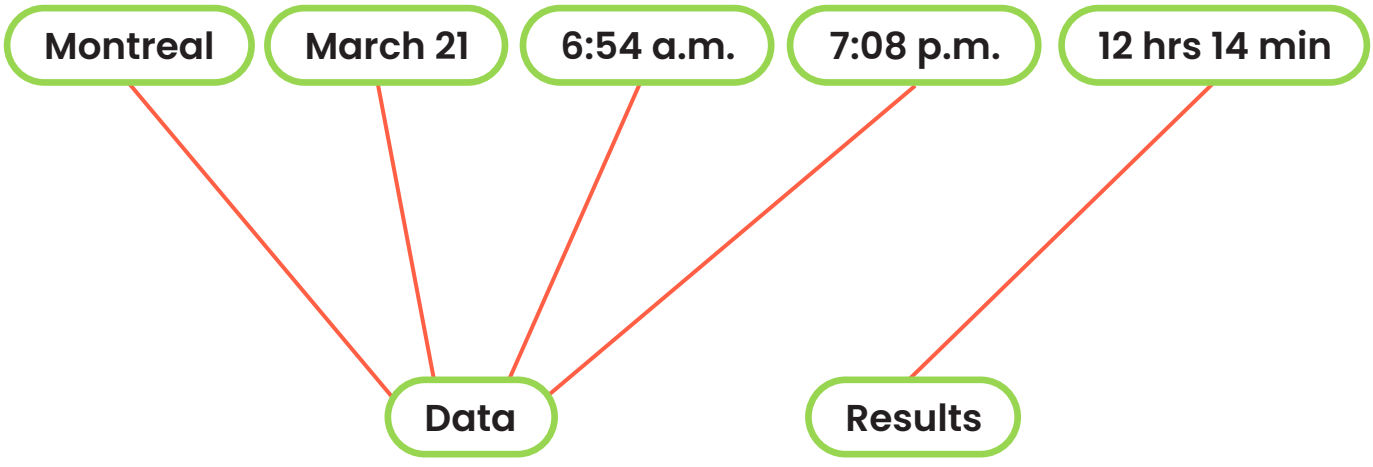


Table 1. Sunrise and sunset times for March 21			
Location	**Sunrise**	**Sunset**	**Daylight hours**
Montreal	6:54 a.m.	7:08 p.m.	**12 hrs 14 min**
Quebec City	6:44 a.m.	6:59 p.m.	*12 hrs 15 min*
Sept-Îles	6:24 a.m.	6:41 p.m.	*12 hrs 17 min*
Kuujjuaq	6:31 a.m.	6:51 p.m.	*12 hrs 20 min*

Table 2. Sunrise and sunset times for June 21			
Location	**Sunrise**	**Sunset**	**Daylight hours**
Montreal	5:05 a.m.	8:46 p.m.	*15 hrs 41 min*
Quebec City	4:50 a.m.	8:43 p.m.	*15 hrs 53 min*
Sept-Îles	4:15 a.m.	8:39 p.m.	*16 hrs 24 min*
Kuujjuaq	3:29 a.m.	9:41 p.m.	*18 hrs 12 min*

Table 3. Sunrise and sunset times for September 21			
Location	**Sunrise**	**Sunset**	**Daylight hours**
Montreal	6:40 a.m.	6:52 p.m.	*12 hrs 12 min*
Quebec City	6:31 a.m.	6:43 p.m.	*12 hrs 12 min*
Sept-Îles	6:11 a.m.	6:24 p.m.	*12 hrs 13 min*
Kuujjuaq	6:17 a.m.	6:34 p.m.	*12 hrs 17 min*

Table 4. Sunrise and sunset times for December 21			
Location	**Sunrise**	**Sunset**	**Daylight hours**
Montreal	7:31 a.m.	4:13 p.m.	*8 hrs 42 min*
Quebec City	7:27 a.m.	3:59 p.m.	*8 hrs 32 min*
Sept-Îles	7:22 a.m.	3:25 p.m.	*8 hrs 3 min*
Kuujjuaq	8:19 a.m.	2:44 p.m.	*6 hrs 25 min*

Question 1

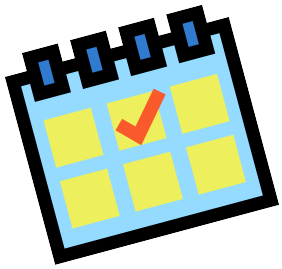
Which day had the longest daylight hours?

- [ ] March 21
- [x] June 21
- [ ] September 21
- [ ] December 21

Question 2

Which day had the shortest daylight hours?

- [ ] March 21
- [ ] June 21
- [ ] September 21
- [x] December 21

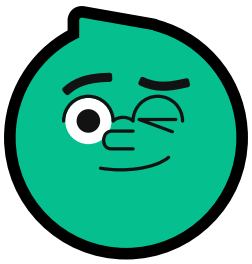


Question 3

Did all the locations have the same amount of daylight hours?
Use one of your results to justify your answer.

- [ ] Yes
- [x] No

On June 21, Montreal had 15 hrs 41 min of daylight, and Kuujjuaq had 18 hrs 12 min.
(Other answers are possible)



Have you done our activity with your class?
We'd love to hear your comments and suggestions.