GO Foods & Nutrient Density

5th Grade Lesson Plan

Goal: Students will understand the concepts of energy density and nutrient density and be able to use these concepts to making healthier choices.

Objectives:

1. Students will be able to define "calorie" as a unit that describes the measurement of energy.
2. Students will be able to explain that people get energy from their food and use that energy on activities to stay alive and be active.
3. Students will be able to explain the difference between energy density and nutrient density.

Materials Needed

- ☐ Food labels (one for each student)
- ☐ Nutrient Superheroes stickers
- ☐ Taste Test
- ☐ Parent Handouts

Lesson

Talking Points	Materials/Activities /Notes
Review previous lesson	
Introduction Today we are going to talk all about GO foods. What you do think GO foods are? In a car, when you see a green light, what does that mean? Right, to GO! These foods are so good for our bodies that we can GO ahead and eat them whenever we want. They provide our bodies with the nutrients they need to grow and be strong.	
DISCUSSION How do we know if we are eating GO foods? We are going to talk about 3 different words today to help us figure out if the foods we are choosing are GO foods: 1) Calories 2) Nutrients 3) Density **CALORIES** Let's start by talking about calories. What is a calorie? A calorie is a unit that we use to measure energy. We use units to measure all sorts of things. For example, what units do you use to describe how tall you are? Inches, feet, centimeters, etc. We can use a stadiometer to measure height (but you don't need to know that!)	

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- If you want to know the temperature outside or your own temperature, what device do you use and what units do you use to describe how warm or cold something is? Thermometer: Degrees, like Fahrenheit, Celsius, or even Kelvin.
- If you are measuring ingredients to make some muffins, what instruments and units do you use? Cups, spoons, teaspoons, tablespoons, etc.
- To measure the amount of energy in a food, calories are the units we use and a calorimeter is the tool that measures calories. Calorimeters measure the amount of energy in a food by burning it. Luckily, we don't have to have a calorimeter at home to know how much energy is in the food we eat – we just have to look at the nutrition label.

Take a look at this nutrition label. We can see how much energy a food gives our bodies by looking at the label. But first, we need to look at the serving size because this tells how much food the rest of the label is about.

- What is the serving size of this food? Right 1 cup. Now we know that the rest of the information on this nutrition label is about 1 cup of the food.
- Now, let's see how much energy this food gives us. Remember, for us to know how much energy a food gives our bodies, we need to look at the number of calories. How many calories does this food give our bodies? Right, 100 calories in 1 cup (remember that's our serving size). This food gives our body 100 units of energy when we eat a cup of it, or 100 calories.

Give each student a nutrition label with these questions on the back.

YOUR TURN! I'm going to pass out nutrition labels for each of you. When you get your label, answer the following questions:

1. What is the serving size of your food?
2. How many calories does one serving have?
3. How many calories does 2 servings have?
4. Pair share: share with your neighbor your answers

ENERGY OUT

Often, when we hear the word "calorie", we think "bad," but do our bodies need energy? Yes, we need energy for everything we do! The energy our body uses is called energy out, because we are using energy to do certain things and the energy is going out of our bodies. What are some things our bodies need energy for?

1. First, your body needs energy just to stay alive for activities like digesting food, breathing, and heartbeat. Each of us burns a certain amount of calories (energy) every day, whatever we do, even when we are sleeping. Just staying alive uses about half of the energy we get from food. How much energy we burn depends on our body size and composition – larger, more muscular people burn calories faster than smaller, less muscular people. No two people are quite the same.
2. Second, we need energy for growing. Children your age need energy just to keep growing.
3. Finally, we need energy for moving our bodies (exercise or physical activity). Changing how much we exercise is the only way we can make easy changes to the energy we use.

Clearly, we need energy for lots of different things in our bodies!

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ENERGY IN

How do our bodies get all the energy it needs? That's right - from food and drinks! We call this ENERGY IN – because our bodies are getting energy from the foods we are eating. Different foods give us different amounts of energy or calories. When you looked at the number of calories in your food, you were looking at the amount of energy it provides the body when you eat it.

- Lower calorie foods give us small amounts of energy. In which food groups do you think we would find lower calorie foods? They include vegetables and fruits, low fat dairy products, and some grains without a lot of added fat and sugar.
- Who can think of an example of a lower calorie food?

Higher calorie foods give us large amounts of calories. They include foods that are high in fat and/or sugar.

- What are some examples of higher calorie foods? Fried foods, nuts, seeds, candy, cake, cookies…

It's really important to balance the energy that our bodies use (ENERGY OUT) with the energy our body takes in (ENERGY IN) so that our bodies can grow and be strong.

NUTRIENTS

Alright, so we've talked all about calories and energy and how important it is to balance our energy. Now let's talk about nutrients.

What are nutrients? Nutrients are chemical substances found in food that help our bodies be healthy. We can't see them AND they are not made in the body, so we must get them from food. GO FOODS have lots of nutrients. Last time I was here, we talked about the 6 nutrient superheroes. Let's review the nutrient superheroes and all the amazing things they do for our bodies.

I'm going to give you some situations– try to guess which nutrient superhero I'm describing.

Scenario 1

John and Fernando are playing basketball in the hot summer sun. John misses a shot. The boys get tired and begin overheating with sweat dripping down their faces. John and Fernando have to stop their game of one-on-one basketball because they're too hot and thirsty to continue.

Who will come to the rescue?

- WonderWater! Her mission is to hydrate our bodies and to help with digestion and elimination. She is found in water, juice, fruits, and veggies.

Scenario 2

Active and athletic Jose rollerblades across the sidewalk and flies off a ramp, flailing into a huge crash. Even though Jose was wearing his helmet, kneepads and wrist pads, he has fallen and hurt his leg. His doctor has determined that it is broken and puts a cast on Jose. The doctor tells Jose to take care of his leg and that the bone needs to heal and get stronger.

Who will come to the rescue?

- Vita-man (vitamin D) and Mighty Mineral (Calcium)! Vita-man has 13 different superpowers and Might Mineral has 21 different superpowers,

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meaning there are 13 different vitamins and 21 different minerals we need every day to keep our bodies healthy. Some examples are:
    - Vitamin A: night vision
    - Vitamin C: heal cuts
    - B vitamins: makes protein & energy
    - Calcium: builds strong bones and teeth
    - Iron: Carries oxygen
    - Potassium: blood pressure & fluid balance
- Vita-Man and Mighty Mineral's sources of power are ALL five healthy food groups. Each food group has different vitamins and minerals, but the fruits and the veggies groups are particularly packed with vitamins and minerals.

Scenario 3
Mrs. Ryan, Stephanie's and Chris' 5th grade teacher, has asked them to stay after school to help her move some books and rearrange some desks. Stephanie and Chris are excited to help their teacher, but soon after they begin, they both start to feel weak. "These desks are too heavy", says Stephanie. "I don't have the strength to lift them", says Chris. "Same here", exclaims Stephanie, "I feel like I have no strength left in my muscles!"
Who will come to the rescue?

- Power Protein helps our bodies grow and build strong muscles. He also helps our bodies heal. Power Protein is mainly found in foods in the Protein Group and foods in the Dairy Group.

Scenario 4
Germaine, wearing a light-weight brown jacket, is walking to school. The sun is out and the temperature is already 65 degrees this morning. But Germaine is cold and shivering on his way to school. The other kids are walking by without jackets and feeling fine. Germaine sits down to rest and to try to get warm, but he knows he has to get right back up or he'll be late for school.
Who will come to the rescue?

- Fantastic Fat! Fat often gets a bad rap but is actually really important for our bodies. We need fat for normal growth and development, cushioning for organs, and insulation/protection from the cold. Fat Cat is mainly found in the Protein Group foods and the Dairy Group foods, also in extra fats we add to foods such as butter, margarine, oil, and salad dressings.

Scenario 5
Last one. Young Ashanti overslept this morning and rushed out the door without eating breakfast. She struggles to stay awake in her 4th grade classroom, unable to focus on her teacher's lessons. Ashanti doesn't have any energy. She can't keep up with the lesson being taught because she's so tired.
Who will come to the rescue?

- Captain Carbohydrate! He provides our bodies with energy to do all the amazing things it does. Captain Carbohydrates is found in the fruit, vegetable, grains, and dairy groups. The only food group that isn't a good source of carbohydrates is the Protein Group.

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We need these 6 nutrient superheroes every day to keep our bodies healthy. Remember, eat a variety of foods from all five of the healthy food groups and you will get enough of each essential nutrient. How do we know which nutrient superheroes are found in the foods we are eating? Again we can take a look at the nutrition label.

The next section on the nutrition label contains the nutrients.
There are some nutrients you want to get more of and some nutrients you want to get less of.

Notice that fat (Fantastic Fat) is listed first, followed by carbohydrate (Captain Carbohydrate), and then protein (Power Protein). At the bottom, you will find Vitamins and Minerals (remember Vita Man and Mighty Mineral?)
There are some nutrients you want to get more of and some nutrients you want to get less of:

- Pick foods with no trans fat
- You also want to pick foods that have more fiber, vitamin A&C, iron and calcium.
    - There are over 30 vitamins and minerals that we need every day but only 4 are usually listed on the Nutrition Fact Label—Vitamin C, Vitamin A, Calcium and Iron. It was decided to list these 4 on the fact label because Americans tend to not get enough of them.

Pass out Nutrient Superhero stickers

YOUR TURN! Now it's your turn again. But before that happens, get up and you have 5 seconds to find a new seat next to a different person. Go…5…4…3…2…1. Take a look at your label and answer the following questions:

1. What nutrient superheroes are found in your food? Add your nutrient superhero stickers to your nutrition label.
2. Which nutrient superheroes is your food missing?
3. Pair share: Share with your answers with your neighbor.

DENSITY
We've talked all about calories and nutrients. Now let's talk about density.

Anybody know what density is? Density is the amount of something per unit or size. For example, take a look at these two boxes of dots, which box has more dots? Right, there are more dots in box B than box A even though the boxes are the same size. That means that box B has a greater density of dots than box A because it has more dots in the same size. Today we are going to talk about calorie (energy) density and nutrient density. We often think about energy density and nutrient density when we are comparing 2 different foods, trying to figure out which is best for our bodies. Today we are going to compare baby carrots and Hot Cheetos. I'm guessing you already know which is the better choice for your body, but let's walk through it anyways because some choices aren't that obvious.

Calorie Density
We'll start by talking about CALORIE DENSITY first. We can also call this ENERGY DENSITY because, remember, calories are energy. We can figure out the energy/calorie density of a food by looking at two different things on the nutrition label - the serving size and the calories.

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Let's take a look at the nutrition label for baby carrots and the label for Hot Cheetos. Remember, the first place we need to look is the serving size. As you can tell, the serving size for both the carrots and Hot Cheetos is 21 pieces. That's nice because it makes it easy to compare the two different foods. If they weren't the same, we would have to a little math to do to compare. Next we need to look at how much energy the food gives our bodies, or the calories. Carrots give our bodies 84 calories for 21 pieces. If we eat 21 Hot Cheetos, how many calories would it give our body? 160 calories. Which food gives our bodies more energy for 21 pieces? Right, the Hot Cheetos! That means that the Hot Cheetos has a higher calorie (energy) density. The Hot Cheetos give our bodies more energy per serving than the carrots, thus has a higher energy density.

Does that make the Hot Cheetos a better choice for our bodies? Well, we have to look at the nutrient density too.

<u>Nutrient Density</u>
Who can guess what NUTRIENT DENSITY is? That's right, NUTRIENT DENSITY is the amount of nutrients per unit or size. Again, we need to look at two different things on the label, the serving size and nutrients (such as vitamins, minerals, carbohydrates, protein, and fat) per serving. Let's look at our carrots and our Hot Cheetos again.

Again, we start at the serving size and we know that the serving size is the same for the two foods. Now, take a look at the nutrients found in these foods. Which food has more nutrients in it? Right, the carrots! You can see that the carrots give our bodies a lot more nutrients than the Hot Cheetos do. In particular look down here at the vitamins and minerals. While the Cheetos give us fat, some carbohydrates and a little protein, they don't give us all of the vitamins and minerals that carrots provide. Carrots have a lot more nutrient density than the Hot Cheetos.

Watch out and be a good nutrition detective. A lot of food companies will make their food servings small so it looks like the food is healthier than it really is. Make sure you always look at how many servings are in a bag, box or can of food BEFORE you look at the rest of the numbers. Depending on how much of the food you eat, you may have to double or triple the numbers on the label.

YOUR TURN! Now it's your turn again. But before that happens, get up and you have 5 seconds to find a new seat next to a different person. Go…5…4…3…2…1. Take a look at your label and compare your food to your neighbor,

1. What is the serving size of each food?
2. Which food has more energy density?
3. Which food has more nutrient density?
4. Which food is a better choice for your body?

So going back to our carrots and Hot Cheetos, which food is the better choice? While the Hot Cheetos give our bodies more energy, it gives our bodies very few, if any, nutrients. When we are choosing food, we want to get the most bang for our buck – we want to choose foods that give our bodies energy but also give our bodies the nutrients that it needs to grow and be strong.

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Take a look at the carrots and see how many nutrient superheroes are found in the carrots. Now, look at the Hot Cheetos. We see a little bit of fat and carbohydrates, a tiny amount of Mighty Mineral, and a bunch of blobs…those blobs are artificial ingredients and other chemicals that food manufacturers use to make Hot Cheetos – things that aren't nutrients!

Which one is my GO food or the one I should eat every day? That's right! The carrots are the GO FOOD.

When selecting food, we can check out the calories to see how much energy our bodies will be getting, but more importantly, we should be checking out what nutrients are in the food! Remember, GO foods have lots of vitamins and minerals. The best way to make sure you are getting that, is eating lots of fruits and vegetables, and saving our snack foods, like Cheetos and Takis, for the weekend.

WHOLE vs. PROCESSED FOODS

Reading the nutrition label is a great way to figure out if the foods you are eating have a high nutrient density, but if you don't want to use the label or if the food doesn't have one, you can get a pretty good idea of the nutrient density of the food by knowing if it is a WHOLE FOOD or a PROCESSED FOOD. Foods that have a high nutrient density are WHOLE FOODS and foods that have a lower nutrient density are often PROCESSED FOODS. Who do you think would win this match-up, WHOLE FOODS or PROCESSED FOODS?

<u>Whole Foods</u>

What is a WHOLE FOOD? Have you heard of the grocery store Whole Foods? Are we talking about the grocery store? No! You can get whole foods at most grocery stores, like Walmart, Kroger, Food Lion, Harris Teeter, Target, etc.

What is a whole food?

1) It is a food that has nothing added to it (sugar, salt, or other added chemicals). Think about the ingredients list on a food.
    a) I have 2 for you to compare. The ingredients list for Hot Cheetos, and the ingredients list for corn. Which food doesn't have anything added to it? Yes, the corn! We've talked about the ingredients list and how it plays an important role in helping us figure out if a food is a good choice for our body. The shorter the ingredients list, the fewer ingredients the food has added to it, which means it's closer to a whole food.
2) A whole food is also a food that doesn't have anything taken away from it. Let's think about whole wheat flour compared to white flour.
    a) Why do we call some flours whole wheat? Because it is made out of the whole seeds (name gives us a clue). What about white flour? How is it made? Just from the endosperm, so the bran and the germ had to be taken away. Which food is closer to a whole food? The whole wheat flour because it has less taken away from it.
    b) Now let's think about rice. Some parts of foods you just can't eat, like the husk on the rice seed (or the husk on your corn). That must be removed from rice. Once that is removed, what you have left is brown rice, which is a whole grain because it is made up of the whole seed. To make white rice, the bran has to be removed. Which food is closer to a whole food? Right, the brown rice.

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3) Another way to think about a whole food, is that a whole food is a food in the form in which nature intended it to be, or as close to it as possible.

Here are some examples of WHOLE FOODS -- they are in their natural state. They still look the way we find them in nature or they may be changed just a little bit so that we can eat them. This means they are in their purest form with all the good stuff right from nature, nothing has been taken away or added. They are also called "unprocessed" foods. Fruits, vegetables and whole grains are examples of whole foods that have had none to very little processing before we eat them.

These whole, unprocessed foods are generally healthy choices. They tend to be higher in vitamins, minerals and other important nutrients – and have a high NUTRIENT DENSITY. Whole Foods are GO FOODS.

<u>Processed Foods</u>

What about processed foods. What are processed foods? Food processing is any change, done on purpose, to a food that occurs before we eat it. It's doing something to our food before we eat it - altering the food from the original form found in nature.

We are going to talk about 2 different types of processing today, simple processing and complex processing.

1) Simple processing – Simple processing are things you can typically do at home, like freezing your foods, drying foods, or canning foods.
    a) Say you go strawberry picking and you want to use some of your strawberries for smoothies so you put them in the freezer to freeze them. You just simply processed your food. Is freezing your food bad for you? No!
    b) How about drying foods? How are raisins made? Are dried foods bad for us? No!
    c) How about canning food? Does anyone know why we can food, or why canning foods started?
        i. For preservation – Some fruits and vegetables don't grow in the winter. We can a lot of foods so that we can enjoy them during the colder seasons, like peaches.
        ii. Is canning our foods bad for us? No! Sometimes we need to watch the sodium content but in general canning is just fine for us.
2) Complex processing - when we heavily change our foods.
    a) Usually this type of processing can't be done at home. It's often done in a factory or science lab.
    b) Think about Takis. Takis are made out of corn. Could you make corn into Takis at your house? Probably not.
    c) How about high fructose corn syrup, which is also made from corn? (No) That's right! You probably need a degree in chemistry to make that at home. Is complex processing good for our bodies?

Here are some examples of processed foods. All of these foods have been majorly changed from their natural form. As you can see, the foods on this slide don't look anything like foods we would find in nature, either growing in a garden or from an animal.

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During processing, important nutrients like vitamins and minerals are often taken away. Processed foods have low NUTRIENT DENSITY. Also extra ingredients like sugar, fat, salt and chemicals are frequently added. While a little bit of these are okay, we don't want to eat too much. Processed foods often have a low NUTRIENT DENSITY and a high ENERGY DENSITY. These types of processed foods are SLOW FOODS.

So a great way to make sure you are choosing GO FOODS is to eat WHOLE FOODs and use the NUTRITION LABEL to make sure the foods you are eating are packed with Nutrients

CHALLENGE

1. Use the nutrition label to choose one more nutrient dense food this week.
2. At lunch today or tomorrow, see how many whole foods you can eat.

REFLECTION QUESTON

What did we learn today? Why is it important? What is something you can do now that you know this information?

Parent Handouts

- Today in Nutrition Class…Go FOODS (Eng&Spa)

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