Winter Trivia

Use this key to check answers and read the explanations.

1. A textbook shows one star-shaped snow crystal with its main arms intact. How many main arms does this classic shape have?

A. Six
B. Four
C. Five
D. Eight

Correct answer: A. Six
Water molecules in ordinary snow crystals arrange in a hexagonal pattern. A star-shaped crystal can grow one main arm in each of six directions.

2. How does a snowshoe hare's mostly white winter coat help it in a snowy forest?

A. It makes the hare's feet wider.
B. It makes the hare easier to see against snow.
C. It makes the hare harder to see against snow.
D. It improves the hare's hearing in deep snow.

Correct answer: C. It makes the hare harder to see against snow.
The white color makes the hare less visible against snow. Its brown summer coat blends into a different background.

3. A tamarack grows cones, but its needles turn yellow and fall before winter. What kind of tree is it?

A. An evergreen conifer
B. A deciduous conifer
C. An evergreen flowering tree
D. A deciduous palm

Correct answer: B. A deciduous conifer
A tamarack is a conifer that sheds its needles each fall. Its branches stay bare until new needles grow in spring.

4. At a town at 40 degrees north latitude, which seasonal event brings the fewest hours of daylight?

A. The September equinox
B. The March equinox
C. The June solstice
D. The December solstice

Correct answer: D. The December solstice
At this Northern Hemisphere latitude, the December solstice has the shortest daylight period. The June solstice has the longest.

5. On what date does Punxsutawney, Pennsylvania, hold its traditional Groundhog Day observance?

A. January 2
B. February 2
C. February 14
D. March 2

Correct answer: B. February 2
The Pennsylvania observance takes place on February 2. The groundhog's shadow is part of the town's spring forecast folklore.

6. A park sign shows a vole in the space just beneath a deep blanket of snow. How can the overlying snow help keep that space warmer than the exposed air?

A. It insulates the space and slows heat loss.
B. It releases heat continually as snowflakes fall.
C. It reflects sunlight downward through the whole snowpack.
D. It constantly replaces the air below with air from above.

Correct answer: A. It insulates the space and slows heat loss.
A snowpack can hold in air warmed by the ground and buffer the sheltered space from colder air above. Small mammals use this subnivean space.

7. Fresh white snow and dark asphalt receive the same amount of incoming sunlight. Which reflects a larger share, and why?

A. They reflect equal shares because the incoming sunlight is equal.
B. Snow, because its albedo is lower.
C. Asphalt, because its albedo is higher.
D. Snow, because its albedo is higher.

Correct answer: D. Snow, because its albedo is higher.
Albedo is the fraction of incoming light a surface reflects. Fresh snow has a higher albedo than dark asphalt, so it reflects a larger share.

8. Which instrument did Wilson Bentley pair with a camera to photograph a single snow crystal in 1885?

A. A barometer
B. A telescope
C. A microscope
D. A sundial

Correct answer: C. A microscope
Bentley combined a microscope and a bellows camera. The microscope let him capture the structure of individual snow crystals.

9. A weather observer records raindrops falling as liquid, then forming a clear ice coating when they strike cold tree branches. What kind of precipitation is recorded?

A. Freezing rain
B. Sleet
C. Snow
D. Hail

Correct answer: A. Freezing rain
Freezing rain stays liquid until it meets a cold surface. Sleet reaches the surface as already-frozen pellets.

10. On clear days at 40 degrees north, the same upright post stands on level ground at local solar noon on both solstices. How does its December shadow compare with its June shadow?

A. It is the same length because the post is unchanged.
B. It is shorter because the Sun is lower in the sky.
C. It is longer because the Sun is higher in the sky.
D. It is longer because the Sun is lower in the sky.

Correct answer: D. It is longer because the Sun is lower in the sky.
The Sun is lower at solar noon on the December solstice at this latitude. Sunlight arrives at a shallower angle and casts a longer shadow.

11. A Northern Hemisphere report counts every day of meteorological winter from December through February. The winter ends in a leap year. How many days belong in the report?

A. 90 days
B. 89 days
C. 91 days
D. 92 days

Correct answer: C. 91 days
Meteorological winter includes all of December, January, and February. February has 29 days in a leap year, giving 31 + 31 + 29 = 91 days.

12. Two fictional plots have the same area. Plot A has 26 cm of snow with 3 cm of snow water equivalent. Plot B has 18 cm of snow with 6 cm of snow water equivalent. Which snowpack holds more water?

A. Plot A holds twice as much as plot B.
B. Plot B holds twice as much as plot A.
C. Plot A holds more because its snow is deeper.
D. Both hold the same amount of water.

Correct answer: B. Plot B holds twice as much as plot A.
Snow water equivalent is the depth of water the snowpack would yield if melted. For equal areas, 6 cm of water means twice the amount in 3 cm.

13. Cold air is moving from west to east across a fictional lake whose surface is warmer than the air. All else being equal, which location is most likely to get lake-effect snow from this crossing?

A. Land directly south of the lake, outside the air's path
B. Land just west of the lake, before the air crosses the water
C. Land directly north of the lake, outside the air's path
D. Land just east of the lake, after the air crosses the water

Correct answer: D. Land just east of the lake, after the air crosses the water
The cold air gains moisture over the warmer water. The wind carries that moisture east, where it can fall as snow on the downwind shore.

14. An exhibit says the Kohrs ranch stored winter ice in a thick-walled log room built around 1880. A visitor wonders how the ice could still help cool food in summer. What does the National Park Service account support?

A. The insulated room slowed melting, leaving ice available in warmer months.
B. The room had open windows to bring in warm summer air.
C. The ranch gathered most of its creek ice at the height of summer.
D. Powered freezers inside the room made fresh ice year-round.

Correct answer: A. The insulated room slowed melting, leaving ice available in warmer months.
The log walls and insulation slowed heat transfer into the room. The National Park Service says the stored ice usually lasted through the summer.

15. In a fictional winter report, ice covers 25% of a lake that spans 120 square kilometers and 75% of a lake that spans 80 square kilometers. What percentage of their combined surface area is ice-covered?

A. 55%
B. 50%
C. 45%
D. 75%

Correct answer: C. 45%
Ice covers 30 square kilometers on the first lake and 60 on the second. Together that is 90 of 200 square kilometers, or 45%.