Name: _____

Measures of Central Tendency

Measures of central tendency are used to take a set of numbers and find a single number that best represents the group. Mean, median, mode, and range are four types of measures of central tendency. Read about each below.

Mean

- Definition: The average of a list of numbers.
- How to find it: add up all the number in the list. Then, divide the sum by how many numbers are in the list.
- Example: 10, 3, 6, 9, 11, 7, 8, 4, 6, 15. 6. 8. 7, 5, 5
  - Sum of the numbers in the list: 110
  - Number of items in the list: 15
  - Mean = $\dfrac{\text{Sum of Numbers}}{\text{Number of Items}} = \dfrac{110}{15} = 7.\overline{3}$

Median

- Definition: The number with the value in the middle of all of the values in a list of numbers.
- How to find it: Write the numbers in order from least to greatest. Then, find the number that is in the middle of the list.
- Example: 10, 3, 6, 9, 11, 7, 8, 4, 6, 15. 6. 8. 7, 5, 5
  - List from least to greatest: 3, 4, 5, 5, 6, 6, 6, 7, 7, 8, 8, 9, 10, 11, 15
  - There are 15 numbers in the list, so the middle number is the one where there are equal numbers to the left and right of it.
  - Median = 7

Mode

- Definition: The most common number in a list of numbers.
- How to find it: Count how many times each number appears in a list. The number that appears the most number of times is the mode.
- Example: 10, 3, 6, 9, 11, 7, 8, 4, 6, 15, 6, 8, 7, 5, 5
  - The number 6 appears the most number of times.
  - This means the mode is 6.

Range

- Definition: The distance, or difference, between the highest and lowest values in a list of numbers.
- How to find it: Subtract the smallest number in the list from the greatest number in the list.
- Example: 10, 3, 6, 9, 11, 7, 8, 4, 6, 15. 6. 8. 7, 5, 5
  - Largest number: 15
  - Smallest number: 3
  - Range: 15 - 3 = 12
  - Range = 12

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Steps to Start a Food Business

Step 1: Read Background Information

Imagine that you and a friend want to start a new food business. You are deciding if you want to start a food truck business or a vending machine business. Read about each business idea below.

Food Truck:

A food truck business will offer a variety of freshly-made snack foods for purchase. The food truck will be able to travel around your town and sell at local events and festivals.

- Pros:
  - Ability to create a new menu monthly or seasonally
  - Food is delivered fresh to customer and not made with preservatives
  - Truck is mobile and can go anywhere (like to big concerts or sports events)
- Cons:
  - Purchase of a food truck is expensive
  - People are needed to run the food truck (expensive to hire people and time intensive to manage people who work for you)
  - Fresh food goes bad quickly and could be wasted
- Can you think of other pros and cons of starting a food truck? Write your thoughts below:

Vending Machine:

A vending machine business will sell your own brand of portable snack foods. You will set up 3 vending machines at different locations throughout your town.

- Pros:
  - Personnel are not needed to run it each day
  - Open for orders 24/7, instead of just small windows of time
  - As owner of the business, you can set your own hours and decide when to service and restock machines
- Cons:
  - Food can't be fresh since it has to be able to sit in a vending machine for an extended period of time
  - To increase profit you need a lot of machines, which take more work to keep serviced and stocked
  - Competition for prime locations
- Can you think of other pros and cons of starting a vending machine company? Write your thoughts below:

Step 2: Analyze Data From a Focus Group

You and your partner decide to collect data from a focus group so you can better understand people's food preferences. Your teacher will give you a handout called "Data From Focus Group." Look through the data from a focus group and use measures of central tendency to analyze the data and answer the questions below. Make sure to show your work.

- What is the mean age of the participants in the focus group?

- What is the most common number (mode) of food truck purchases made by members of the focus group?

- What is the most common number (mode) of vending machine purchases made by members of the focus group?

- What is the median value of money spent on food truck purchases in a month?

- What is the median value of money spent on vending machine purchases in a month?

- What is the range of the focus group's age? Do you think it is a large enough range to be representative of the people that will be a customer at your food business? Why or why not?

- Do you think the sample size (number of people surveyed) is enough to give you confidence in the data? Why or why not?

- Based on your analysis of the data, which business do you want to start and why?

Step 3: Create a Minimal Viable Product (MVP)

Use art supplies and building materials to build an MVP for your food truck or vending machine. Requirements for your MVP include:

- A physical structure that is at least the size of a shoe box (see examples below)
- A name for your business that is prominently displayed on your structure (food truck or vending machine)
- A menu featuring at least 4 items your food business will sell

- Remember to refer to the calculations you did in step 2 to help you make your business decision.

Examples of MVPs:
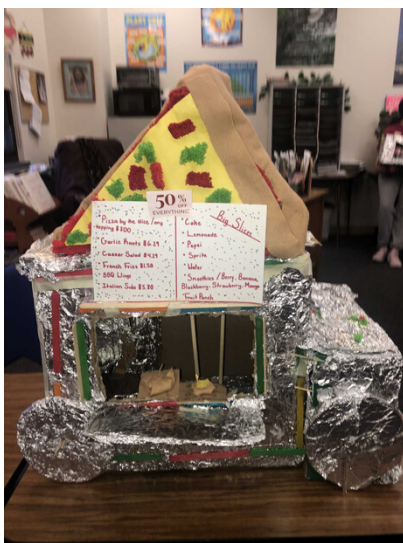
Name: _____

Data From a Focus Group

Age of Participants

Participant Number	Age in Years
1	14
2	37
3	46
4	23
5	26
6	16
7	23
8	53
9	42
10	34

Number of Purchases From a Food Truck in the Last Month

Participant Number	Number of Purchases
1	2
2	3
3	9
4	7
5	18
6	4
7	3
8	8
9	1
10	3

Amount of Money Spent on Food Trucks in the Last Month

Participant Number	Money Spent
1	19
2	21
3	59
4	48
5	139
6	29
7	26
8	61
9	13
10	21

Number of Purchases From a Vending Machine in the Last Month

Participant Number	Number of Purchases
1	13
2	12
3	5
4	15
5	13
6	15
7	8
8	13
9	9
10	7

Amount of Money Spent on Vending Machine Purchases in the Last Month

Participant Number	Money Spent
1	36
2	29
3	14
4	46
5	41
6	47
7	19
8	35
9	18
10	12

Other Data:

The focus group participants were also asked what their favorite snack food is. The results are shown below:

- 53% of participants' favorite snack is chips
- 16 % of participants' favorite snack is french fries
- 14% of participants' favorite snack is an apple1
- 0 % of participants' favorite snack is a soft pretzel
- 7% of participants' favorite snack is trail mix

The focus group participants were also asked whether they prefer to buy snacks that are healthy or unhealthy. The results are shown below:

- 44% Unhealthy
- 36 % Healthy
- 20% equal amounts of healthy and unhealthy

Name: _____

How to Create a Crowd-Funding Video

Create a crowd funding video that will advertise your new food company and help you get funding! Follow the steps below:

Step 1: Write a script

Opening

The opening of your video should introduce your company and grab your viewer's attention. You might want to open with an interesting fact or a question. Write 2 or 3 sentences you can use for your opening below:

_____

_____

_____

_____

Middle

The middle of your video should teach your viewers all about your new business and convince them to invest in it! Write 5 or 6 sentences that you can use for the middle of your episode.

_____

_____

_____

_____

_____

_____

_____

_____

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Closing

The closing of your video should wrap up what you have told your viewers. You can also tell viewers how to invest in your new business or how to contact you with questions or concerns. Write 2 or 3 sentences that you can use for the closing of your video below:

_____

_____

_____

_____

_____

_____

_____

Step 2: Record Your Video!

Use your script and a tablet or smart phone to create your crowdfunding video!

Name: _____

Teacher Key

What is the mean age of the participants in the focus group? 31.4 years old

What is the most common number (mode) of food truck purchases made by members of the focus group? 3 purchases

What is the most common number (mode) of vending machine purchases made by members of the focus group? 13 purchases

What is the median value of money spent on food truck purchases in a month? $27.50

What is the median value of money spent on vending machine purchases in a month? $32.00

What is the range of the focus group's age? Do you think it is a large enough range to be representative of the people that will be a customer at your food business? Why or why not? The range of ages is 39 years. Answers will vary based on opinion.

Based on your analysis of the data, which business do you want to start and why?
Students can make an argument for either business, making sure they use the data to support their case. For example, people make more purchases from the vending machine. This might be a good reason for the business to expand to more machines knowing that they are well used. Alternatively, people spend more money on each visit to the food truck. Therefore, you can potentially make more profit with fewer customers.

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