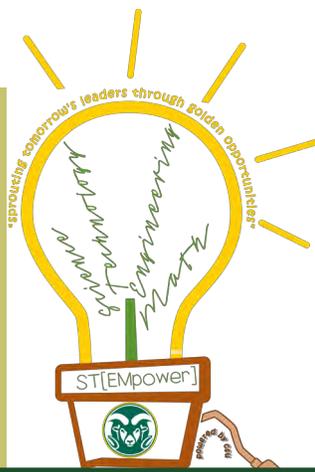


ST[EMpower]

YUMMY GOOD!



VOLUME 11, ISSUE 2, January 2022

Delicious Food and Healthy Eating

CONTENT HIGHLIGHTS

- Homeostasis: A Sweet Balancing Act *page 2*
- My Plate: Balanced Meals and Portion Size *page 11*
- Salt: Egg Osmosis *page 18*
- Fats: Energy Food *page 24*
- The Carb Card Game *page 29*
- Make It Mine: My Favorite Recipes *page 61*
- Gross Gastronomy! *page 67*
- Service Project: Food Secure *page 70*



Food holds a unique place in the human experience. When we think of other cultures, we first think of their cuisine. Even though different cultures have very different dishes, the importance of food is a shared human experience.

Food is so much more than basic survival. It is first an emotional connection. We equate food with family, traditions, memories, and even our identities. Creating dishes for our loved ones provides that joyful connection to each other.

There are four basic factors to what makes a delicious dish:

1. flavor
2. aroma
3. appearance
4. texture

Food not only sustains us emotionally, but also physically. What we eat is important to our quality of life and our health.

My beagles are an example of this. Pete and Archie were



Archie

Pete

rescue beagles. When I adopted them, they were starving. I could count their individual vertebrae and ribs. Their coats were coarse and dry. That was 7 years ago. Now they are well fed with high quality food, visit the vet regularly, and are loved. Their coats are mostly soft, but they still have a small section of fur by their tails that is coarse and dry. That is lasting evidence of their starvation diet when they were abandoned.

Food only becomes a means of survival when people become food insecure. The last activity in this issue are ideas how you can alleviate food insecurities in your county and in our world.

Homeostasis (*homoios* = “still,” *stasis* = “stay the same”) is the active upkeep of an organism’s insides in response to the surrounding outside.

An example of **homeostasis** is how mammals regulate their body temperature. The average body temperature for people is 98.6°F. The normal range of body temperature is between 97-99°F. That means it can be normal to have a fairly constant temperature of 97.8°F. That is perfectly normal, and it falls within the acceptable range.

Homeostasis works by sweating when we get hot. The blood vessels in our skin expand to expel heat. We even use behavior (seeking out shade, air conditioning, or swim to cool down). **Homeostasis** works by shivering when get cold. Our blood vessels narrow to keep in our heat. We use behavior by wearing warmer clothes, and pulling our arms and legs closer to our bodies to keep warm.

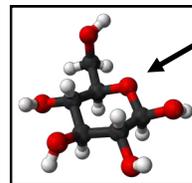
Another example of **homeostasis** is the **negative feedback** loop between **glucose**, **glycogen**, and **insulin**. This system maintains **glucose** (a simple sugar) levels within a healthy range in our bloodstream. Our cells need **glucose** to make little packets of energy that provide the fuel for the cell to function properly.

Developed by: Madeline Keleher, Ph.D.
Modified by: Barbara J. Shaw, Ph.D.
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How it works:

- You eat a meal
- The food travels to your stomach where it is broken into large molecules of fats, carbohydrates, and proteins
- The molecules travel to your intestines, where the carbohydrates are broken down further into glucose molecules
- Glucose is absorbed from the intestines into the bloodstream
- The higher levels of glucose trigger your liver to convert the glucose into glycogen, and stores it there
- Throughout the day, the liver releases glucose into the bloodstream, maintaining constant blood sugar levels
- Your pancreas makes and releases insulin into the bloodstream
- Insulin attaches to the cell, like a key in a lock, opening the cell’s port to transport glucose into the cell
- The cell uses the glucose in the cellular respiration pathway to make ATP, a little packet of energy to power the cell’s metabolic functions

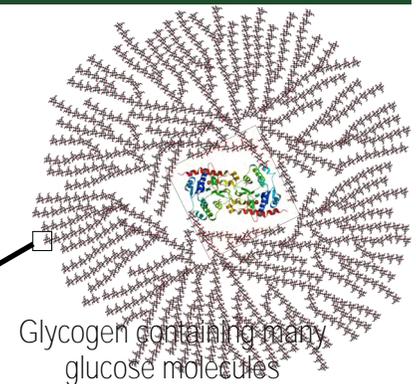
A single glucose molecule



POWER WORDS

- **glucose**: a simple sugar our body uses for energy
- **glycogen**: glucose stored in the pancreas
- **homeostasis**: the tendency toward a relatively stable equilibrium between interdependent elements, especially as maintained by physiological processes
- **insulin**: a hormone to open cells, allow glucose inside
- **negative feedback**: the counteraction of an effect; for example, if blood sugar increases, out bodies signal the release of insulin to counteract that increase

For more information about glucose and glycogen, see the green sidebar on page 4.



Glycogen containing many glucose molecules

MATERIALS

- coat hanger
- two 3 oz. paper cups
- 7 pieces of 12” string
- 50 blue beads
- 50 red beads
- print single-sided pages 9—10
- tape
- metal paperclips (larger works better, but not necessary)
- print 3 copies of page 8 (can be double or single-sided)
- scissors
- sharpened pencil

DO

- Watch: <https://www.youtube.com/watch?v=OYH1deu7-4E>
- Tell your parent how insulin opens the cell to allow glucose to enter.

People with diabetes have disrupted negative feedback loop. This causes too much glucose in their blood. Too much blood sugar can damage blood vessels, impair the ability of their blood vessels to widen, and lead to organ damage. Diabetes is just one example of many diseases that are due to a failure of **homeostasis**.

In this activity, you will explore how **homeostasis** works to maintain blood sugar. It also explores how diabetes disrupts the normal function.

Directions:

DO

Build the Balance

- Cut out the shapes on page 10 (“Too Much Glucose” and “Not Enough Glucose” markers, “Glucose” and “Insulin” cup labels, and the “Glucose” arrow).
- Suspend the hanger so it

- hangs freely (e.g. by a pencil). Loosely tape the markers “TOO MUCH GLUCOSE” on the left and the “NOT ENOUGH GLUCOSE” on the right in side of the hanger, leaving about 3” from the end.
- Shift the markers until the coat hanger is balanced. Secure the tape to the marker and the coat hanger.
- Cut a piece of string 12” long. Tape one end of the string to the “Glucose” arrow by the small circle. Tie the other end of the string to the center of the hanger so that the arrow is level with the bottom of the two markers.



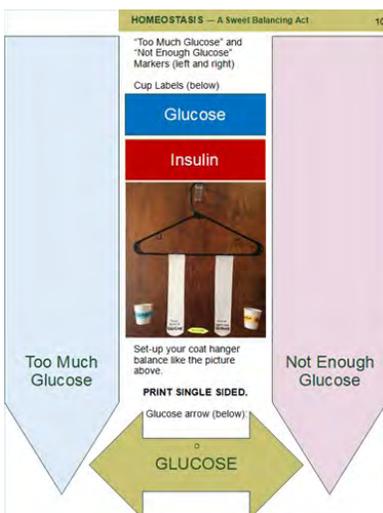
- Attach 1-3 paperclips to the “Glucose” arrow to add a bit of weight.
- Suspend the hanger. Shift the “Glucose” arrow string on the hanger until the

FASCINATING FACTS

- Broccoli has more protein than a steak—calorie for calorie!
- Jelly beans can take between 7-21 days to make! If you are interested in making your own jelly bean, check out an earlier issue of ST[EMpower]. See 63.Hogwarts issue on the webpage <https://tra.extension.colostate.edu/about-stem-k12/stem-resources/>. The issue’s link is located towards the bottom of the page.

hanger is balanced.

- Tape the “Glucose” label to one cup and “Insulin” label on the other cup.
- Poke 3 holes equally spaced into the top of each cup with your sharpened pencil. The pencil hole should be about ¼ inch below the rim.
- Cut 6 pieces of string 12” long. Thread one piece of string through each hole and tie it to keep in place.



JOKES

- Q. What does Charles Dicken’s keep on his spice rack?
A. The best of thymes; the worst of thymes...
- Q. What do you call a fake noodle?
A. An impasta...

- Pull the three strings together about 3" above the cup. Balance the cup. Tie the strings together (example below). Be careful that the cup remains level at the knot.



each card. You will use these paperclips to hang the card on the coat hanger.

GLUCOSE and GLYCOGEN

- **Glucose** is the sugar in our bloodstream that our body uses for energy.
- **Glycogen** is a stored form of energy. After eating, when there is too much glucose in the bloodstream, the extra glucose is converted to glycogen to be stored in the liver and muscles.

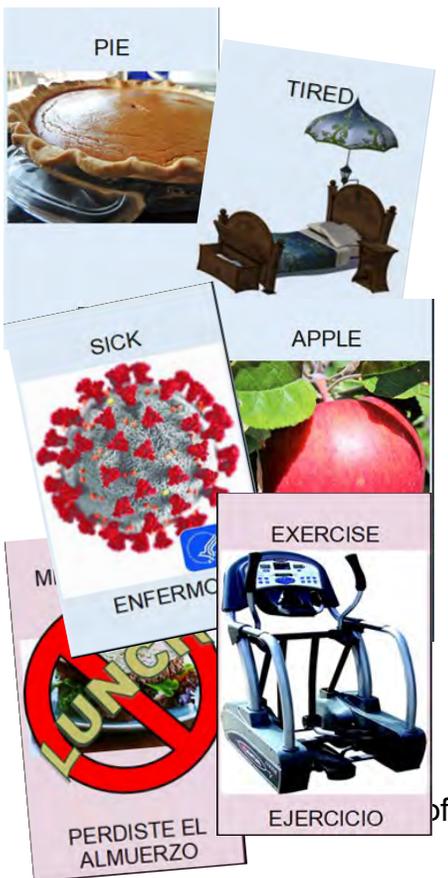
- Tie the three strings on the "Glucose" cup on the left side of your hanger. Tie your "Insulin" cup on the right side your hanger.
- Suspend your coat hanger and shift the cup strings until the hanger is balanced.
- Cut out your 6 scenario cards. Open 6 paperclips



- Tape 15 paperclips to the back of "SICK" card. These paperclips will act as a weight for your card.
- Tape 10 paperclips to the back of the "PIE" and "MISSED LUNCH" cards.
- Tape 8 paperclips to the back of "APPLE" and "EXERCISE" cards.
- Tape 6 paperclips to the "TIRED" card.
- Your coat hanger balance is ready!

What Do You Think?

- Think of a time when you felt really hot. What did your body do to cool down? **Sweat, blood vessels at skin's surface widen to expel heat, seek an air conditioner, or go swimming, etc.**
- Think of a time when you felt really cold. What did your body do to warm up? **Shiver, goosebumps (hair**



INSULIN

- **Insulin** is a hormone that is responsible for allowing glucose in the blood to enter cells, providing them with the energy to function. Your pancreas makes the hormone insulin.
- **Hormones** are a regulatory substance produced in an organism and transported in tissue fluids such as blood to stimulate specific cells or tissues into action.

stands on end, your body keeps in more heat), blood vessels narrow to lose less heat, put on warmer clothes, sit by a campfire, etc.

Normal Function

- Put 5 blue beads into the **glucose** cup and 5 red beads into the **insulin** cup. Where is the glucose level? (It should be in the middle, a healthy level).
- Follow the instructions on the datasheet in the table on page 8 (image below).

HOMEOSTASIS — A Sweet Balancing Act		
<p>We need glucose (sugar) to survive. Glucose gives fuel to our brains and muscles. One way our bodies maintain glucose homeostasis is balancing glucagon and insulin. If your glucose levels get too low, you may feel confused, faint, have a seizure, or even die. If your glucose levels are too high, it can damage your kidneys, heart, eyes, and feet over time.</p> <p>You will simulate your body's response to different environmental. Blue beads represent glucagon molecules. Red beads represent insulin molecules. Before each of the 6 rounds, start with 5 blue beads in the glucagon cup and 5 red beads in the insulin cup. During each round, check off the appropriate boxes and record the number of beads you added in the spaces below.</p>		
<p>You just ate three slices of cake. Add the "cake" card to the left side of the hanger.</p> <p>What happens to your glucose levels? <input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels? <input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>	<p>You missed. Add the "missed lunch" card to the right side of the hanger.</p> <p>What happens to your glucose levels? <input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels? <input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>	<p>You just ate an apple. Add the "apple" card to the left side of the hanger.</p> <p>What happens to your glucose levels? <input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels? <input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>
<p>You are feeling sick. Add the "sick" card to the left side of the hanger.</p> <p>What happens to your glucose levels? <input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels? <input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>	<p>You stayed up late last night and only slept a few hours. Add the "tired" card to the left side of the hanger.</p> <p>What happens to your glucose levels? <input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels? <input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>	<p>You just exercised. Add the "exercise" card to the right side of the hanger.</p> <p>What happens to your glucose levels? <input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels? <input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>

- Add the "PIE" scenario card to the left-most edge of the hanger. That will cause the **glucose** level to drop toward the "Too much **glucose!**" side of the meter.
- On the instructions worksheet for "PIE:"
 - first question, check the box "too high" **glucose** levels
 - second question, check the box for "**insulin**" beads
 - third question, count and record how many insulin beads are added to balance the coat hanger.

- Remove the beads from the cup and start the next round with 5 blue beads in the **glucose** cup and 5 red beads in the **insulin** cup.
- Remove the pie card, and add the next scenario card to the hanger. Work through your datasheet, recording your results.
- Repeat until you have tested all 6 of the scenario cards ("PIE," "MISSED LUNCH," "APPLE," "SICK," "TIRED," and "EXERCISE").

REFLECT

Thought Questions:

- Analyze your data on your datasheet by working through the following questions and thoughts.

We need **glucose** (sugar) in order to survive. **Glucose** is what gives fuel to our brains and muscles. One of the ways our bodies maintain **glucose homeostasis** is through having the right balance of **glucose** and **insulin**. If your **glucose** levels get too low, you may feel confused, faint, have a seizure, or even die. If your **glucose** levels are too high for long periods of time, it can damage your kidneys, heart, eyes, and feet. In this activity, you will simulate your body's response to different environmental

Too much glucose (e.g. eating PIE)



Not enough glucose (e.g. exercising)



conditions that change **glucose** levels, such as eating and exercise.

SOME MORE JOKES

Q. Why did the yogurt go to an art exhibition?
 A. Because it was cultured...

Q. What did the shark say when it ate a clownfish?
 A. This tastes a bit funny...

- Which environmental conditions raised **glucose** levels? **Eating pie, eating an apple, being sick, not enough sleep.**
- Which environmental conditions lowered **glucose** levels? **Missing lunch and exercising.**
- Did eating an apple or eating pie throw off the **glucose** levels more? **The pie made the glucose levels even higher than the apple did.**
- Explain the limitations of maintaining **glucose homeostasis**. **If we go days without eating, we will run out of glucose and starve. If we eat too many sugary foods for a long time, we can develop diabetes, which damages our organs.**
- Can you think of other ways your body maintains

When insulin binds with the insulin receptor, the glucose channel opens. Glycogen can enter the cell. Insulin acts like a key opening a door. Without the key, the door remains closed.

Type 1 Diabetes, no insulin to open the channel. The key is lost.

Type 2 Diabetes, the cell does not respond to insulin. The lock is broken.

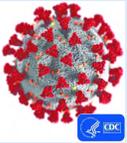
e.g. means for example



homeostasis? Almost of our metabolism functions through **homeostasis**. There are only a few exceptions, e.g. childbirth.

ANOTHER JOKE

Q. What do you get from pampered cows?
A. Spoiled milk...

<p>You just ate three slices of PIE. Add the "PIE" card to the left side of the scale.</p>  <p>What happens to your glucose levels? <input checked="" type="checkbox"/>oo high or • too low Which beads do you have to add to restore glucose levels? <input checked="" type="checkbox"/>insulin or • glucagon How many beads added? # of red beads</p>	<p>You missed lunch and feel hungry. Add the "missed lunch" card to the right side of the scale.</p>  <p>What happens to your glucose levels? • too high or <input checked="" type="checkbox"/>oo low Which beads do you have to add to restore glucose levels? • insulin or <input checked="" type="checkbox"/>glucagon How many beads added? # of blue beads</p>	<p>You just ate an apple. Add the "apple" card to the left side of the scale.</p>  <p>What happens to your glucose levels? <input checked="" type="checkbox"/>oo high or • too low Which beads do you have to add to restore glucose levels? <input checked="" type="checkbox"/>nsulin or • glucagon How many beads added? # of red beads</p>
<p>You are feeling sick. Add the "sick" card to the left side of the scale.</p>  <p>What happens to your glucose levels? <input checked="" type="checkbox"/>oo high or • too low Which beads do you have to add to restore glucose levels? <input checked="" type="checkbox"/>nsulin or • glucagon How many beads added? # of red beads</p>	<p>You stayed up really late last night (only slept a few hours). Add the "tired" card to the left side of the scale.</p>  <p>What happens to your glucose levels? <input checked="" type="checkbox"/>oo high or • too low Which beads do you have to add to restore glucose levels? <input checked="" type="checkbox"/>nsulin or • glucagon How many beads added? # of red beads</p>	<p>You just exercised. Add the "exercise" card to the right side of the scale.</p>  <p>What happens to your glucose levels? • too high or <input checked="" type="checkbox"/>oo low Which beads do you have to add to restore glucose levels? • insulin or <input checked="" type="checkbox"/>glucagon How many beads added? # of blue beads</p>

APPLY

Diabetes Demonstration

- Type 1 Diabetes: A person with Type 1 Diabetes does not make enough **insulin**. To open the cell's port, a person with Type 1 Diabetes needs to inject **insulin**. To represent this condition, you must add your red **insulin** beads using tweezers, one at a time.
- Repeat the balance activity for the Type 1 Diabetes condition with the 6 scenario cards. Record your data on your "Type 1 Diabetes" datasheet.
- Type 2 Diabetes: A person with Type 2 Diabetes makes enough **insulin**, but it does not open the cell's port for **glucose** to enter the cell. To represent this condition, poke a large hole in the bottom of the "**glucose**" cup.
- Repeat the balance activity for the Type 2 Diabetes condition with the 6 scenario cards. Record your data on your "Type 2 Diabetes" datasheet.

Think about it!

- There are two types of diabetes. Type 1 Diabetics cannot make **insulin**. In the activity we just did with the cups and beads, how did you simulate Type 1 Diabetes?
Type 1 Diabetes: The red insulin beads needed to be "injected" to balance the glucose beads. To maintain homeostasis, a Type 1 diabetic needs to inject insulin.
- Type 2 diabetics *can* make **insulin**, but their bodies don't respond to it. How did you simulate Type 2

diabetes? **Type 2 diabetes: A hole in the insulin cup! You add beads, but they all fall out.**

- Explain how the body is good at maintaining **glucose homeostasis**. **The body can bring glucose levels back down after a meal and can raise them after you exercise or when you're sick (to give your body more energy to fight the disease).** To a certain extent, we can eat, skip meals, exercise, not sleep well, and still more-or-less maintain **glucose homeostasis**.

Just the Facts

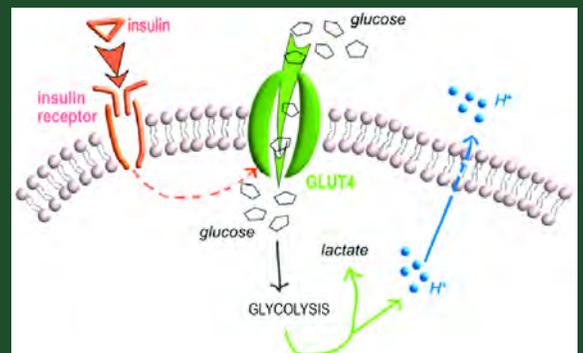
- Over 10% of the adult population has diabetes. Of every 10 adults, you probably know 1 person with this disease.
- Most adults have Type 2 Diabetes. Out of every 100 adults with diabetes, 95 will have Type 2 Diabetes.
- It is much rarer for children to have diabetes. Out of every 500 youths, one will have diabetes. You may have a friend who has diabetes.
- Out of 2,000 children, 3 will have Type 1 Diabetes, and 1 will have Type 2 Diabetes.
- Diet can help people with Type 2 Diabetes.

FASCINATING FACTS

- Doctors formerly thought Type 2 Diabetes was incurable. Promising new research suggests that with major lifestyle changes, some people can go into remission for years. Even if healthy eating and physical activity don't eliminate your diabetes, they can help you stay healthier.
- Beans and legumes don't cause sudden blood sugar spikes, and are good for diabetes diets. One cup of beans, lentils, or chickpeas per day helped lower blood sugar and reduce heart disease risk in a recent study involving people with Type 2 Diabetes.



Insulin binds to receptor on cell membrane (red) opens the glucose channel (green) for glucose to enter the cell. Image from ResearchGate



We need glucose (sugar) to survive. Glucose gives fuel to our brains and muscles. One way our bodies maintain glucose homeostasis is balancing glucose and insulin. If your glucose levels get too low, you may feel confused, faint, have a seizure, or even die. If your glucose levels are too high, it can damage your kidneys, heart, eyes, and feet over time.

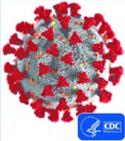
You will simulate your body's response to different environmental. Blue beads represent glucose molecules. Red beads represent insulin molecules. Before each of the 6 rounds, start with 5 blue beads in the glucose cup and 5 red beads in the insulin cup. During each round, check off the appropriate boxes and record the number of beads you added:

Check which condition you are collecting data:

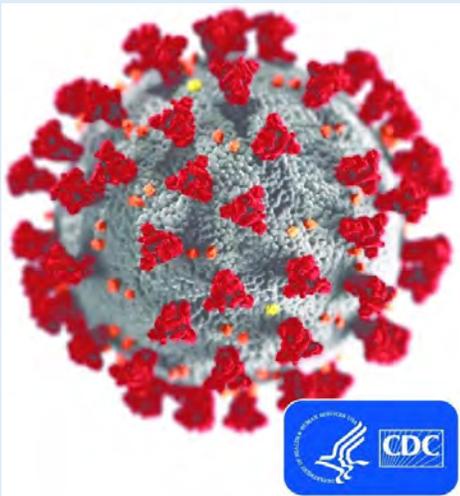
NORMAL FUNCTION _____

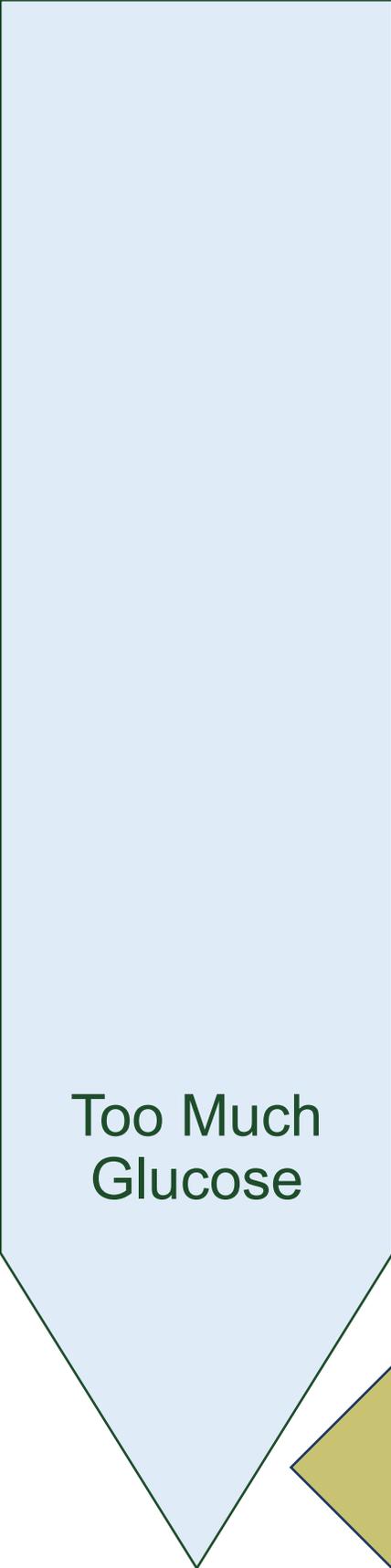
TYPE 1 DIABETES _____

TYPE 2 DIABETES _____

<p>You just ate three slices of pie. Add the "pie" card to the left side of the hanger.</p>  <p>What happens to your glucose levels?</p> <p><input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels?</p> <p><input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>	<p>You missed. Add the "missed lunch" card to the right side of the hanger.</p>  <p>What happens to your glucose levels?</p> <p><input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels?</p> <p><input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>	<p>You just ate an apple. Add the "apple" card to the left side of the hanger.</p>  <p>What happens to your glucose levels?</p> <p><input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels?</p> <p><input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>
<p>You are feeling sick. Add the "sick" card to the left side of the hanger.</p>  <p>What happens to your glucose levels?</p> <p><input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels?</p> <p><input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>	<p>You stayed up late last night and only slept a few hours. Add the "tired" card to the left side of the hanger.</p>  <p>What happens to your glucose levels?</p> <p><input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels?</p> <p><input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>	<p>You just exercised. Add the "exercise" card to the right side of the hanger.</p>  <p>What happens to your glucose levels?</p> <p><input type="checkbox"/> too high or <input type="checkbox"/> too low</p> <p>Which beads do you have to add to restore glucose levels?</p> <p><input type="checkbox"/> insulin or <input type="checkbox"/> glucagon</p> <p>How many beads added?</p>

- Print single sided.
- Cut out the 6 rectangles scenario cards.
- Open a paperclip to form a hook and tape to the back.
- Tape weights (paperclips) to the back:
 - Tape 15 paperclips to the back of “SICK” card.
 - Tape 10 paperclips to the back of the “PIE” and “MISSED LUNCH” cards.
 - Tape 8 paperclips to the back of “APPLE” and “EXERCISE” cards.
 - Tape 6 paperclips to the “TIRED” card.
- Your coat hanger balance is ready for your demonstration!

<p>PIE</p>  <p>TARTA</p>	<p>MISSED LUNCH</p>  <p>PERDISTE EL ALMUERZO</p>	<p>APPLE</p>  <p>MANZANA</p>
<p>SICK</p>  <p>ENFERMO</p>	<p>TIRED</p>  <p>CANSADO</p>	<p>EXERCISE</p>  <p>EJERCICIO</p>



“Too Much Glucose” and
“Not Enough Glucose”
Markers (left and right)

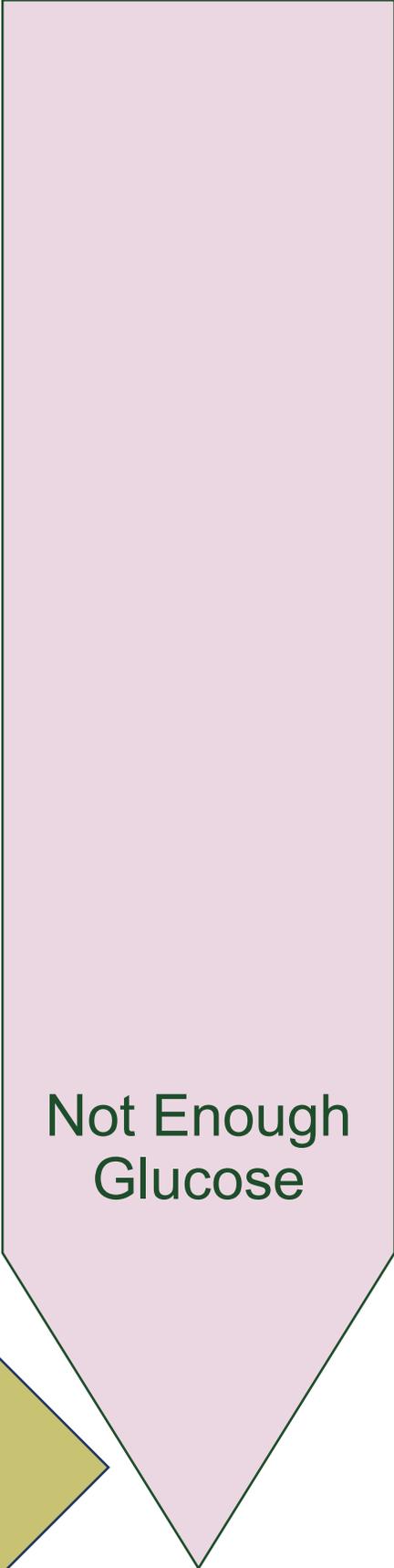
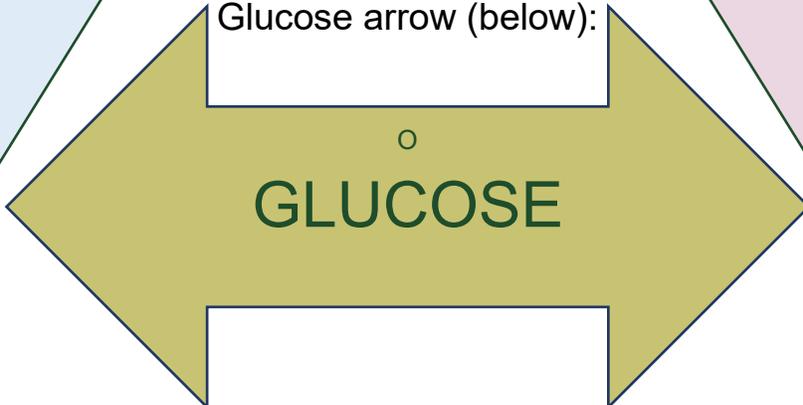
Cup Labels (below)



Set-up your coat hanger
balance like the picture
above.

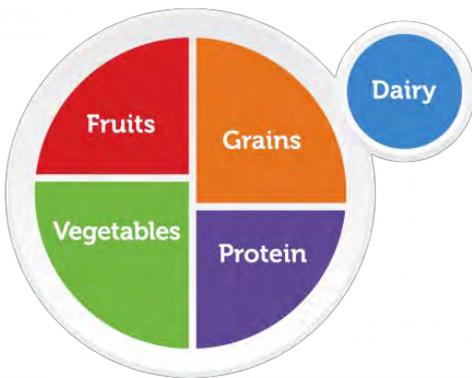
PRINT SINGLE SIDED.

Glucose arrow (below):



Americans have access to a wide variety of healthy foods. In spite of access to a high quality diet, over 40% of the people in the United States are obese, including 20% of youth are obese. Obesity is a complex disease. There are many reasons:

- Our serving sizes are much larger than 20 years ago
- We consume more empty calories
- Our activities have become more sedentary, like playing computer games rather than playing sandlot baseball or go for a swim.



Examine the two plates below. The plate on the left looks like the hamburger is enormous! The plate on the right looks like the hamburger is medium sized. There is room to add extra food on that plate. The only difference between the two pictures is the plate. It is actually the same hamburger on different sized plates!



Which burger is bigger? It is a trick question. It is the same burger on two different sized plates.

Empty calories add calories with little or no nutritional value. For example, if you have a snack of a can of cola and 26 cheese puffs, you consumed almost 500 calories.

The amount of calories you need every day changes depending on your age and activity level. If you are between 6 and 12, you need 1600 to 2200 calories. The range depends on your activity levels. During your teen years, you require the most calories during your lifetime. Very active teen girls need 2200 calories and very active teen boys need up to 3000 calories! As you age, your caloric needs decrease.

Calories are only part of our diet. You also need to eat a variety of food to obtain the necessary organic and inorganic compounds to maintain your health. Our bodies need carbohydrates, proteins, fats, and some trace nutrients (like iron).

Back to our empty calorie snack. You just ate 480 calories. In your snack, you acquired very little nutritional value (cheese puffs have some calcium). If you are an active 9 year old, you can eat about

POWER WORDS

- **carbohydrate:** large group of organic compounds occurring in foods. They can typically be broken down to release energy in an animal's body.

There are 3 types of carbs:

- sugars: natural sugar in fruit and milk, or added sugar in soda and many packaged foods
- starches: wheat, oats and other grains, starchy vegetables like corn and potatoes, and dried beans, lentils, and peas
- fiber: part of plant foods that are not digested, but necessary for a healthy diet

Developed from lessons designed by Karen Massey, retired Routt County FCS Agent.
Modified by: Barbara J. Shaw, Ph.D.

2000 calories a day. You just ate one-quarter your total daily calorie requirement. You gained energy in carbohydrates but little additional nutrition. It is okay to have empty calorie snacks occasionally. They are tasty and satisfying. Just be aware of how many you eat.

Managing your diet includes eating a variety of foods in the

MATERIALS

- 1 paper dinner plate
- 1 paper dessert plates
- shredded green paper
- shredded blue paper
- shredded orange paper
- shredded red paper
- shredded purple paper
- ruler
- markers in green, blue, orange, red, purple and black
- Construction paper in green, blue, orange, red, and purple colors
- scissors
- print page 17

proper proportions. There are tricks so you feel sated and full:

- **Smaller plates:** Instead of using larger plates with greater surface area to hold food, use smaller plates (see the image on page 11 at the bottom).
- **Smaller portions:** Fill your bowl three-quarters full.
- **Savor your food:** If you eat slowly, studies show you feel fuller, quicker.
- **Make substitutions:** Instead of eating a ridiculous portion of one food (like mashed potatoes and gravy), eat a smaller amount accompanied by a salad or other vegetable. A myriad of studies show benefits for eating more veggies.
- **Eat protein:** Eating 4-5 ounces of animal protein can help you feel fuller.
- **Wait 20 minutes:** If you still feel hungry 20 minutes

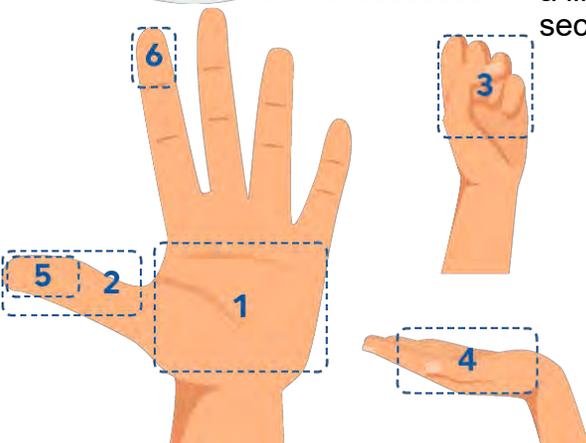
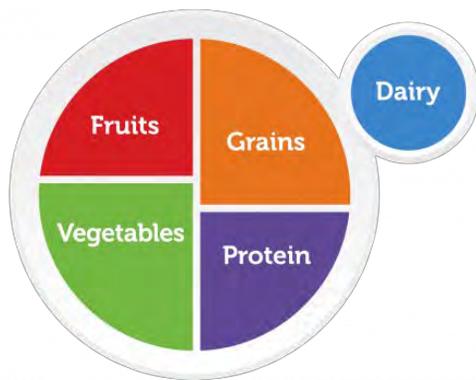
after a meal, add another serving of non-starchy vegetables.

- **Left-overs:** To-go boxes aren't just there for show. If you get a huge plate at a restaurant, get excited about the fact that you can eat that same meal twice. Ask for a to-go box when your food arrives. Place half your food in your box before enjoying your meal.

DO

Prepare your Plates!

- An easy way to eat balanced meals is to use USDA's My Plate.
- Use your ruler to draw a vertical (up and down) line with the black permanent marker through the center of the plate forming two equal halves.
- Examine the "My Plate" image on the left. Your next two lines need to draw a larger quarters for "Grains" and "Vegetables."
- With your ruler, divide the left side, making the lower quarter a little larger. Draw a line with a black marker forming these two sections.
- With your ruler, divide the right side, making the upper quarter a little larger. Draw a line forming these two sections.



HAND MEASUREMENTS

1. **3 ounces of meat, fish, or poultry**—Palm of hand (no fingers)
2. **1 ounce of meat or cheese**—Thumb (tip to base)
3. **1 cup or 1 medium fruit**—Fist
4. **1–2 ounces of nuts or pretzels**—Cupped hand
5. **1 tablespoon**—Thumb tip (tip to 1st joint)
6. **1 teaspoon**—Fingertip (tip to 1st joint)

Images on these pages are from USDA MyPlate <https://www.myplate.gov/> and CDC Serving Hand <https://www.cdc.gov/diabetes/managing/eat-well/meal-plan-method.html>

- Label your plates:
 - Dessert plate "Dairy" with a blue marker
 - Upper left quarter of your dinner plate "Fruits" with the red marker
 - Lower left quarter of your dinner plate "Vegetables" with the green marker
 - Upper right quarter of your dinner plate "Grain" with the orange marker
 - Lower right quarter of

JOKES

- Q. Why is it annoying to eat next to basketball players?
A. Because they dribble all the time...
- Q. What do you call a train carrying bubblegum?
A. A chew-chew train...
- Q. What do you call a bear with no teeth?
A. A gummy bear...

your dinner plate
“Protein” with the purple marker

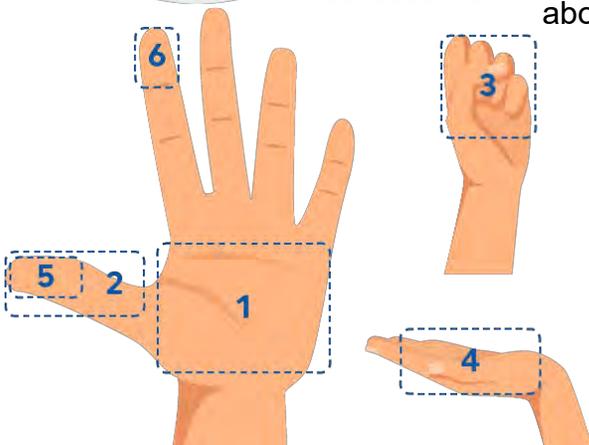
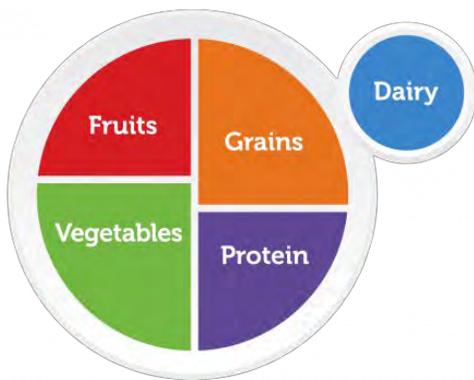
- This is the correct balance for you to get the vitamins, proteins, and minerals you need for your body to function. It also will help you to maintain the proper daily carbohydrate servings.

Just Right!

- Eating a variety of foods is only part of the equation. You can still gain or lose weight if you don't manage your portion sizes. In this second activity, you will visualize how much of each food group you can eat.
- The shredded color paper represents the different food groups.

Purple = protein

- Orange = starches
- Green = vegetables
- Red = fruit
- Blue = dairy



- We will be “making” a Greek Salad with Grilled Chicken (recipe page 16) to practice hand measurements.
- Lettuce is considered “FREE.” You can pile high with non-starchy vegetables. YUM! Our recipe calls for have 1 and 3/4 cups of green leafy lettuce and 1/4 cup of red onion.
 - Use your hand for this measurement. With the green shredded paper, shape **2 cups** (2 fists). Place your “vegetables” on your plate.
- For your fruit, 1/3 cup chopped cucumber, 1/3 cup chopped green bell pepper, and 1/3 cup of chopped tomatoes.
 - Use your hand for this measurement. With the red shredded paper, shape **1 cup** (1 fist). Place your “fruit” on your dessert plate.
- Starches include starchy vegetables like peas, corn, potatoes, as well as grains like rice and pasta.
 - For this recipe, you need 1/2 cup of chickpeas (garbanzo beans). Use the orange shredded paper and measure the cupped hand for 1/2 cup.
- One serving of protein is about the size of a playing

HAND MEASUREMENTS

1. **3 ounces of meat, fish, or poultry**—Palm of hand (no fingers)
2. **1 ounce of meat or cheese**—Thumb (tip to base)
3. **1 cup or 1 medium fruit**—Fist
4. **1–2 ounces of nuts or pretzels**—Cupped hand
5. **1 tablespoon**—Thumb tip (tip to 1st joint)
6. **1 teaspoon**—Fingertip (tip to 1st joint)

Images on these pages are from USDA MyPlate <https://www.myplate.gov/> and CDC Serving Hand <https://www.cdc.gov/diabetes/managing/eat-well/meal-plan-method.html>

- card deck. It would fit comfortably in the palm (no fingers) of your hand. We will be adding grilled chicken breast.
 - With the blue shredded paper, shape a card deck sized form that fits comfortably in your palm. Place your “protein” on your plate in the Protein section.

FASCINATING FACT

- The brain is the only carbohydrate-dependent organ in the body. The brain exclusively uses glucose, a basic simple sugar carbohydrate, to function. Your brain cells need twice the energy of any other cells in your body!

- You can add Dairy group feta cheese to your tasty Greek salad. Remember, use cheese sparingly. It adds so much to the taste of a meal, but also packs calories.
 - You can use your hand for this measurement. With the blue shredded paper, shape **1 ounce of meat or cheese**—Thumb (tip to base). Place your “dairy” on the white circle.
 - Dress your salad with 1 Tbsp lemon juice, 2 Tbsp olive oil, 1 teaspoon oregano, 1 teaspoon garlic, 1 teaspoon Dijon mustard, 4 minced kalamata olives (a fruit).
 - You can use your hand measurement. 1 tablespoon is equal to the measurement of your thumb to the first joint. One teaspoon is your

index finger to the first joint.

- (Note that some of these ingredients are high in fat and calories, but they are healthy fats.)
- Look at your plate, and you have measured out the proper portions for each type of food.
- What can you need to do to modify your diet to eat healthier and varied foods?

REFLECT

Delicious, Healthy Meals

Set-up:

- Trace your dessert plate on a sheet of blue construction paper. You can fit several circles on each piece of paper. Cut out each of these circles.
- Trace the paper plate on 3 sheets of green, 3 sheets of orange, 3 sheets of red, and 3 sheets of purple construction paper.
- Cut out each of the paper plate construction paper circles.
- Fold the circle construction paper in half, and once again, to make four equal pie shapes.
- Cut the construction paper on the fold lines. You will have 12 pie wedges of green, orange, and blue. Each color represents a

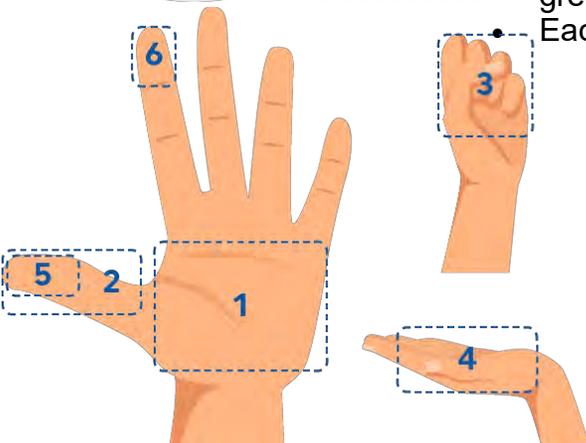
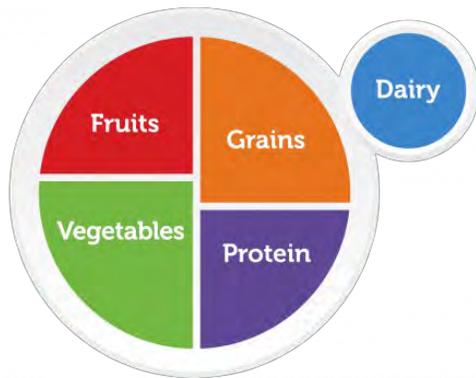
FASCINATING FACT

- Carbohydrates are the only fuel source metabolized fast enough to support hard exercise. For an active person, a low-carb diet would definitely not be a wise choice. With a limited supply of carbohydrates in the body, engaging in hard exercise will result in low energy, muscle fatigue, and even mental fog
- metabolism:** the chemical processes that occur within a living organism in order to maintain life

Images on these pages are from USDA MyPlate <https://www.myplate.gov/> and CDC Serving Hand <https://www.cdc.gov/diabetes/managing/eat-well/meal-plan-method.html>

different food group:

- Green represents non-starchy vegetables
- Orange represents starchy foods
- Purple represents protein
- Red represents fruit
- Blue represents dairy
- List foods by category on the different color paper “pie pieces” (hint—check pages 33-59 for all kinds of foods in different food groups!)



FASCINATING FACT

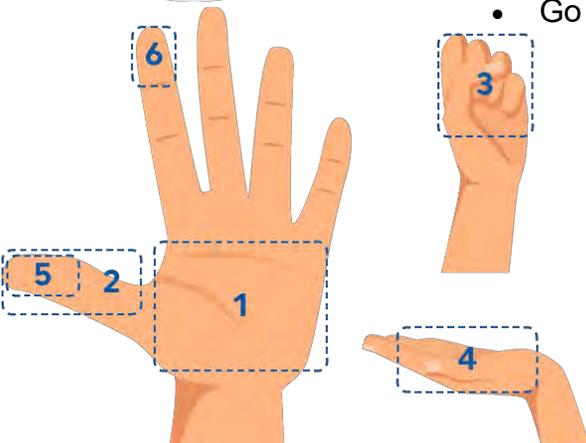
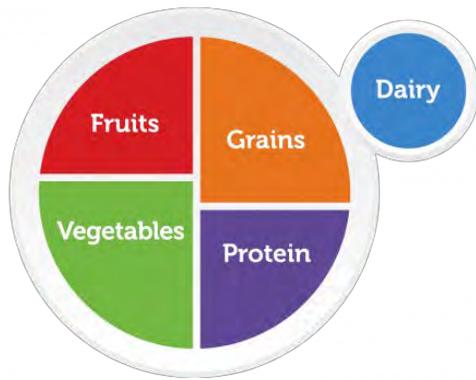
- The brain is the only carbohydrate-dependent organ in the body. The brain exclusively uses glucose, a basic simple sugar carbohydrate, to function. Your brain cells need twice the energy of any other cells in your body!

- Green—list non-starchy vegetables including those veggies that you eat regularly.
- Orange—list starchy food, like peas, corn, potatoes, pasta, rice, etc.
- Purple—list proteins including lean cuts of meat, poultry, fish, eggs, beans, lentils, tofu, etc.
- Blue—list dairy products like cheese, cottage cheese, yogurt, and milk.
- Red—list fruits, including avocado, tomato, dried fruit (raisins, prunes or cranberries) or purees, like applesauce.
- Lay out all your color pie shapes with the foods listed on them. Each of your meal plates needs to be covered with the color pie shapes, following these rules:
- One quarter of your plate needs to have green pie shapes.

- One quarter of you plate needs orange pie shapes.
- One quarter of your plate needs purple pie shapes.
- One quarter of your plate needs red pie shapes
- You need one blue circle above your plate.

Planning your meal

- This is a way to plan a healthy and delicious meal, making sure that you have included all the food groups. To demonstrate how to use this system, you will use the recipe for the Greek Salad.
- You could eat a large serving of a single vegetable, like a big plate of broccoli. What if you want to have a Greek salad (like in the example)? You can use the wedges to plan your meal, keeping track your carbs and different food groups for a balanced meal, and portion size.
- The Greek salad included several vegetables, feta cheese, chickpeas, grilled chicken, tomato (a fruit), and a dressing.
- You could substitute with different items. For example, the starchy food was chickpeas, but you could select whole wheat pita bread (4" diameter).
- Go through your list of



FASCINATING FACT

- Carbohydrates are the only fuel source metabolized fast enough to support hard exercise. For an active person, a low-carb diet would definitely not be a wise choice. With a limited supply of carbohydrates in the body, engaging in hard exercise will result in low energy, muscle fatigue, and even mental fog.

Images on these pages are from USDA MyPlate <https://www.myplate.gov/> and CDC Serving Hand <https://www.cdc.gov/diabetes/managing/eat-well/meal-plan-method.html>

- vegetables. Add one green wedge for each of the following we used for our salad (okay to overlap the pie wedges):
 - green leafy lettuce
 - red onion
 - oregano and garlic (in very small amounts)
- Go through your list of proteins. Add one blue wedge for your grilled chicken to your plate.

FASCINATING FACT

- Carbohydrates are the most important energy source for the body. Your body *wants* to use carbs. It stores them in reserves to *make* you use them, even if you stop feeding them to yourself. They are utterly essential to life and health, and they contain no more calories than any other macronutrient. Maintaining a healthy diet with diabetes needs carbohydrates, but within the range your body uses.

Looking at your list, what other proteins could you use instead the chicken?

- Go through your list of starches. Select chickpeas (garbanzo beans), and add to your Starches on your plate. What other starches could you substitute?
- Go through your list of Dairy. Add one white circle to your Dairy circle for the Feta Cheese. (Cheese is also a good source of protein.)
- Go through your list of Fruit. Add one red circle to your Fruit circle for
 - cucumber
 - green bell pepper
 - tomato
 - kalamata olives
 - lemon juice
- Select heart healthy oils, like olive, almond, walnut, or other nut oils, safflower, and avocado oils. Use very sparingly as these are calorie rich foods.

APPLY

Plan Dinner:

- Plan dinner tonight for your family, applying everything you have learned in these activities. Keep in mind balancing your meal with different food groups in the proper portion sizes. At this point, you do not need to count carbohydrates, calories, or protein. We will explore ways to make carb counting easier.
- What recipes will you pick that uses the different foods you have on each plate? Your final meal may have vegetables, protein, dairy, and grain in a single dish (like beef stew).
- Add ingredients to your food

groups. You only need determine if it is classified as vegetable, starchy food, protein, dairy, or fruit.

- Look for easy substitutions for tasty healthy solutions. Brown rice has a delicious nutty flavor. Carb balanced tortillas can replace tortillas. Use heart-healthy oils instead of butter (but always in moderation).
- Have fun and be creative!

Greek Salad w/ Grilled Chicken

Directions for the Salad

- Pound the chicken breast with a meat mallet until uniformly 1” thick.
- Grill chicken breast until cooked through (165°F when a meat thermometer is inserted in the center)
- While the chicken is grilling, wash and tear lettuce to bite size pieces.
- Dice the onion, cucumber, tomato; slice the red onion.
- Add all ingredients to the salad bowl.

Directions for the Dressing:

- Mince garlic and olives.
- In the mason jar, add the oil, lemon juice, oregano, garlic, and kalamata olives. Add lid and shake until mixed.

Greek Salad w/ Grilled Chicken—2 servings

Ingredients:

Salad

- chicken breast—1
- green leafy lettuce ~ 2 cups
- tomato—1/4 cup
- cucumber—1/4 cup
- red onion—1/4 cup
- green bell pepper—1/4 cup
- chickpeas—1/4 cup

Dressing

- olive oil—4 Tbsp
- lemon juice—2 Tbsp
- oregano—pinch dried
- garlic—1 clove minced
- kalamata olives—8 minced

- Pour over salad and toss with the salad spoons.

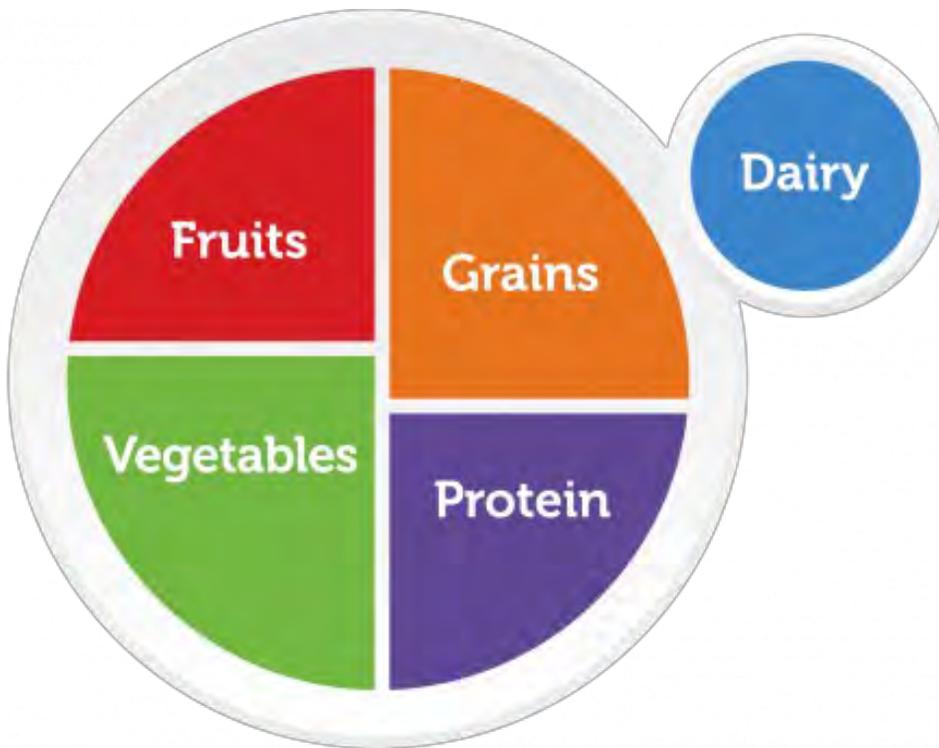


Greek Salad w/ Grilled Chicken—2 servings

Equipment:

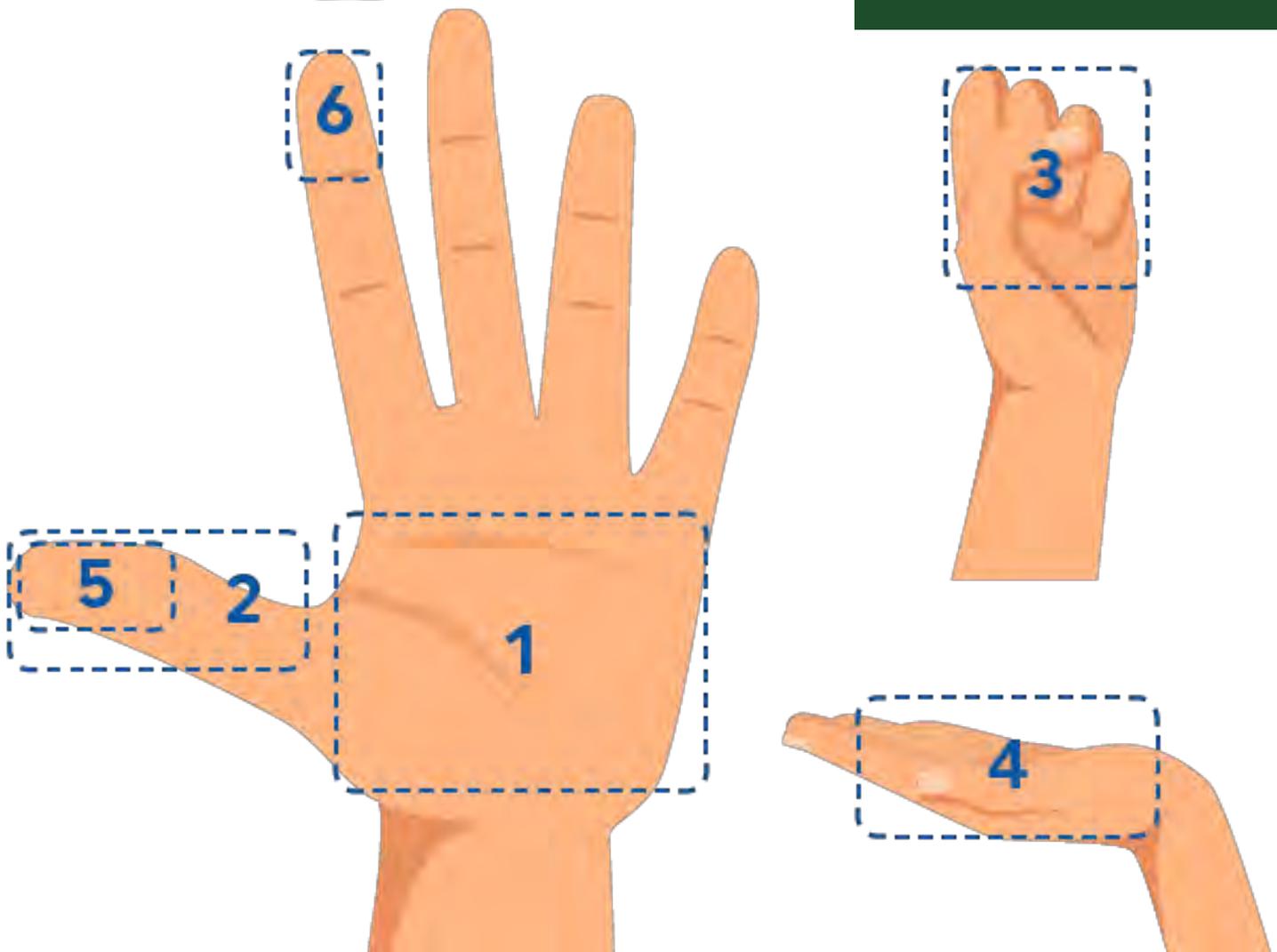
- frying pan
- meat mallet
- tongs (or fork)
- meat thermometer
- mason jar w / lid
- cutting board
- sharp knife
- large bowl
- salad spoons

ENJOY!



HAND MEASUREMENTS

1. **3 ounces of meat, fish, or poultry**—Palm of hand (no fingers)
2. **1 ounce of meat or cheese**—Thumb (tip to base)
3. **1 cup or 1 medium fruit**—Fist
4. **1–2 ounces of nuts or pretzels**—Cupped hand
5. **1 tablespoon**—Thumb tip (tip to 1st joint)
6. **1 teaspoon**—Fingertip (tip to 1st joint)



You need salt for a healthy diet. That's the good news. There is also bad news. You only need a tiny amount of salt per day. It is very easy to include too much salt in our diet.

Salt improves the flavor of food. Our bodies need salt (sodium chloride and potassium chloride) in trace amounts for our cells to transport nutrients, maintain healthy blood pressure, and stay **hydrated**.

If you eat too much salt, and it can actually make you feel sick. It can make your tummy feel bloated, your skin feel tight, you can feel weak, have trouble sleeping, and even make you go to the bathroom more often. YUCK!

Diffusion is the natural movement of molecules spreading out. For example, if you peel an orange, others around you start to smell the orange. Eventually, everyone in the room can smell it. The orange vapors released as it is peeled spread throughout the room.

Osmosis is a special case of diffusion. Water will move across a semi-permeable membrane (like our cellular

membrane) from a higher water potential to a lower water potential. Simply stated, if there is a selectively permeable membrane separating different concentrations of salt in water, the water will move from the side with the least number of salt molecules to the side with the greatest number of salt molecules diluting the salt.

Osmosis works regardless what is in the water, like sugar or proteins. Salt causes an imbalance and increases the pressure.

Below left is a cartoon depicting water moving from the low solute concentration (high water concentration to the high solute concentration (low water concentration). The arrow indicates which way the water is moving.

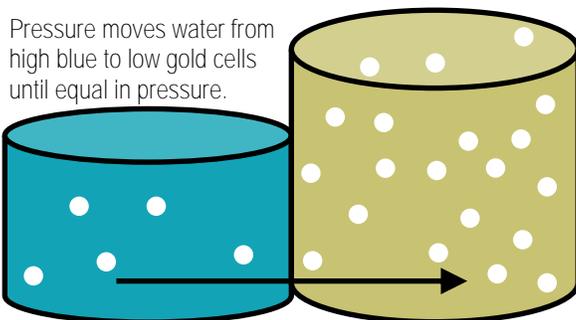
In this experiment, you will observe how salt impacts a single cell. A chicken egg is a single cell (before it is fertilized to become a chick).

DO

Prepare your Eggs!

**HANDLE WITH CARE!
WASH YOUR HANDS
FREQUENTLY!**

Pressure moves water from high blue to low gold cells until equal in pressure.



Water moves across a semi-permeable membrane from low solute (high water pressure) to high solute concentration (low water pressure).

POWER WORDS

- **hydrate:** cause to absorb water
- **osmosis:** a special condition of diffusion of water moving across a semi-permeable barrier (cell membrane) from low solute concentration to high solute concentration
- **sodium chloride:** a colorless crystalline compound occurring naturally in seawater and halite; common salt
- **solute:** components (like sodium chloride) dissolved in water

continued on page 19



- You can either follow these directions or watch Ms. Stephanie's video directions for Shell-less Eggs Part 1 video https://www.youtube.com/watch?v=GpTWfB5qbU&ab_channel=STEMinwithSteph

MATERIALS

- 3 pint or quart mason jars
- 3 eggs
- gallon vinegar
- slotted spoon
- cereal bowl
- distilled water (can use tap water)
- table salt
- food scale (if available) or ruler
- print pages 22-23
- measuring cup
- permanent marker
- masking tape
- timer

- **NOTE:** Vinegar removes the calcium shell. The egg is contained inside the delicate membrane. Decalcifying the eggs take 3 to 7 days.
- Gently place an egg in each container. Each egg will be given a different treatment for this experiment.
- Fill the containers, covering the egg with the vinegar.
- Attach the lids and set aside for 24 hours.



24 hours later...



- **NOTE:** Handle the egg with extreme care.
- Carefully drain the vinegar from each jar, using the slotted spoon to protect the egg in the jar.
- Replace with fresh vinegar.
- Attach the lid; set aside for 24 hours.
- Wash your hands!

Repeat the above step...

- Repeat the above step each day until the calcium shell has been completely dissolved by the vinegar. The egg will only have the membrane containing the egg. You need to repeat this step between 1 and 5 more times (variables are shell thickness, vinegar strength, and jar size)
- Wash your hands!



Prep the Experiment:

- Carefully remove the eggs and place in a cereal bowl.
- Rinse each jar three times and fill each jar 3/4 full with distilled water. If you are using a pint jar, use 1.5 cups of distilled water. If you are using a quart jar, use 3 cups of distilled water.
- “H₂O” Egg
 - Measure the egg (weigh in grams—see how to Tare below) on a food scale (preferred method) or measure width of the egg with a ruler in centimeters.

POWER WORDS

continued from page 18

- **tare:** subtract the weight of the container from the total weight
- **treatment:** in an experiment, this is the variable that changes to compare results



- Record on your Osmosis Datasheet. in the “H₂O” (water) column.

Tare before you weigh!

Tare means you subtract the container’s weight:

- Place the bowl on the scale and turned on the scale. It automatically set the weight to zero.
- Turn on the scale. Set the bowl on the scale. Push the “Tare” button on the scale.
- Weigh the bowl on the scale and record the bowl weight. Add the egg and record both. Subtract the bowl weight from the egg’s weight

- Carefully return the egg in the first jar with water. Replace the lid. Place a piece of masking tape on the jar. Label the jar H_2O (water) with a permanent marker.



- “Saturated Salt” Egg
 - Add 3 Tablespoons salt to the second jar. Stir to dissolve the salt. Add 3 more Tablespoons salt and stir. Continue adding the salt as long as it dissolves in the water. Eventually, some of the salt will remain in the water. The water is now saturated with salt.
 - Measure the egg (weigh in grams—see how to Tare below) on a food scale (preferred method) or measure width of the egg with a ruler in centimeters.
 - Record on your Osmosis Datasheet. in the “Saturated Salt” column.

- Carefully return the egg in the second jar. Replace the lid. Place a piece of masking tape on the jar. Label the jar “Saturated Salt” with a permanent marker.
- “Salt = Egg” Egg
 - If you are using a 1 pint Mason jar, add 1 teaspoon salt and stir until dissolved. If you are using a 1 quart jar, add 2 teaspoons salt to the jar and stir until dissolved.
 - Measure the egg (weigh in grams—see how to Tare below) on a food scale (preferred method) or measure width of the egg with a ruler in centimeters.
 - Record on your Osmosis Datasheet. in the “Saturated Salt” column.
 - Carefully return the egg in the third jar with water. Replace the lid. Place a



POWER WORDS

- **osmotic pressure:** requires a semi-permeable membrane with a different concentration of solutes on either side of the membrane; the side with lower concentration of water has the higher osmotic pressure

- piece of masking tape on the jar. Label the jar “Salt = Egg” with a permanent marker.
- Wash your hands after handling the eggs.

Conduct the Experiment:

- Set the timer for one hour.
- When the timer goes off, carefully remove each egg (one at a time), and weigh on the scale (or measure with the ruler). Return the egg to the correct jar.
- Set the timer for 1 hour.

Repeat



You can watch Ms. Stephanie’s video on how to remove the shell from chicken eggs on her 4-H STEM in with Steph YouTube site “Shell-Less Egg Part 1”:

https://www.youtube.com/watch?v=GpTWfB5gbU&ab_channel=STEMinwithSteph

- Repeat at least three times (the initial baseline and three 1-hour measurements) or until the eggs no longer are changing mass or centimeters.
- Once the eggs are no longer changing mass or centimeters, measure the amount of water remaining in each jar. Record these data in the correct column on your datasheet.



REFLECT

- Complete your datasheet and answer the questions below:
 - What happened to the size of the egg after remaining in distilled water?
 - Was there more or less liquid left in the jar?
 - Did water move into or out of the egg? Why?
 - What happened to the size of the egg after remaining in salt water?
 - Was there more or less liquid left in the jar?
 - Did water move into or out of the egg? Why?
 - What happened to the size of the egg after remaining in 1 or 2 teaspoons salt water?
 - Was there more or less liquid left in the jar?
 - Did water move into or

- out of the egg? Why?
- Describe your experiment to an adult.

APPLY

- Complete the Data Analysis on page 23.
- Explain your experimental results with an adult. What did you discover in your experiment?

We need a small amount of salt for a healthy body. Prepared food are often loaded with salt. In the “Make It Mine” activity, you will learn how to read a nutrition label and can see for yourself how much salt we eat without even knowing!

What happens to our bodies if we eat too much salt?

- Our kidneys filter our blood. If we consume too much salt, it is harder for our kidneys to function properly.
- Our kidneys retain water, we bloat. This swelling can happen in your hands and feet, face, legs and arms, and body. It is uncomfortable, but not dangerous. This extra water is stored in the lymphatic system, not in the cells.
- Even though we are bloated, our cells are dehydrated. That can cause nauseated, diarrhea, or stomach

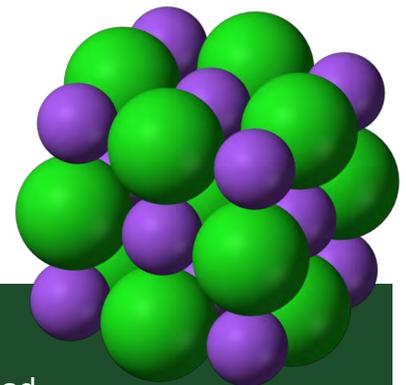
POWER WORDS

- hypertonic: in our experiment, the hypertonic solution is the “Saturated Salt” solution
- hypotonic: in our experiment, the hypotonic solution is the distilled water
- isotonic: in our experiment, the isotonic solution is the “Salt = Egg” solution
- lymphatic system: network of tissues, vessels and organs that move lymph (clear watery fluid) back to your heart
- solute: substance dissolved (usually in water) to form a solution
- solution: mixture of two or more substances in liquid (usually water)

NaCl molecule image from Benjah-bmm27 in public domain

cramps. (NOT FUN!)

- The extra fluid in the bloodstream and lymphatic system increases our blood pressure.



FASCINATING FACTS

- Salt has a fascinating story in human history. It had tremendous value for preserving food. It was so valuable, Roman soldiers were sometimes paid in salt!
- The saltiest body of water is the Don Juan Pond in Antarctica. It is so salty (over 40 percent), it rarely freezes. Cool! No, downright COLD!

Egg	H ₂ O	Saturated Salt	Salt = Egg
Starting solution (see note below)			
Starting g or cm			
Hour 1 g or cm			
Hour 2 g or cm			
Hour 3 g or cm			
Ending solution (see note below)			
subtract Hour 3 g or cm from Starting g/cm			
Subtract ending solution from starting solution (you may have a negative number)			

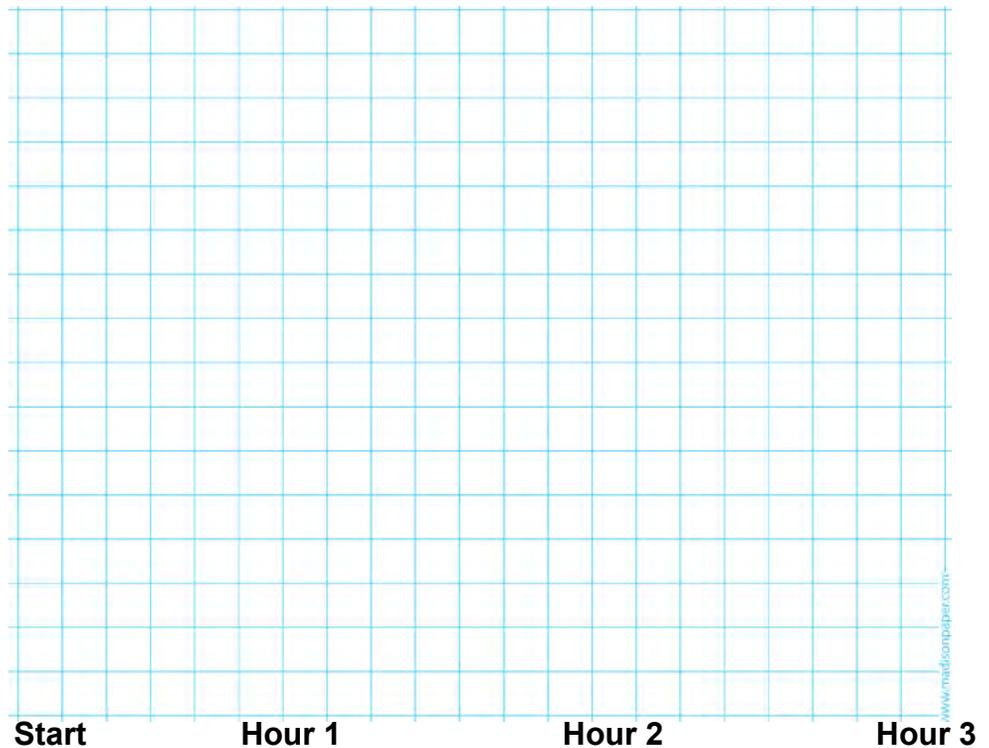
NOTE: Convert your cup measurement to milliliters. 1.5 cups = 355 milliliters, 3 cups = 710 milliliters. For your final amount of solution, use an internet converter. Search: X (your ending amount) = milliliters to convert.

Use different colors for each treatment:

Legend:

- H₂O
- Saturated Salt
- Salt = Egg

Egg mass in grams or width in centimeters



We need fats for a healthy diet. Fats are high energy foods packed full of calories. They also help our bodies absorb some vitamins and minerals. So, even though we need them, we need to watch how much we consume.

There are three types of fats which have different effects on your health. Eating healthy fats can lower the risk of disease and reduce bad cholesterol in your blood.

Foods with the healthy fats include:

- olive, canola, safflower, sunflower, peanut oils, and margarines
- avocados, olives
- nuts (almonds, pecan, hazelnut, pistachios, walnuts, almonds) and seeds (sunflowers, sesame)



Another good fat contains Omega-3 fat. These fats can also help lower the risk of heart attack and stroke. Food that contain Omega-3 fat are:

- salmon, trout, herring, sardines, tuna, and white fish

- flaxseed, walnuts, canola, linseed, and soybeans



Unhealthy fats are saturated and trans fats. They contain the type of cholesterol that can clog blood vessels. Primarily animal fats, they are found in lard, beef, lamb, pork, and chicken fat, and milk/cream.

DO

Directions:

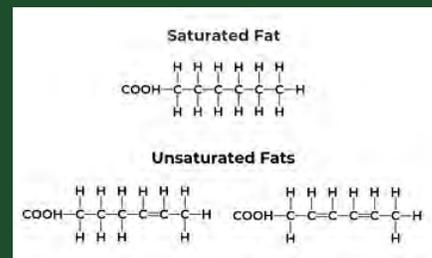
- Print and cut out pages 25-27 (one-sided).
- Print page 28 and place face-up on a table.
- Read the descriptions of Unsaturated Fats, Omega-3 Fats, and Saturated Fats on the sorting page (pg. 28).
- One at a time, examine the stack of fats cards. Determine which type of fat the food pictured contains.

REFLECT

- After you have sorted all the

POWER WORDS

- saturated fat: the lipid (fat molecule) has hydrogen atoms attached at every carbon, allowing lipids to remain closely layered. This can allow the fat to be a solid at room temperature
- unsaturated fat: the lipid does not have hydrogen atoms attached to every carbon, forming kinks in the chain. The lipids cannot remain closely packed, remaining a liquid at room temperature



cards, consider with your partner or a parent the discussion questions on the sorting page (28).

APPLY

- Discuss with your family ways you can modify your meals by replacing the “bad” fats to those that are healthier. For example, what can you use instead of butter on your toast?

MATERIALS

- Pages 25—28 printed single-sided
- scissors
- paper and pencil (to jot notes)

Adapted from Alberta Health Services: Healthy Eating Starts Here <https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-nutrition-activities-classroom.pdf#page=76>

vegetable oil



coffee cream



butter



whipping cream



hamburger



margarine



salmon (with dill sauce)



almonds



walnuts



bacon



avocado



coconut oil



ice cream



cheese



olives



olive oil



sunflower seeds



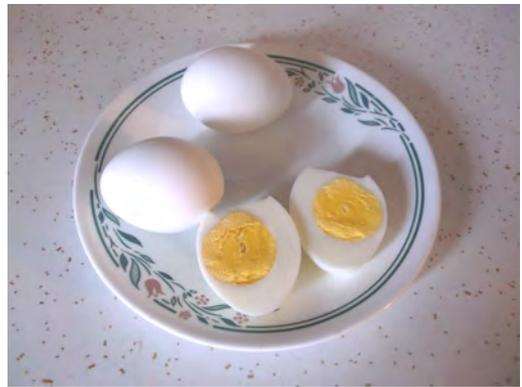
muffin



doughnuts



hard boiled eggs



sesame seeds and tahini



shortening



bratwurst



mayonnaise





Unsaturated Fats

- are liquid at room temperature
- can help prevent heart disease and stroke by lowering the bad fats in your blood vessels

Place unsaturated fats cards here.

Discussion:

- Q. Which types of fats are healthy fats?
A. Unsaturated fats are healthy fats. They can help lower the bad cholesterol in your blood vessels if you eat these instead of foods with saturated fat.
- Q. Which foods have healthy fats?
A. Olive, canola, safflower, sunflower, peanut oils, and margarines made from these oils; avocados, olives; nuts (almonds, pecans, hazelnuts, pistachios, walnuts, almonds) and seeds (sunflower, sesame).

Omega—3 Fats

- are a type of unsaturated fats
- can help lower the risk of heart disease and stroke
- may have other health benefits:
 - help with brain development
 - reduce inflammation in the body

Place Omega—3 fats cards here.

Discussion:

- Q. What is an Omega-3 fat?
A. Omega-3 fats are an essential fatty acid that your body cannot produce.
- Q. Which foods have Omega-3 fats?
A. Fatty fish, fish oil, flax seeds, chia seeds, flaxseed oil, and walnuts.

Saturated Fats

- are hard at room temperature
- mainly come from animal sources
- are unhealthy fats
- can clog blood vessels, increase blood pressure, and increase the risk of heart disease and stroke

Place saturated fats cards here.

Discussion:

- Q. What are unhealthy fats?
A. Primarily found in animal fat, these fats can health problems over time.
- Q. What can you do to limit the amount of the fats that contain bad cholesterol?
A. Choose lean meats with no visible fat or trim the fat before cooking
eat less bacon and sausage, eat less butter and lard, choose lower fat cheese, made with less than 20% milk fat), and lower milk fat (2% milk or less)

The one common need for all life on Earth is water. In addition to water, we need four basic types of nutrients:

- protein
- carbohydrates
- fats
- trace amounts of vitamins and minerals

This activity focuses on carbohydrates, but it also includes information about fats and protein. Information about diabetes is included throughout this activity as an example.

The Carb Card Game is designed to help you plan daily

Each card (image on right below) contains basic nutritional information:

- Carb Servings
- Portion (size of serving)
- Total Carbs
- Fiber
- Calories
- Fat
- Protein

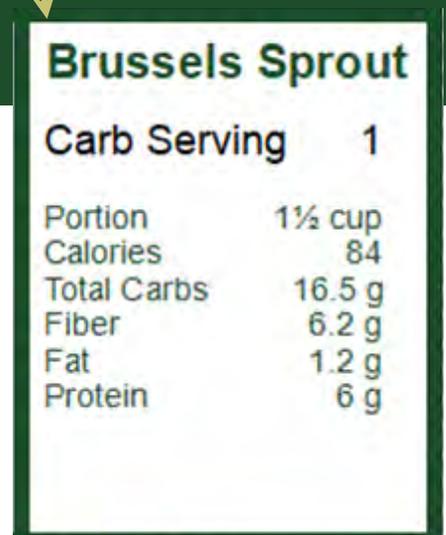
DO

Directions:

- Print and cut out the pages 33-59 of Counting Carb cards and the Breakfast, Lunch, Dinner, Snack labels on page 60.
- The cards include many of

Counting Carbohydrate Grams or Servings

- Someone with either Type 1 or 2 diabetes can help manage the disease through limiting carbohydrates.
- Strive to maintain a daily intake of 200 grams spread equally across your meals. Each meal should have 60 g carbohydrates, with snacks accounting for the remaining 20 g.
- It may be simpler for you to count carbohydrate servings instead. Each serving = 15 g. Strive to maintain 13 servings of carbs each day, consuming 4 carbs per meal, and 1 for snacks.



meals, and focus on carbohydrates or calories.

The cards are color coded:

- pink (red)—fruit
- blue—dairy
- purple—protein
- orange—starches
- green—vegetables
- yellow—other (oil, coffee/tea, etc.)

MATERIALS

- ProSimpli 3" x 5" Index card holder sleeve 5 rows 4 columns, 20 Card Slots, 18"x22" (*optional*)
- Print pages 36-60 single-sided
- small sticky notes
- pen / pencil
- magnets (to hang card holder)
- scissors
- scratch paper

the most common fruits, vegetables, starches, proteins, dairy, and other types of food. Notice that within each food group, there are additional blank cards for you to complete for more foods. For example, if your favorite is Durian Fruit, you can complete a card for Durian Fruit.

- You can store your cards in a snack-size plastic bag.
- If you are using the ProSimpli card holder, decide where you will place it. For example, you can hang it on your refrigerator with magnets. Consider where it will be most convenient for daily use. Be sure to ask your parent.

EXAMPLES

For example, 15 grams of carbs for different food groups is as such:

- Most fruits: 15 grams carbs = 1/2 cup or 1 smallish (~4 oz.) piece – then there are some exceptions which people learn over time
- Most starchy vegs: 15 grams carbs = 1/2 cup – then there are some exceptions which people learn over time
- Most dairy: 15 grams carbs = 1 cup – then there are some exceptions which people learn over time
- Most grains (pasta/rice/etc.): 15 grams = 1/3 cup – then there are some exceptions which people learn over time
- Most beans: 15 grams = 1/2 cup (with some exceptions)

PUTTING IT TOGETHER: Counting Carbs 33

Artichoke Carb Serving 1 Portion 1 med. cooked Calories 61 Total Carbs 14 g Fiber 6.9 g Fat 0.2 g Protein 3.5 g	Arugula Carb Serving 1 Portion 15 cup raw Calories 75 Total Carbs 15 g Fiber 4.9 g Fat 1.5 g Protein 7.5 g Use as a free food	Asparagus Carb Serving 1 Portion 2 cup cooked Calories 80 Total Carbs 16 g Fiber 7.2 g Fat 0.8 g Protein 8.8 g
Bamboo Shoot Carb Serving 1 Portion 5 shoots Calories 85 Total Carbs 15 g Fiber 7 g Fat 1.5 g Protein 11 g	Bean—Green Carb Serving 1 Portion 1 1/2 cup Calories 66 Total Carbs 15 g Fiber 8 g Fat 0.6 g Protein 3.6 g	Beet Carb Serving 1 Portion 1 cup Calories 75 Total Carbs 17 g Fiber 3.4 g Fat 0.3 g Protein 2.9 g
Bok Choy Carb Serving 1 Portion 7.5 cups Calories 67.5 Total Carbs 15 g Fiber 5.3 g Fat 7.5 g Protein 7.5 g	Broccoli Carb Serving 1 Portion 1 stalk Calories 63 Total Carbs 13 g Fiber 5.9 g Fat 0.7 g Protein 4.3 g	Brussels Sprout Carb Serving 1 Portion 1 1/2 cup Calories 84 Total Carbs 16.5 g Fiber 6.2 g Fat 1.2 g Protein 6 g

REFLECT

- As an example, we will have the following items for our daily meals:
 - Breakfast: 1 cup oatmeal, 1/2 cup milk, 1 Tbsp. honey, 2 Tbsp. dried cranberries, and cinnamon
 - Lunch: grilled cheese sandwich, tomato soup, 1/2 cup yogurt, 1/2 cup milk, and a peanut butter cookie
 - Dinner: fast food hamburger with tomato, lettuce, pickle, and

katsup, French fries, and a cola

- Snacks: potato chips; string cheese

- Go through your cards and pull out the listed food. If you do not have a card for a specific food listed, jot it down on one of your blank cards. Be sure to color code the food.
- NOTE: spices and herbs are

- OPTIONAL: Place Page 60 labels for Breakfast, Lunch, Dinner, and Snack, across the top row of your card holder. (See note in green box below). You can keep track of the food you eat for each meal in the column.
- Organize your cards within food group alphabetically.
- The backs of the cards are blank. You can add additional nutrition information or list some recipes that use this food.
- Place the blank cards at the bottom for future use.



The ProSimpli Card Holder is a really nice place to hold your cards, but it is a bit expensive. I only found one company that made them. If you would like to purchase it, search Amazon for “ProSimpli Card Holder.”

MAKE YOUR OWN CARB CARD

Missing a favorite food? The blank Carb Cards are for you to add missing foods. If your family eats plantain, you can make your own Carb Card. See page 62 for directions.

FREE. You do not have to count them in your total.

- If you purchased the ProSimpli, place the cards into the appropriate meal's slot. If not, arrange them on a table or counter, organizing the food selected for each meal.
- Insert or place in a stack the food for breakfast below the Breakfast label. Be sure that you can read each card.
- Insert or place in a stack the food for lunch below the Lunch label. Be sure that you can read each card easily.
- Insert or place in a stack the food for dinner below the

All together, you drink 8 ounces of milk. You can either use a sticky note indicating the total carbs, or you can use one of your blank cards to record a second helping of milk (see black circle below).

- Count the total carbs for each meal:
 - Breakfast Total
 - Lunch Total
 - Dinner Total
 - Snacks Total
- Write the total carbs or carb servings on a sticky note, and place in the correct column for that meal.
- Add your total carbs (Breakfast + Lunch + Dinner

HEALTHY DIET AND YOU AFTER:

- 1 day—You will feel less hungry all day.
- 7 days—you may notice that you are decreasing water retention; your eyes may not be less puffy.
- 14 days—you may feel less hungry as it gets towards mealtime (and less hangry!)
- 21 days—you may feel less bloated. You may also be getting a better night sleep!
- 28 days—your cravings will be subsiding, and your immune system is getting stronger!



+ Snacks = Total Carbs for the day.)

- Each meal should have about an equal amount of carbs (e.g. 60 g or 4 servings per meal + 20 g or 1 or 2 serving for snacks).
- Each meal should be colorful, with plenty of green, some blue, orange, and purple, over the entire day. This will help you eat more balanced meals for a healthy diet. remember the My Plate lesson and portion control. Use the same proportion of colors.

Dinner label. Be sure that you can read each card easily.

- Insert or place in a stack the food for Snacks label. Be sure that you can read each card easily.
- Notice that you have milk for both breakfast and lunch.

CARBOHYDRATES

- You can keep track of carbohydrates by total grams or by number of servings. We are using an average. They may not be what you require. Talk with your doctor about what is best for you.
- We are using 200 g total carbs per day (a typical average). To convert grams to servings, divide 200g by 15g (1 serving = 15 grams). You can have 13-14 servings of carbohydrates per day.

APPLY

- Look at your meals. Is it balanced? Look at the colors:
 - 1/5 (or more) of the color is green
 - 1/5 of the color is orange
 - 1/5 of the color is red
 - 1/5 of the color is purple
 - 1/5 of the color is blue
- many calories do you need per day? (Review page 11 for this information.)
- Do you need to adjust the food for the number of calories?
- How many grams of protein did this diet provide? (94.6 grams).
- Do you need to adjust the

HEALTHY DIET AND YOU AFTER:

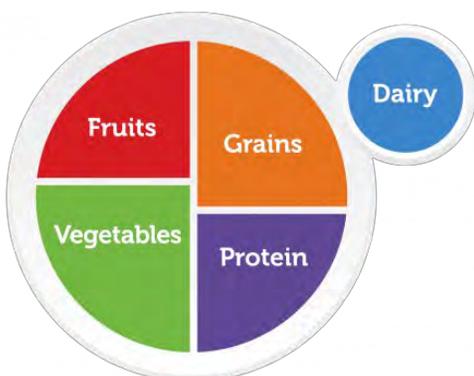
- 1 day—you will feel less hungry all day.
- 7 days—you may notice that you are decreasing water retention; your eyes may not be so puffy.
- 14 days—you may feel less hungry as it gets towards mealtime (and less hangry!)
- 21 days—you may feel less bloated. You may also be getting a better night sleep!
- 28 days—your cravings will be subsiding, and your immune system is getting stronger!



- Go through your Carb Cards and adjust your meals to better meet the “rules.”
- Plan tomorrow’s meals for you and your family. Keep an eye on the colors, carbs, fats, calories, and proteins.

- Were your carbs divided equally throughout the day?
 - How many calories are you eating at each meal? What are the total calories in this example? (2,822 calories)
 - Review the calories you need based on your age and activity level. About how
- food for the grams of protein you need in a day assuming
- under 13 years old, 34 grams
 - over 13 years old boy 52 grams
 - over 13 year old girl 42 grams

NOTE: As we discussed first, food is more than just for our health. It has importance to us as we celebrate, have family time, and so much more. Your family may have an Ice Cream Sundaes on Sunday. Incorporate these celebrations in your planning!



RULES OF THE CARB CARD GAME:

- Try to adjust your carbs to be evenly divided throughout the day to better fuel your body
- Maintain your calorie count for your age and activity levels
- Eat enough protein for your age group (and gender)
- Select foods from each of the 5 food groups.
- Use the pie shapes from the Portion Control lesson to help you plan.

Apple

Carb Serving 1

Portion	small fruit
Calories	52
Total Carbs	17 g
Fiber	2.4 g
Fat	0.2 g
Protein	0.5 g

Applesauce

(no added sugar)

Carb Serving 1

Portion	1/2 cup
Calories	52
Total Carbs	17 g
Fiber	2.4 g
Fat	0.2 g
Protein	0.5 g

Apricot

Carb Serving 1

Portion	4 small fruits
Calories	68
Total Carbs	15.6 g
Fiber	2.8 g
Fat	0.1 g
Protein	0.5 mg

Avocado

Carb Serving 1

Portion	1 cup
Calories	234
Total Carbs	12 g
Fiber	10 g
Fat	21 g
Protein	2.9 g

Good source Omega-3

Banana

Carb Serving 1

Portion	1/2 fruit
Calories	52
Total Carbs	13.5 g
Fiber	2.6 g
Fat	0.2 g
Protein	0.7 g

Blackberry

Carb Serving 1

Portion	1 cup raw
Calories	62
Total Carbs	14 g
Fiber	8 g
Fat	0.7 g
Protein	2 g

Blueberry

Carb Serving 1

Portion	3/4 cup
Calories	63
Total Carbs	15.8 g
Fiber	0.9 g
Fat	0.4 g
Protein	0.8 g

Cantaloupe

Carb Serving 1

Portion	1 cup
Calories	60
Total Carbs	15 g
Fiber	1.6 g
Fat	0.3 g
Protein	1.5 g

Cranberries—Dried

Carb Serving 1

Portion	2 Tbsp.
Calories	62
Total Carbs	16.5 g
Fiber	1 g
Fat	0.2 g
Protein	0 g

Cherry**Carb Serving 1**

Portion 3/4 cup raw
 Calories 65
 Total Carbs 16 g
 Fiber 2.3 g
 Fat 0.3 g
 Protein 1.1 g

Clementine**Carb Serving 1**

Portion 2 sm. fruits
 Calories 35
 Total Carbs 18 g
 Fiber 1 g
 Fat 0 g
 Protein 1 g

Coconut Meat**Carb Serving 1**

Portion 4 x 4 x 1"
 Calories 320
 Total Carbs 14 g
 Fiber 8 g
 Fat 30 g
 Protein 3 g

Figs**Carb Serving 1**

Portion 2 sm. fruit
 Calories 60
 Total Carbs 15.4 g
 Fiber 2.4 g
 Fat 0.2 g
 Protein 0.6 g

Grapes**Carb Serving 1**

Portion 1 cup
 Calories 62
 Total Carbs 16 g
 Fiber 1 g
 Fat 0.3g
 Protein 0.6 g

Grapefruit***Carb Serving 1**

Portion 1/2 med.
 Calories 52
 Total Carbs 13 g
 Fiber 2 g
 Fat 0.2 g
 Protein 0.9 g

*Avoid if taking Statin-based prescription drugs

Honeydew Melon**Carb Serving 1**

Portion 1 cup diced
 Calories 61
 Total Carbs 15 g
 Fiber 1.4 g
 Fat 0.2 g
 Protein 0.9 g

Kiwifruit**Carb Serving 1**

Portion 1/2 cup
 Calories 55
 Total Carbs 13 g
 Fiber 5 g
 Fat 0.5 g
 Protein 1 g

Lemon**Carb Serving 1**

Portion 3 sm. fruits
 Calories 51
 Total Carbs 15 g
 Fiber 1.6 g
 Fat 0.2 g
 Protein 0.6 g

Lime

Carb Serving 1

Portion	2 sm. fruit
Calories	40
Total Carbs	14 g
Fiber	3.8 g
Fat	0.1 g
Protein	1 g

Mandarin

Carb Serving 1

Portion	1 lg. fruit
Calories	47
Total Carbs	12 g
Fiber	2 g
Fat	0.3 g
Protein	0.7 g

Mango

Carb Serving 1

Portion	2/3 cup
Calories	66
Total Carbs	17 g
Fiber	1.7 g
Fat	0.1 g
Protein	0.9 g

Nectarine

Carb Serving 1

Portion	1 med. fruit
Calories	62
Total Carbs	15 g
Fiber	2.4 g
Fat	0.5 g
Protein	1.5 g

Olives

Carb Serving 1

Portion	140 sm. fruit
Calories	588
Total Carbs	15.4
Fiber	14 g
Fat	61.6 g
Protein	4.2 g

Good source Omega-3

Orange

Carb Serving 1

Portion	1 med. fruit
Calories	62
Total Carbs	15.4 g
Fiber	3.1 g
Fat	0.16 g
Protein	1.2 g

Papaya

Carb Serving 1

Portion	1 cup cubed
Calories	62
Total Carbs	16 g
Fiber	2.5 g
Fat	0.4 g
Protein	0.7 g

Peach

Carb Serving 1

Portion	1 sm. fruit
Calories	51
Total Carbs	12 g
Fiber	2 g
Fat	0.3 g
Protein	1.4 g

Pear

Carb Serving 1

Portion	1/2 med. fruit
Calories	51
Total Carbs	13.5 g
Fiber	2.8 g
Fat	0.2 g
Protein	0.3 g

Pineapple

Carb Serving 1

Portion	3/4 cup
Calories	62
Total Carbs	16.5 g
Fiber	1.7 g
Fat	0.2 g
Protein	0.7 g

Plum

Carb Serving 1

Portion	2 med. fruit
Calories	60
Total Carbs	15 g
Fiber	1.8 g
Fat	0.4 g
Protein	1 g

Pomegranate

Carb Serving 1

Portion	1/2 med. fruit
Calories	64
Total Carbs	15 g
Fiber	3 g
Fat	1 g
Protein	1.5 g

Prunes

Carb Serving 1

Portion	2.5 fruit
Calories	57
Total Carbs	15 g
Fiber	1.7 g
Fat	0.1 g
Protein	0.5 g

Quince

Carb Serving 1

Portion	1 fruit
Calories	57
Total Carbs	14 g
Fiber	1.9 g
Fat	0.1 g
Protein	0.4 g

Raisins

Carb Serving 1

Portion	2 Tbsp.
Calories	60
Total Carbs	15.5 g
Fiber	0.1 g
Fat	0 g
Protein	0.5 g

Raspberry

Carb Serving 1

Portion	1 cup
Calories	64
Total Carbs	15 g
Fiber	8 g
Fat	0.8 g
Protein	1.5 g

Strawberry

Carb Serving 1

Portion	1¼ cup
Calories	61
Total Carbs	15 g
Fiber	4 g
Fat	0.6 g
Protein	1.2 g

Tangerine

Carb Serving 1

Portion	1 med. fruit
Calories	60
Total Carbs	15 g
Fiber	2 g
Fat	0.3 g
Protein	0.9 g

Watermelon

Carb Serving 1

Portion 1¼ cup
Calories 58
Total Carbs 15 g
Fiber 0.8 g
Fat 0.3 g
Protein 1.1 g

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving

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Artichoke

Carb Serving 1

Portion	1 med. cooked
Calories	61
Total Carbs	14 g
Fiber	6.9 g
Fat	0.2 g
Protein	3.5 g

Arugula

Carb Serving *FREE*

1 Portion	1 cup raw
	½ cup cooked
Calories	5
Total Carbs	1 g
Fiber	1 g
Fat	0.1 g
Protein	0.5 g

Asparagus

Carb Serving *FREE*

1 Portion	1 cup raw
	½ cup cooked
Calories	20
Total Carbs	4 g
Fiber	1.8 g
Fat	0.2 g
Protein	2.2 g

Bamboo Shoot

Carb Serving 1

Portion	5 shoots
Calories	85
Total Carbs	15 g
Fiber	7 g
Fat	1.5 g
Protein	11 g

Bean—Green

Carb Serving *FREE*

1 Portion	1 cup raw
	½ cup cooked
Calories	22
Total Carbs	5 g
Fiber	2 g
Fat	0.2 g
Protein	1.2 g

Beet

Carb Serving 1

1 Portion	1 cup raw
	½ cup cooked
Calories	75
Total Carbs	17 g
Fiber	3.4 g
Fat	0.3 g
Protein	2.9 g

Bok Choy

Carb Serving *FREE*

1 Portion	1 cup raw
	½ cup cooked
Calories	9
Total Carbs	2 g
Fiber	7.1 g
Fat	1 g
Protein	1 g

Broccoli

Carb Serving *FREE*

1 Portion	1 cup raw
	½ cup cooked
Calories	31
Total Carbs	6 g
Fiber	2.4 g
Fat	0.4 g
Protein	2.5 g

Brussels Sprout

Carb Serving 1

Portion	1½ cup
Calories	28
Total Carbs	5.5 g
Fiber	2.1 g
Fat	0.4 g
Protein	2 g

Cabbage—Green**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Calories	17.3
Total Carbs	4.1 g
Fiber	1.4 g
Fat	0.1 g
Protein	1 g

Cabbage—Red**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Calories	28
Total Carbs	4.7 g
Fiber	1.9 g
Fat	0.1 g
Protein	1.3 g

Carrot**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Calories	52
Total Carbs	12 g
Fiber	3.6 g
Fat	0.3 g
Protein	1.2 g

Cauliflower**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Calories	27
Total Carbs	5.3 g
Fiber	2.1 g
Fat	0.3 g
Protein	2.1 g

Celery**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Calories	14
Total Carbs	1.6 g
Fiber	1.6 g
Fat	0.2 g
Protein	0.7 g

Cucumber**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Calories	16
Total Carbs	2.5 g
Fiber	1.2 g
Fat	0.1 g
Protein	0.7 g

Eggplant**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Calories	21
Total Carbs	4.8 g
Fiber	2.5 g
Fat	0.2 g
Protein	0.8 g

Jicama**Carb Serving 1**

1 Portion	1 cup raw
	½ cup cooked
Calories	46
Total Carbs	11 g
Fiber	5.9 g
Fat	0.1 g
Protein	1.2 g

Kale**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Portion	2½ cup
Calories	7.4
Total Carbs	1 g
Fiber	1 g
Fat	0.3 g
Protein	0.6 g

Leek**Carb Serving 1**

Portion	1 cup raw
	½ cup cooked
Calories	75
Total Carbs	12.5 g
Fiber	1.6 g
Fat	0.3 g
Protein	1.3 g

Lettuce—Iceberg**Carb Serving *FREE***

Portion	1 cup raw
	½ cup cooked
Calories	10
Total Carbs	2.1 g
Fiber	0.9 g
Fat	0.1 g
Protein	0.6 g

Lettuce—Leaf

(Spring Mix)

Carb Serving *FREE*

Portion	1 cup raw
	½ cup cooked
Calories	20
Total Carbs	3 g
Fiber	2 g
Fat	0 g
Protein	2 g

Lettuce—Romaine**Carb Serving *FREE***

Portion	1 cup raw
	½ cup cooked
Calories	20
Total Carbs	3 g
Fiber	2 g
Fat	0 g
Protein	2 g

Mushrooms**Carb Serving *FREE***

1 Portion	1 cup raw
	½ cup cooked
Calories	105
Total Carbs	16.1 g
Fiber	4.9 g
Fat	1.4 g
Protein	15.4 g

Mustard Greens**Carb Serving *FREE***

Portion	1 cup raw
	½ cup cooked
Calories	15
Total Carbs	2.6 g
Fiber	1.8 g
Fat	0.2 g
Protein	1.6 g

Okra**Carb Serving *FREE***

Portion	1 cup raw
	½ cup cooked
Calories	18
Total Carbs	3.6 g
Fiber	2 g
Fat	0.2 g
Protein	1.5 g

Onion—Red**Carb Serving 1**

Portion	1 cup raw
	½ cup cooked
Calories	64
Total Carbs	14.9 g
Fiber	2.7 g
Fat	0.2 g
Protein	1.8 g

Onion—White/Yellow**Carb Serving 1**

Portion	1 cup raw
	½ cup cooked
Calories	64
Total Carbs	15 g
Fiber	2.3 g
Fat	0.2 g
Protein	1.8 g

Pepper—Green Bell

Carb Serving *FREE*

Portion	1 cups raw ½ cup cooked
Calories	30
Total Carbs	6.9 g
Fiber	2.5 g
Fat	0.3 g
Protein	1.3 g

Pepper—Red/ Orange/Yellow Bell

Carb Serving *FREE*

Portion	1 cups raw ½ cup cooked
Calories	39
Total Carbs	9 g
Fiber	3.1 g
Fat	0.4 g
Protein	1.5 g

Radish

Carb Serving *FREE*

Portion	1 cups raw ½ cup cooked
Calories	19
Total Carbs	3.9 g
Fiber	1.9 g
Fat	0.1 g
Protein	0.8 g

Shallot

Carb Serving 1

Portion	½ cup raw ¼ cup cooked
Calories	56
Total Carbs	13.6 g
Fiber	2.4 g
Fat	0 g
Protein	2.4 g

Spinach

Carb Serving *FREE*

Portion	½ cup raw ¼ cup cooked
Calories	14
Total Carbs	1.5 g
Fiber	1.3 g
Fat	0.2 g
Protein	1.7 g

Swiss Chard

Carb Serving *FREE*

Portion	½ cup raw ¼ cup cooked
Calories	6.8
Total Carbs	1.4 g
Fiber	0.6 g
Fat	0.1 g
Protein	0.6 g

Tomatillo

Carb Serving *FREE*

Portion	1 cup raw ½ cup cooked
Calories	42
Total Carbs	7.8 g
Fiber	2.6 g
Fat	1.4 g
Protein	1.2 g

Tomato

Carb Serving *FREE*

Portion	1 cup raw ½ cup cooked
Calories	32
Total Carbs	7 g
Fiber	2.2 g
Fat	0.4 g
Protein	1.6 g

Tomato Soup

Carb Serving 3

Portion	1 can
Calories	217
Total Carbs	46 g
Fiber	3.4 g
Fat	1.4 g
Protein	4.5 g

Water Chestnuts

Carb Serving 1

Portion	1 cup raw
	½ cup cooked
Calories	79
Total Carbs	19.4 g
Fiber	4 g
Fat	0.1 g
Protein	1.4 g

Zucchini

Carb Serving *FREE*

1 Portion	1 cup raw
	½ cup cooked
Calories	21
Total Carbs	3.9 g
Fiber	1.2 g
Fat	0.4 g
Protein	1.5 g

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving

Portion
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Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving *FREE*

1 Portion	1 cup raw
	½ cup cooked
Calories	21
Total Carbs	3.9 g
Fiber	1.2 g
Fat	0.4 g
Protein	1.5 g

Carb Serving

Portion
 Calories
 Total Carbs
 Fiber
 Fat
 Protein

Carb Serving

Portion
 Calories
 Total Carbs
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Carb Serving

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 Fiber
 Fat
 Protein

Carb Serving

Portion
 Calories
 Total Carbs
 Fiber
 Fat
 Protein

Carb Serving

Portion
 Calories
 Total Carbs
 Fiber
 Fat
 Protein

Bean—Black**Carb Serving 1**

Portion $\frac{1}{3}$ cup cooked
 Calories 82
 Total Carbs 15 g
 Fiber 6.2 g
 Fat 0.3 g
 Protein 5.3 g

Bean—Kidney**Carb Serving 1**

Portion $\frac{1}{3}$ cup cooked
 Calories 85
 Total Carbs 15 g
 Fiber 5 g
 Fat 0.4 g
 Protein 5.9 g

Bean—Navy**Carb Serving 1**

Portion $\frac{1}{3}$ cup cooked
 Calories 77
 Total Carbs 14.2 g
 Fiber 5.8 g
 Fat 0.4 g
 Protein 4.5 g

Bean—Pinto**Carb Serving 1**

Portion $\frac{1}{3}$ cup cooked
 Calories 82
 Total Carbs 15 g
 Fiber 5 g
 Fat 0.3 g
 Protein 5 g

Bread—Multigrain**Carb Serving 1**

Portion 1 slice
 Calories 58
 Total Carbs 12 g
 Fiber 1.7 g
 Fat 1 g
 Protein 2.6 g

**Bread—Whole
Wheat****Carb Serving 1**

Portion 1 slice
 Calories 67
 Total Carbs 12.3 g
 Fiber 1.1 g
 Fat 1.1 g
 Protein 2.4 g

Bread—White**Carb Serving 1**

Portion 1 slice
 Calories 70
 Total Carbs 14 g
 Fiber 0 g
 Fat 1 g
 Protein 2 g

Bulgur Wheat**Carb Serving 1**

Portion $\frac{1}{2}$ cup
 Calories 76
 Total Carbs 16.9 g
 Fiber 4.1 g
 Fat 0.2 g
 Protein 2.8 g

**Chickpea
(garbanzo)****Carb Serving 1**

Portion $\frac{1}{2}$ cup cooked
 Calories 90
 Total Carbs 15 g
 Fiber 4.1 g
 Fat 1.6 g
 Protein 4.6 g

Corn

Carb Serving 1

Portion ½ cup cooked
 Calories 66
 Total Carbs 14.6 g
 Fiber 2 g
 Fat 0.9 g
 Protein 2.5 g

Cornmeal

Carb Serving 1

Portion 3 Tbsp.
 Calories 83
 Total Carbs 17.6 g
 Fiber 1.7 g
 Fat 0.8 g
 Protein 1.9 g

Edamame

Carb Serving 1

Portion 1 cup shelled
 Calories 188
 Total Carbs 13.8 g
 Fiber 8 g
 Fat 8 g
 Protein 18.4 g

French Fries

Carb Serving 3

Portion medium
 Calories 328
 Total Carbs 45 g
 Fiber 3.4 g
 Fat 15 g
 Protein 3.8 g

Lentil

Carb Serving 1

Portion ½ cup cooked
 Calories 89
 Total Carbs 15.5
 Fiber 6.1 g
 Fat 0 g
 Protein 6.9 g

Oatmeal

Carb Serving 1

Portion ⅔ cup
 Calories 87
 Total Carbs 15.2 g
 Fiber 2.2 g
 Fat 1.4 g
 Protein 3.6 g

Parsnip

Carb Serving 1

Portion ⅔ cup cooked
 Calories 67
 Total Carbs 16 g
 Fiber 3.4 g
 Fat 0.2 g
 Protein 1.2 g

Pasta

Carb Serving 1

Portion ½ cup
 Calories 87
 Total Carbs 18.5 g
 Fiber 3.2 g
 Fat 0.4 g
 Protein 3.7 g

Peanut

Carb Serving 1

Portion 84
 Calories **483**
 Total Carbs 13.8 g
 Fiber 7.2 g
 Fat 42 g
 Protein 21.9 g

Peas (dried/fresh)

Carb Serving 1

Portion $\frac{3}{4}$ cup cooked
 Calories 93
 Total Carbs 16.5 g
 Fiber 5.4 g
 Fat 0.3 g
 Protein 6.2 g

Peas—Snow

Carb Serving 1

Portion $1\frac{1}{2}$ cup cooked
 Calories 101
 Total Carbs 16.5 g
 Fiber 6.8 g
 Fat 0.6 g
 Protein 7.8 g

Pita Bread

Carb Serving 1

Portion 1 small
 Calories 75
 Total Carbs 15.4 g
 Fiber 2.1 g
 Fat 0.7 g
 Protein 2.7 g

Potato—Red

Carb Serving 1

Portion $\frac{1}{3}$ cup cooked
 Calories 67
 Total Carbs 14.7 g
 Fiber 1.4 g
 Fat 0.1 g
 Protein 1.7 g

Potato—White

Carb Serving 1

Portion $\frac{1}{2}$ cup cooked
 Calories 68
 Total Carbs 15.6 g
 Fiber 1.6 g
 Fat 0.1 g
 Protein 1.9 g

Potato—Yellow

Carb Serving 1

Portion $\frac{2}{3}$ cup cooked
 Calories 63
 Total Carbs 15 g
 Fiber 2.5 g
 Fat 0 g
 Protein 1.3 g

Potato Chips

Carb Serving 1

Portion 15 chips
 Calories 160
 Total Carbs 15 g
 Fiber 1 g
 Fat 10 g
 Protein 2 g

Pumpkin

Carb Serving 1

Portion 2 cups cooked
 Calories 60
 Total Carbs 16 g
 Fiber 1.2 g
 Fat 0.2 g
 Protein 2.4 g

Rice—brown

Carb Serving 1

Portion $\frac{1}{3}$ cup
 Calories 72
 Total Carbs 15 g
 Fiber 1.2 g
 Fat 0.6 g
 Protein 1.4 g

Rice—white

Carb Serving 1

Portion	1/3 cup
Calories	68
Total Carbs	15 g
Fiber	0.2 g
Fat	0.1 g
Protein	1.4 g

Rice—wild

Carb Serving 1

Portion	2 Tbsps.
Calories	71
Total Carbs	15 g
Fiber	1.3 g
Fat	0.2 g
Protein	3 g

Rolls—whole wheat

Carb Serving 1

Portion	1 small roll
Calories	80
Total Carbs	14 g
Fiber	2 g
Fat	2 g
Protein	3 g

Soybean

Carb Serving 1

Portion	1 cup cooked
Calories	298
Total Carbs	17 g
Fiber	8.1 g
Fat	15.4 g
Protein	28.6 g

Squash—Butternut

Carb Serving 1

Portion	1 cup cooked
Calories	63
Total Carbs	16 g
Fiber	2.8 g
Fat	0.1 g
Protein	1.4 g

Squash—Danish

Carb Serving 1

Portion	1/2 cup cooked
Calories	58
Total Carbs	15 g
Fiber	4.5 g
Fat	0.2 g
Protein	1.2 g

Squash—Spaghetti

Carb Serving 1

Portion	2 cups cooked
Calories	62
Total Carbs	14 g
Fiber	3 g
Fat	1.2 g
Protein	1.2 g

Squash—Summer
(zucchini or yellow)

Carb Serving 1

Portion	1 cup cooked
Calories	62
Total Carbs	14 g
Fiber	8 g
Fat	0.8 g
Protein	2 g

Tortillas—Corn 4"

Carb Serving 1

Portion	3 tortillas
Calories	69
Total Carbs	15 g
Fiber	1.3 g
Fat	0.9 g
Protein	3 g

Tortillas—Corn 6"

Carb Serving 1

Portion	1 tortilla
Calories	96
Total Carbs	11 g
Fiber	1.3 g
Fat	0.7 g
Protein	1.4 g

**Tortillas Wheat—
6"**

Carb Serving 1

Portion	1 tortilla
Calories	90
Total Carbs	14 g
Fiber	1 g
Fat	2.5 g
Protein	2 g

**Tortillas Wheat—
8"**

Carb Serving 2

Portion	1 tortilla
Calories	140
Total Carbs	26
Fiber	1.5 g
Fat	2.5 g
Protein	4 g

**Tortillas Wheat—
10"**

Carb Serving 2

Portion	1 tortilla
Calories	190
Total Carbs	31 g
Fiber	1.7 g
Fat	4.5 g
Protein	7 g

**Tortillas Wheat—
12"**

Carb Serving 3

Portion	1 tortilla
Calories	290
Total Carbs	48 g
Fiber	2 g
Fat	8 g
Protein	8 g

**Tortillas—Wheat
low carb**

Carb Serving 1

Portion	1 tortilla
Calories	70
Total Carbs	19 g
Fiber	15 g
Fat	3 g
Protein	5 g

**Tortillas—Whole
Wheat low carb**

Carb Serving 1

Portion	1 tortilla
Calories	45
Total Carbs	12 g
Fiber	10 g
Fat	2 g
Protein	4 g

Turnip

Carb Serving 1

Portion	2 cups cooked
Calories	72
Total Carbs	16 g
Fiber	4.6 g
Fat	0.2 g
Protein	2.4 g

**Yam (sweet
potato)**

Carb Serving 1

Portion	1/3 cup cooked
Calories	63
Total Carbs	14.8 g
Fiber	2 g
Fat	0 g
Protein	0.8 g

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving

Portion
Calories
Total Carbs
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Carb Serving

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Carb Serving

Portion
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Total Carbs
Fiber
Fat
Protein

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Beef

Carb Serving 0

Portion 3 oz.
 Calories 218
 Total Carbs 0 g
 Fiber 0 g
 Fat 13 g
 Protein 24 g

Lean Cuts

Bison

Carb Serving 0

Portion 4 oz.
 Calories 121
 Total Carbs 0 g
 Fiber 0 g
 Fat 2 g
 Protein 24 g

Lean Cuts

Egg

Carb Serving 0

Portion 1 large
 Calories 78
 Total Carbs 0.6 g
 Fiber 0 g
 Fat 5 g
 Protein 6 g

Fast Food Burger

Carb Serving 4

Portion 1 burger
 Calories 677
 Total Carbs 54 g
 Fiber 5 g
 Fat 37 g
 Protein 31 g

Fish—Fatty (e.g. salmon)

Carb Serving 0

Portion 3 oz.
 Calories 121
 Total Carbs 0 g
 Fiber 0 g
 Fat 5.4 g
 Protein 17 g

Good source Omega-3

Fish—White (e.g. cod)

Carb Serving 0

Portion 4 oz.
 Calories 90
 Total Carbs 0 g
 Fiber 0 g
 Fat 0.5 g
 Protein 20 g

Fowl (e.g. chicken)

Carb Serving 0

Portion 3 oz.
 Calories 128
 Total Carbs 0 g
 Fiber 0 g
 Fat 2.7 g
 Protein 26 g

Game (e.g. elk)

Carb Serving 0

Portion 4 oz.
 Calories 159
 Total Carbs 0 g
 Fiber 0 g
 Fat 3.3 g
 Protein 25 g

Lean Cuts

Lamb / Mutton

Carb Serving 0

Portion 4 oz.
 Calories 178
 Total Carbs 0 g
 Fiber 0 g
 Fat 7.6 g
 Protein 25 g

Lean Cuts

Pork

Carb Serving 0

Portion 4 oz.
 Calories 219
 Total Carbs 0 g
 Fiber 0 g
 Fat 10.6 g
 Protein 29 g

Lean Cuts

Seeds and Nuts

Carb Serving 0

Portion 1 oz.
 Calories 164
 Total Carbs 6.1 g
 Fiber 3.5 g
 Fat 14.2 g
 Protein 6 g

General nut/seeds info
 based on almonds

Shell Fish (e.g. scallops)

Carb Serving 0

Portion 4 oz.
 Calories 137
 Total Carbs 6.3 g
 Fiber 0 g
 Fat 1 g
 Protein 24 g

Carb Serving

Portion
 Calories
 Total Carbs
 Fiber
 Fat
 Protein

Carb Serving

Portion
 Calories
 Total Carbs
 Fiber
 Fat
 Protein

Carb Serving

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Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Butter**Carb Serving 0**

Portion	1 Tbsp.
Calories	102
Total Carbs	0 g
Fiber	0 g
Fat	12 g
Protein	0.1 g

Buttermilk**Carb Serving 1**

Portion	1 cup
Calories	99
Total Carbs	12 g
Fiber	0 g
Fat	2.2 g
Protein	8 g

Cheese—Cottage**Total Carbs**

Portion	1½ cup
Calories	270
Total Carbs	15 g
Fiber	0 g
Fat	7.5 g
Protein	13 g

Cheese—Goat**Carb Serving 0**

Portion	1 oz.
Calories	103
Total Carbs	0 g
Fiber	0 g
Fat	8 g
Protein	6 g

**Cheese—Hard
(e.g. Parmesan)****Carb Serving 0**

Portion	1 oz.
Calories	110
Total Carbs	0.9 g
Fiber	0 g
Fat	7.3 g
Protein	10.1 g

**Cheese—White
(e.g. Swiss)****Carb Serving 0**

Portion	1 slice / 1 oz.
Calories	86
Total Carbs	0.3 g
Fiber	0 g
Fat	6.8 g
Protein	5.9 g

**Cheese—Yellow
(e.g. Cheddar)****Carb Serving 0**

Portion	1 slice / 1 oz.
Calories	110
Total Carbs	0 g
Fiber	0 g
Fat	9 g
Protein	7 g

**Grilled Cheese
Sandwich****Carb Serving 2**

Portion	1 sandwich
Calories	400
Total Carbs	39 g
Fiber	6 g
Fat	19 g
Protein	18 g

Ice Cream**Carb Serving 1**

Portion	½ cup
Calories	137
Total Carbs	16 g
Fiber	0.5 g
Fat	7.3 g
Protein	2.3 g

Milk Almond
(unsweet)

Carb Serving 0

Portion 1 cup
Calories 30
Total Carbs 1 g
Fiber 0.7 g
Fat 2.5 g
Protein 1 g

Milk—2%

Carb Serving 1

Portion 1 cup
Calories 122
Total Carbs 12 g
Fiber 0 g
Fat 4.8 g
Protein 8 g

Milk—Whole

Carb Serving 1

Portion 1 cup
Calories 149
Total Carbs 12 g
Fiber 0 g
Fat 7.9 g
Protein 8 g

String Cheese

Carb Serving 0

Portion 1
Calories 80
Total Carbs 0
Fiber 0
Fat 6 g
Protein 7 g

Yogurt

Carb Serving 1

Portion 5.3 oz.
Calories 120
Total Carbs 11 g
Fiber 0.5 g
Fat 2.5 g
Protein 12 g

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving

Portion
Calories
Total Carbs
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Carb Serving

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Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Coffee

Carb Serving 0

Portion 1 cup black
 Calories 1
 Total Carbs 0 g
 Fiber 0 g
 Fat 0 g
 Protein 0.3 g

Cola

Carb Serving 4

Portion 12 oz can
 Calories 140
 Total Carbs 39 g
 Fiber 0
 Fat 0
 Protein 0

Honey

Total Carbs 1

Portion 1 Tbsp.
 Calories 64
 Total Carbs 17 g
 Fiber 0 g
 Fat 0 g
 Protein 0 g

Oil (e.g. Olive)

Carb Serving 0

Portion 1 Tbsp.
 Calories 119
 Total Carbs 0 g
 Fiber 0 g
 Fat 14 g
 Protein 0 g

Good source of Omega-3

Peanut Butter Cookie

Carb Serving 2

Portion 1 cookie
 Calories 216
 Total Carbs 26 g
 Fiber 1 g
 Fat 105 g
 Protein 3.9 g

Sugar—Brown

Total Carbs 1

Portion 1 Tbsp.
 Calories 53
 Total Carbs 13.5 g
 Fiber 0 g
 Fat 0 g
 Protein 0 g

Sugar—White

Total Carbs 1

Portion 1 Tbsp.
 Calories 46
 Total Carbs 12 g
 Fiber 0 g
 Fat 0 g
 Protein 0 g

Tea

Carb Serving 0

Portion 1 cup
 Calories 0
 Total Carbs 0.1 g
 Fiber 0.1 g
 Fat 0 g
 Protein 0 g

Carb Serving

Portion _____
 Calories _____
 Total Carbs _____
 Fiber _____
 Fat _____
 Protein _____

Carb Serving

Portion
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Carb Serving

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Carb Serving

Portion
Calories
Total Carbs
Fiber
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Protein

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

Fold at the dotted line

BREAKFAST

~4 Carb Servings

ST[EMPOWER]

Fold at the dotted line

Fold at the dotted line

LUNCH

~4 Carb Servings

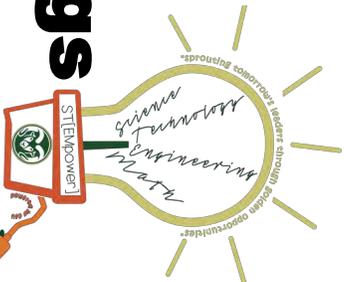
ST[EMPOWER]

Fold at the dotted line

DINNER

~4 Carb Servings

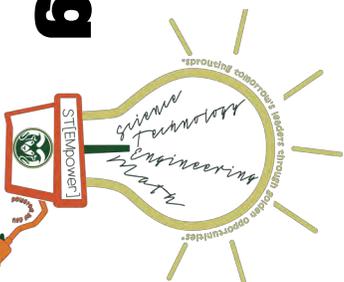
ST[EMPOWER]



SNACKS

~1 Carb Serving

ST[EMPOWER]



We all have our favorite family recipes. This activity folds your family favorites into your explorations in healthy and yummy eating! You do not have to give up anything. The point is to continue your family traditions within a healthy diet.

This activity will show you how to develop your Carb Cards for your favorite meals. This will help with your meal planning.

DO

Directions

- To complete this activity, you need to learn how to read a nutrition label. On page 63, examine the nutrition information. Locate the following information:
 - Find the serving size
 - Find how many servings
 - How many calories per serving?
 - How many grams of total fat?
 - how many grams of total carbohydrates?
 - How many grams of protein?
 - Are there trace nutrients (minerals and vitamins?)

REFLECT

- Grab your favorite family recipe.
- There is room for 19 ingredients on the worksheet (page 65).
- Identify the recipe on the top line. In our example on page 64, our recipe is called “Mom’s Low Carb Chili.”
- List all the ingredients in the first column. You will need to adjust each item for how many servings the recipe makes (5 in our example).
- Any food item that is in a

can or package contains the nutritional information. You can use the label.

- If you are using fresh ingredients (e.g. onions) you can use your Carb Cards.
- Compare your recipe to the serving amount listed on the can. In our example, the recipe calls for 1 cup (8 ounces) of tomato sauce. Tomato sauce usually comes 8, 15, or 28 ounces cans. If you have a larger can, you can look up the information on the internet for 1 cup serving size.
- Gather those items and list: Calories, Total Carbs, Fiber,

HOW TO READ A LABEL

- Number servings
- Serving size
- Total calories
- Total fat
- Total carbs
- Dietary fiber
- Protein

Note that most of the measurements are in grams. Trace nutrients (minerals and vitamins) are measured in milligrams (smaller than a gram). Calories are measured differently.

Fat, and Protein that you find on the label.

- Remember, you are completing the nutritional information for the entire dinner, and not just for a single serving of the recipe.
- When you have completed collecting your nutritional information, add the

DEVELOP CARB CARDS—Your Favorite Recipes 66

Recipe: *EXAMPLE—Mom's Easy Low Carb Chili*

Ingredient	Calories	Total Carbs	Fiber	Fat	Protein
1 lb. ground beef—95% lean	414	0g	0g	20.7g	97.1g
2 large bell peppers diced (x 2)	40 x 2 = 80	8 x 2 = 16g	3.2 x 2 = 6.4g	0.7 x 2 = 1.4g	7.6 x 2 = 15.2g
1 large onion diced	45	0.2g	1.7g	0.1g	1.1g
4 oz can green chilis diced	24	2.2g	1.1g	0.2g	0.8g
1 cup tomato sauce	30	10.1g	3.7g	0.5g	3.2g
1 cup beef broth	15	0.1g	0g	0.2g	0.7g
1 Tbsp. tomato paste	15	3g	0.7g	0.1g	0.7g
1/4 cup sour cream fat free	47	1g	0g	0g	2g
5 tortillas low carb (x 5)	120 x 5 = 600	70 x 5 = 350g	13 x 5 = 65g	3 x 5 = 15g	8 x 5 = 40g
1/4 cup green onions diced	5	1.2g	0.4g	0g	0.8g
1/4 cup cheddar shredded	114	0g	0g	8.4g	7g
1/4 cup tomatoes diced	5	1.2g	0.5g	0.1g	0.4g
1/4 cup avocados sliced	50	3.1g	2.4g	8.4g	0.7g
spices—free food					
partic—free food					
Total	1121	167.4g	63.7g	38.7g	199.4g
Number servings 5 (divide by 5)	224.2	33.5g	12.7g	7.7g	39.9g
Divide Total Carbs by 15 = Carb Serving		2.23g round to 2			

MATERIALS

- print page 63-64 (double-sided)
- print page 65—Datasheet
- print page 66—Make It Mine Carb Cards
- pencil
- scissors
- computer with internet

totals for each column. You now have the total calories, carbs, fiber, fat, and protein for the dish.

- Divide the totals by the number of servings in the dish. In our example, this recipe serves 5.
- The last step is to determine how many carb servings are in 1 portion. Divide the Total Carbs by 15 for the number of servings.
- Round your servings. If you have 2.49 or less servings, round to 2. If you have 2.5 or more servings, round to 3.

Family Recipes:

- Repeat this activity to make one Carb Card for each of your favorite family recipes.

Modify a Family Favorite?

- If you have a family member with diabetes, or if you would like to lose a couple extra pounds, you can examine your “Make It Mine” datasheet to help you with these special diets.
- To make a recipe more diabetes-friendly, focus on the carbs. Can you substitute a high carb ingredient for one that is lower in carbs?
- If you want to lose a couple of pounds, enjoy your food, but include a large salad lightly tossed with a low-calorie vinaigrette.
- You can enjoy all the foods you have always enjoyed. What if your Uncle has diabetes, and you want to prepare a food he can enjoy? The green boxes on this page provide suggestions you can use to modify your favorite meals.

How to complete a Carb Card for foods not included:

- We are using plantain (cooking banana) for the example how to add a new food to your Carb Cards.
- You need to use the internet. If you don't have access to a computer with internet, check with your community library.
- Search on the food you want to add (our example is plantain) and the word “nutrition.” Example: “*plantain nutrition*”
- Look for a reputable source, like the US Department of Agriculture (USDA).

<i>Plantain</i>	
Carb Serving	3
Portion	1 cup
Calories	180
Total Carbs	47 g
Fiber	0.5 g
Fat	1.9 g
Protein	
<i>Note: good source of vitamins and minerals</i>	

DIABETES FRIENDLY

- Uncle Fred is your favorite uncle. He has diabetes. What can you do to help him maintain a healthy diabetic diet and celebrate at your home?
- Uncle Fred needs to divide his carbohydrates equally throughout the day.
- Protein and fiber will help him feel full after a meal.
- Include a fruity dessert, like apple crumble (with a sugar alternative instead of granulated sugar).
- Snack trays include diabetes-friendly foods like:
 - hard boiled eggs
 - almonds
 - veggies with whole-grain crackers, cheese, hummus, guacamole
 - turkey roll-ups

- Jot down the information in the proper locations on your Carb Card (example on the left).
- Plantains are chock full of vitamins and minerals, those trace nutrients we need.

Have YUMMY Fun!

LOSING WEIGHT

- Follow these important rules to lose weight:
 - **TALK TO YOUR DOCTOR!**
 - Lose weight slowly. Find fun active activities.
 - **TALK TO YOUR DOCTOR!**
 - Eat protein, carbohydrates, fats, and trace nutrients. Don't cut out these necessities.
 - **TALK TO YOUR DOCTOR!**
 - Feel fuller with protein and higher fiber foods.

HOW TO READ A LABEL

Nutrition Facts	
8 servings per container	
Serving size	2/3 cup (55g)
Amount per serving	
Calories	230
	% Daily Value*
Total Fat 8g	10%
Saturated Fat 1g	5%
<i>Trans</i> Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	13%
Dietary Fiber 4g	14%
Total Sugars 12g	
Includes 10g Added Sugars	20%
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 240mg	6%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Serving size

Total calories per serving

Total fat

Salt (teens need 3800 mg)

Total carbs

Dietary fiber

Protein

Trace minerals and vitamins

Recipe: *EXAMPLE—Mom's Easy Low Carb Chili*

Ingredient	Calories	Total Carbs	Fiber	Fat	Protein
1 lb. ground beef—95% lean	616	0 g	0 g	22.7 g	97.1 g
2 large bell peppers diced (x 2)	43 x 2 = 86	9.9 x 2 = 19.8 g	3.3 x 2 = 6.6 g	0.5 x 2 = 1 g	1.6 x 2 = 3.2 g
1 large onion diced	40	9.3 g	1.7 g	0.1 g	1.1 g
4 oz can green chilis diced	24	5.2 g	1.9 g	0.3 g	0.8 g
1 cup tomato sauce	90	18.1 g	3.7 g	0.5 g	3.2 g
1 cup beef broth	17	0.1 g	0 g	0.5 g	2.7 g
1 Tbsp. tomato paste	13	3 g	0.7 g	0.1 g	0.7 g
1/4 cup sour cream fat free	47	10 g	0 g	0 g	2 g
5 tortillas low carb (x 5)	120 x 5 = 600	19 x 5 = 95 g	13 x 5 = 65 g	3 x 5 = 15 g	5 x 5 = 25 g
1/4 cup green onions diced	8	1.8 g	0.6 g	0 g	0.5 g
1/4 cup cheese shredded	114	0.4 g	0 g	9.4 g	7 g
1/4 cup tomatoes diced	8	1.8 g	0.5 g	0.1 g	0.4 g
1/4 cup avocado sliced	58	3.1 g	2.4 g	5.4 g	0.7 g
spices - free food					
garlic—free food					
Total Carbs: 167.6 g	1721	167.6 g	83.1 g	55.1 g	144.4 g
Divide by Number Servings <u>5</u>	344.2	33.5 g	16.6 g	11 g	28.9 g
Divide Total Carbs by 15 = Carb Serving		33.5 / 15 =			

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

My Own Recipe

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

My Own Recipe

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

My Own Recipe

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

My Own Recipe

Carb Serving

Portion
Calories
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My Own Recipe

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My Own Recipe

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

My Own Recipe

Carb Serving

Portion
Calories
Total Carbs
Fiber
Fat
Protein

My Own Recipe

When my son was 9 or 10, he wanted to make a surprise dinner. He shoed everyone out of the kitchen and began his masterpiece.

He brought it out to the table covered with a napkin. Then he announced: “Tonight is Runny Nose Burrito!” With flair, he snapped the napkin off the plate, and there it was! Runny Nose Burrito. He had shaped the burrito to look like a big schnoz. Oozing out of the “nostrils” was guacamole!

We all laughed and had a great evening. However, the first couple of bites were with filled with tremendous trepidation!

Our enjoyment of food has three factors:

- taste
- texture
- visual appeal

The Runny Nose Burritos were delicious, but we still hesitated before the first bite. The texture was a typical burrito. My son only changed the presentation of the dish.

In this activity, you will explore Gross Gastronomy, or the “art” of making food look gross! The food must taste good, so you are evaluating it only on the aspects of texture or visual appeal. You will then ask your family and/or friends to rate your “masterpieces!”

DO

Directions:

ONLY USE FOOD!

The Gross Gastronomy Challenge starts with exploring

the texture of food by making a couple of recipes.

Edible Slime

Time Required: 30 min

Materials:

- 14 oz. can sweetened condensed milk
- 1½ tablespoon cornstarch
- food coloring (or add a little unsweetened powdered drink mix)
- couple of drops vanilla or other flavoring, if desired

Procedure:

- In a saucepan over low heat, stir together the sweetened condensed milk and cornstarch. Stir and heat until the mixture thickens. Remove from heat.
- Stir in the coloring and any flavorings. Allow the slime to cool.
- Save until the “Reflect” section of this activity.

Ectoplasm

Time Required: 15 min.

Materials:

- 1 teaspoon soluble fiber (e.g., Metamucil psyllium fiber)
- 1 cup water
- large microwave safe bowl
- measuring cup
- measuring teaspoon
- microwave
- wood spoon

POWER WORDS

- **gastronomy:** the practice or art of choosing, cooking, and eating good food
- **schnoz:** a nose, especially a large nose (from the German schnauzer, which means snout)
- **trepidation:** a feeling of fear or agitation about something that may happen



This activity does not have any images so that you can put your imagination into full gear!

- food coloring (edible)
- 1 Tbsp natural sweetener
- 1/4 cup lemon juice

Procedure

- Pour the water and fiber into a large microwave-safe bowl.
- Microwave on high power for 3 minutes.
- Stir, return it to the microwave and heat it for another 3 minutes.

MATERIALS

- sweetened condensed milk
- cornstarch
- food coloring
- vanilla
- Metamucil psyllium fiber
- lemon juice
- natural sweetener
- pan
- wood spoon
- measuring cup
- measuring spoons
- microwave-safe bowl
- blindfold
- food samples (page 68)
- print page 69 / pencil
- sample spoon

- Stir and check its consistency. If you want drier ectoplasm, microwave the ectoplasm another minute or two. Continue checking the ectoplasm and microwaving it until you achieve the desired consistency.
- Add lemon juice, sweetener, and a drop of food coloring. You'll get an interesting effect if you incompletely mix the coloring into the ectoplasm, such as multicolored streaks.
- Save until the "Reflect" section of this activity.

REFLECT

- In this section, you need a parent or friend to help.
- Gather a plate of sample food. Suggestions (not limited to, and it is fine to substitute):
 - edible slime
 - ectoplasm
 - avocado (slice and smashed)
 - banana (slice and smashed)
 - cracker crumbs
 - spices or herbs (just a pinch)
 - pepper (just a pinch)
 - cookie crumbs
 - cheese
 - olives
 - etc.
- Prepare each food sample. You will need two small bites of each sample. Be sure that you prepare enough that each person participating will have a chance to evaluate each item with two bites.
- Use a small spoon for each sample.
- Select the first person, and

blindfold him/her.

- First bite:
 - The participant **pinches their nose** and only tastes the sample.
 - Record their responses:
 - * What does it taste like?
 - * What is the texture?
 - * Is it pleasing?
 - * Describe it.
- Second bite:
 - The participant **sniffs** the sample, and then **tastes** the sample.
 - Record their responses:
 - * What does it taste like?
 - * What is the texture?
 - * Is it pleasing?
 - * Describe it.
- Move through each of the sample foods that you collected.
- When the first participant has completed each sample, remove the blindfold, and pick the next participant. Be sure to wash the spoon.
- Do not use the same order of food, but be sure to record for the correct food sample.
- When everyone has had a turn tasting each sample with their nose pinched, and then sniffing before tasting, examine the results. What do you notice? What is most surprising?

CONSIDER THIS!

Can you develop a rating sheet to evaluate the food you prepare? What other factors would you include?

Start with one of your favorite recipes. Rate it. Why does it rate the way it does?



APPLY

- Plan a Gross Gastronomy meal. You can look at ideas online if you search for terms like: Halloween food recipes.
- Your meal **MUST** taste good. Your meal can have either gross visual appeal OR gross texture. Only play with one factor.
- Record your family's response on the datasheet.

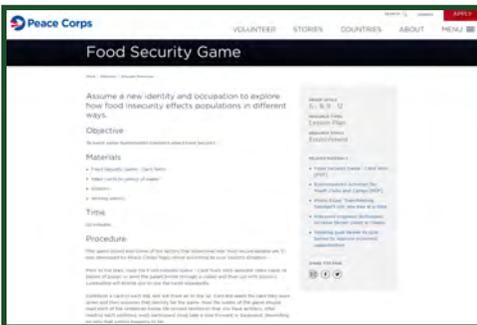
FASCINATING FACTS

- We can detect over one trillion different smells!
- Our tongue can only differentiate 5 different flavors (salt, sweet, bitter, sour, and umami (protein savory))
- It is our nose that helps us enjoy the many flavors.
- Our brain is what detects the different smells, not our nose. Our nose only collects the information.
- The smell receptor cells are replaced between every 30-60 days.

People across our planet struggle to find enough food; that includes people in the United States and in your community. You and your friends can make a difference! Remember, think globally and act locally!

DO

Peace Corps has a wonderful game to help you learn about the factors that contribute towards food insecurity worldwide. You need lots of friends (up to 30 people) The entire lesson is located at the Peace Corps website listed above and duplicated into this lesson for ease only. Peace Corps is part of our government, and the materials in the public domain.



Directions:

- Gather friends or ask one of your teachers to present this lesson.
- This game demonstrates some of the determining factors how food-secure people are. The game was developed by Peace Corps/ Togo (located in western Africa). The situations are relevant to this country.
- Prior to the start, print pages 73-78 single-sided. Cut apart the cards. You can laminate them to use the cards repeatedly.

- Distribute one card to each participant. If you have 15 people or fewer, play this game twice with new cards.
- Participants for a straight line. Each person assumes the identity on their card for the game.
- One person is selected as the reader. They read the statement below, allowing the participants to follow the directions the reader gives.
 - If you are female, take a step back.
 - If you are under 18 or over 70 years, take a step back.
 - If your job gives you a fixed salary—for example, teaching or serving as a state employee—step forward.
 - If you are a gardener or farmer and you are using green technology, move a step forward.
 - If you are a gardener or farmer and you burn the field after the harvest, take a step back.
 - If your level of education is less than second grade, take a step back.
 - If you have children, move a step forward.
 - If you have more than three children, take a step back.
 - If you are infected with

FOOD SECURITY

The USDA developed the following definitions:

Food Security

- **High food security** (old label=Food security): no reported indications of food -access problems or limitations.
- **Marginal food security** (old label=Food security): one or two reported indications— typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake.

This lesson plan is an activity from the [Environmental Activities for Youth Clubs and Camps](#), a resource developed by the Peace Corps Office of Overseas Programming and Training (OPATS). It was contributed by Peace Corps/Togo.

Malaria, take a step back.

- If you do not have a disability or disease, advance a step.
- If you do not speak your country's native administrative language, take a step back.
- If you do farming, move a step ahead.
- If you hunt animals, take a step back.

MATERIALS

- print pages 73-78 single sided
- print page 79, one for each participant
- scissors
- pencil

REFLECT

- Complete the worksheet on page 79.
- Discuss the results with all the participants.
- Can you modify the Peace Crops cards to reflect the factors that lead to food insecurity in the United States? (See the facts about hunger in the US below.) Replay the game. Do the results change?

Hunger is not just an issue in poor countries. Hunger is a problem here in the United States, too. Feeding America (<https://www.feedingamerica.org/hunger-in-america>) states:

- According to the USDA, more than 38 million people, including 12 million children, in the United States are food insecure.
- The pandemic has increased food insecurity among families with children and communities of color, who were already faced hunger at much higher rates before the pandemic.
- Every community in the country is home to families who face hunger. Rural communities are especially hard hit by hunger.
- Many households that experience food insecurity do not qualify for federal nutrition programs and visit their local food banks and other food programs for extra support.
- Hunger in Latino, African American, and Native American communities is higher because of systemic racial injustice. To achieve a hunger-free America, we

must address the root causes of hunger and structural and systemic inequities.



APPLY

Develop a Service Project to fight Food Insecurity!

In 4-H, you can explore your interests, discover yourself, and connect with your community. All 4-H projects have a service component. You can make a huge difference with a service project in fighting food insecurity in your community!

Food banks are supported through generous donations from the community. Generally,

FOOD INSECURITY

The USDA developed the following definitions:

Food Insecurity

- **Low food security** (old label=Food insecurity without hunger): reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake.
- **Very low food security** (old label=Food insecurity with hunger): reports of multiple indications of disrupted eating patterns and reduced food intake.

these donations do not include fresh produce.

Gus Westermann (Dolores County) and Greg Felsen (Montezuma County) are CSU Extension County Directors. The SW Research Center High Altitude Fruit Tree Orchard had an abundant apple harvest last year (2020). Gus spearheaded a harvesting project, and Greg helped organize with Care &

SW Research Center High Altitude Fruit Tree Orchard service project to donate apples to local food banks in SW Colorado and NW New Mexico



Share Food Banks of the Rockies to deliver this abundance to area food pantries. They also organized with a FEMA National Guard team to do a drop in Shiprock, NM for the Northern Navajo Nation. Darrin Parmenter worked with the La Plata food banks to provide apples.



You do not have to be an adult to make a difference. The following stories are about teens:

Kate Atschinow runs a foundation called Cutting Out Hunger in New Jersey. She

employs extreme couponing to purchase food for her local pantry at deeply discounted prices. She has donated more than \$40,000 worth of food! She also teaches community members how to use extreme couponing to help those in need become more self-reliant and face food insecurity with more empowerment and dignity.

Parker Romney lives in Indiana. She works with 15 youth volunteers to assemble and plant indoor aeroponic tower gardens in three local elementary schools. These gardens help provide fresh produce to children year round. This year-round method gives children the opportunity to learn to plant, grow, harvest and eat healthier food.

Lauryn Hinkley of North Dakota runs an annual peanut butter and jelly drive for her program One Backpack at a Time. She collects food for children who rely on school-provided meals during the week. On weekends, they do not receive school food and may miss meals. Peanut butter and jelly are the most expensive items in the backpack, so without donations, One Backpack at a Time would not be able to include them. Lauryn has

FOOD BANKS

Volunteer at your local food bank. Feeding America has a service to locate the food bank in your community. You add your zip code or state. <https://www.feedingamerica.org/find-your-local-foodbank>



Stories about the teens fighting food insecurity were found at Points of Light's website (<https://www.pointsoflight.org/blog/kids-and-teens-can-make-their-mark-hunger-through-innovative-service-projects/>)

collected more than 15,000 pounds of peanut butter and jelly!

What can you do to make a difference for people in your community facing food insecurity? Discuss ideas with your friends or the 4-H Extension Agent in your county.

The green boxes contain information about food banks.

FOOD BANKS (continued)

- While food banks love donations of canned goods, they can purchase more food with money donations. Food banks pool their money and bid on food, stretching their dollars.
- Fresh food donations need to be coordinated with the food bank.

Sex	Male	Sex	Female
Age	8	Age	8
Primary Work	Student	Primary Work	Student
Secondary Work	Trader of agricultural products	Secondary Work	Trader of agricultural products
Education Level	CP2	Education Level	CP1
Number of Children	0	Number of Children	0
Green Techniques	None	Green Techniques	Composting
Illness	Blind	Illness	None
Other	Orphan, doesn't speak native language	Other	Orphan
Sex	Male	Sex	Female
Age	13	Age	13
Primary Work	Student	Primary Work	Apprentice
Secondary Work	Tree processor	Secondary Work	Gardener
Education Level	CM1	Education Level	CM1
Number of Children	0	Number of Children	0
Green Techniques	None	Green Techniques	Composting
Illness	HIV/AIDS positive	Illness	HIV/AIDS positive
Other	Member of an agriculture co-op	Other	Doesn't speak native language
Sex	Male	Sex	Female
Age	22	Age	22
Primary Work	Gardener	Primary Work	Stay-at-home spouse
Secondary Work	Mushroom grower	Secondary Work	Trader of agricultural products
Education Level	Primary	Education Level	Ninth grade
Number of Children	0	Number of Children	1
Green Techniques	Composting, alley farming	Green Techniques	None
Illness	None	Illness	Blind
Other	Owner of a well-groomed field	Other	Member of an agriculture co-op

Sex	Male	Sex	Female
Age	8	Age	8
Primary Work	Student	Primary Work	Student
Secondary Work	Trader of agricultural products	Secondary Work	Trader of agricultural products
Education Level	CP2	Education Level	CP1
Number of Children	0	Number of Children	0
Green Techniques	None	Green Techniques	Composting
Illness	Blind	Illness	None
Other	Orphan, doesn't speak native language	Other	Orphan
Sex	Male	Sex	Female
Age	13	Age	13
Primary Work	Student	Primary Work	Apprentice
Secondary Work	Tree processor	Secondary Work	Gardener
Education Level	CM1	Education Level	CM1
Number of Children	0	Number of Children	0
Green Techniques	None	Green Techniques	Composting
Illness	HIV/AIDS positive	Illness	HIV/AIDS positive
Other	Member of an agriculture co-op	Other	Doesn't speak native language
Sex	Male	Sex	Female
Age	22	Age	22
Primary Work	Gardener	Primary Work	Stay-at-home spouse
Secondary Work	Mushroom grower	Secondary Work	Trader of agricultural products
Education Level	Primary	Education Level	Ninth grade
Number of Children	0	Number of Children	1
Green Techniques	Composting, alley farming	Green Techniques	None
Illness	None	Illness	Blind
Other	Owner of a well-groomed field	Other	Member of an agriculture co-op

Sex	Male	Sex	Female
Age	45	Age	45
Primary Work	Teacher	Primary Work	Housewife
Secondary Work	Pig breeder	Secondary Work	Trader of agricultural products
Education Level	University	Education Level	Sixth grade
Number of Children	5	Number of Children	6
Green Techniques	Composting	Green Techniques	None
Illness	None	Illness	None
Other	Handles livestock	Other	Doesn't speak native language
Sex	Male	Sex	Female
Age	80	Age	80
Primary Work	Trader of agricultural products	Primary Work	Housewife
Secondary Work	Farmer	Secondary Work	Gardener
Education Level	None	Education Level	None
Number of Children	7	Number of Children	4
Green Techniques	Composting	Green Techniques	Composting
Illness	Deaf	Illness	Deaf
Other	Illiterate, owner of a field, doesn't speak native language	Other	Illiterate, doesn't speak native language
Sex	Male	Sex	Female
Age	9	Age	9
Primary Work	Student	Primary Work	Student
Secondary Work	Animal hunter	Secondary Work	Farmer
Education Level	CP2	Education Level	CP1
Number of Children	0	Number of Children	0
Green Techniques	None	Green Techniques	Green fertilizer
Illness	None	Illness	Leg amputee
Other	Doesn't speak native language	Other	Burns field after harvest

Sex	Male	Sex	Female
Age	15	Age	15
Primary Work	Apprentice	Primary Work	Apprentice
Secondary Work	Animal hunter	Secondary Work	Converter of agricultural products
Education Level	CM1	Education Level	CM1
Number of Children	0	Number of Children	1
Green Techniques	None	Green Techniques	Natural insecticide
Illness	HIV/AIDS positive	Illness	None
Other	Doesn't speak native language	Other	Member of an agriculture co-op
Sex	Male	Sex	Female
Age	25	Age	25
Primary Work	Teacher	Primary Work	Converter of agricultural products
Secondary Work	Pig breeder	Secondary Work	Mushroom farmer
Education Level	University	Education Level	Ninth grade
Number of Children	2	Number of Children	3
Green Techniques	Composting	Green Techniques	Green fertilizer, natural insecticide
Illness	Finger amputee	Illness	None
Other	Handles livestock	Other	Handles livestock
Sex	Male	Sex	Female
Age	49	Age	49
Primary Work	Electrician	Primary Work	Housewife
Secondary Work	Tree processor	Secondary Work	Farmer
Education Level	10th grade	Education Level	CM2
Number of Children	4	Number of Children	2
Green Techniques	Alley farming	Green Techniques	Alley farming
Illness	None	Illness	None
Other	Owner of a well-groomed field	Other	Illiterate, burns field after harvest

Sex	Male	Sex	Female
Age	77	Age	77
Primary Work	Farmer	Primary Work	Housewife
Secondary Work	None	Secondary Work	Farmer
Education Level	None	Education Level	None
Number of Children	6	Number of Children	6
Green Techniques	Alley farming	Green Techniques	Green fertilizer
Illness	None	Illness	None
Other	Illiterate, owner of a well-groomed field	Other	Illiterate, doesn't speak native language
Sex	Male	Sex	Female
Age	3	Age	3
Primary Work	None	Primary Work	None
Secondary Work	None	Secondary Work	None
Education Level	None	Education Level	None
Number of Children	0	Number of Children	0
Green Techniques	None	Green Techniques	None
Illness	None	Illness	None
Other	Orphan	Other	None
Sex	Male	Sex	Female
Age	17	Age	17
Primary Work	Student	Primary Work	Student
Secondary Work	Peach grower	Secondary Work	Converter of agricultural products
Education Level	CM1	Education Level	CM1
Number of Children	0	Number of Children	1
Green Techniques	Green fertilizer	Green Techniques	Green fertilizer
Illness	None	Illness	HIV/AIDS positive
Other	Handles livestock	Other	Member of an agriculture co-op

Sex	Male	Sex	Female
Age	21	Age	21
Primary Work	Pig breeder	Primary Work	Post office employee
Secondary Work	Driver	Secondary Work	Converter of agricultural products
Education Level	Primary school	Education Level	University
Number of Children	0	Number of Children	2
Green Techniques	None	Green Techniques	None
Illness	None	Illness	None
Other	Member of an agriculture co-op	Other	Handles livestock
Sex	Male	Sex	Female
Age	41	Age	41
Primary Work	Driver	Primary Work	Housewife
Secondary Work	Gardener	Secondary Work	Peach grower
Education Level	10th grade	Education Level	Sixth grade
Number of Children	2	Number of Children	5
Green Techniques	Natural insecticide	Green Techniques	None
Illness	None	Illness	None
Other	Owner of a well-groomed field	Other	Handles livestock
Sex	Male	Sex	Female
Age	67	Age	67
Primary Work	Converter of agricultural products	Primary Work	Housewife
Secondary Work	Farmer	Secondary Work	Farmer
Education Level	None	Education Level	None
Number of Children	3	Number of Children	9
Green Techniques	Natural insecticide	Green Techniques	Green fertilizer
Illness	Deaf	Illness	None
Other	Illiterate, burns field after harvest	Other	Illiterate, doesn't speak the native language

1. What did you notice during this activity?

2. After this exercise, can you better explain food security to your neighbors? Why or why not?

3. What are the things you can do to improve the level of food security in your family, community, and world? (Developing new ways of generating income, increasing food production for home use, improving nutrition, improving farmer business skills, increasing literacy, improving girls' education, etc.)

4. Why do you think that one's level of education and ability to read, speak, and write their country's national administrative language are important for food security? (These can increase people's chances of obtaining good-paying jobs, which can enable them to purchase ample food and pay for their children's education. Also, ability to read can provide access to information that can help people make sound decisions about a range of food security-related issues: e.g., making healthy food choices, maintaining the health of their family, making good decisions in their personal and professional lives.)

5. How do diseases and disabilities contribute toward food insecurity? (Unhealthy people cannot work to the best of their ability; thus, their income suffers. Often, sick people cannot hold food down and become malnourished.)

6. The first statement was that all women should take a step back. Why do you think this was the case? (Opportunities for education and, therefore, for developing skills for generating income are often fewer for women. Women often do not obtain the nourishment in their diets that men do.)

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CITATIONS

Information:

- <https://dtc.ucsf.edu/living-with-diabetes/diet-and-nutrition/understanding-carbohydrates/counting-carbohydrates/>; <https://dtc.ucsf.edu/pdfs/FoodLists.pdf>; <https://fcs.osu.edu/intranet/fcs-professionals/dining-diabetes>; <https://www.cdc.gov/diabetes/managing/eat-well/meal-plan-method.html>; <https://www.cdc.gov/diabetes/managing/eat-well/diabetes-and-carbohydrates.html>; <https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-nutrition-activities-classroom.pdf#page=76>; <https://www.verywellfit.com/calorie-counts-and-nutrition-facts-overview-4581869>; <https://www.eatthismuch.com/food/nutrition/bamboo-shoots,1849/>
 - Homeostasis—Diabetes: Madeline Keleher, Ph.D.
 - Other activities developed, tested, and written by Dr. Barbara J. Shaw, edited and reviewed by the Colorado State University Extension Family Consumer Science Agents; <https://www.eatthismuch.com/food/browse/?type=food&group=Vegetables%20and%20Vegetable%20Products>
 - Jokes and Facts: <https://www.rd.com/list/short-jokes/>; <http://alovelettertofood.com/2013/09/7-surprising-facts-about-carbs/>
 - produces-extracellular-acidification-The-insulin-stimulated-glucose_fig1_330028154; Key, Lock, and rustic red door by Marc Pascual from Pixabay—<https://pixabay.com/photos/key-lock-rustic-door-red-976352/>; De Meyts P. The Insulin Receptor and Its Signal Transduction Network. [Updated 2016 Apr 27]. In: Feingold KR, Anawalt B, Boyce A, et al., editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK378978/>; Häggström, Mikael (2014). "Medical gallery of Mikael Häggström 2014". *WikiJournal of Medicine* 1 (2). DOI:10.15347/wjm/2014.008. ISSN 2002-4436. Public Domain;
 - My Plate and Portion Size: <https://www.myplate.gov/>; *Images on this page from USDA MyPlate* <https://www.myplate.gov/>; *CDC Serving Hand* <https://www.cdc.gov/diabetes/managing/eat-well/meal-plan-method.html>; *Salad: CSUE MFSH*—https://www.flickr.com/photos/csu_extension_food_and_nutrition/14909678585/in/album-72157646023645259/; <https://www.tasteofhome.com/recipes/power-lasagna/>; <https://www.eatingwell.com/recipe/248214/turkey-leek-shepherds-pie/>;
 - Sodium and Fats: Miss Steph's Shell-less Eggs <https://stempower.extension.colostate.edu/>; Saturated Fats / Unsaturated Fats: <https://www.trifactanutrition.com/blog/what-is-healthy-fat-and-what-are-the-best-sources>
 - Service Project: Images by Gregory H. Felsen, Colorado State University Extension, Montezuma County.
- All other images by Dr. Barbara J. Shaw, Colorado State University Extension Western Region Youth Development STEM K/12 Specialist

Images:

- Strawberries: Colorado State University Extension—Nutrition, Food Safety, and Health (CSUE MFSH) https://www.flickr.com/photos/csu_extension_food_and_nutrition/35319529581/
- Homeostasis—Diabetes: Madeline Keleher, Ph.D.; Baldini, N., Avnet, S. (2018) The Effects of Systemic and Local Acidosis on Insulin Resistance and Signaling <https://www.researchgate.net/figure/Insulin-stimulation->