

Stats and Probability

Part A [Lesson 1] - Conducting Experiments to Gather Data

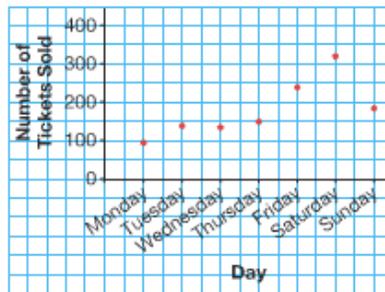
- Perform experiment on pg. 255 and read over the experiment on pg. 256.
- Work with a partner... Which sum occurs most often when you roll 2 dice labeled 1 to 6? You will need 2 dice labeled 1 to 6. Take turns to roll the dice. Find the sum of the numbers on the dice. Each student rolls the dice 25 times.
 - Record the results in a chart
 - Which sum occurred most often?
 - How do your results compare with those of another pair of students?
 - What other questions could you make up and answer using this data?
- Which letter of the alphabet occurs most often in the English language? Use the attached sheet (**Practise Sheet 1 - PS1**) to help answer the following questions and gather your data.
 - Predict the answer the question above. Explain your prediction.
 - Design an experiment you can use to check your prediction.
 - Conduct the experiment and record your results.
 - Use the data you collected to answer the question above.
 - What other conclusions can you make from your data?

- Lesson 0 Questions
- Practise Sheet 1 & 2
(PS1&2)

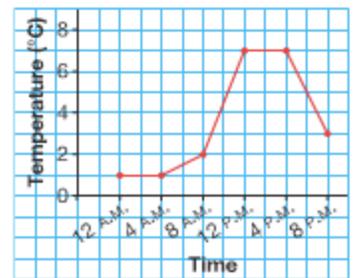
Part B [Lesson 2] - Interpreting Graphs

- Review examples on pgs. 259 – 261
- For each graph to the right:
 - What is the title?
 - What does each axis show?
 - Why are the points not joined or joined?
 - Are the data discrete or continuous?
 - What conclusions can you make from the graphs?

a) Number of Tickets Sold at the Local Theatre Over 1 Week



b) Temperature in Whistler, BC, April 7, 2008

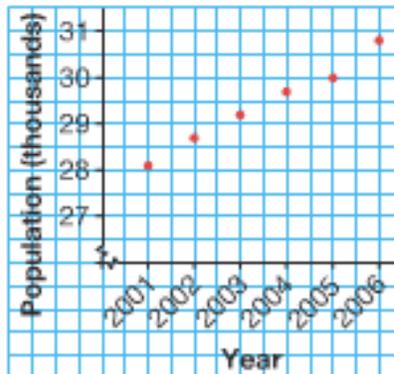


- Look at the graphs below.

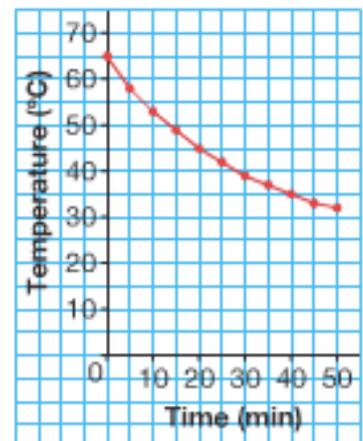
i) My Baby Sister's First Year



ii) Population of Nunavut, 2001–2006

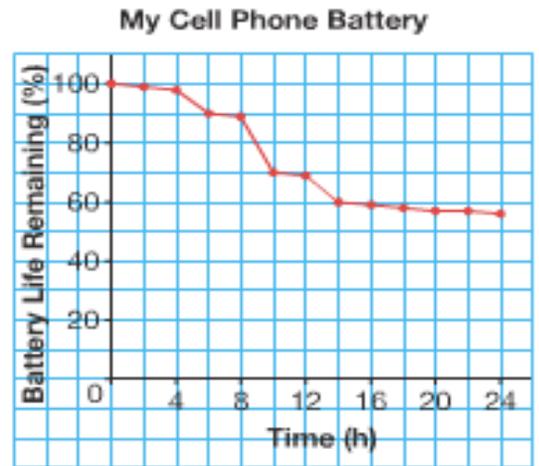


iii) How My Hot Chocolate Cooled



- How are the graphs alike? How are they different?
- What conclusions can you make from each graph?

4. Lexie measured the life left on her cell phone battery every 2 hours for 24 hours. She used a line graph to display the data.
- What happened in the first 4 hours?
 - What happened between hours 4 and 6?
 - How many times might Lexie have used her phone? Explain.
 - Between which 2 hours did he use her cell phone the most? How do you know?
 - What percent of the battery life remained after 24 hours?
 - What other conclusions can you make from the graph?



Practise Sheet 3 (PS3)

Part C [Lesson 3] - Drawing Graphs

- Review examples on pgs. 263 – 265
- The table to the right shows how far James' family travelled on a car trip to Regina. **Graph Paper needed.**
 - Draw a line graph to display the data
 - How did you choose the scale on the vertical axis?
 - What was the distance travelled each hour from hrs 2-4? 6-8?
 - What do you think was happening from hour 4 to 5?
 - What other conclusions can you make from the graph?
- Your electronic data Graph will fit into this section.

Time Passed (h)	Distance Travelled (km)
1	80
2	180
3	280
4	380
5	380
6	480
7	530
8	580

Practise Sheet 4 (PS4)

Part D [Lesson 4] - Choosing an Appropriate Graph

- Complete the shoe size chart on the board; copy the completed table; draw a graph. What conclusions can you make? Read and review the examples on page pg 267-268.
- Rachel conducted an experiment to answer this question: How fast does the center of a potato cool down after it is removed from boiling water? **Graph Paper needed.** The table to the right shows the data
 - Draw a graph to display the data. Explain your choice.
 - What conclusions can you make from the graph?

Time (min)	Temperature (°C)
0	91
5	80
10	67
15	58
20	50
25	45
30	41
35	37
40	34

Practise Sheet 5 (PS5)

Part E [Lesson 5] - Theoretical and Experimental Probability

- Read and review all concepts from pgs. 271-279. Complete the questions on **Practise Sheet 6 (PS6)** for Theoretical Probability. Then complete **Practise Sheet 7 (PS7)** for Experimental Probability .
- Complete the questions for the **Probability Experiments Assignment (PS8)**.

**Practise Sheet 6 (PS6)
Practise Sheet 7 (PS7)
Probability Experiments Assignment (PS8)**

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Lesson 0: Using a Questionnaire to Gather Data

1. Design a questionnaire for collecting data to answer each question.
 - a) Which spread to put on toast is most preferred by your friends?

 - b) What is the favourite weekend activity of students in your class?

 - c) Which Canadian city would the students in your class most like to visit?

2. What is the favourite type of footwear of students in your class?
 - a) Design a questionnaire you could use to find out.

 - b) Predict the results of your questionnaire.

 - c) Ask the question. Tally the results.

Response	Tally	Number of Students

- d) How did the results compare with your prediction?

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Practice Sheet 1 (PS1)

Part A [Lesson 1] - Conducting Experiments to Gather Data

Question 3 – Experiment Sheet

Which letter of the alphabet do you think is used most often in the English language? _____
Why do you think so?

Strategy

Choose a paragraph from a book you are currently reading. Count the number of times each letter occurs in the paragraph. Record the results in the tally chart.

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

Which letter occurs most often? _____ Write 2 other things you know from your data. In other words, what **Conclusions** can you make from the data???

1. _____

2. _____

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Practice Sheet 2 (PS2)

Part A [Lesson 1] - Conducting Experiments to Gather Data

1. Malaika and Ava experimented by playing the game Rock, Paper, and Scissors. They wanted to answer this question: Which action wins most often? Here are the data the students collected.

Action	Number of Wins
Rock	9
Paper	11
Scissors	10

Use the data above. What conclusions can you make? Explain.

2. Which method would you use to collect data to answer this question?

How many times can you clap your hands in 20 s?

Explain your choice of method. Collect the data. Answer the question.

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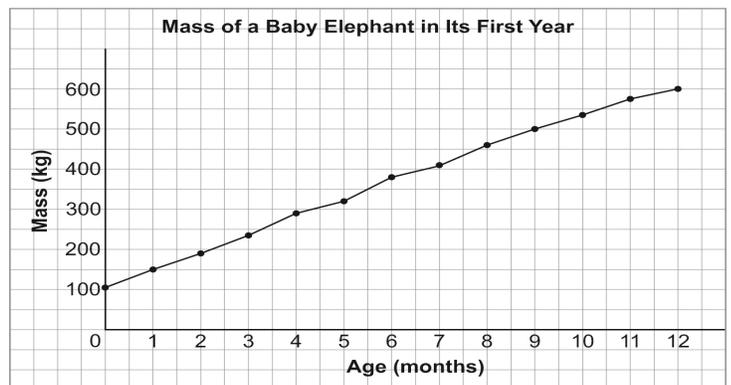
Practice Sheet 3 (PS3)

Part B [Lesson 2] - Interpreting Graphs

1. Would you use a line graph or a series of points to display each set of data? Explain your choices.
- the volume of milk in a glass as it is filled.
 - the number of games won by the Vancouver Canucks each month in the 2010–2011 regular season.
 - the distance travelled by a mail carrier as she covers her route.

2. Answer the following questions using the graph to the right.

a. What does this line graph show?



b. About how much did the baby elephant weigh at each age?

- i) birth ii) 1 month iii) 6 months iv) 1 year

c. During which month did the elephant gain the most mass? The least mass? How does the graph show this? Explain.

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Practice Sheet 4 (PS4)

Part C [Lesson 3] - Interpreting Graphs

----- You will need grid paper -----

1. One afternoon, Angela measured the temperature outside her house every hour.

Time (P.M.)	1:00	2:00	3:00	4:00	5:00	6:00
Temperature (°C)	12	15	18	18	14	12

- Draw a line graph to display these data.
- How did you choose the scale on the vertical axis?
- What conclusions can you make from the graph?

2. This table shows the number of people living in Red Deer, Alberta from 2002 to 2007.

- Draw a graph to display these data. (Write each population to the nearest thousand)
- Did you join the points? Explain.
- What do you know from looking at the graph?

Year	Population
2002	70 593
2003	72 691
2004	75 923
2005	79 082
2006	82 971
2007	85 705

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Practice Sheet 5 (PS5)

Part D [Lesson 4] - Choosing an Appropriate Graph

----- You Will Need Grid Paper -----

1. Louisa surveyed the Grade 6 students in her class to answer this question:

What is your favourite type of dance?

The table to the right shows the data she collected.

- a) Draw a graph to display these data. Explain your choice of graph.

Type of Dance	# of boys	# of girls
Break Dancing	3	2
Hip Hop	4	3
Texas Line Dancing	3	5
Ballet	1	3
Other	4	2

- b) Which type of dance is most popular? Explain.

2. Complete the following.

- a. Choose an appropriate method to collect data to answer this question:

What type of movie do the students in your class prefer to watch?

- c. Collect the data. Record the results.

- d. Draw a graph to display these data. Explain your choice of graph.

- e. What conclusions can you make from the graph?

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Practice Sheet 6 (PS6)

Part E [Lesson 5] - Theoretical and Experimental Probability

----- Theoretical Probability -----

1. Mikayla rolls an octahedron labelled A, A, A, B, C, C, C, C. What is the theoretical probability that the octahedron will land on each letter?

2. Gillian's penny jar contains 25 pennies from 2004, 32 pennies from 2006, 17 pennies from 2007, and 26 pennies from 2008. She picks a penny from the jar at random.
 - a) List all the possible outcomes.

 - b) What is the theoretical probability of each outcome if...
 - i. Gillian picks a penny from 2007.

 - ii. Gillian picks a penny from an even-numbered year.

 - iii. Gillian picks a penny from a leap year.

3. Matt is playing a game at a fun fair. Twenty-five small metal boats are floating in a large tub. On the bottom, 20 boats are marked "Too bad," 4 boats are marked "Take another turn," and 1 boat is marked "You win!" Matt uses a magnet on a stick to pull a boat from the tub.

What is the theoretical probability of each outcome if...

 - a) Matt loses on his first turn.

 - b) Matt gets a second turn.

 - c) Matt wins on his first turn.

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Practice Sheet 7 (PS7)

Part E [Lesson 5] - Theoretical and Experimental Probability

----- Experimental Probability -----

1. Work with a partner. Use the face cards from a standard deck of cards. Shuffle the face cards and place them in a pile on the desk, face down.

a) What is the theoretical probability that the top card is:

i) a red queen?

ii) a black king?

iii) the jack of diamonds?

2. Turn over the top card and record the result. Return it to the pile and shuffle the cards again. Repeat the experiment 11 times.

a. What was the experimental probability of turning over:

i) a red queen?

ii) a black king?

iii) the jack of diamonds?

b. Would the experimental results change if you were to repeat it more times??? Try and find out. What happened? Explain.

b) How do the experimental probabilities compare with the theoretical probabilities? Explain.

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Practice Sheet 8 (PS8)

Part E [Lesson 5] - Theoretical and Experimental Probability

----- Probability Experiments Assignment -----

You will be designing and carrying out experiments using the following materials: For each experiment, you will:

- Design a **question** that you will try to answer after the experiment is over
 - **Predict** what the **outcome(s)** will be before you conduct the experiment – don't forget to **explain** why – you can use math or logical thinking (outside the box) to come up with explanations!!!
 - Come up with a **chart** to record your data
 - Start your **experiment** – clues to help you with the experiment will be in each section below.
 - Don't forget to **answer** the question (conclusion)
 - We will be **graphing** one of your experiments
1. **Dice** – choose one or more of the following 6 or 20 sided dice. Possible ideas:
 - how many times the number 6 will come up after 50 rolls
 - what is the chance the number 3 will not come up after 30 rolls
 2. **Spinner** – using the spinner make up some experiments that will allow you to:
 - Predict how many times a certain color will come up, or not come up or more than 2 colors will come up.
 - Decide how many spins you are going to make to conduct the experiment
 3. **Cards** – grab a deck of 52 cards and figure out how many of each color or number or face card or ???
 - Shuffle the deck of cards
 - Predict how many times one of the numbers, colors or face cards will come up every time you turn a card over
 - Conduct the experiment by deciding how many times you will flip the cards over
 - You can decide whether you replace the card back in the deck or leave it out. Make sure you make a prediction each time before you flip a card
 4. **Color Tiles** – using the tiles, decide how many of each color and what colors you will place in the bag.
 - Mix well and predict what the chances of one or more colors will be pulled out each time.
 - Conduct the experiment by deciding how many times you will choose from the bag
 - You can decide whether you replace the tile back in the bag or leave it out. Make sure you make a prediction each time before you choose a tile from the bag