*Allergy

Lesson 5 – Weight a Minute…

Overview

This lesson introduces the concept of **measurement**. Measurement is the assignment of numerals to the characteristics of objects or people. When we look around us, we can see that the people, animals, plants, and other objects in our world differ in a variety of ways. Some characteristics (variables) can be classified into groups. Some characteristics (variables) must be measured. Measurement is important to scientists because it allows for precision when describing characteristics. It also provides a method for making comparisons or quantifying relationships between variables. Measurement is also important and relevant in our daily lives. For example, measurements of our weight can tell the doctor important information about our overall health. Measurement is also important when cooking so that we know the right amount of each ingredient to use so that our meals can turn out tasty.

In an activity about serving size, UQUEST scientists will weigh the amount of food recommended as a serving as indicated by Nutrition Facts labels. This activity will teach UQUEST scientists about reading Nutrition Facts labels and how to use serving size suggestions when deciding how much to serve themselves. Finally, UQUEST scientists will document the data collected and compare the estimated and actual serving sizes of foods.

Science Objectives:

UQUEST scientists will:

- Understand that measurement is important in science.
- Use tools to measure characteristics (variables) of objects.
- Understand how to use a digital scale to measure the weight of objects.

Health Messages:

- Knowing the serving size can help us decide our portions - how much to serve ourselves.
- Pay attention to how your body feels before and after eating to decide how much you want to eat.

Reinforcement of previous messages:

- Variability (Lesson 2) - Measurement allows UQUEST scientists to quantify variability.

Vocabulary:

- **Measurement:** The assignment of numerals to the characteristics of objects.
- **Units:** The metric we use to measure different things and compare how big or small something is. Examples include grams, pounds, and ounces.
- **Scale:** A scale is a tool that scientists use to measure weight.
- **Serving size:** A recommended amount of food or drink according to The Nutrition Facts Label.

- **Portion:** A portion is the amount of food that we choose to eat for a meal or snack, which may include more than one serving from the Nutrition Facts Label.

Materials:

- UQUEST kit
- Greek yogurt
- Berries (blueberries, raspberries)
- Granola Yes
- Plantain chips* - one large bag for each team Yes
- Light weight paper bowls (2 per UQUEST scientist) Yes
- Ziploc or brown paper bags (1 per UQUEST Scientist) Yes
- 4-5 Scoopers/Spoons Yes
- 4-5 digital food scales Yes
- 4-5 Measuring cups Yes
- Paper cups Yes
- Water Yes
- Red food coloring Yes
- 4-5 Rulers Yes
- Thermometers (non-contact or digital) Yes
- Syringe (without needle) Yes
- Magnetic dry-erase easel with dry erase markers Yes

Preparation:

At UM:

- Check settings of the scale to make sure it is set to grams. Practice using scale.
- Mix water with red food coloring

At OYC:

- Ensure that no scientist has an allergy to any foods used today
- Place materials (snacks, bowls, utensils, scales, dry erase boards, etc.) at each table.
- Prepare dry erase board with the graph template (i.e., with axes labeled, title).

Introductory Script:

Welcome UQUEST scientists.

Remember the lab notebook is an important tool that scientists use to record their observations and the results of their experiments.

Let's open up your lab notebooks to the second page. Like all scientists, UQUEST scientists pay attention to the world around them. They create an environment that helps them to learn about the world. They listen to each other. They communicate with each other. And they treat each other with respect.

Let's review the values of a UQUEST scientist. Each UQUEST scientist reads OUT LOUD one value.

1. **Pay attention** when others are talking.
2. **Speak in a low voice**. Do not scream.
3. **Respect each other.** Do not push or shove each other.

Be sure to praise the students when they do well and tell them why.

Relaxation

Before we begin the lesson, we'd like to start off by doing a relaxation activity. When scientists are relaxed, they do better science.

- Guide the UQUEST scientists, through relaxation for ~1 minute. For example, take 10 deep breaths.

Instructions for Lesson 5

1. **Introduction**
    - ***a.*** **Show digital scale, measuring cup, and ruler to the UQUEST scientists.**
    - ***b.*** *Look at these three objects. Let's think about them.*
        - i. *What are they? What are they used for? How are they alike?*
            1. **If not stated, say:** *they are all tools used for measurement.*
    - c. *What does **measurement** mean?*
        - i. *Measurement gives a number that shows the size or amount of something.*
    - d. *We use measurement every day! What are some things in our lives that can be measured?*
        - i. *What does a clock or a watch measure?*
            1. *Time!*
        - ii. *If we are making cookies, what would we measure?*
            1. *We measure the flour, sugar, chocolate chips – the recipe tells us how much of each to measure and put in so that its tastes good!*
        - iii. *When you go to the doctor, does your doctor or nurse measure anything?*
            1. *Your height, your weight, your temperature, your heart rate.*
    - e. *These are all examples of things we measure. These measurements are important in our daily activities – for example, when we are cooking, telling time, or checking our temperature.*
    - *f.* **UQUEST guide points to the digital scale.**
        - *i.* *What is this? What can we do with the scale?*
            1. *This is a scale used to weigh objects.*
        - ii. *Scientists use tools like scales for measurements. Scientists use tools to measure characteristics or variables like height, weight, size, time, or the amount of something.*
        - ***iii.*** **Ask what scientists can measure**
            1. **Examples:** *distance, length, weight, temperature, and time.*

g. Ask scientists about other tools of measurement

i. **Example:** *Chefs use measuring cups to measure ingredients, builders use rulers to measure the size of bricks, doctors use a thermometer to measure your temperature, and we use a watch to tell time.*

2. Intro Activity

a. Present thermometer and syringe

i. *What is a thermometer used for?*

1. To measure temperature (the degree of hotness or coldness of an object)

ii. *What unit of measurement do we use to measure temperature?*

1. *Fahrenheit or Celsius*

2. *Is 100 degrees Fahrenheit hot or cold?*

a. Hot! That's the temperature you may feel on a hot summer day in Miami.

iii. Practice taking temperature measurements by having scientists measure the temperature of other scientists in the group.

iv. Now let's look at this other tool. It is called a syringe. What is a syringe used for?

1. To measure and inject medication into the body or take out fluid from the body.

v. What unit of measurement do we use with this syringe?

1. *Milliliters! You can see that this syringe measures up to 20 mL*

vi. Practice using syringe with scientists

1. We are going to take turns taking out 20mL of red liquid from one cup and injecting it into this second cup.

2. Remember that we only want the liquid to reach the "20" millimeter mark.

3. **UQUEST scientists take turns using syringe.**

vii. Now we have used two tools that scientists use for measurement. Let's measure some more!

3. Activity

a. Introduce serving size and portion

b. **Discuss portion and serving sizes (with importance of balancing snacking and meals)**

c. *How do you determine how much food to serve yourself when you decide to eat a snack? Do you eat the whole bag or box, or just part of it?*
    i. *A **portion** is the amount of food that you choose to eat for a meal or snack. For example, if I decide to eat 30 chips, then my portion is 30 chips.*
    ii. *A **serving size** is a recommended amount of food or drink according to the Nutrition Facts label. For example, 15 chips may be 1 serving size, and 30 chips may be 2 serving sizes.*
        1. *These servings are typically used to determine the recommended amount of food a person should eat.*
    iii. *The Nutrition Facts label is found on packaged foods—on the backs of cans, sides of boxes, back of packages.*
        1. **Point to plain chips bag's Nutrition Facts label.**

d. Direct scientists to lab notebooks page 5B.
    i. *Think about how many chips you typically serve yourself. I'm going to pass around the plantain chips bag and I want you to pour plantain chips into your bowl, the amount you would normally pour yourself.*
        1. **Emphasize this is not a competition! If they would like more chips later, we will give them more. For now, scientists will just pour into the bowl the amount they would typically eat.**
        2. **Help scientists pour if necessary to prevent spillage.**
    ii. *This is the amount of chips that each of you may typically eat.*
    iii. **Have scientists WAIT to eat food until after measurements are completed.**

e. **Now it's time for yogurt!**
    i. *Think about how much yogurt you typically serve yourself. I'm going to pass around the container and I want you to scoop the yogurt into your bowl, the amount you would normally pour yourself.*
    ii. **Repeat above steps as you did with plantain chips.**

f. **Introduce scale**
    i. **The digital scale will be needed for this activity.**
    ii. **Have each UQUEST scientist choose a small classroom object to weigh (e.g., pencil, lab notebook). Weigh the object and have UQUEST scientists read the weight in grams.**
        1. *What number is displayed? That means that the <u>pencil</u> [or other object] weighs XX grams. How do we know that the unit of measurement in grams and not ounces or pounds?*

a. *We look at this part of the digital scale* **[UQUEST Guide points]** *that says "g" for "grams."*
b. *It is important to know the unit of measurement. A unit is what we use to measure different things and compare how big or small something is.*

g. **Use the scale to weigh amount of plantain chips and yogurt**

i. **Place empty bowl on top of scale, and set to tare so that the bowl is not considered in the weight of the portion.**
ii. **Remove empty plate**
iii. **Scale should give you a negative number**

h. **Scientists take turns placing their pre-poured bowl with chips on top of scale.**

i. *Scientists, place the bowl with the chips onto the scale. What number is shown on the scale?*

1. **Example**: 45 grams. *Yes, the bowl weighs 45 grams.*
2. *How do you know the unit is grams?*
a. *We know this because it says "g" on the scale* (**point to this part on the scale).**
3. *Write this number down in your lab notebooks next to where its asks "How many grams is a typical portion of plantain chips?"*

ii. <u>Repeat for yogurt bowl.</u>

1. *Write this number down in your lab notebooks next to where its asks "How many grams is a typical portion of yogurt?"*

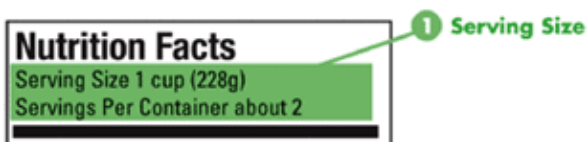
i. **Next, have the UQUEST scientists look at the Nutrition Facts label on the packages.**

j. *The Nutrition Facts label tells you how many servings are in the package and the amount for one recommended serving size.*

k. *Where does it say "serving size?"* **Once UQUEST scientists finds it, show the rest of team.**

i. *What is the recommended serving size for this plantain chips bag?*
1. **Example***: It is 228 grams.*
2. *Write this number down in your lab notebooks. Is this more or is it less than the weight of the plantain chips we just measured?*
a. **Example:** *It is less than what we just measured.*

ii. What is the recommended serving size for this yogurt container?
1. Example*: It is 170 grams.*
2. Write this number down in your lab notebooks. Is this more or is it less than the weight of the yogurt we just measured?
a. Example: *It is less than what we just measured.*



l. **Use a food scale to measure the recommended serving size.**

i. *Let's take another bowl and measure the recommended serving size, XX grams, for this bag of chips. And XX grams for yogurt.*
    1. **Place empty bowl on top of scale, and set to tare so that the bowl is not considered in the weight of the serving.**
    2. **Remove empty plate**
    3. **Scale should give you a negative number**
ii. *Slowly add chips to the bowl on top of the scale until it reads XX grams.*
iii. Repeat for yogurt

m. **Place that bowl next to the bowl with the portion size determined by the UQUEST scientists. Ask them to compare the two, and let them share their thoughts.**
i. Which bowl has more?

n. Now you can eat your snacks!
i. Distribute toppings (berries and granola) for them to add to their yogurt.
1. Optional (if time permits): scientists can also weigh their yogurt toppings
2. *Berries and granola are healthy toppings we can add for extra flavor to our yogurt.*

o. Pour each UQUEST scientist's chips into a Ziploc or paper bag for them to take home.
i. **Put the bags to the side and distribute at the end of the lesson to minimize distractions.**

p. Health message
i. **Example***: We saw that our portion of yogurt and plantain chips is bigger than the recommended serving size.*
ii. Ask about eating more than recommended portion
1. If we eat portions on a regular basis that are larger than our body requires, we may overeat and feel sluggish (low energy).
iii. What are some ways we can keep our portions within a single serving size?
a. We can look at the Nutrition Facts labels on foods more often so we know the actual recommended serving size.
2. We can also avoid eating snacks like chips or cookies right from the package. Instead, put one serving size on our plate, close the bag and put it away. If you still want more after that first serving, stop and pay attention to how your body feels.
3. If your stomach feels full, then that is a message from your body to stop eating. When you snack on healthier foods like fruits and vegetables, its usually okay to have more than one serving.

4. Documentation
a. Have scientists create a bar graph to compare a recommended serving size of plantain chips to the portion we typically serve ourselves.
b. **Please turn to page 5C in your lab notebook.**
c. **Review title, horizontal and vertical axes, and their respective labels**
i. Title: Weighing our food
ii. X axis: "Food measurement."
iii. Y axis: "weight in grams"

d. *It is also important to state the unit of measurement. What unit did we use? What unit do you see on vertical or y-axis?*
    i. *Grams*
e. *What is the graph missing? Can you fill it in?*
    i. *It's missing some of the numbers on the Y axis*
f. Complete graph
    i. *Find the number on the Y or vertical axis that represents the portion size that you served yourself. Remember you wrote down this number earlier in your lab notebooks.*
    ii. Repeat for recommended serving size.

4. **Discussion**

1. **Now let's discuss what we did today. I will ask some questions, and if you answer, you get a sticker. At the end, the stickers can be traded in for a special prize. Let's GO!**
    i. **Award sticker for every question answered.**
    ii. **Note: below are example questions. You can ask additional questions not listed.**

2. **What differences do you see between the bars? What does the difference in sizes of the bars represent?**
    a. *A taller or longer bar means more weight. The portion of food we may normally serve ourselves may be more than the recommended serving size.*
3. **What did we do and learn today?**
    a. *Today we measured the weight of our food in grams using the scale.*
    b. *Then we wrote those measurements in our lab notebooks and we graphed the weight of our portions (how much we would typically eat) and of the recommended serving sizes of the snacks. We measured and compared the portion and recommended serving size of yogurt and plantain chips.*
4. **What are some examples of how we use measurement in our everyday lives?**
    a. **Examples:** *We use measurement to tell time, check our temperature, and measure ingredients for a recipe.*
5. **What unit of measurement did we use to measure the snacks?**
    a. *Grams*
6. **What tools can we use to measure? What tool can we use to measure weight specifically?**
    a. *We can use rulers, measuring cups, and scales specifically for weight*
7. **Health message**
    a. *We learned that sometimes the portion of yogurt and of plantain chips we serve ourselves is more than the recommended serving size.*
    b. What is a serving size? Where can you find out the serving size of a food?
        i. *A serving size is a recommended amount of food or drink according to the Nutrition Facts Label that is located of the back or side of packages, boxes, containers, and wrappers.*
    c. *Were you surprised to learn what a recommended serving size looks like?*
    d. *How can the recommended serving size influence the way you eat?*

i. *Knowing how much is recommended can help us decide our portions -- how much to serve ourselves. We can put one serving size on our plate, close the bag and put it away. If we still want more after that first serving, we can stop and pay attention to how our body feels.*

8. **Wrap-up**

a. *What did you learn today? Write that down on the lines on page 5D.*
b. *How much did you like today's lesson on scale from strongly agree to strongly disagree.*
c. **Award prize at the end based on number of stickers.**

References

- HealthPoweredKids by Alina Health. Retrieved from https://healthpoweredkids.org/lessons/portion-distortion/

Lesson 5
Weight a Minute...

Date: _____

Measurement

PLANTAIN CHIPS

How many grams is a typical portion of plantain chips? ____ grams

How many grams is the recommended serving size for plantain chips? ____ grams

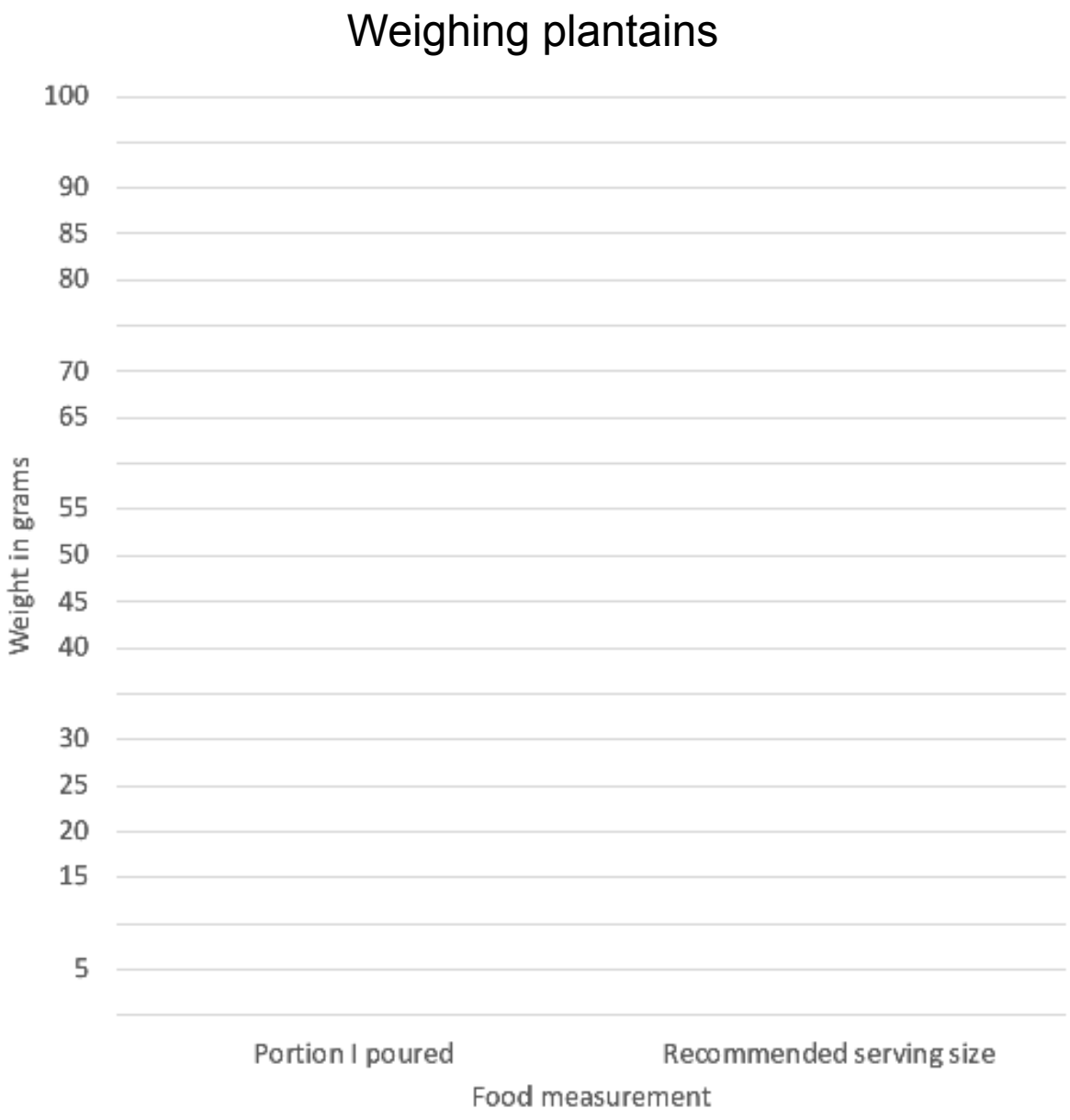
YOGURT

How many grams is a typical portion of yogurt? ____ grams

How many grams is the recommended serving size for yogurt? _____ grams

Date: _____

Graphing



Date: _____

Lesson 5

What did I learn today?

_____

_____

_____

I liked this lesson (circle one):

Strongly Agree	Agree	Disagree	Strongly Disagree