

## MCE PTSA SCIENCE ACTION

### 2<sup>nd</sup> Grade: Grossology Lab

*Updated May 2018*

#### **2<sup>nd</sup> Grade Coordinator's Notes:**

- Usually takes place end of May/early June
- Reserve the auditorium, 5 tables, garbage bin, and access to Janitor's Closet closest to the auditorium
- Lab time: allow 1 hour if possible – 10 minutes for intro; 10 minutes per station; 30 seconds transition time x 4 = 2 minutes; 2-3 minutes for conclusion

#### **OBJECTIVES**

Students will be able to:

1. Understand that our bodies use many methods to protect us
2. Understand that these methods often involve what we consider to be gross substances
3. Understand the protective functions of eye "gunk", ear wax, scabs, snot/boogers, and drool/spit
4. Understand why burps and farts occur
5. Understand how vomiting occurs and why it serves a useful purpose
6. Understand why we sweat & why we poop

#### **MATERIALS**

##### **INTRODUCTION**

- OJ
- Water
- Crackers
- Cocoa powder
- Banana – ½ per class
- Foil pan
- 2 plastic cups (one with bottom cut out) – per class
- Paper cup (with small hole cut in the bottom) – 1 per class
- Zip-top gallon bag – 1 per class
- Pantyhose – 1 per class
- Scissors
- Bucket
- Paper towels
- Baby wipes
- Video of the Poop demo:  
<https://www.stem.org.uk/resources/elibrary/resource/35396/digestive-system-experiment>

**TABLE 1**

- Zip-top Plastic baggies (one per student)
- 3 oz. paper cups (2 per station, plus extras)
- Corn syrup (1.5 oz per student)
- Corn starch (1 oz. per student)
- Green & yellow food coloring
- Baby wipes
- Paper towels
- Slop bucket

**TABLE 2**

- Saliva diagram
- Zip-top plastic baggies (1 per student)
- 3 oz. paper cups (1 per station)
- Lemon juice (1 oz. per student)
- Water (a couple of gallons per class – can use containers from Buoyancy lab)
- Saltine crackers or bread slice (1 per student)
- Paper towels
- Slop bucket

**TABLE 3**

- Bucket
- Balloons (4 per class)
- Funnel
- Baking soda (approx.. 12 oz. per class)
- Spoon or scoop for the baking soda
- White vinegar (approx.. 8 oz. per class)
- Small bottle to pour vinegar
- Slop bucket

**TABLE 4**

- Alcohol prep pads (1 per student)
- Timer (watch or smart phone would work!)
- 2 “ear canals” – oatmeal container with bottom cut out; outside covered in construction paper; Velcro on inside of one container
- 2 tennis balls
- Slop bucket

## **INTRODUCTION**

The human body can sometimes seem gross.

- Can anyone think of a gross thing that our bodies make? (*scabs, vomit, poop, burps, farts, etc.*)
- Does anyone know why our bodies make these oozy, gushy, smelly, and crusty substances? (*to protect our bodies*)

Today we are going to learn about some of those gross things. Even though things like mucus, vomit, and scabs might seem gross, there is a reason our bodies make them!

### **GROSS FACT #1: EYE GUNK**

Raise your hand if you have ever woken up in the morning and found gunk in the corners of your eyes.

Can anyone guess why our eyes make that gunk? (*encourage a few responses*)

The gunk protects our eyes. Our eyes produce mucus all day but our tears flush out the mucus before it can harden. Our eyelashes work like windshield wipers during the day to wipe away the tears.

Tears are mostly water plus a little salt with some oil, mucus, and chemicals called enzymes that kill germs and protect our eyes.

At night our windshield wipers aren't working so the mucus builds up, dries, and hardens.

### **GROSS FACT #2: SCABS**

Another gross thing our bodies make is a scab. Can anyone guess why scabs are important? (*allow a few guesses*)

A scab is a special barrier created by our bodies when we get a cut or scrape. It's like a natural Band-Aid! It prevents germs from getting inside us while our skin reforms underneath. Also, a scab helps stop blood from continuously oozing out of our wound, so that we don't lose too much blood.

### GROSS FACT #3: POOP

1. *This bag is our stomach and inside we have some stomach acid (orange juice)*
2. *Add crackers & banana to the bag – this is the food we might eat*
3. *Add water - this water represents saliva*
4. *Squeeze out the air & seal the bag. Start mashing it up; walk around and have kids mash it a bit. Our hands are acting like the stomach walls and squishing the food.*
5. *Now we're going to transfer the food to the small intestine.*
  - a. *Slide pantyhose opening over the cut-away bottom of a plastic cup; place in foil pan*
  - b. *Cut corner off bag and pour into cup*
6. *Pick up cup and slide food down*
  - a. *The liquid represents nutrients being absorbed and used by our body*
  - b. *Parts that the body can't digest are left in the intestine – it moves from the small intestine and into the large intestine*
  - c. *Now the waste needs to exit your body, so how do we get it out?*
7. *Squeeze the waste out through the hole and into the bucket*
  - a. *So, what does this represent?!*

Poop is important because it's our body's way of getting rid of the parts of the food that cannot be used.

Today we are going to learn about other gross things that our bodies do. But remember, even though these things seem gross, they are all really important in keeping us healthy.

Now we will break up into four groups. You will start at one table, and have a chance to do all four activities.

We have some rules for Science Action:

1. Listen carefully to directions
2. Never put anything from Science Action in your mouth
3. Have fun!

## ACTIVITY 1: SNOT & BOOGERS (Slime)

### GROSS FACTS: SNOT & BOOGERS

Snot and boogers seem pretty gross, right? Did you know they keep us healthy? Snot and boogers help protect our bodies by trapping foreign things like dust and bacteria that might enter our nose.

- We breathe air in through our nose, which cleans the air using its nasal hairs.
- These hairs trap harmful particles, like dirt, sand, pollen, and germs.
- Snot coats our nasal hairs & traps these particles. Snot is a combination of mucus and bacteria-killing chemicals.
- Gradually, snot is moved to the back of our throat and swallowed, and then it is destroyed in our stomachs.
- We make a new batch of snot about every 20 minutes, and we swallow about a quart of snot each day!
- When snot dries out inside our nose, boogers are formed. These are crusty globs contain the harmful particles that were trapped by the nasal hairs.
- Boogers are removed when we blow our nose or sneeze (which can propel air and snot at speeds of up to 100 miles per hour!).

### MAKING FAKE SNOT:

1. Give a plastic baggie to each student.
2. Pour corn syrup into 3 oz. paper cups - fill halfway. Students pour into their baggie.  
(keep cups for next group, or toss)
3. Pour corn starch into another set of 3 oz. paper cups – fill  $\frac{1}{4}$  of the way. Students pour into their baggie.
4. Add 4 drops green food coloring and 2 drops yellow food coloring per baggie.
5. Seal the baggies and instruct the students to knead it.

### **Explain:**

- The baggies represent our noses
- What does the corn syrup represent? (*mucus/snot*)
- What does the corn starch represent? (*dirt, pollen, etc.*)
- What does the food coloring represent? (*bacteria*)
- Why is snot so important? (*it carries away dirt and bacteria*)

Note: Instruct students to toss their baggies into the slop bucket (empty bucket into the garbage after each class)

## ACTIVITY 2: SPIT, DROOL & VOMIT

### Part I. SPIT & DROOL

- Spit is also called saliva, and it is produced in three pairs of salivary glands (see diagram).
- We produce nearly a quart of saliva each day!
- Saliva is mostly water & helps us to eat by moistening each bite of food and allowing it to be swallowed easily
- Saliva has enzymes that help break down our food
- Saliva helps our taste buds so we can taste our food – we actually make saliva when we smell food, before we even taste it!
- Saliva also has bacteria-killing chemicals to help keep germs from getting past our mouths

### HOW SALIVA HELPS US SWALLOW OUR FOOD

1. Distribute a baggie to each student
2. Pour water into 3 oz. cups – fill halfway. Students pour into baggie.
3. Pour lemon juice into 3 oz. cups – fill 1/3 or 1/4. Have the students smell the lemon juice.
  - a. *ASK: What happened in your mouth when you smelled the lemon juice? (start to produce saliva – our body does this when we smell food; our mouth is getting ready to eat)*
  - b. Students pour lemon juice into baggie.
4. Place a cracker into each student's baggie and seal.
  - a. **NOTE:** Be sure the kids squeeze the air out before sealing the bags.
5. Instruct the students to use their fingers to break up the cracker.

### **Explain:**

- The baggie represents your mouth, and the cracker is a food you might eat.
- What does the water represent? (*saliva*)
- What does the lemon juice represent? (*enzymes in our saliva that break down food*)
- What does breaking the cracker with your fingers represent? (*chewing with your teeth*)
- What is happening to the cracker? (*it's getting broken down to make it easy to swallow*)

### PART II. VOMIT

What happens if we eat spoiled food, or eat too much, and need to quickly get rid of something in our digestive system that might be harmful? (*we puke/vomit/throw up*)

When we eat more than our stomach can hold, or if there is something upsetting our stomach, our body knows we have to get rid of it right away. Our brain sends a signal that makes the food from our stomach shoot up and out of our mouths, and we vomit.

Vomit is half-digested, soggy food from our stomachs (*hold up the baggie of "food" from Part I*), slimy stomach mucus, saliva, and stomach acids that help us digest food. When we puke, mashed up food in our intestines comes up, past the stomach and out again. That nasty smell can be blamed on our stomach acids.

Does anyone know why it's important that we are grossed-out by vomit?

- Vomit usually contains something that could make us sick, so it's important to stay away
- It's good that we are grossed out by vomit...that reaction actually helps keep us healthy

NOTE: Instruct students to toss their baggies into the bucket (empty bucket into the garbage after each class)

### ACTIVITY 3: BURPING & FARTING

What are burps and farts? (*gases*)

Where do these gases come from?

- There are gases that we swallow, and other gases that our bodies make.

#### Burps:

- Our stomach is like a balloon. When we eat, drink, or talk, sometimes we swallow gas – or air – which adds gas to our stomach.
- When our stomach digests food, it also creates gas.
- If the gas pressure in our stomach gets too high, the air comes up and out our mouths as a burp.
- Did you know cows burp a lot? Every year, cows in the US burp about 50 million tons of gases into the atmosphere. If these gases could be caught and contained, the burps of 10 cows could keep a small house heated for a whole year!

#### Farts:

- Farts are the extra gases escaping through our large intestine and out through our anus.
- Did you know that most of us pass a quart of gas each day? But not all at once! We burp or fart 10 to 15 times a day.
- Sometimes we don't even know we have burped or farted. It's the loud or smelly ones that we notice!
- What makes a fart smell? The smell comes from gases created by the bacteria in our gut.
- When we eat foods with a lot of sulfur, such as cauliflower, eggs, or meat, the more our farts will stink.
- Beans might make you fart a lot, but beans don't have as much sulfur, so they aren't usually too smelly.

#### MAKING A BURP (demo)

1. Hold a balloon over the bucket. The balloon represents your stomach.
2. Attach the funnel to the balloon and add about  $\frac{3}{4}$  of a 3 oz. cup of baking soda to the balloon. The baking soda represents the food in your stomach.
3. With the funnel still in place, put  $\frac{1}{2}$  of a 3 oz. cup of white vinegar into the balloon. The vinegar represents your stomach acid.
  - a. The reaction represents what happens when your stomach acids react with food to produce gas.
4. Quickly pinch the balloon neck closed with your fingers – this represents a sphincter in your esophagus.
5. Remove the funnel quickly. The balloon stomach will fill with gas.
6. Release the sphincter to let the gas go in a belch!

NOTE: If the “burp” did not make a good sound, blow up the wet balloon and stretch the neck out sideways while you release the air. It makes a great screeching sound!



## ACTIVITY 4: SWEAT & EAR WAX

### Part I. SWEAT

- Another liquid produced by our bodies is sweat. Sweat is a natural air conditioning system for our bodies
- Sweat contains water, salts, and other chemicals, and is released all over our bodies from the pores of our skin.
- When sweat is released, it spreads across our skin, then it evaporates and causes our skin to cool.
- When sweat evaporates, it leaves the salt and chemicals behind. This is why our skin tastes salty and feels sticky after sweating.
- The body odor associated with sweat is not due to the sweat itself, but it's actually from the waste products of the bacteria that feed on sweat!

### THE COOLING EFFECT OF SWEAT EVAPORATING

1. Distribute an alcohol prep pad to each student.
2. Have them swipe the alcohol on their arm.
  - Ask how it feels.
3. While still wet, have the students blow on their arm (where the alcohol was used).
  - Ask how it feels now.
4. Have the students run in place for 1 minute
5. After one minute, have them touch their arm
  - Does your skin feel warm?
6. Now have students swipe the alcohol pad on their arm again
  - Did you notice a difference?

#### **Explain:**

- The heat from our skin gives the liquid molecules of the alcohol a little energy, and they change from a liquid to a gas.
- As the liquid changes to a gas – or evaporates – it carries the heat energy away with it.
- The heat comes from our skin, so our skin cools down.
- Sweat works the same way: the heat from our body is transferred to the sweat, and then into the air, so we feel cooler

### PART II: EAR WAX

Sweat carries away heat from our skin to keep us cool, but there are other gross substances made by our bodies to carry away germs to keep us healthy.

- Has a grown-up ever cleaned some gunk out of your ears?
- What is that gunk called? (*ear wax*)
- Does anyone know why our bodies make ear wax? (*to protect our ear drum*)

Ear wax coats the entire ear canal, all the way to the eardrum, and protects our ears from harmful particles. Ear wax even contains bacteria-killing chemicals; it is very sticky and traps these harmful particles.

- What would be some examples of harmful particles that could get into your ear? (*dirt, pollen, dust*)
- What do you think these tubes could represent (*ear canal*)
- There is some Velcro inside one tube, which is going to be our ear wax. The other tube has no ear wax.
- This ball represents some dirt or pollen floating around in the air. Let's see what happens.

Hold the tube with no Velcro horizontally and ask one student to slowly roll the pollen (*tennis ball*) through the ear canal. What happened? (*it went all the way through*)

Now hold the tube with Velcro horizontally and ask one student to slowly roll the pollen through the ear canal. What happened? (*the ear wax trapped the pollen and didn't let it go through to the ear drum*)

- Allow the other students to try rolling the balls through the tubes, as time allows

***Explain:***

Each day's newly-produced ear wax pushes the older ear wax toward the outer ear. As the older ear wax moves along, it dries up and forms small clumps or flakes which eventually fall out of our ears and take the dirt and pollen along with it.

## **CONCLUSION**

1. We learned that our bodies produce some gross substances; can you remember one gross substance and why it is helpful?
2. What was your favorite activity?
3. What was something new that you learned today?