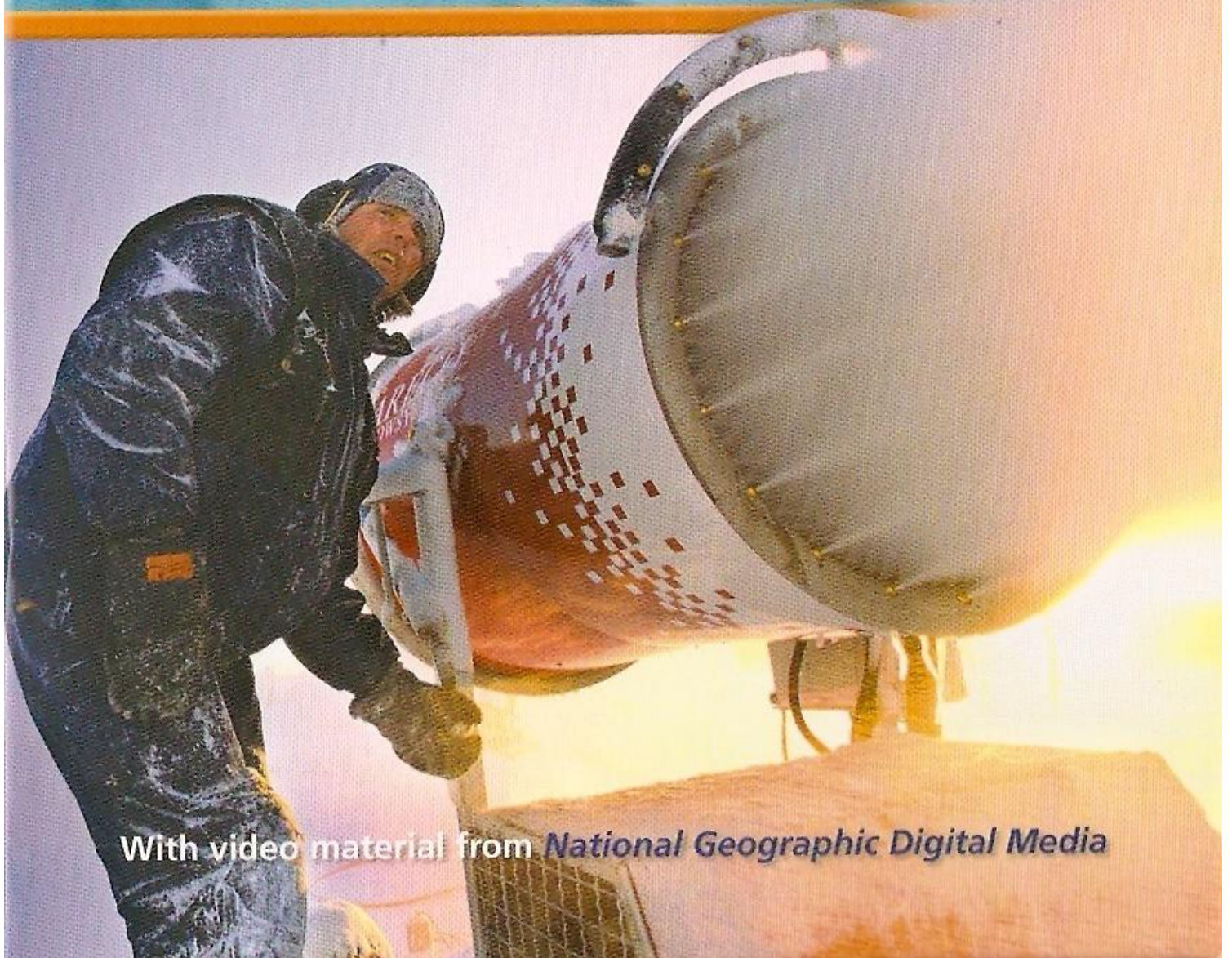




FOOTPRINT
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Snow Magic!



With video material from *National Geographic Digital Media*

Words to Know

This story is set in the United States (U.S.), in the state of Minnesota. It takes place in a city called Taylors Falls, which is near Minneapolis [minneapolis].

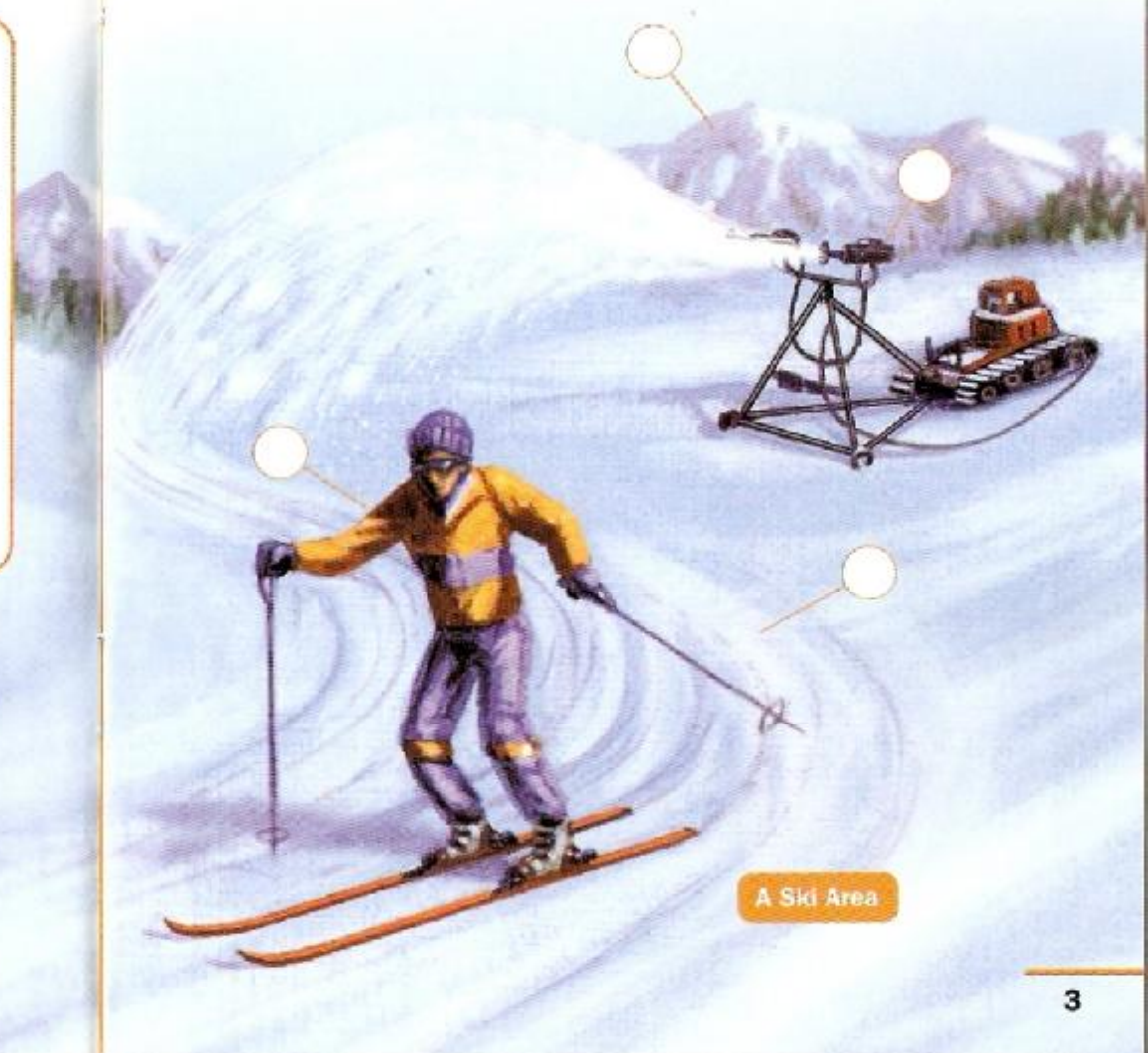


A Weather Words. Here are some weather words you will read in the story. Write the letter of the correct phrase to complete the definitions.

- | | |
|-------------------------|---|
| 1. Weather is ____. | a. the season when the weather is coldest |
| 2. Snow is ____. | b. white, frozen water that falls from the sky |
| 3. Winter is ____. | c. the level of heat or cold |
| 4. Freeze means ____. | d. the fast, natural movement of air |
| 5. Temperature is ____. | e. the conditions of the outside environment |
| 6. Wind is ____. | f. to become hard at or below 0 degrees Celsius/32 degrees Fahrenheit |

B Skiing. Read the definitions and look at the picture. Write the number of the correct underlined word next to each item.

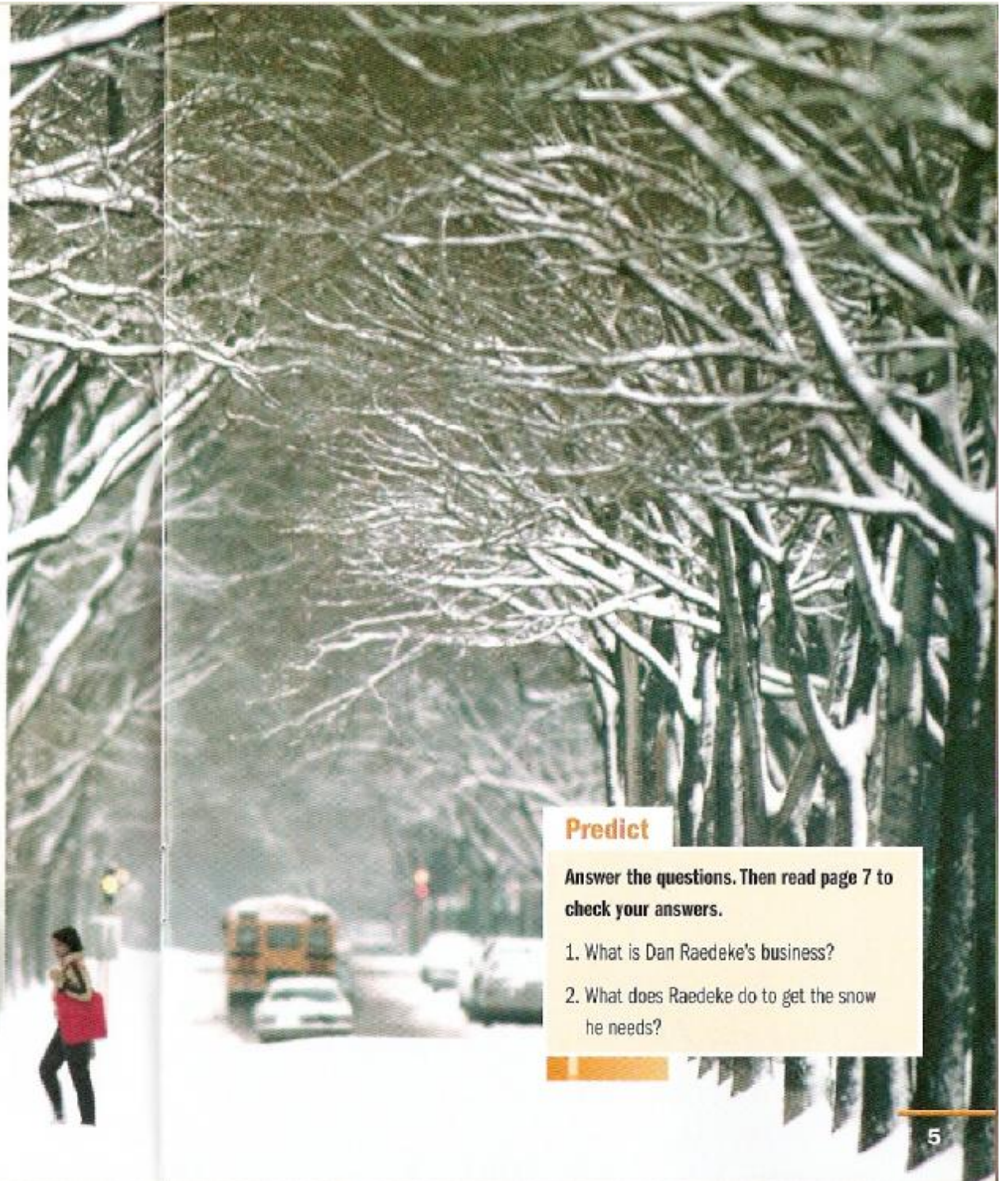
1. A piste is a snow-covered area that people ski on.
2. A mountain is a high area of land.
3. A snow-making machine makes artificial (not real) snow.
4. A skier is a person who moves on snow with long, pieces of wood or plastic, called 'skis.'



The city of Minneapolis is one of the coldest places in the United States. Winter there usually lasts a very long time. However, even in winter the area sometimes has warmer weather, and that means less snow.

Most people really like this warm weather, but Dan **Raedeke**¹ doesn't like it at all. Snow is very important for Raedeke's business. If it's too warm for the snow to stay on the ground, he has a big problem!

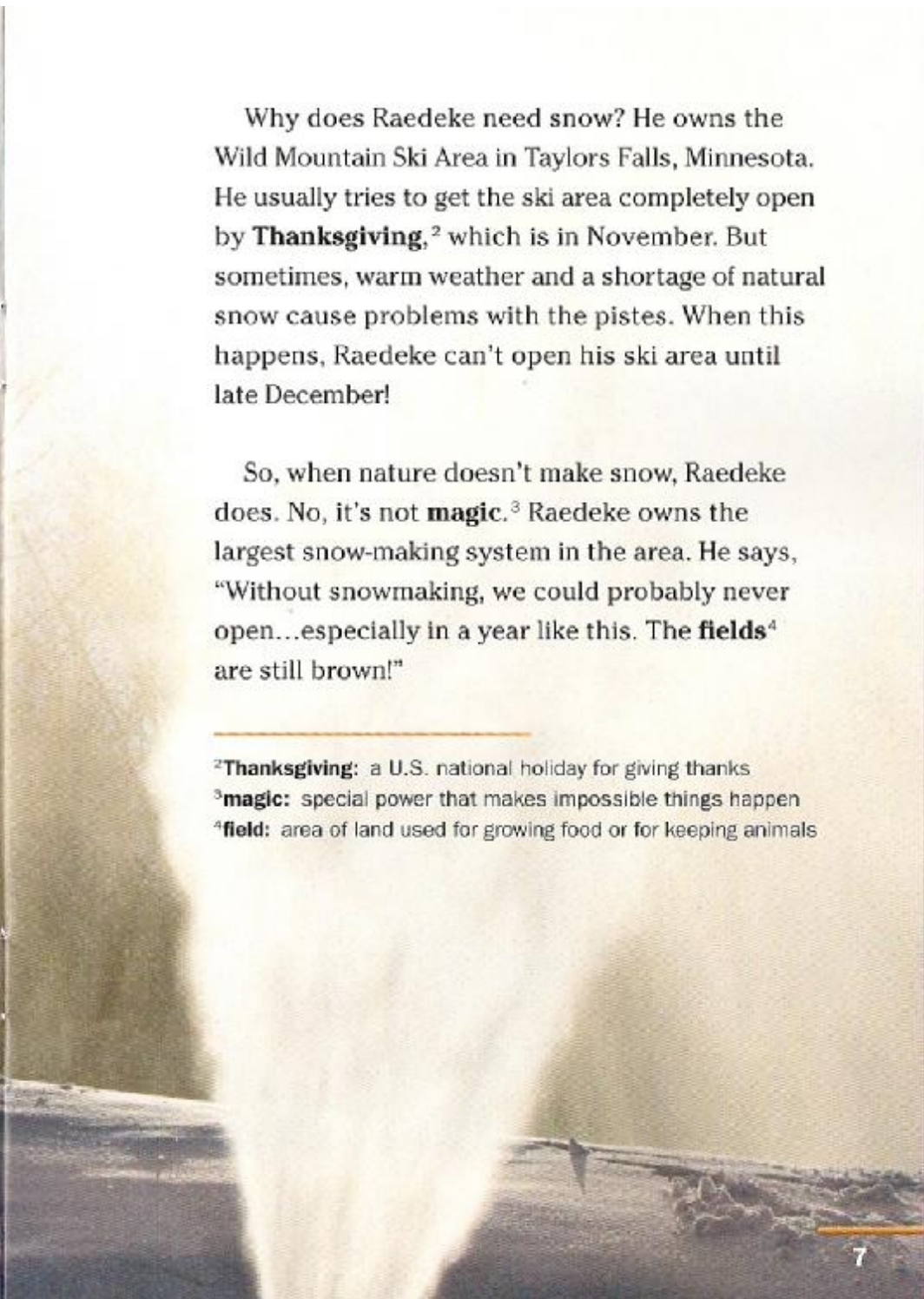
¹Raedeke: [rædʒki]



Predict

Answer the questions. Then read page 7 to check your answers.

1. What is Dan Raedeke's business?
2. What does Raedeke do to get the snow he needs?



Why does Raedeke need snow? He owns the Wild Mountain Ski Area in Taylors Falls, Minnesota. He usually tries to get the ski area completely open by **Thanksgiving**,² which is in November. But sometimes, warm weather and a shortage of natural snow cause problems with the pistes. When this happens, Raedeke can't open his ski area until late December!

So, when nature doesn't make snow, Raedeke does. No, it's not **magic**.³ Raedeke owns the largest snow-making system in the area. He says, "Without snowmaking, we could probably never open...especially in a year like this. The **fields**⁴ are still brown!"

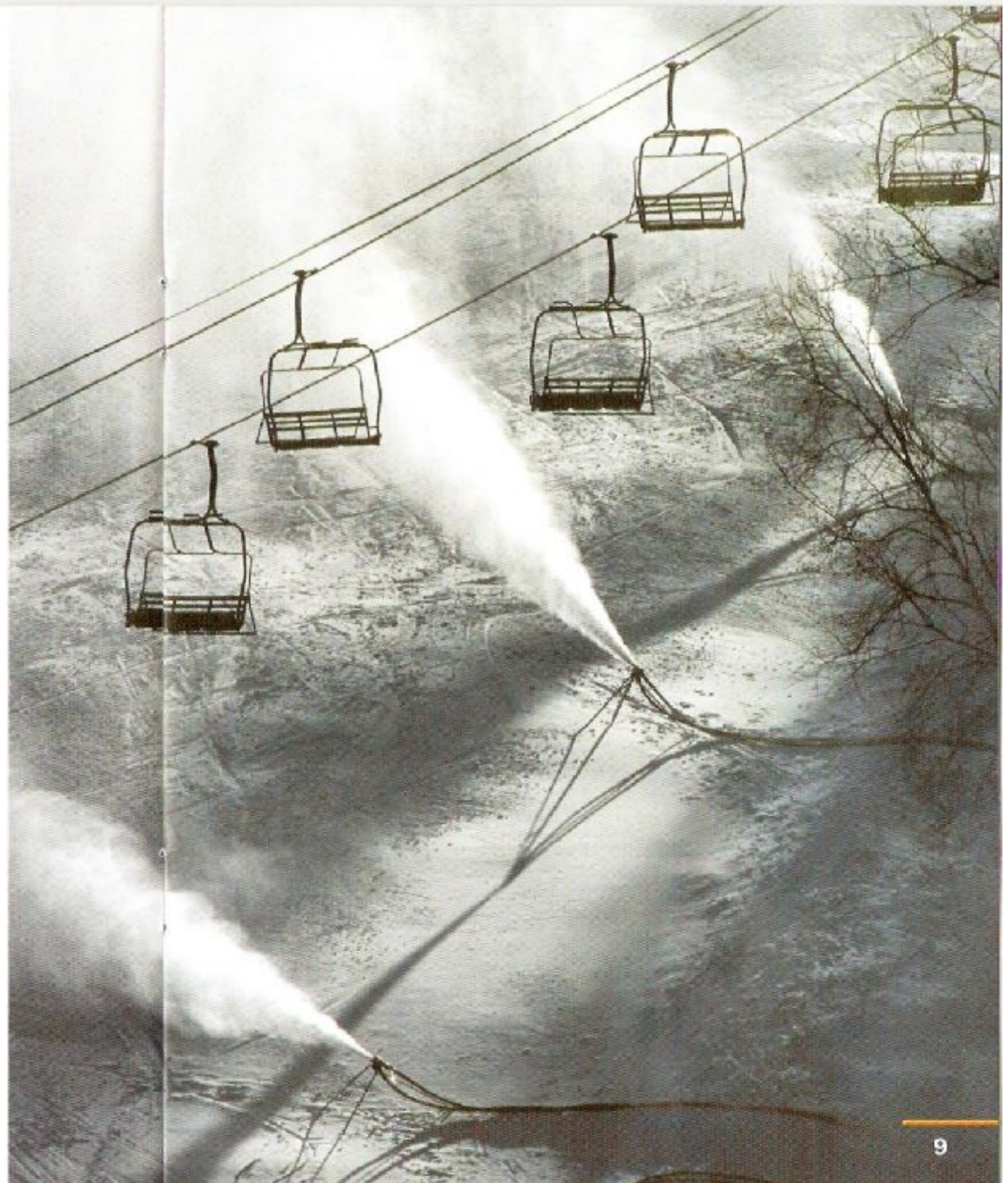
²**Thanksgiving**: a U.S. national holiday for giving thanks

³**magic**: special power that makes impossible things happen

⁴**field**: area of land used for growing food or for keeping animals

Snow has always been a very important part of Raedeke's life. His family bought the Wild Mountain Ski Area 28 years ago. Since then, he's spent nearly every day on the mountain. That experience has helped Raedeke a lot. In addition, Raedeke also studied **mechanical engineering**.⁵ The combination of these two things makes Raedeke a 'specialist' in making snow. He really understands snowmaking and the machines that do it. "Best machine-made snow ever!" he says of his machines. "Look how great that snow is!"

⁵**mechanical engineering:** the study of making machines and systems

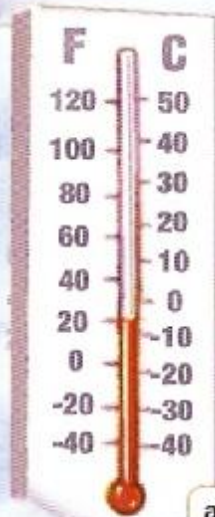


Snowmaking is a kind of science, but it's also an art, too. It's careful and detailed work. The person making the snow has to carefully measure the water, check the air temperature, and watch the wind. Raedeke explains, "if there's wind, it'll actually **blow**⁶ [the water] around and allow it to freeze before it hits the ground. That's why the **snow guns**⁷ are always high in the air."

⁶**blow**: move with air currents

⁷**snow gun**: a special machine that pushes water into the air to make snow

wind



air temperature

snow

water

snow gun

Identify the Main Idea

Skim the previous pages and answer the questions.

1. Why does Raedeke know so much about snowmaking?
2. How does he feel about making snow with machines?

There are good things about both real and man-made snow. However, they are very different. Real snow is drier, softer, and better quality for skiing. But man-made snow lasts longer when there are a lot of people skiing on it.

Raedeke depends on snow for his business. Because of this, he has some of the best snow-making technology available. His newest machines are tall, thin **poles**⁸ called 'water sticks.' Raedeke selected them because they produce a lot of snow very quickly. "They make a very soft snow—almost as good as snow from the sky. In one night we can cover this entire **trail**,"⁹ he reports. "They're great!" That may be why Raedeke has water sticks on half of the Wild Mountain pistes.

⁸**pole:** a long wooden or metal rod

⁹**trail:** another word for a piste; a path

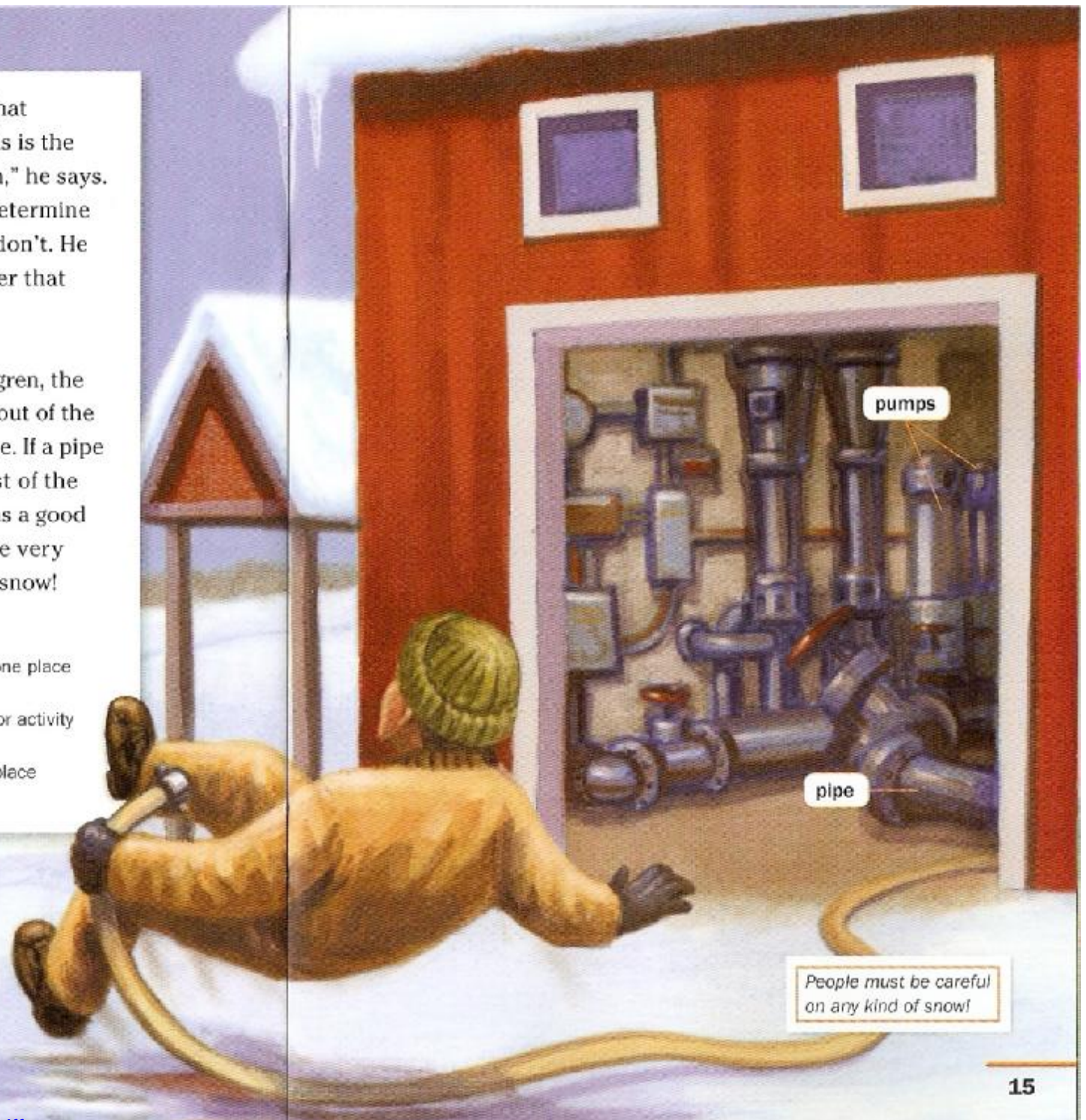
Raedeke then talks about the building that houses the **pumps**¹⁰ for making snow. "This is the **nerve centre**¹¹ of the snow-making system," he says. He explains that it takes good timing to determine which pistes need snow and which ones don't. He adds that only six pumps control the water that goes through all the **pipes**.¹²

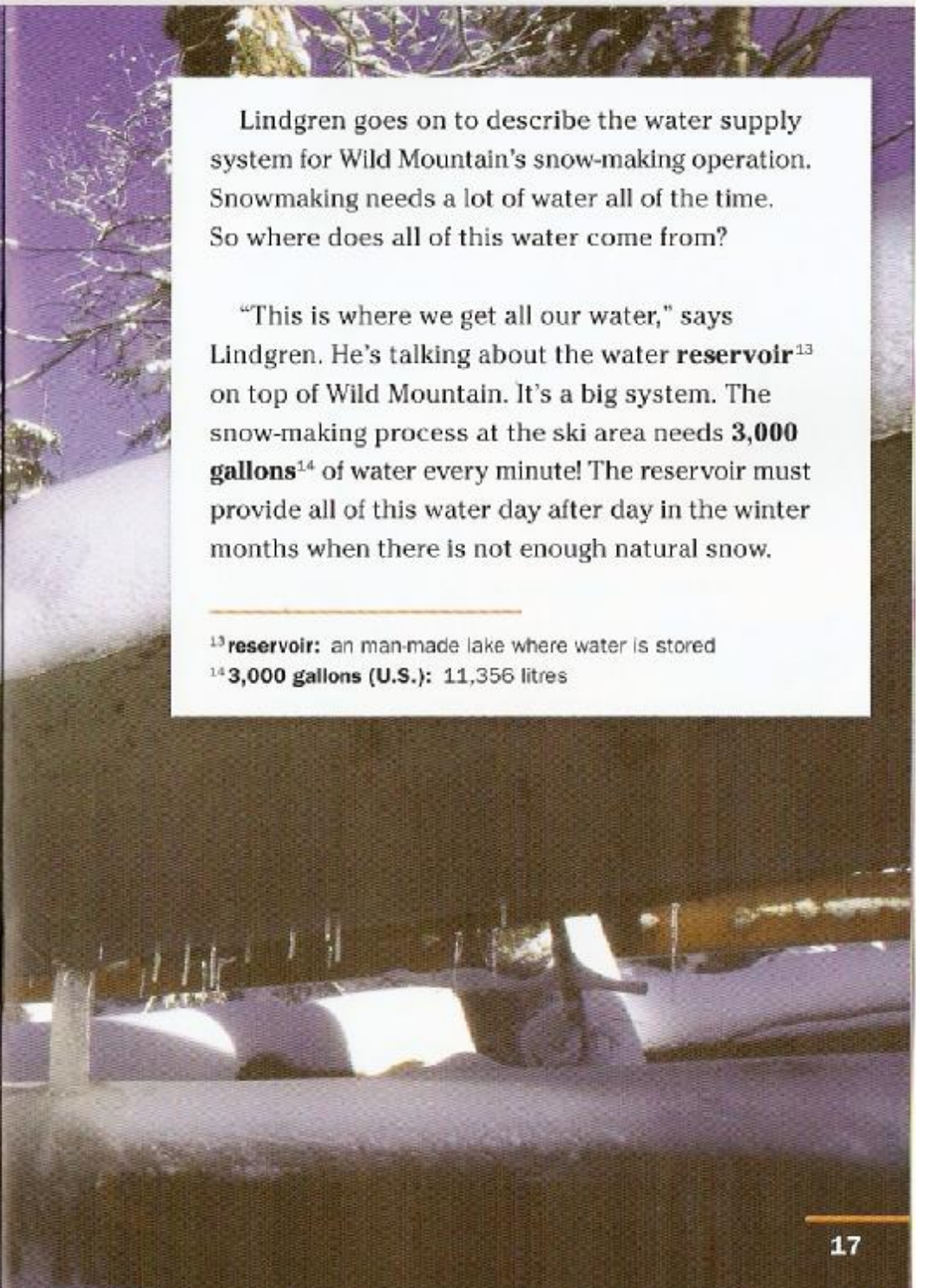
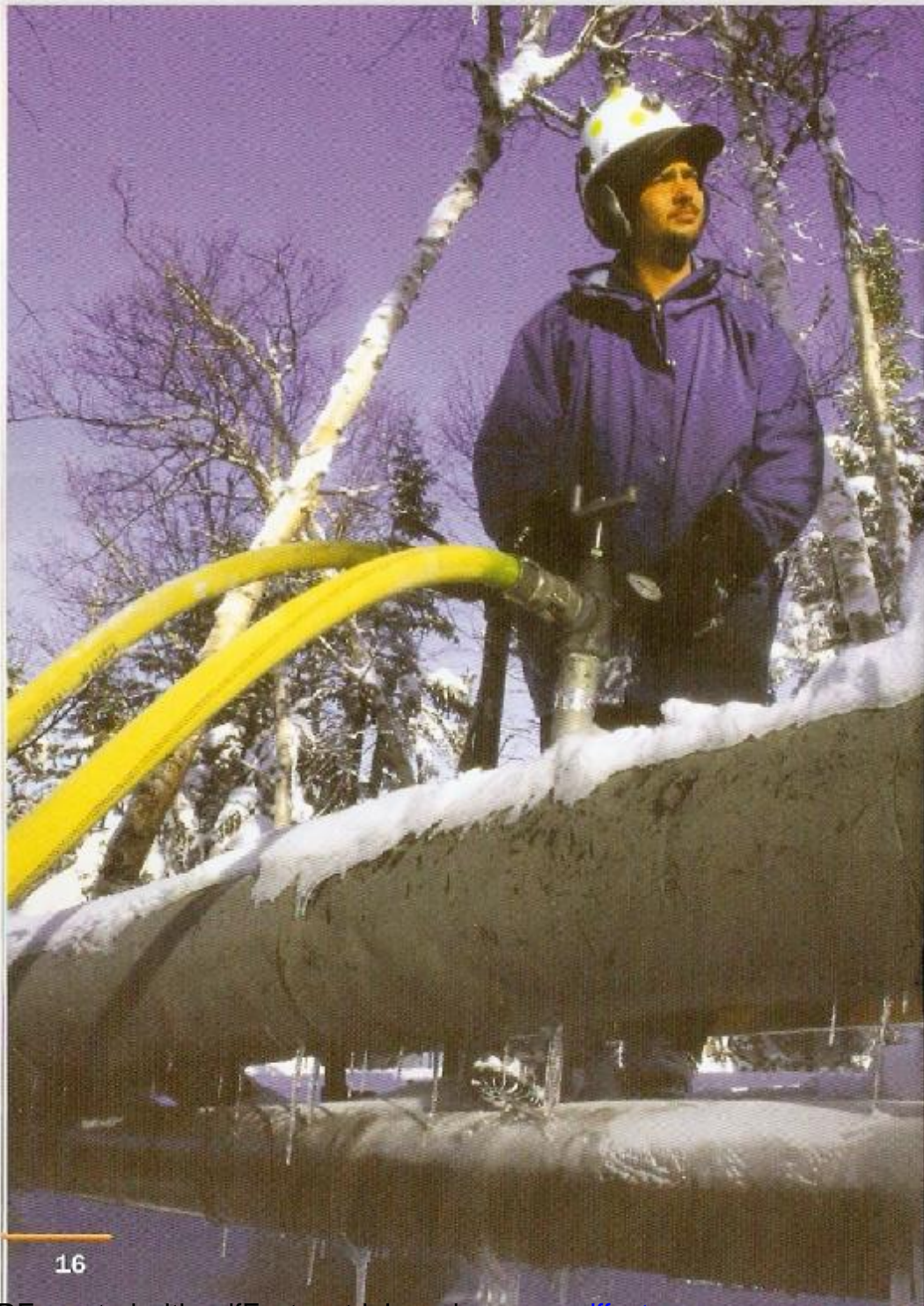
When the water is turned off, Dave Lindgren, the mountain manager, quickly gets the water out of the system. If he doesn't, the pipes might freeze. If a pipe freezes, it's completely useless for the rest of the winter. As he does this, Lindgren also learns a good lesson. Just like all the skiers, he has to be very careful. It's easy to fall over on any kind of snow!

¹⁰ **pump:** a machine that forces water to move from one place to another

¹¹ **nerve centre:** a place from which an organisation or activity is controlled or managed

¹² **pipe:** a tube through which liquids pass from one place to another





Lindgren goes on to describe the water supply system for Wild Mountain's snow-making operation. Snowmaking needs a lot of water all of the time. So where does all of this water come from?

"This is where we get all our water," says Lindgren. He's talking about the water **reservoir**¹³ on top of Wild Mountain. It's a big system. The snow-making process at the ski area needs **3,000 gallons**¹⁴ of water every minute! The reservoir must provide all of this water day after day in the winter months when there is not enough natural snow.

¹³ **reservoir**: an man-made lake where water is stored

¹⁴ **3,000 gallons (U.S.)**: 11,356 litres

Raedeke is very careful about the snow-making process. He often spends all day and most of the night checking the system. He says, "We check the snow, and we want it like a good snowball." He then picks up a handful of snow. "You can see it's just a little bit wet, and so we'll go to the [snow] gun and turn down the water," he explains. The process requires a lot of care. If there's too much water, the snow becomes soft; if there's too little water, the snow doesn't stay on the ground long enough.

To prepare for the next day, Raedeke operates the snow-making machines all night. The pistes will be covered with new snow in the morning. Wild Mountain will be ready for the day's skiers—with or without nature's help. With good weather, and a little 'snow magic,' Raedeke can keep his skiers happy all winter!



After You Read

1. In Minneapolis, winter is _____ cold and long.
A. normally
B. always
C. pleasantly
D. never
2. On page 7, the word 'completely' in paragraph one can be replaced by:
A. partly
B. possibly
C. totally
D. nearly
3. On page 7, Raedeke explains that he has to open the ski area later this year because:
A. The fields are still brown.
B. The weather is warm.
C. There is not enough real snow.
D. all of the above
4. What is Raedeke's job?
A. skier
B. business owner
C. mechanical engineer
D. mountain manager
5. On page 10, 'it's' refers to:
A. air temperature
B. science
C. wind direction
D. snowmaking
6. On page 10, the writer says that snowmaking is an art because:
A. It is also a science.
B. The snow is artificial.
C. It is a complicated process.
D. The snow guns are high in the air.

7. On page 13, the word 'selected' in the phrase 'Raedeke selected them' can be replaced by:
A. decided
B. chose
C. liked
D. needed
8. On page 13, Raedeke says his machines are great because they are _____.
A. tall
B. thin
C. new
D. fast
9. On page 14, what is the writer's purpose in the last line?
A. to show that everyone should be careful on snow
B. to show that Lindgren does not have to be careful
C. to explain how pipes freeze
D. to talk about Raedeke's fall
10. According to page 18, why might artificial snow not stay on the ground very long?
A. It is too soft.
B. There is too much water.
C. It is too cold.
D. There is not enough water.
11. Which is a good heading for page 18?
A. Machines Don't Work All Night Long
B. Raedeke Makes a Good Snowball
C. Raedeke's Magic Keeps Skiers Happy
D. Machines Don't Need To Be Checked

My Visit to the South Pole

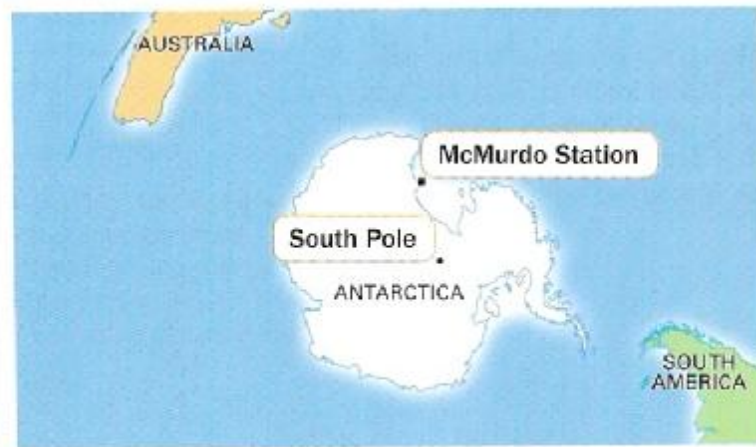
December 19

This is going to be a long day. Actually, I'm going to have several very long days. In order to begin my visit to the South Pole, I have to go a long way. First, I have to get from the U.S. to McMurdo Station in Antarctica. I left the house at 5.00 a.m. this morning and I won't reach Antarctica for at least three days. It's over nine thousand miles away!

December 22

Well, I'm finally here. We arrived at McMurdo Station at 9.00 p.m. last night. It's windy and freezing cold and there is so much snow on the ground. It isn't even winter in Antarctica now! I don't know what the temperature is and I don't want to know. The people with me are a very international group—North Americans, Europeans, and South Americans. Tomorrow we are leaving to go to the South Pole!

The Area around the South Pole



Here I am at the South Pole!

December 24

Here I am at the South Pole! The weather is unbelievably cold. It's 11.00 p.m. and it looks like it could be 11 a.m. There is daylight here for 24 hours a day at this time of year. Can you believe I just met a group of skiers? They're from Australia and they're spending nine days skiing around Antarctica, finishing at the South Pole. I thought my trip was unusual...

December 27

I'm back at McMurdo Station. Thank goodness! Coming back from the South Pole wasn't as easy as getting there. The weather was bad and the wind was blowing really hard. It made getting back to the station very difficult. There were problems, but I have had a lovely time here. Right now, however, I'm so cold! My warm bed is going to be a great ending to a wonderful few days...



Word Count: 315

Time: _____



Vocabulary List

blow (10)

field (7)

freeze (2, 10, 14)

magic (7, 18)

mechanical engineering (8)

mountain (3, 7, 8, 13, 14, 17, 18)

nerve centre (14)

pipe (14, 15)

piste (3, 7, 14, 18)

pole (13)

pump (14, 15)

reservoir (17)

skier (3, 14, 18)

snow (2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 14, 17, 18)

snow gun (10, 11)

snow-making machine (3, 18)

temperature (2, 10)

trail (13)

weather (2, 4, 7, 18)

wind (2, 10)

winter (2, 4, 14, 17, 18)