Problem of the Week
Problem A and Solution
Winter Fun

Problem

Ben asked his classmates what their favourite activities were during the winter. The following chart shows the results.

Survey Results

Building a Snowman	❄ ❄ ❄
Sledding	❄ ❄ ❄ ❄
Skiing	❄
Skating	❄ ❄

Key

❄ = 3 students

Which of the following statements are true about the chart?

a) Six fewer students like skating than like sledding.

b) One more student likes building a snowman than likes skating.

c) One student likes skiing and four students like sledding.

d) Nine more students like sledding than like skiing.

Justify your answers.

Solution

To answer these questions, we can use the chart to determine the actual number of people that answered the questions in the survey. From the key we know that each snowflake represents 3 students.

Survey Results

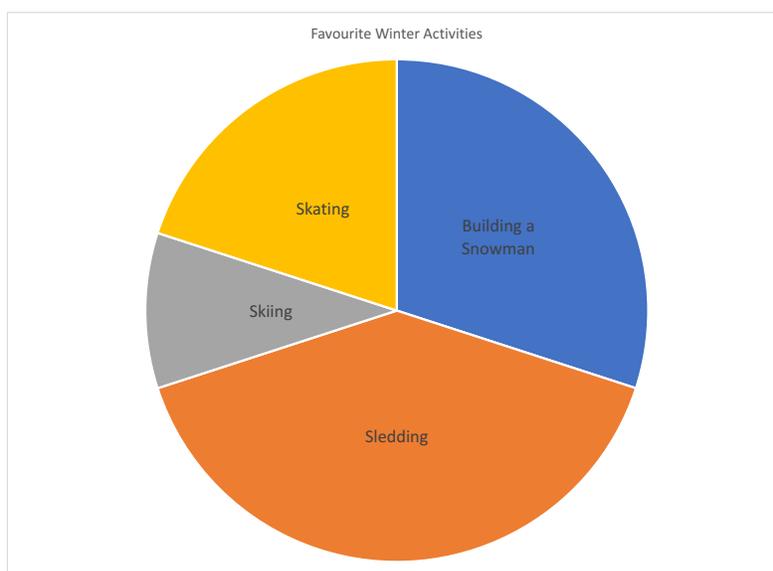| Building a Snowman	$3 + 3 + 3 = 9$ students
Sledding	$3 + 3 + 3 + 3 = 12$ students
Skiing	3 students
Skating	$3 + 3 = 6$ students

Based on the information from the table,

a) Is true, since $12 - 6 = 6$ fewer students like skating.

b) Is not true, since $9 - 6 = 3$ more students like building a snowman than like skating.

c) Is not true, since 3 students like skiing and 12 students like sledding.

d) Is true, since $12 - 3 = 9$ more students like sledding than like skiing.

Teacher's Notes

The key in a pictograph gives us specific information about the survey data. Similarly the numbers on an axis of a bar chart or line chart provide more information about the data being represented in these graphical formats. However, there are several conclusions we can reach based on the pictograph, without knowing how much each snowflake represents. Here are some observations that would be the same even if we changed the value of the key:

- Sledding is the most popular activity.

- The majority of the students enjoy either sledding or building a snowman the most.

- Twice as many students say sledding is their favourite compared to those who say skating is their favourite activity.

- Three times as many students say building a snowman is their favourite compared to those who say skiing is their favourite activity.

- When asked what their favourite activity is, 30% of the students said building a snowman, 40% said sledding, 10% said skiing, and 20% said skating.

- Without knowing the key, we could use the pictograph information to draw a pie chart of the survey results.

Favourite Winter Activities

Can you think of other observations that are independent of the fact that one snowflake represents three students?