

# Call 911, It's an Emergen-C!!!

FRAMEWORK
I. Scientific and Engineering Practices 1. Asking questions 4. Analyzing and interpreting data
II. Cross-Cutting Concepts 4. Systems and system models
III. Physical Sciences LS 1. From molecules to organisms: Structures and processes

SKILLS/OBJECTIVES
o Learning what vitamins are and how they help our body
o Learning what foods have vitamins in them

MATERIALS
o 1/2 teaspoon cornstarch o 1 cup water o Iodine o More water o Eyedropper o Medium sized bowl o Several smaller bowls o Crushed vitamin C tablet dissolved in 1 cup of water o Various beverages: orange juice, soda, cranberry juice, grapefruit juice, and Gatorade o Fruit Fact Worksheet o 2-3 cups fortified cereal o Magnet o Bowl o Spoon or other utensil o Water

## BACKGROUND

- Do you guys know what germs are? Well, what happens when germs invade our bodies? How come we don't always get sick? How do we protect ourselves?
- We have a natural defense force in our bodies called our immune systems. Immune systems are like little soldiers inside our bodies that fight against the "bad guys." Immune systems aren't always naturally strong enough to fend off all the germs that we come in contact with all day. So, in order to make sure we stay healthy, we have to make our immune systems strong. What do you think makes our immune system strong?
- Vitamins! Do you know what vitamins are? Our immune systems love vitamins. Vitamins protect us from getting colds, coughs and stomachaches. It's like having our own personal army!

Activity # 1	<b>Vitamin C Experiment: Test the amount of vitamin C in different substances</b>
Materials	<ul style="list-style-type: none"> <li>○ 1/2 teaspoon cornstarch</li> <li>○ 1 cup water</li> <li>○ Iodine</li> <li>○ More water</li> <li>○ Eyedropper</li> <li>○ Medium sized bowl</li> <li>○ Several smaller bowls</li> <li>○ Crushed vitamin C tablet dissolved in 1 cup of water</li> <li>○ Various beverages: orange juice, soda, cranberry juice, grapefruit juice, and Gatorade</li> </ul> <p>* Prepare experimental mix before class</p>
Worksheet	No

- A lot of vitamins have “boring” names. Some of them are named after the alphabet. There’s Vitamin A, B, C, D, and E! Every day you eat something with these vitamins in it, which help us grow big and strong.
- Right now we’re going to do an activity that helps us see how much Vitamin C is in the food we like to eat.
- Do you know what Vitamin C is for? Do you know what foods have Vitamin C in it?
- Vitamin C helps the body heal itself from within- it helps our cells stay healthy and fixes the cells that are wounded. Vitamin C is also really important for our immune systems (remember what the immune system is?); it’s sort of like super-food for our immune cells. There is a lot of vitamin C in orange juice, and that’s

why it's important to drink orange juice when you've got a cold. Let's see what other stuff has vitamin C in it!

- **Mix ½ teaspoon cornstarch into 1 cup cold water; dissolve mixture by heating.**
- **Measure 1 cup of water into a bowl and add 1 teaspoon of the cornstarch mixture. Using an eyedropper, add 4 drops of iodine and stir.**
- The mixture should be a pale blue. **Prepare mixture before class.** During experiment, introduce it as the “magic vitamin c indicator solution”.
- **Put 2 tablespoons of the “magic vitamin c indicator solution” into several small bowls. Using a clean eyedropper add the vitamin C solution to one of the blue mixtures. In another bowl add orange juice, another orange soda, etc.** Make note of how many drops it takes before the blue color to disappear.
- Only foods with vitamin C will make the blue color disappear. The punch and orange soda do not have vitamin C. If a food does not have vitamin C, the solution will not change color.
- So when you are feeling sick, should you have juice or orange soda?
- From the results of our experiment, we know that all of the fruit drinks contained vitamin C. This tells us that fruit is an excellent source of vitamins! What other vitamins are found in fruit?

Activity # 2	<b>Match the Vitamin to the Fruit Game</b>
Materials	○ Fruit Fact Worksheet
Worksheet	Yes

- **Introduce worksheet** with information about fruit on one side and information about vitamins on the other.

- Vitamin Facts:

Vitamin A makes our hair, skin and teeth strong. It also helps with vision.

Vitamin B helps us convert the food we eat into energy we can use to stay active.

Vitamin C makes our immune systems strong, and helps protect us from getting sick.

- Vitamin D helps us absorb calcium from food, which makes our bones strong. Our bodies have a very special way of getting vitamin D. Does anyone know how we do this? Our skin is able to absorb vitamin D from sunlight! How long do you think it takes for our skin to absorb enough vitamin D so that we can grow big and strong? 10-15 minutes everyday. This is why it is important to spend time playing outside.

- Vitamin E makes our skin strong, and helps heal our cuts and scrapes.

Fruit facts:

Mango: Improves eyesight

Banana: Increases energy

Strawberry: Heals coughs and colds

Blueberry: Protects cell membranes (Just like there are walls around a castle, there are walls around our cells to keep all the important stuff in them protected, sort of like a cell's *skin*)

Milk: Strengthens bones

Introduce a mango, banana, strawberry, and blueberry. Most fruit contain many vitamins but some fruits are higher in certain vitamins than others. Guess which fruit has high amounts of vitamin A, B, C, D and E.

Answer key:

Vitamin A = Mango

Vitamin B = Banana

Vitamin C = Strawberry

(Vitamin D = Milk) \*Explain that milk is great source of calcium, but we need vitamin D in order to absorb calcium. We can get vitamin D from foods like fish and mushrooms, and also from the sun.

Vitamin E = Blueberry

Activity # 3	Exploring Minerals
Materials	<ul style="list-style-type: none"><li>○ 2-3 cups fortified cereal</li><li>○ Magnet</li><li>○ Bowl</li><li>○ Spoon or other utensil</li><li>○ Water</li><li>○ Blender (optional)</li><li>○ Napkin/paper towel</li></ul>
Worksheet	No

- Besides vitamins, there are also these things we need called *minerals*.
- Vitamins and minerals are a pair, like shoes and socks- we need both of them!
- An important mineral we are going to learn about is iron. Iron is important because it helps the oxygen we breathe get transported through our blood- iron is the car and oxygen is the passenger! Iron also helps with our immune systems and gives us energy.
- Now, I know what you are thinking- iron?? That stuff that is used to build buildings? How can I eat that? Well, we're going to show you how what you eat has iron packed into it.
- Iron is magnetic, so we can extract (take it out) of our mushed-up food with a magnet!
- **Pour cereal into a bowl or blender.**
- **Add water until it covers all the cereal.**
- **Mash the cereal with a spoon or mix** it with water, using a blender. The more finely ground the cereal is, the easier it will be to collect the iron.

- **Stir the magnet through the crushed cereal.** Iron is heavy and will sink, so be sure to pay attention to the bottom of the bowl.
- Black fuzz/iron will accumulate on the magnet. It's easiest to see the iron if you wipe it on a white napkin or paper towel.
- Can you see the iron? This mineral is really important for our bodies and we can get it just from eating cereal

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## CONCLUSIONS

Vitamins and mineral are all around us, and they are very important for staying healthy. If you eat fruits and vegetables and cereal, you can get the vitamins you need!

## Vitamin Matching Activity

Vitamin A makes our hair, skin and teeth strong. It also helps with vision.
Vitamin B helps us convert the food we eat into energy we can use to stay active.
Vitamin C makes our immune systems strong, and helps protect us from getting sick.
Vitamin D helps us absorb calcium from food, which makes our bones strong.
Vitamin E makes our skin strong, and helps heal our cuts and scrapes.



Mango: Improves eyesight



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Strawberry: Heals coughs and colds



Blueberry: Protects cell membranes



Milk: Strengthens bones