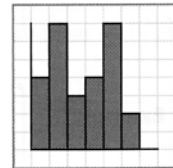
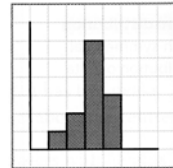
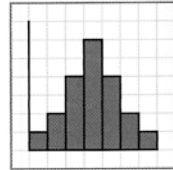


Worksheet 8-4: Common Data Distributions

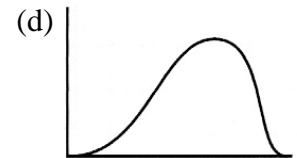
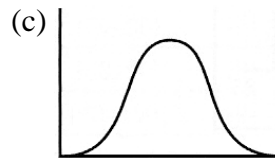
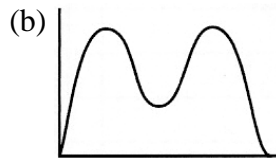
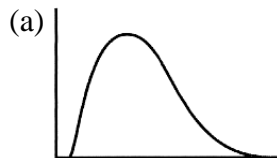
Frequency distributions show the frequency of each outcome in a given situation. The range in values and the frequency of specific values are important measures in data analysis.

Common Patterns of Data Distributions:

- **Normal Distribution** (*bell-shaped*)
 The data are distributed symmetrically about the mean. The mean, the median, and the mode are close in value and are located at the centre of the distribution.
- **Skewed Distribution**
 The data has the appearance of a normal distribution that has been pushed to one side of the mean. The result is an asymmetrical or lopsided distribution.
- **Bimodal Distribution**
 The data has the appearance of two peaks (having two modes). The distribution is symmetrical, with frequencies clustering around two sub-groups (the two modes).



1. Classify each distribution as normal, skewed, or bimodal



2. In each case, predict the shape of the data distribution. Give a reason for your prediction.

(a) the heights of members of the Toronto Raptors basketball team

(b) the cost of 1 L of gas in a city in Ontario

(c) the masses of players on the Canadian Olympic men's and women's hockey teams

3. Give an example of a set of data that has each distribution.

(a) normal distribution

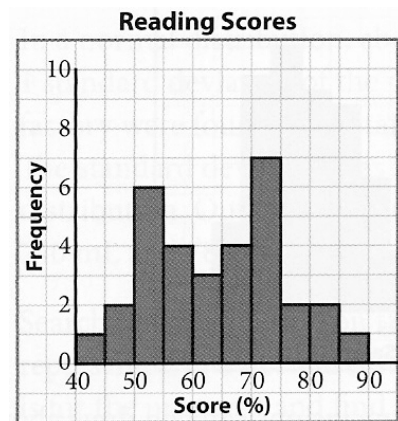
(b) skewed distribution

(c) bimodal distribution

4. The histogram shows the reading scores for a grade 4 class.

(a) What type of distribution is this?

(b) What might cause this type of distribution in the reading scores in this class?



- Answers:**
- (a) skewed right (positive), (b) bimodal, (c) normal or bell-shaped, (d) skewed left (negative);
 - (a) NBA basketball players are taller than average people, so the heights of the members of the basketball team should be skewed to the right when compared among themselves, (b) Since the price of gas is fairly standard in a city, with few differences between self-serve or full-service stations, the data should be normally distributed with a bell-shape, (c) Most male players will have a greater mass than most female players, so the distribution should be bimodal;
 - (a) the lengths of hairs on a cat, or shoe sizes sold by a major chain of shoe stores, (b) the masses of pumpkins in a giant pumpkin contest, or average weight of premature babies, (c) the times for male and female Olympic athletes in the 100 m dash or the masses of players on the Canadian Olympic men's and women's basketball team;
 - (a) bimodal, (b) girls might be, on the average, better or more focused readers than boys at this age.