Get Ready

Name: _____ Date: _____

Fractions, Decimals, and Percents

To convert a fraction to a percent, convert the fraction to a decimal number by dividing the numerator by the denominator. Then, multiply the decimal by 100 and add a percent symbol.

$\frac{4}{9} = 0.444\,44\ldots$
$= 0.444\,44\ldots \times 100\%$
$= 44.\overline{4}\%$

Use a bar over the repeating part of a repeating decimal.

1. Complete the following table.

Fraction	Decimal	Percent
a) $\frac{4}{5}$		
b)	0.666666…	
c) $\frac{4}{11}$		
d)		$33.\overline{3}\%$

Probability

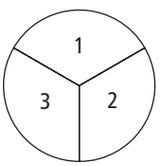
The probability of an event is a measure of the likelihood that it will occur. The probability of an impossible event is 0 or 0%. The probability of a certain event is 1 or 100%.

A coin is flipped. What is the probability that it lands heads up, $P(\text{H})$? Write your answer as a fraction, a decimal, and a percent.

$$P(\text{H}) = \frac{\text{favourable outcomes}}{\text{possible outcomes}}$$
$$= \frac{1}{2}$$

The probability of heads is $\frac{1}{2}$, 0.5, or 50%.

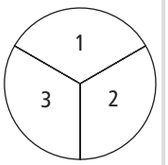
2. The spinner is spun once. What is the probability of spinning 2, $P(2)$? Write the answer as a fraction, a decimal, and a percent.



Name: _____ Date: _____

Using Tables and Tree Diagrams

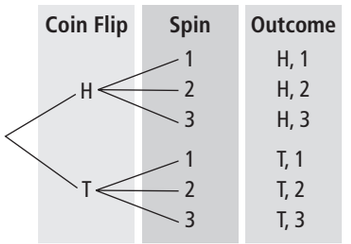
Tables and tree diagrams are common ways to organize outcomes. A coin is flipped and a spinner is spun. Below is the sample space.



Table

Coin	Spinner		
	1	**2**	**3**
Heads (H)	H, 1	H, 2	H, 3
Tails (T)	T, 1	T, 2	T, 3

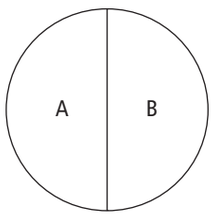
Tree Diagram

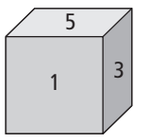


There are 6 possible outcomes: (H, 1), (H, 2), (H, 3), (T, 1), (T, 2), (T, 3).

P(T, 3) is $\frac{1}{6}$, $0.1\overline{6}$, or $16.\overline{6}\%$.

3. a) Create a table to show the sample space for the spinner and the fair six-sided die.



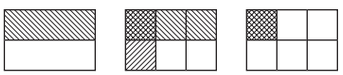


b) List the sample space.

c) What is $P(A, < 5)$?

Multiplying Fractions

You can use paper folding to multiply proper fractions.

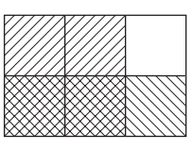


$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$

To multiply fractions without a diagram, multiply the numerators and multiply the denominators.

$\frac{1}{2} \times \frac{1}{3} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$

4. What multiplication statement does the diagram represent?



5. Multiply. Show your answer in lowest terms.

$\frac{3}{5} \times \frac{5}{6}$

Name: _____ **Date:** _____

11.1 Determining Probabilities Using Tree Diagrams and Tables

***MathLinks 8*, pages 410–418**

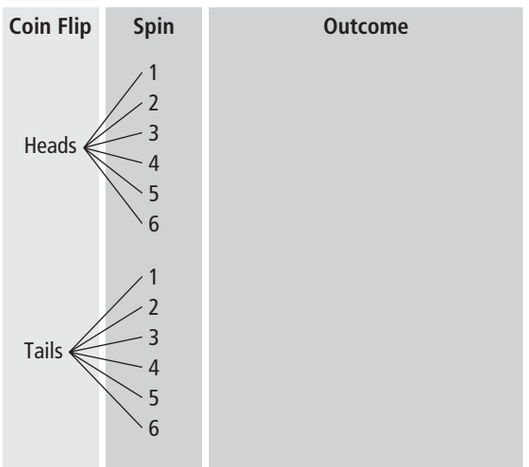
Key Ideas Review

Match each statement in column A to a term in column B.

A	B
1. Determined from tree diagrams and tables. _____	**a)** probability
2. The probability of A then B occurring. _____	**b)** tree diagrams
3. The number of favourable outcomes divided by the total number of possible outcomes. _____	**c)** P(A, B)
4. The probability both A and B occurring. _____	**d)** probabilities
5. Used to show sample space for a probability experiment. _____	**e)** P(A then B)

Practise and Apply

6. The following tree diagram shows the sample space for flipping a coin and rolling a six-sided die. Fill in the outcome column.



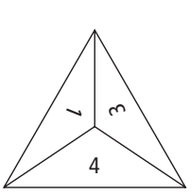
a) What is P(H, 6)?

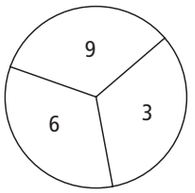
b) What is P(T, odd number)?

c) What is P(H, 7)?

Name: _____ **Date:** _____

7. A four-sided die labelled 1, 2, 3, and 4 is rolled and a spinner labelled 3, 6, and 9 is spun.





a) Create a table to show the sample space.

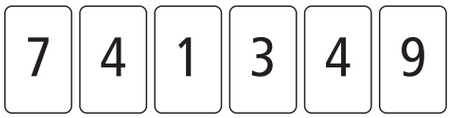
b) What is *P*(sum even number)?

8. Each week Sam (H) and Lacy (T) choose chores by flipping a coin and spinning a spinner.

a) Draw a tree diagram to show the sample space.

b) What is the probability that Sam will have to do dishes this week?

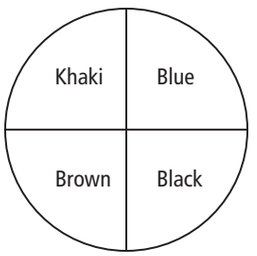
9. In this card game there are two identical sets of six cards. You pick up a card from each set. The idea of the game is to make a sum of 10.



a) Create a table to show all the combinations.

b) What is *P*(3, 3)?

10. Trey chooses his outfits by spinning this spinner twice. The first spin is for the colour of pants and the second spin is for the colour of shirt.



a) Show the sample space.

b) What is *P*(same colour)?

Name: _____ **Date:** _____

11.2 Outcomes of Independent Events

***MathLinks 8*, pages 419–425**

Key Ideas Review

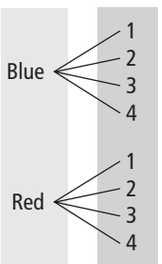
Use the diagrams to fill in the blanks for #1.

1. Name the methods shown that can be used to determine the possible number of outcomes.

a) _____

b) _____

c) _____



	1	2	3	4
Blue	B, 1	B, 2	B, 3	B, 4
Red	R, 1	R, 2	R, 3	R, 4

$2 \times 4 = 8$

Practise and Apply

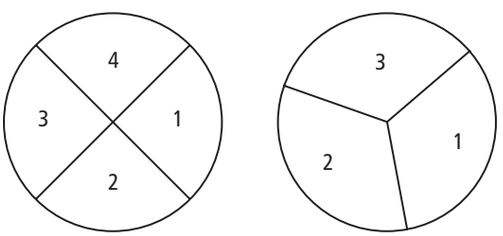
2. Christine is making her lunch. She can choose strawberry, peach, or raspberry yogurt and an apple, an orange, grapes, or a banana. She picks one yogurt and one piece of fruit.

a) Draw a tree diagram to show the sample space.

b) How many possible outcomes are there?

c) Check your answer using multiplication.

3. A new game uses the following two spinners.

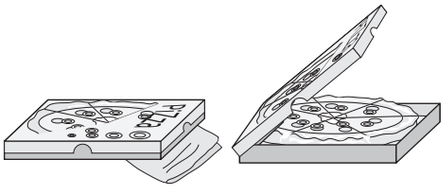


a) Use multiplication to determine the total number of possible outcomes.

b) Check your answer using another method.

Name: _____ **Date:** _____

4. Aira is ordering pizza for her birthday party. There are three choices for crusts (thin, regular, stuffed), two choices for meat (pepperoni or ham), and four choices for toppings (mushrooms, pineapple, green peppers, extra cheese).

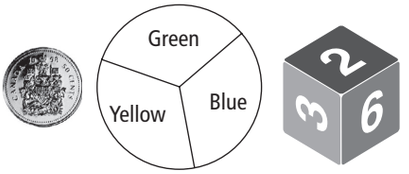


a) Draw a tree diagram to show how many different types of pizza she can order.

b) Verify the number of pizzas using multiplication.

c) If one of the guests is allergic to mushrooms, how many pizzas can Aira order? Use multiplication to verify your answer. Show your work.

5. Use a tree diagram and multiplication to find the outcomes of these three events.



a) Tree diagram:

Multiplication:

b) How many possible outcomes are there?

6. a) Create a question that would give the following number of possible outcomes: $2 \times 5 \times 3 = 30$.

b) Draw a tree diagram to verify the number of possible outcomes.

Name: _____ **Date:** _____

11.3 Determining Probabilities Using Fractions

***MathLinks 8*, pages 426–435**

Key Ideas Review

Choose from the terms below to complete #1.

experimental multiplying results simulation success tables tree diagrams

1. a) When you are finding probability using two or more independent events, you can find the probability by _____ the probabilities of _____ for each single event.

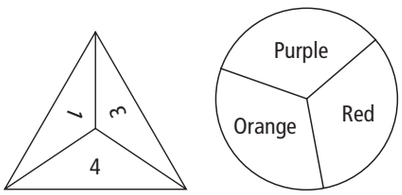
b) There are three ways to find the probability of independent events: _____, _____, and _____.

c) A _____ is an experiment that can be used to model a real situation.

d) The _____ of a simulation are called _____ results.

Practise and Apply

2. Chad tosses this die and spins the spinner.



a) Show the sample space.

b) What is the probability of rolling a 4 and spinning purple?

c) Verify your answer by multiplying each successful probability.

3. Jessie and Johan use their pencil cases to predict the probability of drawing the same pencil out of each case.

a) What is the probability of them both choosing a grey pencil from their pencil cases? Use multiplication to find your answer.

b) Verify your answer using a tree diagram.

Name: _____ **Date:** _____

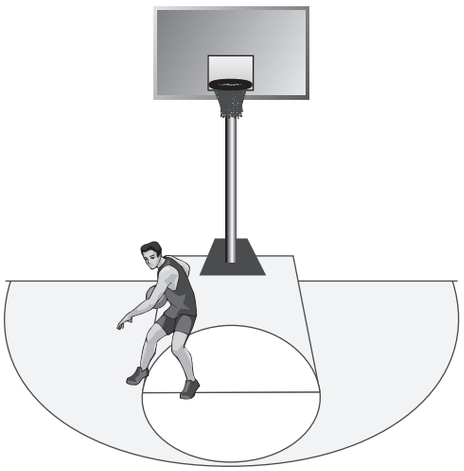
4. The Grade 8 students have decided to decorate their school. Each class gets a part of the school to decorate. There are four Grade 8 classes: 8A, 8B, 8C, and 8D, and there are six available areas in the school: the foyer, library, hallway, gymnasium, cafeteria, and office. The students roll a six-sided die to determine which area they will decorate.

a) Design and describe a simulation to find the probability that 8C will get the foyer. Perform 20 trials. Record your results. What is the experimental probability of *P*(8C, foyer)?

b) Use multiplication to determine the theoretical probability of *P*(8C, foyer). Show your answer as a fraction and a percent to two decimal places.

c) Compare your experimental and theoretical probability.

5. Greg plays basketball for the school team. His statistics show he has a 60% chance of making his first foul shot and a 25% chance of making his second shot.



a) What is the probability of making both shots? Show your thinking.

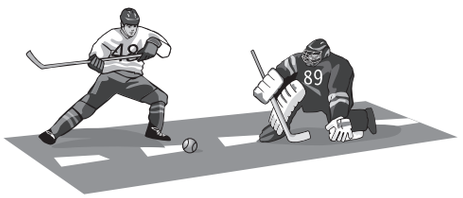
b) Design and describe a simulation to find the experimental probability of him making both shots. Repeat the simulation 25 times. Record your results. What is *P*(both shots)?

c) Compare the experimental probability and theoretical probability.

Name: _____ **Date:** _____

Link It Together

The annual street hockey tournament is next weekend. The Stribers do all the planning and they are ready with all the information. There are seven teams entered this year. Each team plays each of the other teams once as the home team. Note that they will also play each of the other teams as the visiting team once.



1. a) Draw a tree diagram to show the number of games that will be played and the teams that will play each other. Remember: You can't play your own team.

b) How many games are played?

c) Use multiplication to check your answer.

2. Josh Striber is on Team 3. He hopes his team can increase their number of wins this year compared to last year's two wins. He sets up a simulation to determine the probability.

a) Create and describe a simulation to see if Josh could win more than two games this year. Explain any assumptions you make. Record the results of your simulation.

b) What is the experimental probability for Josh's team winning more than two games?

Name: _____ **Date:** _____

Vocabulary Link

Draw a line from the example or description in column A to the correct term in column B, then find each term in the word search.

A	B
1. This is a successful result in a probability experiment.	**a)** experimental
2. This uses a model to find out what might happen in a real situation.	**b)** favourable outcome
3. In this type of event, the outcome of one event has no effect on the other. For example, you spin a spinner and then flip a coin.	**c)** independent
4. This includes all possible outcomes of a probability experiment.	**d)** probability
5. Simulations are often used to develop this type of probability.	**e)** sample space
6. This refers to the likelihood of an event occurring.	**f)** simulation
7. This is the calculated probability of an event occurring.	**g)** theoretical

H	X	F	Q	H	W	F	U	Z	J	E	I	Y	U	U	X	A	I	V	Z
N	F	D	R	X	X	A	B	D	J	X	K	E	J	Y	L	I	N	W	V
C	Y	Q	U	Z	V	V	V	J	J	P	R	N	L	N	W	L	D	W	T
M	M	E	P	Y	S	O	T	M	H	E	G	M	V	G	T	Q	E	F	W
M	F	D	O	F	A	U	R	R	X	R	A	V	Z	W	X	O	P	S	F
I	C	D	D	A	Z	R	Q	P	E	I	B	J	M	X	F	P	E	I	X
Z	W	G	B	Q	M	A	J	V	I	M	T	U	O	O	O	M	N	M	X
T	H	L	N	F	M	B	N	M	N	E	B	D	I	X	I	L	D	U	Z
K	Q	A	W	L	X	L	Y	D	Z	N	B	K	O	J	U	S	E	L	G
Q	Z	Q	O	T	H	E	O	R	E	T	I	C	A	L	Z	S	N	A	B
Z	D	M	S	Z	B	O	U	V	Z	A	H	O	L	W	E	J	T	T	L
G	B	N	P	P	L	U	M	A	H	L	T	D	N	I	B	E	N	I	K
N	S	W	C	J	Y	T	S	A	M	P	L	E	S	P	A	C	E	O	Q
T	H	C	F	D	E	C	C	Z	P	J	U	F	Z	J	J	C	C	N	K
A	M	W	Z	Z	I	O	S	P	R	O	B	A	B	I	L	I	T	Y	D
W	P	U	Q	J	R	M	U	F	Z	P	U	F	M	Q	T	J	C	T	S
F	M	X	A	C	P	E	X	N	I	N	B	C	V	V	Z	X	R	M	Z
R	V	H	L	A	D	B	I	N	Y	V	X	O	B	O	B	J	G	F	G