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1.6 What Are the Odds?

Focus: probability, media, number sense

Chapter 1

Warm Up	
1. The probability of picking the 7 of clubs from a deck of cards is 1 in _____.	**2.** The probability of picking any red card from a deck of cards is 1 in _____.
3. What is the probability of flipping "tails, tails, tails" with 3 coins?	**4.** Reduce the following fractions to lowest terms. **a)** $\frac{5}{10}$ **b)** $\frac{70}{100}$

What Are Odds?

You flip a coin. 

The probability of flipping heads is

$$\frac{\text{\# of chances of winning}}{\text{\# of possible flips}} = \frac{1}{2}.$$

Another way of showing this is 1:2.

heads⤴ ⤵tails

Go to pages 1–2 to write the definition for **odds** in your own words.

The **odds** of flipping heads are $\frac{\text{\# of chances of winning}}{\text{\# of chances of losing}} = \frac{1}{1}$.

Another way of showing this is 1:1.

heads⤴ ⤵tails

This can be confusing because the term **odds** is often used in the media as another word for probability or chance.

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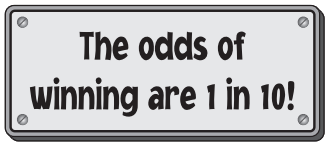
- An ad such as the following really means that the *probability* of winning is 1 in 10 (or 10%).



- The odds of winning would be 1:9.
  chance of winning ↑ ↑ chance of not winning

1. a) Calculate the odds of drawing a red card from a deck of cards.

$$\frac{\text{How many red cards are in the deck? } \_\_\_\_}{\text{How many not red cards are in the deck? } \_\_\_\_} = \_\_\_\_$$

Odds are shown as a ratio. The odds are 1:____.

b) What are the odds of drawing a spade from a deck of cards? The odds are 1: ____.

c) What are the odds of drawing an ace from a deck of cards?

d) What are the odds of drawing a jack, queen, or king from a deck of cards?

e) What are the odds of rolling a 3 with one die?

f) What are the odds of flipping "heads, heads" with 2 coins?

g) What are the odds of flipping "tails, tails, tails" with 3 coins?

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Populations

2. Collect the following data.

a) What is the student population of your school? _____

b) What is the grade 9 population? _____

c) What is the grade 10 population? _____

d) What is the grade 11 population? _____

e) What is the grade 12 population? _____

f) How many teachers are there? _____

g) How many teachers are male? _____

h) How many teachers are female? _____

i) How many other people work in the school? _____

j) Therefore, what is the total **population** of the school? _____

You have now worked with your school's population. Go to pages 1–2 to write a definition for **population** in your own words.

Look at the glossary for help.

3. What are the odds that the next teacher to walk past your classroom will be male?

Simplify a ratio of 4 : 8 by dividing both numbers by 4.
4 : 8 = 1 : 2

4. Determine the following ratios. Whenever possible, write the ratios in simplest form.

a) The ratio of grade 9s to grade 10s: _____

b) The ratio of grade 9s to grade 12s: _____

c) The ratio of grade 11s to grade 12s: _____

d) The ratio of students to teachers: _____

e) The ratio of teachers to other people who work in the school: _____

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Samples

The school principal wants to do a survey about starting and finishing the school day 3 hours later than the current start and end times.

5. a) This would make your school day start at _____ and finish at _____.

b) Explain why the principal might not wish to survey the entire population of the school.

_____

_____

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- The principal decides to survey a sample of the school population.
- A sample is part of a population.
- A good sample represents the entire population.

6. The principal is trying to decide which of the following samples would best represent the school's population.
- Consider your school's population.
- Read the description of each proposed sample.
- Decide which ones are potentially good samples.
- Which ones are potentially bad samples?

Proposed Sample	Good Sample	Bad Sample
a) Survey all of the grade 9s.		
b) Survey all of the teachers.		
c) Survey 10 students from each grade and ask 10 teachers.		
d) Survey 10% of the population.		
e) Survey only those old enough to vote.		
f) Survey 10% of the population of each grade, the teachers, and the other staff.		
g) Survey the students in the cafeteria.		

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7. Choose 1 proposed sample you classified as a "Bad Sample." Explain your thinking.

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8. a) Describe a good sample of your school's population.

b) Discuss your sample idea with several other students. Listen to their coaching to make sure that your sample plan represents the school's population. Revise your sample if necessary.

c) Using the sample, conduct a small survey to determine whether the odds are likely or unlikely that your school's population is in favour of starting and finishing the school day 3 hours later. Record your results.

In Favour	
Not in Favour	

d) What can you conclude from your survey?

Probability in the Media

Many people read long-term forecasts before making plans.

- Can we play volleyball outside on Monday?
- Will it be warm enough to ride our bikes on Wednesday?
- Should we plan a weekend beach party?

The long-term forecast on the next page shows the type of information the media provide.

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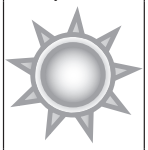
Long-Term Forecast

	Monday Sept. 13	Tuesday Sept. 14	Wednesday Sept. 15	Thursday Sept. 16	Friday Sept. 17	Saturday Sept. 18
						
	Cloudy With Sunny Breaks	**Showers**	**Isolated Showers**	**Mostly Sunny**	**Sunny**	**Sunny**
P.O.P.	40%	80%	60%	20%	20%	10%
High	18°C	16°C	17°C	18°C	21°C	22°C
Low	11°C	13°C	9°C	14°C	16°C	18°C
24-Hr Rain	close to 1 mm	close to 10 mm	close to 5 mm			

Chapter 1

9. a) What does P.O.P. stand for?

Hint: P.O.P. has two *P*s. One stands for the topic of this chapter. The other is another word for rain.

b) How can it help you plan outdoor jobs or events?

c) Which day, in your opinion, would be best for a family barbecue? Explain why.

d) You work for a company that paves driveways. List the days you think you will be able to work this week.

Check Your Understanding

1. Jack says, "The odds of a 6-day forecast being right are slim to none." What might he mean by this?