

The Reason for Seasons

During the year, some people experience four seasons- winter, spring, summer, and fall- and some people do not. Who experiences all the seasons and who doesn't? What determines the seasons of the year and who has them? If you don't already know, you will find out in this lesson.

The Long Lift Ride

It was a beautiful, sunny, December day in Colorado, and Sophia was happy to be on her holiday break. She and her family had driven from Denver to the mountains for a ski vacation, and she was just learning how to ski the intermediate slopes. The air was cold, but the clear blue sky seemed to stretch forever. Sophia loved to look out over the countryside from the top of the mountain and then-whoosh!- she was on her way carving a trail down the ski slope.



At the bottom of the mountain, Sophia shuffled along with hundreds of other skiers as they made their way to the chair lift. She liked to listen to the conversations around her. Sometimes she caught pieces of conversations in different languages. It was exciting to be in a place that so many people visited from around the world.

Finally, she was at the head of the line. The ski lift operator waved to her to join another skier and they hurried in front of the chair. As it came up behind them, they say down just in time for the chair to lift them up and carry them back up the mountain.

Sophia turned to the other skier and smiled. "I'm always afraid I'll fall in front of the chair and whole lift will have to stop while I get myself back!"

The other skier laughed, "That's what happened to me the first time I tried to ride this life. My legs went one way and my arms went another and it seemed to take forever to get me all straightened out. But ever since then, I've had a ripper of a time!"

Sophia looked at her chair lift companion. "Did you say 'ripper'? You are not from Colorado, are you?"

"No, I'm on holiday from Sydney, Australia. My name is James. And 'ripper' is just an expression we Australians use to show our enthusiasm."

"Hi, James. My name is Sophia. I'm on my holiday break from school in Denver."

James replied, "I just finished school for the year and this is my summer break."

Just then, the chair lift slowed down, made a couple of jerky movements, and then came to a complete stop. As the two skiers sat there swinging high up in the air, they looked at each other.

"Someone must have fallen!" they both said at the same time.

Then, Sophia realized what James had just said. "What do you mean, 'summer break'? It's freezing here!"

James laughed and looked at Sophia. "Yes, it is winter here, but where I come from it is summer. When I return home, I will have more than a month to sail and surf and play at the beach before my next year of school starts in February. Oh, I do love summer!"

"I love summer, too," said Sophia, puzzled, "but my summer doesn't happen in December. I have to wait until July."

"Oh, July is the month when I'm busiest at school. The weather gets cold and, if I have time, I can ski in Australia on our big snow fields."

James and Sophia realized that so many things in their lives were opposites. As they sat in the Colorado winter sun waiting for the chair lift to start again, they made more comparisons.

"In Colorado, January and February are long winter months with lots of school work and not many school holidays," Sophia shared.

James smiled. "You'll have to come to Australia during January. We have yacht races and summer festivals and fun in the sun... and no school!"

"June is my favorite month," Sophia offered. "Not only is my birthday in June, but that's when we get out of school. My family usually takes a vacation in July and then we go back to school in late August. I like school, but it's fun not to be on a schedule for a while."

James shook his head. "December is my favorite time of year. That's when summer really begins for us, and we have our longest days and shortest nights. Then, we go back to school in late February, as fall approaches."

Just then, the chair lift gave a jerk and, with a groan, began moving slowly up the hill. Sophia and James fell silent as they watched the lift come closer and closer to the top. As they were getting ready to get off the chair, James turned to Sophia.

"Let's ski together down the slope. At the bottom, I can get a piece of paper and a pencil and write down my address. We could become pen pals and continue comparing what it's like to live in Colorado with what it's like 'down under' where I come from."

"Sounds like a ripper of an idea to me," Sophia called over her shoulder as she started down the slope. "Last one down buys the hot chocolate!"



Lesson 3: Seasons: Comparing Colorado and Australia

- 1) Create a double bubble map comparing Colorado and Australia:
- 2) Explain the cause of seasons in Denver, Colorado.
- 3) What explains the fact that different places on Earth (like Denver, Colorado, and Sydney, Australia) have different seasons at the same time of year?
- 4) What effect does direct versus indirect sunlight have on the temperature of various locations?
- 5) Use your understanding from this lesson to write an imaginary letter to Sophia from James or to James from Sophia. In your letter, explain what you have learned about the reason for the seasons. Write this letter on a separate sheet of paper.
- 6) Why would you experience the temperature changes? Think about how the Sun's light would shine on you in different places.
- 7) In what positions would Sophia experience Sunlight more directly than James?
- 8) In what positions would James experience Sunlight more directly than Sophia?

- 9) Are there regions on the Earth orange where the Sunlight always stays fairly direct?
- 10) Are there regions on the Earth orange where the Sunlight always stays indirect?
- 1) A. Notice how the Sunlight falls on the places where James and Sophia live. Record your observations.
- B. Turn the Earth orange so that its axis is horizontal as it travels around the Sun. Where does the Sunlight fall now? Record your observations.
- C. Hold the Earth orange so that its axis is at a slight tilt as you move the orange around the Sun. Record your observations.
- D. What are some other positions for the Earth orange as it travels around the Sun?
- E. Can you find a way that the Earth orange could move that would explain the pattern of opposite Seasons the two young people were talking about on the chairlift? Record the position of the Earth orange that explains the pattern of opposite seasons.

Lesson 3: Seasons

Draw a Picture of This Investigation