

Important Concepts . . .

# Preview Review



**Mathematics Grade 8 TEACHER KEY**  
**W2 - Lesson 4: Critiquing the**  
**Representation of Data**

## Important Concepts of Grade 8 Mathematics

W1 - Lesson 1 .....	Perfect Squares and Square Roots
W1 - Lesson 2 .....	Working with Ratios and Rates
W1 - Lesson 3 .....	Multiplying and Dividing Fractions
W1 - Lesson 4 .....	Multiplying and Dividing Integers
W1 - Lesson 5 .....	Working with Percents
W1 - Review	
W1 - Quiz	
W2 - Lesson 1 .....	Modelling and Solving Linear Equations Using Algebra Tiles
W2 - Lesson 2 .....	Solving Linear Equations
W2 - Lesson 3 .....	Graphing and Analyzing Linear Relations
W2 - Lesson 4 .....	Critiquing the Representation of Data
W2 - Lesson 5 .....	Probability of Independent Events
W2 - Review	
W2 - Quiz	
W3 - Lesson 1 .....	Pythagorean Theorem
W3 - Lesson 2 .....	Calculating Surface Area
W3 - Lesson 3 .....	Calculating Volume
W3 - Lesson 4 .....	Drawing 3-D Objects
W3 - Lesson 5 .....	Congruence of Polygons
W3 - Review	
W3 - Quiz	

## Materials Required

Protractor  
Ruler  
Calculator

**No Textbook  
Required**

**This is a stand-  
alone course.**

### Mathematics Grade 8

#### Version 6

#### Preview/Review W2 - Lesson 4

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# Preview/Review Concepts for Grade Eight Mathematics

## Teacher Key



***W2 - Lesson 4:***

***Critiquing the Representation  
of Data***

# OBJECTIVES

By the end of this lesson, you will be able to:

- Identify the advantages and disadvantages of different graphs, including circle graphs, line graphs, bar graphs and pictographs
- Justify the choice of a graphical representation for a given situation
- Explain how the format of a given graph, such as the size of the intervals, the width of the bars and the visual representation, may lead to misinterpretation of the data.
- Explain how a given formatting choice could misrepresent the data.

## W2 – Lesson 4: Critiquing the Representation of Data

### Materials required:

- Paper, Pencil, and Grid paper

### Part 1: Choosing the best graph to represent data

Data can be displayed using a bar graph, line graph, pictograph, or a circle graph.

Determining which type of graph to use to display your data is important because you want the data being represented in the graph to be interpreted correctly.

The intention of the graph could be misinterpreted if the data is misrepresented.

Type of graph	Advantages	Disadvantages
Bar Graph	<ul style="list-style-type: none"> <li>• Lengths of bars compare data values</li> <li>• Scale can be used to find the total</li> <li>• Easy to draw</li> </ul>	<ul style="list-style-type: none"> <li>• May be difficult to read based on scale used</li> <li>• Does not show percents of the total for comparison</li> </ul>
Line Graph	<ul style="list-style-type: none"> <li>• Easy to draw and read</li> <li>• Shows data changes over time</li> <li>• Can be used to estimate values between and beyond data points</li> </ul>	<ul style="list-style-type: none"> <li>• Does not show parts of a whole</li> <li>• A zig-zag pattern can be difficult to interpret</li> </ul>
Pictograph	<ul style="list-style-type: none"> <li>• Lengths of symbols compare data values</li> <li>• Looks great</li> <li>• Key can be used to find the total</li> </ul>	<ul style="list-style-type: none"> <li>• A large number of symbols make it difficult to read</li> <li>• Does not show parts of a whole</li> <li>• Difficult to draw</li> </ul>
Circle Graph	<ul style="list-style-type: none"> <li>• Shows parts of a whole,</li> <li>• Shows percents of a total</li> <li>• Compares part of the whole to one another</li> </ul>	<ul style="list-style-type: none"> <li>• Does not show data values and the total</li> <li>• Difficult to draw accurately</li> </ul>

## Example 1

Meghna wants to plant the fastest growing flowers in her garden. She chooses seeds from four different flower companies. She wants to do this experiment over a two-week period. What type of graph should she use to display her collected data?

Since Meghna wants to compare the growth of four different types of seeds over a period of time, she should use a line graph.

## Practice Questions

Determine which type of graph would be the best to use to display the given information.

1. The monthly budget for the Chung family.

*A circle graph is used to compare parts of a whole to one another. In this case, the whole is the total funds available for that month and the parts are the different amounts of money that are spent in each category.*

2. The temperature change over the month of September.

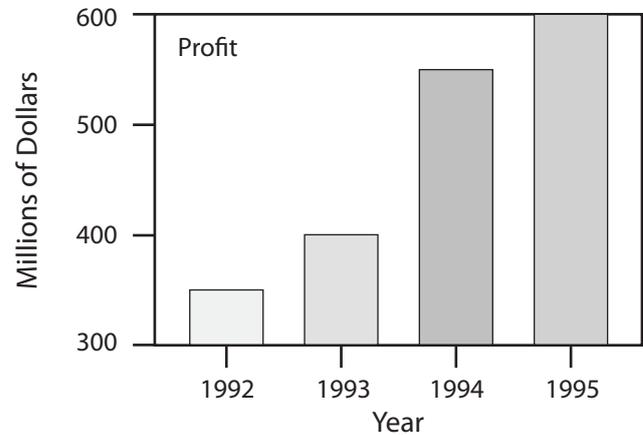
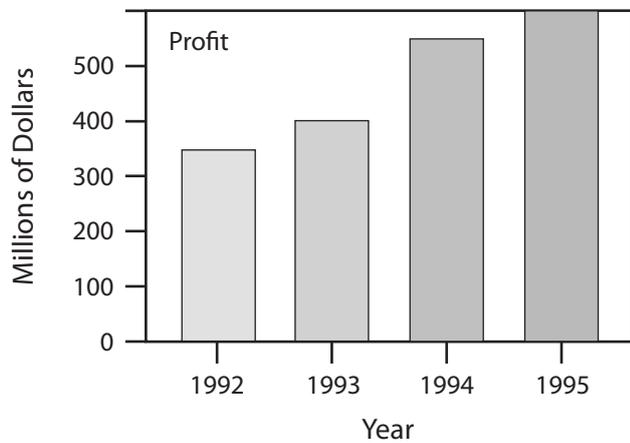
*A line graph is used to observe the changes over time. The time could be represented along the x-axis and the temperature could be represented along the y-axis.*

3. The different number of vehicles sold in a given year by a car dealership.

*A bar graph is used to compare categorical data. The different types of vehicles could be represented along the x-axis and the number of each type of car could be represented along the y-axis.*

## Part 2: Displaying Data

When displaying data, consistency is vital to ensure data is not misinterpreted or misrepresented. Make sure the bars are the same width in a bar graph, the scales are consistent along both axes, and the origin always starts at zero.



In the first bar graph, the width of the bars is the same size, the scales are consistent, and the origin starts at zero. The data presented here is presented correctly.

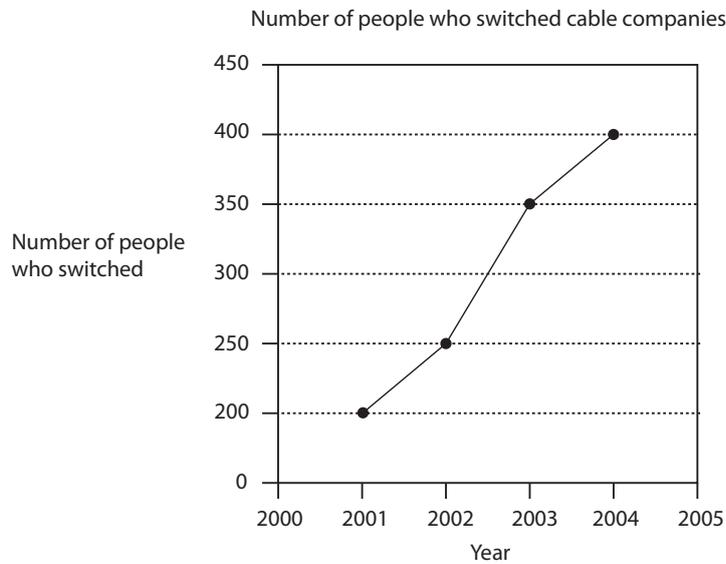
In the second graph, the width of the bars is the same size, however, the origin starts at 300 not 0, and the scales are inconsistent.

In the second graph, it looks like there was a huge increase in profits from 1993 to 1994. Compared to the first graph the increase in profits is highly exaggerated. This is an example of how the data is not incorrect or misleading; it is the way the data is represented that is misleading.

### Practice Questions

Determine how the data is being misrepresented in the following graphs.

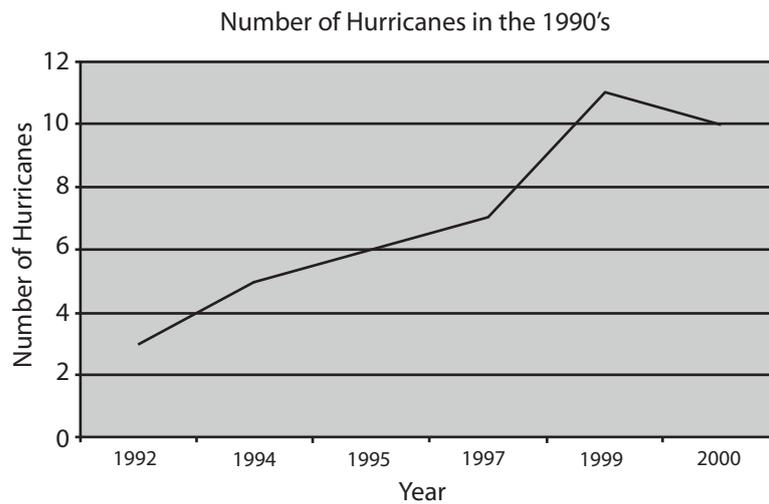
1.



***The scale along the y-axis is inconsistent. The increment increases by 200 and the second increment increases by 50.***

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2.



***The scale along the x-axis is inconsistent. The years do not increase sequentially, they go from 1992 to 1994 to 1995 to 1997, etc.***

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## Lesson 9: Assignment

Determine the best graph to use for each of the following situations.

1. Measuring how far Sharah runs over a 7-day period

*A line graph is used to observe the changes over time. The time could be represented along the x-axis and the distance she runs could be represented along the y-axis.*

2. Illustrating the percentage of roses, daisies, marigolds, and lilies in a garden

*A circle graph is used to compare parts of a whole to one another. In this case, the whole is the total number of flowers in the garden and the parts are the different types of flowers.*

3. Determining how many people enjoyed a particular movie on a scale of 1-5

*A bar graph is used to compare categorical data. The different scales could be represented along the x-axis and the frequency of each response could be represented along the y-axis.*

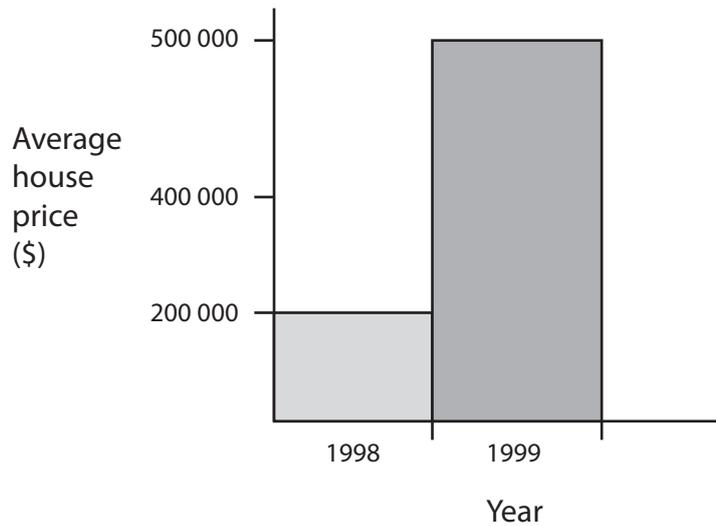
4. Measuring the amount of sunlight hours on a given day in August

*A line graph is used to observe the changes over time. The time could be represented along the x-axis and the amount of sunlight could be represented along the y-axis.*

Determine how the given graphs are misrepresenting the data.

5.

Average house prices in two years



***The scale along the y-axis does not start at zero and the scales are inconsistent. This graph makes it seem like the house prices increased significantly in one year.***

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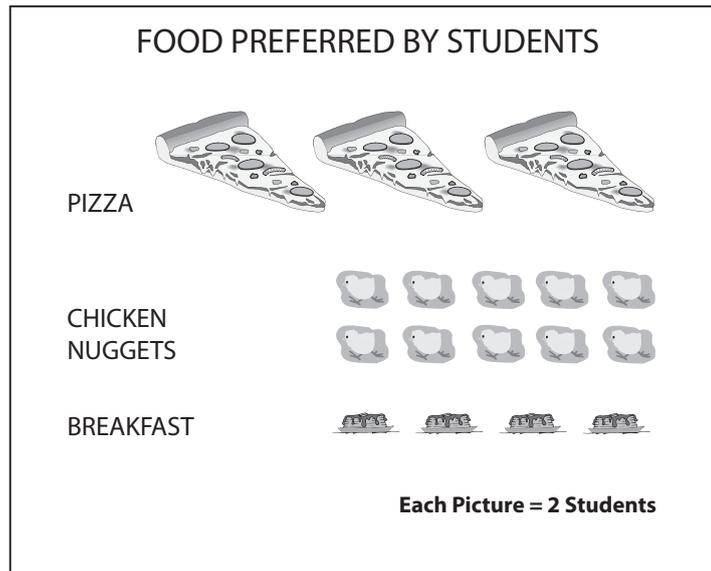


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6.



***The pictures that represent pizza lunches are bigger than any other picture yet they represent the same number of students as the other pictures. The oversized pizza pictures make it seem like more students prefer pizza when in actuality more students prefer chicken nuggets.***

