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Unit 7.8, Lesson 2: Notes

Name Ishaan

My Notes

The letters PROBABILITY are in a bag. In an experiment, one letter is picked at a time and returned to the bag.

1. What is the sample space for this experiment?

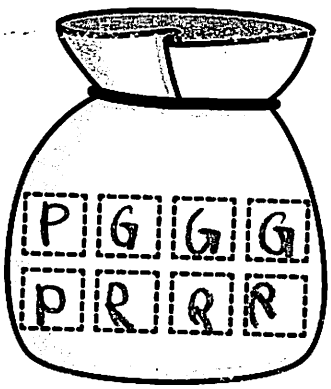
   11 letters

2. Describe how to determine the probability of picking a Y from the bag on the next pick.

   $\frac{\#\text{ of chosen outcomes}}{\#\text{ total outcomes}} = \frac{\text{want}}{\text{Have}}$

Write the probability of each event happening on the next pick.

3. Picking the letter P from the bag. $\frac{1}{11} = 9.09\%$
4. Picking the letter B from the bag. $\frac{2}{11} = 18.18\%$
5. Picking the letters B or I from the bag. $\frac{4}{11} = 36.36\%$
6. Picking the letter S from the bag. $\frac{0}{11} = 0\%$

7. 

Label the pieces in the bag so that it has these probabilities on the next pick:

- ✓ The probability of picking a P is $\frac{1}{4}$.
- ✓ The probability of picking a B is 0.
- ✗ The probability of picking a G is equal to the probability of picking an R.

Summary

To go from a fraction to a percent, multiply by 100

- ☑ I can determine the probability of an event using its sample space.
- ☑ I can compare probabilities written as fractions, decimals, and percentages.

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Unit 7.8, Lesson 3: Notes Name _____

My Notes

There are 6 blocks in a bag. The table shows results from 100 picks.

Block Color	Number of Picks
Purple	32
Red	68

1. Based on these results, how many of the 6 blocks are red?

$\frac{68}{100} = 0.68 \cdot 6 = 4.08$

≈ 4

Explain your thinking.

Since 68% of the blocks picked were red, we can assume 68% of the actual blocks are red, which is about 4.

2.1 Design a bag where the probability of picking a green block is 60%. ■ = block

60% of 10 = 6

2.2 About how many times out of 50 picks do you expect to pick a green block?

60% of 50 = 30

Explain how you know.

Since 60% of the blocks are green, we should expect 60% of the pick to be green

Summary

Find the probability rate = $\frac{\#\text{ of chosen}}{\#\text{ of total}}$

then multiply that by the actual number you have.

- [x] I know that sometimes outcomes of an experiment are not equally likely.
- [x] I can use proportional reasoning with data from a repeated experiment to make predictions.

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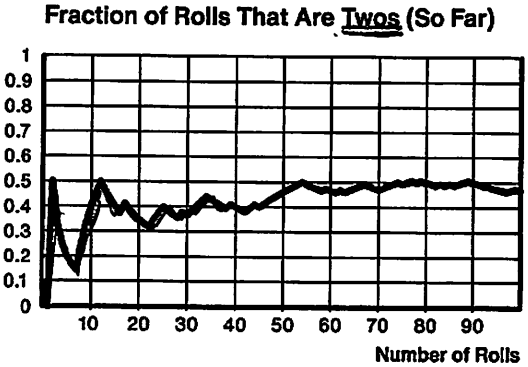
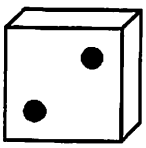
Unit 7.8, Lesson 5: Notes

Name _____

My Notes

Here is a graph of the results of 100 rolls of a number cube.





1. What is the probability of rolling a 2 with a **standard number cube**?

   $\frac{1}{6}$

2. Based on these results, what is the probability of rolling a 2 with **this number cube**?

   $0.5 = \frac{1}{2}$

3. Explain how you know this number cube is unfair.

   Based on the graph, the probability is not what we expect, so it's unfair

4. Describe or draw what this number cube could look like.

   2, 2, 2, 1, 3, 4

Summary

- Use graphs of repeated experiments to tell something is fair based on where the graphs flatten out.

- [x] I can decide whether or not something is fair based on the results of a repeated experiment.
- [x] I can use the results from a repeated experiment to approximate the probability of an event.

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Unit 7.8, Lesson 6: Notes

Name _____

My Notes

Outcomes

$3 \cdot 2 = 6$

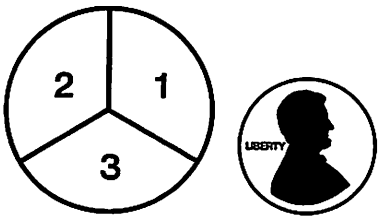
When finding the probability

Use:

- table
- list
- tree
- Multiply the individual probabilities

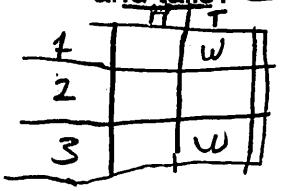
when you have two things, then the table is the easiest

Here is a game involving a spinner and a fair coin.



1.1 How many outcomes are in the sample space?

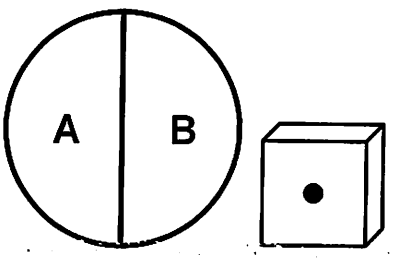
1.2 What is the probability of getting an odd number and tails?



$\frac{2}{6}$ = $\frac{\text{Odd}}{\frac{2}{3}} \cdot \frac{\text{tails}}{\frac{1}{2}} = \frac{1}{3}$

1.3 Describe your strategy.

A new game is played with a spinner and a number cube.



2.1 Make a tree, table, or list to represent the sample space.

	1	2	3	4	5	6
A		✓		✓		✓
B						

2.2 What is the probability of getting an "A" and an even number?

$\frac{3}{12} = \frac{1}{2} \cdot \frac{3}{6} = \frac{1}{4}$

Summary

- Sample space = # of outcomes for each item / just multiply the number of outcomes for
- probability = # desired outcomes / # total outcomes

- [x] I can write out the sample space for a multistep experiment using a list, table, or tree diagram.
- [x] I can calculate the probability of a multistep event.

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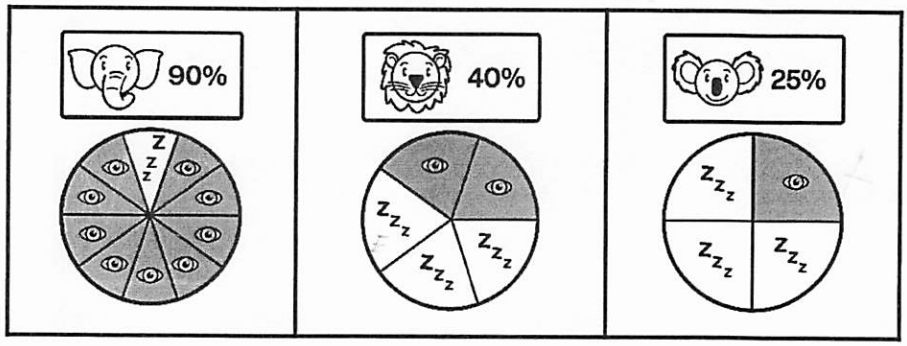
Unit 7.8, Lesson 7: Notes

Name _____

My Notes

Brianna designed a simulation to help her estimate the probability of seeing her three favorite animals awake when she visits the zoo.



1. Describe how Brianna could use these spinners to estimate the probability that at least two of her favorite animals will be awake when she visits the zoo.

She could run repeat experiment (100) to see the probability of each animal being awake

The table shows the results of 300 experiments with the spinners.

Experiments with . . .	Count	Percentage
No animals awake	12	4%
1 animal awake	171	57%
2 animals awake	105	35%
3 animals awake	12	4%

2. Estimate the probability that at least 2 of Brianna's favorite animals will be awake when she visits the zoo.

35% + 4% = 39%

Summary

Create a model to represent a real world situation

- ☐ I can use a simulation to estimate the probability of a multistep real-world event.
- ☐ I can connect real-world situations and the probability tools I could use to simulate those situations.

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Unit 7.8, Practice Day 1: Worksheet Name _____

Carnival Games

1. The bag one

2. A

3. B, because 75725

4. D, where D

Rubber Duck, Rubber Duck, Rubber Duck, Rubber Duck

1. 8

2. 168

3. A, of how, it's fair

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Unit 7.8, Lesson 9: Car, Bike, or Train? Name _____

Activity 1: Marco's Mean and MAD

Here is the data Marco collected about how long it took him to get to school on different days.

Car: 12, 62, 14, 16	**Bicycle**: 25, 23, 22, 28, 27	**Train**: 11, 15, 30, 16, 27, 15

Marco wonders which option is best. He decides to check with some calculations.

Mean of Car

12 + 62 + 14 + 16

74 + 30

104

$\frac{104}{4}$ = 26 minutes

1. Explain what Marco did to calculate the mean.

2. What does the mean say about traveling by car?

MAD of Car

car: 12 62 14 16

distance from 26: 14 36 14 10

3. Explain or show what "distance from 26" represents in Marco's work.

$\frac{14 + 36 + 14 + 10}{4}$

$\frac{74}{4}$ = 18.5

4. Marco made a mistake calculating the mean absolute deviation (MAD).

   Find the mistake and calculate the correct MAD.

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Unit 7.8, Lesson 10: Notes Name _____

My Notes

population - a set of people or item that we want who it's about.

Sample - part of a population, a smaller piece of the population.

Alisha wants to know how many minutes 7th graders at her school spend on their cell phone each day.

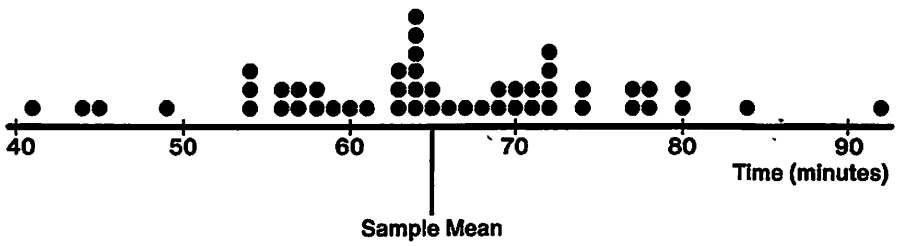
1. What is the **population** for Alisha's question?

The population is all of the 7th graders at her school

2. What is a **sample** Alisha could use to help answer this question?

A sample could be one 7th Grade class

Alisha asked 50 random 7th graders how many minutes they spend on their phone per day and calculated a sample mean of 65 minutes.



3. Why would Alisha decide to collect a sample to answer her question rather than use the population?

It would take too much time & effort to ask all of the 7th graders

Summary

Using a samples gives us a smaller set of numbers to work with but it also gives us data about the whole population

- [x] I can explain what a sample is and when it is useful.
- [x] I can compare the means of samples to the mean of the population.

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Unit 7.8, Lesson 11: Notes Name _____

My Notes

1. In your own words, explain what it means for a sample to be *representative* of a population.

- The sample should come from many parts of the population.
- It's representative if it looks like a smaller version of the population.

2. Match each headline with the sampling method that most likely produced it.

Headline	Sampling Method
C One Quarter of Working Americans Spend Time Working From Home!	A. Ask all 100 employees at one technology company.
A Most Americans Spend Time Working From Home!	B. Ask all the employees at 100 random grocery stores.
B Almost No One Works From Home!	C. Call random phone numbers until you ask 100 people.

3. Which sampling method above is most likely to produce a representative sample? Explain your thinking.

C. Calling random gives us an unbiased sample because we have no idea where they work from a variety of places.

Summary

You need an sample to be representative and random so it isn't biased.

☑ I can explain why a sampling method is or is not likely to produce a biased sample.

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Unit 7.8, Lesson 12: Notes

Name _____

My Notes

Percentage:

$\frac{\text{Have}}{\text{Sample}} \cdot 100$

Cameron bought a bag of White Flower Seed Mix and is curious how many flowers of each type there are. Cameron planted 25 seeds, and these were the results.

Flower Type	Count	Percentage
Daisy	14	56%
White Zinnia	5	20%
Aster	6	24%
Total	25	100%

1. Complete the table with the percentage of each flower type.

2.1 Estimate how many of the 600 seeds in the bag will be asters. Organize your calculations so others can follow them.

$\frac{6}{25} \cdot 600 = 144$

2.2 What could you do to be more confident in your estimate?

Higher number → More flowers

Less number → Less flowers

Summary

Proportional • Population

☑ I can use proportional reasoning and a sample to estimate information about a population.

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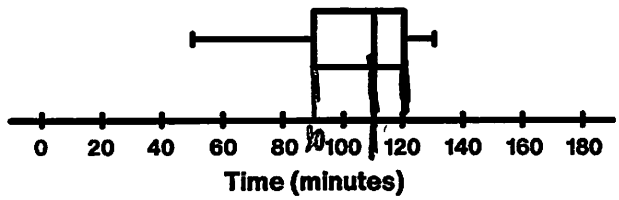
Unit 7.8, Lesson 13: Notes

Name Ethan

My Notes

- Median is the middle line in a box
- IQR is the length of the box

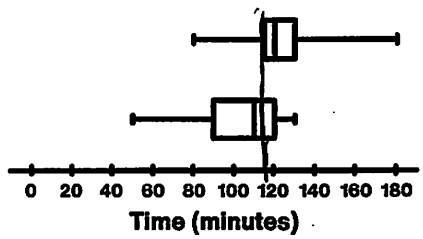
Sai asked 10 random people (sample) at their school how many minutes they exercise each week. Then Sai created a box plot of the answers.



1.1 Label the median on the box plot. 90 mins

1.2 What is the interquartile range (IQR)? 120 - 90 = 30

Sai asked another 10 people. Here are both sets of results.

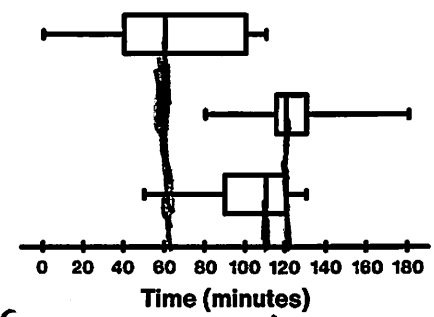


2. Estimate the ~~population median~~ middle of the medians.

Explain your reasoning.

Estimate at 115, middle of the two medians

Sai took a third sample.



3. Does the new data make you more or less confident in your estimate?

Explain your reasoning.

Less confident because now the data is more spread out

$\frac{(60+120+120)}{3}$ = population mean

$= 93$

Summary

- ☐ I can estimate the mean or median of a population based on a sample of the population.
- ☐ I can use the variability of a sample to get an idea for how accurate my estimate is.