

# STUFFEE® INTRODUCTION AND COMMENTS

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Do you have a big zipper down the front of your chest? Can you unzip your body and take out your insides and look at them? No? Of course not! But there is someone who can... Stuffee®!

Stuffee, The Children's Museum of Pittsburgh's big-eyed, blue-haired mascot can turn inside out to show children (and grown-ups!) of all ages how our bodies work. His smiling face and stuffed body create an appealing and friendly image for children as they learn about anatomy.

On the outside, Stuffee looks like a real person. He has eyes and ears and a nose like a real person. He has ten fingers and ten toes like a real person. However, there are many things that separate Stuffee from a real person. Stuffee's enormous size, blue hair, big green zipper, and red hearts on the outside make it very evident that we are not all the same.

How do you do a Stuffee presentation? There is not one answer for this question. Stuffee presentations can be created to fit your own style. You may choose to focus on outside differences, or perhaps eating right. Maybe you'd like to talk about the digestive system or maybe you'd like to talk about every system! The decision is up to you. We do, however, have a few suggestions for creating a successful presentation...

#1- Know what you are talking about!!! The best way to go into a presentation is being comfortable and knowledgeable about what you are discussing anatomy! Even if you don't plan on covering certain areas of the body in your presentation, you never know what kind of questions you will get! Parents and children alike will be curious about Stuffee, so it is best to know about all of Stuffee's parts.

#2- Be aware of your audience. If your audience is made up of preschoolers, know how to give a preschool-level presentation. If your audience is a bunch of seventh-graders, give a seventh grade-level presentation. If your audience is composed of families with a wide range of ages, make your presentation appropriate for that audience. You get the picture...

#3- Get them excited! If you aren't involving your audience in your Stuffee® presentation, they are probably going to get bored very quickly. Maybe try involving your audience by passing out parts of Stuffee's lunch and his organs. Ask questions and incorporate activities for everyone to participate in. Get everyone excited about working "hands-on" with you and Stuffee!

#4- Play it by ear. If you plan on giving a detailed presentation and halfway through it you can tell that your audience is getting fidgety, adapt to the audience. You may want to pick up the pace, briefly go over what you had planned on talking about in detail, or you may even want to cut the presentation short. Know how to "wing it". Chances are that if you continue with your original plan, the audience will only get more impatient and less cooperative. In turn, it won't be a very enjoyable experience for you or the audience.

#5- Try to involve everyone. Stuffee isn't just for kids. Adults seem to take a liking to him as well. Let them get involved by participating in the activities and answering the questions. Often times if your audience is shy, the adults are the best way to go. Once children see that they are having fun, they want to be a part of the fun too!

#6- Keep their attention through rewards. Keeping a child's attention can sometimes be really tough. One way to remind children that they need to pay attention and not talk through the presentation is by rewarding them. Children love to hold the parts of Stuffee's lunch and his soft, squishy organs. Reward the children who are paying attention by letting them hold these items, and remind the other children that you will pass out Stuffee's parts to the boys and girls who are doing a

nice job of sitting down quietly and paying attention. Remember that Stuffee was created to be fun and lovable, but he is a valuable teaching tool as well. Use him to create an exciting and informational presentation for people of all ages.

## **Stuffee's® Insides: Anatomy**

### ***The Digestive System***

*Digestion* is the breaking up of food into its basic components so that it can pass into the blood and be absorbed by all body tissues for the continuation of life and energy.

Food enters into the digestive system through the mouth where it is

chewed and mixed with *saliva*, a secretion released by the mouth that contains an enzyme that helps in the breakdown of food. This process begins to change the physical and chemical properties of the food. It then travels to...

*The Esophagus (the short, smooth, light pink tube that hooks into Stuffee)*

- is also known as the “food tube”
- is where swallowing occurs
- connects the mouth with the stomach
- pushes the food downward through a muscular movement called peristalsis; the food doesn't just “fall” can be connected and snapped into

*The Stomach (the beige pouch-like organ that has veins and arteries on the outside of it)*

- is like a “food processor”
- grinds, tears, and mashes food
- adds digestive juices called acids to the food, which help with the break down process
- makes the food look like applesauce or s
- can be connected and snapped into

*The Small intestine (the long and thin dark red tube with one fat end)*

- has a fat part called the *duodenum*; this part finishes mashing the food
- pushes the food through its length

- is the longest part of the digestive system
- has millions of tiny fingers inside called *villa*, which are about the size of a hair and absorb all of the *nutrients*, the chemical substances needed for good health, from the food; this gives your body energy and energy is needed to do everything
- can be connected and snapped into

*The Large Intestine (the short and fat beige tube with a little “hook” on the end)*

- is where all of the indigestible parts of the food go
- acts like a “sponge” and sucks out all of the liquids
- leaves only waste, and like garbage, it is “thrown away” through the *anus*, the opening at the end of the digestive system where waste leaves the body, when you go to the bathroom
- has an appendage called the *appendix* which has no known purpose, but is thought to have been useful to primitive ancestors in the digestion of dense fiber

All of these parts (the esophagus, stomach, small intestine, and large intestine) make up the *alimentary canal*. Once these parts are removed from Stuffee®, they can be connected to show that they make up one long tube. This tube begins at the mouth and ends at the anus; it simply changes size and shape depending on the job that each part needs to do. *Peristalsis*, the continuing waves of involuntary muscle contractions passing along the walls of any hollow tube that forces the contents onward, occurs throughout the *alimentary canal*. Other parts of the digestive system (but not part of the alimentary canal):

*The Liver (the dark purplish organ that can be unzipped in order to see the green bile ducts)*

- is the heaviest internal organ
- produces *bile* to help digest fat
- stores carbohydrates in the form of glycogen, which can quickly be converted to glucose for other parts of the body

*The Gall Bladder (the tiny green organ that resembles a pea and is connected to the pancreas) .*

- is the organ that stores the bile from the liver
- dispenses bile when it is needed by the duodenum

*The Pancreas (the orange carrot-shaped organ that is attached to the gall bladder) .*

- is another organ that produces digestive juices for the duodenum
- acts like a huge salivary gland

## **The Circulatory System**

The Heart (the red and blue organ with a short tube coming out of its top that can be hooked into Stuffee®)

- is a muscle; it is a four-chambered pump
- is about the size of your fist pumps blood throughout the body and keeps it running rests when we are sleeping but it never stops beating

*The Blood Vessels (the red and blue tubes that can be seen on Stuffee's stomach)*

- are the body's delivery system; they deliver food and oxygen and take away waste and carbon dioxide
- in a person's body are about 60,000 miles long
- are divided into three types:
  - Arteries-* carry blood away from the heart and carry oxygen-enriched blood to all parts of the body
  - Veins-* carry blood back to the heart and then to the lungs to get a replenishment of oxygen
  - Capillaries-* the tiniest of blood vessels where the exchange of nutrients and gasses occur

*The Kidneys (the two red bean-shaped organs that have tubes coming out of them) .*

- are the two glands located in the small of the back
- are like a "filter" for the blood

- are part of the excretory system but their job is to separate waste materials from the blood; this waste is carried to the *bladder*, the bag-like organ that stores and then eliminates *urine*, the waste water containing unwanted chemicals
- have glands on top of them called *Adrenal Glands*; they secrete adrenaline which relates to stress

## ***The Respiratory System***

*The Trachea (the beige divided tube that looks like an upside-down slingshot that can be hooked into Stuffee®)*

- is also known as the “wind pipe”
- is in front of the esophagus
- is a long tube which starts at the back of the mouth at the *epiglottis*, the *epiglottis* is the tiny trapdoor attached to the back of the tongue that prevents food from being breathed in
- branches into two main bronchi or air tubes which divide and subdivide into smaller *bronchioles*, the smallest air passages which reach the *alveoli* or air sacs
- as well as the bronchioles are lined with mucus to trap dirt and keep the lungs clean
- can be connected and snapped into

*The Lungs (the two light pink football-shaped organs that unsnap to show the alveoli)*

- are the two elastic air sacs which are inflated and relaxed by the *diaphragm*, the sheet of muscle that makes a moveable floor for the lungs
- are like balloons- when they fill up with air they get bigger, and when they empty out they shrink back to their original size
- are made up of three lobes for the right lung and only two lobes for the left, leaving room for the heart on the left side; both lungs still function the same . breathe in (inhale) oxygen-enriched air and breathe out (exhale) oxygen poor air, or air that has a great deal of carbon dioxide in it  
are constantly irritated and have too much mucus in them  
when people smoke, and in turn, it makes it hard for them to breathe

The Alveoli (the little white circles that can be seen when the lungs are unsnapped)

- are tiny air sacs at the end of the bronchioles where the oxygen and carbon dioxide are exchanged

- act like balloons as well; they blow up when air comes in and shrink when the air goes out

## **FUN FACTS**

### **The Digestive System**

- The average person eats about three pounds of food a day or 1, 095 pounds-more than half a ton- a year.
- Your mouth makes about ½ quart of saliva daily. Your whole body produces more than seven quarts of assorted digestive juices every day.
- Children are born with taste buds all over their mouths. By adulthood, most of them disappear. leaving only 3000, mostly on their tongues.
- The small intestine is about 21 feet long.
- The digestive system is really one long tube from mouth to anus. It changes size and shape along the way depending on the job that each part does.
- Food takes two days to make the whole journey through your body.
- An adult's liver weighs three to four pounds, making it the largest internal organ. Skin is the largest organ of all.
- Fresh urine has no bacteria in it.
- Each kidney contains about one million tiny tubes that would measure approximately 40 miles if stretched out.

### **The Circulatory System**

- Every cell in your body is no more than a hair's width away from a capillary.
- Capillaries are so tiny that blood cells must file through them single file.
- 3,000 blood cells lined up would measure an inch.
- The larger the animal, the slower the pulse rate. Humans average about 70 beats per minute, elephants about 25 beats per minute, and a mouse about 500 beats per minute.
- The heart circulates the body's blood more than 1,000 times a day.
- Laid end to end, all of the body's blood vessels would measure about 60,000 miles.
- The heart is the body's strongest muscle.
- An adult has 3-6 quarts of blood, depending on body size.
- Your heart is about the size of your fist.
- A complete heartbeat usually takes less than on
- Your lungs are about the size of footballs.  
Lungs are the only organs in the body light enough to float on water. The surface area of the lungs is about 25 times the skin's.

A cough can leave your lungs, throat, and mouth at up to 70 miles per hour.

An adult may breathe more than 20, 000 times a day. Children breathe even more.

- Lungs have no muscles of their own.  
An adult's lungs normally hold about three quarts of air, but in vigorous exercise, they may expand to breathe four quarts of air.

- Only 1/6 of the air in your lungs is exhaled at a time.

#### The Skeletal System

- Your body has 206 bones. Mammals all have roughly the same number of bones in their bodies, regardless of size. Giraffes, humans, and chipmunks all have seven vertebrae in their necks, but the bones are very different sizes!

(These activities can be used alone or incorporated into your own Stuffee presentations.)

### **The Digestive System**

- To demonstrate the movement of food through the digestive system, particularly through the small intestine, squeeze a tube of toothpaste or use a long thin balloon to demonstrate peristalsis (waves of contraction) that moves food along.
- Have children trace each other's shapes on large pieces of paper. Help them to properly locate their own digestive organs. Remember to point out that the stomach is between the ribs above the waist, the small intestine sits under your belly button, and your large intestine lies just below the waist.
- Have children cut out organs using different colored construction paper and sandwich them between two sheets of wax paper. This layering effect will help them to see where our organs are located and how they overlap one another.
  - Use a twenty-one foot length of rope to represent the length of the small intestine. Have the children lie down next to the rope and see how many children it takes to make up the length of the small intestine.
  - Use a paper grocery bag and have the children draw the different body parts of them. They can then wear them like a vest and be "inside-out" just like Stuffee®

## **The Circulatory System**

- Have a child give a strong squeeze to a tennis ball 10 times per minute (approximates the normal pulse) to get a good idea of how hard the heart works.
- Use a stethoscope to hear the heart beat.
  - Construct a stethoscope. (The first one was invented in 1819 and was nothing more than a hollow tube, but was generally better than an ear on the chest.) Make a simple one with a paper tube or a rolled-up sheet of paper. A more sophisticated one could be constructed with a rubber tube and funnel.

Have children observe blood vessels in themselves or others by examining the underside of the tongue (a mirror and magnifying glass might be helpful). The thick blue lines are veins; the thick pink lines are arteries; the tiny hair-thin lines are capillaries. Capillaries are also easily observed by pulling down the lower fold of the eyelid.

- See how your heart rate changes when you exercise. Feel your pulse before you exercise. Then do jumping jacks or some other type of exercise and take your pulse afterward. Note the increase in pulse rate.

## **The Respiratory System**

- Blow up a balloon to demonstrate expansion and contraction of the lungs. You can use a hand below the balloon to represent the diaphragm (the muscle that moves up and down making the chest cavity larger or smaller).
- To demonstrate the expansion and contraction of the lungs, use a zip-lock bag and straw with the straw inserted into the side of the bag and sealed tightly. The straw will act as the trachea (windpipe). Have the child breathe in and out and note the expansion and contraction of the bag.
  - Use a tape measure to measure around a child's chest when he/she breathes in and again when he/she breathes out. Note the difference in size.
- To get an idea of how much air you breathe out, take a deep breath and then blow into a balloon.