

## OUTLINE OF THE STUFFEE LESSON

Stuffee, The Children's Museum of Pittsburgh's blue-haired mascot, is an appealing, overstuffed character who, with you his presenter, turns "inside out" to reveal the major abdominal organs for a fun-filled anatomy lesson.

### MAJOR POINTS:

1. Using Stuffee as a reference, it is easy to note that we are all quite different on the outside in size, shape and color, but we are all remarkably alike on the inside! Stuffee's organs, while made of appealing fabrics, colors and textures, are really quite accurate representations of actual human organs, close to scale for a body as large as Stuffee's, and should always be identified for the audience.

- A. What we have on the inside makes us work on the outside. There is nothing frightening or embarrassing about our insides.
- B. Each of our organs has an important job to do. Most of our organs work together cooperatively to do all the jobs that keep our bodies running.

II. The Digestive System follows a sequence. (As each organ is discussed, it is taken out of Stuffee's body cavity, displayed and passed around to the children. When all digestive parts are connected it is easy to show why another name for the digestive system is the alimentary canal; it is one long tube through which food passes.)

- A. Food normally enters the digestive system through the mouth where chewing, the mixing of saliva and swallowing (the muscular movement of the esophagus or food pipe) change the physical and chemical properties.
- B. The food continues to be digested and travels through the rest of the organs of the alimentary canal consisting of the:
  - 1. Stomach: which grinds, tears, and mashes food with strong digestive juices added to aid the process.
    - a. The stomach is like a food processor.
    - b. The food is mashed into a kind of food "soup".
  - 2. Small Intestine: which finishes mashing the food in large, fat part (duodenum), and then pushes the food the length of the small intestine (approximately 21'). Most of the nutrients are absorbed and sent through the body while the rest of the food is sent on to the:
  - 3. Large Intestine: where the indigestible parts of food move to; where liquids are absorbed into the blood, and from which waste passes out of the body.
- C. Other organs which assist digestion, but are not part of the alimentary canal are the:
  - 1. Liver: which is the largest (heaviest) organ in the body (The skin is the largest organ). This complicated organ has lots of important jobs.
    - a. Bile is produced to help digest fat. (Bile) ducts can easily be seen if Stuffee's liver is unzipped.
    - b. The liver also stores carbohydrates in the form of glycogen and can be quickly converted to glucose for other parts of the body.
  - 2. Gall bladder: the organ where the liver stores bile until it is needed

by the small intestine. In Stuffee it looks like a pea and is connected to the:

3. Pancreas: another organ, which produces digestive juices to send to the small intestine and resembles a carrot.

III. The Respiratory System has several important points to remember:

- A. Oxygen-enriched air is breathed in (inhaled), and oxygen-poor air (or air that has a great deal of carbon dioxide in it) is breathed out, or exhaled.
- B. Oxygen is the fuel that turns food (nutrients) into energy.
- C. Lungs are like balloons. As they fill up with air they get bigger, as they empty out air, they get smaller.
- D. Working with blood, the respiratory system uses the:
  1. Wind pipe (trachea): the long tube which starts at the back of the mouth (where the epiglottis - a tiny trapdoor attached to the root of the tongue to prevent food from being breathed in by mistake) and branches into two main bronchi or air tubes which divide and subdivide into smaller bronchial or air passages on the surfaces of the lungs.
  2. Lungs: two elastic air sacs, which are inflated and relaxed by the diaphragm (a sheet of muscle that makes a movable floor for the lungs) and other chest muscles.
    - a. Stuffee's windpipe connects to the two lungs.
    - b. Two lobes make up the left lung, and three the right.
  3. Alveoli: tiny air sacs where the oxygen and carbon dioxide are exchanged and are readily seen when the lobes of Stuffee's lungs are unsnapped.

IV. The Circulatory System consists of two main parts:

- A. The heart is a pump, which keeps the body running.
- B. Blood vessels are the body's delivery system; delivering food and oxygen and taking away waste and carbon dioxide. There are 60,000 miles of blood vessels in the body. They are:
  1. Arteries: which are the vessels that carry blood away from the heart and carry oxygen-enriched blood to all parts of the body.
  2. Veins: which are the vessels that carry blood back to the heart and then to the lungs to get a replenishment of oxygen.
  3. Capillaries: are the tiniest of blood vessels where the ready exchange of nutrients and gases occur.
- C. Kidneys: These two glands located in the small of the back are part of the excretory system but are explained here because of their job to separate waste materials from the blood, thus "cleaning" it or filtering it. The waste material is carried to the bladder (through small tubes called ureter) where it is eliminated as urine.
  1. Adrenal glands: glands found on top of the kidneys secrete adrenalin, which helps the body relate to stress.
- D. Stuffee's circulatory system consists of the:
  1. Heart
    - a. Each person's heart is about the size of his fist.
    - b. The heart gets its rest when we are sleeping but it never stops pumping blood or beating.
  2. Main blood vessels leaving and entering the heart, and the blood vessels in the kidneys.

## INTRODUCTION AND COMMENTS TO STUFFEE'S PRESENTER

Stuffee, The Children's Museum of Pittsburgh's blue-haired mascot will soon be coming to you. This appealing, overstuffed character turns inside out via a large green zipper to reveal the major abdominal organs for a fun-filled anatomy lesson for pre-schoolers to medical students!

On the outside, Stuffee is suggestive of a real person. His size, shape, blue hair, big smiling eyes, ear-to-ear grin, and giant zipper up the middle place him as a rather distant relation to any real person. This fact is used to point out that we all look quite different on the outside. On the inside, however, we all look quite remarkably alike! And Stuffee's organs, while made of appealing fabrics, colors and textures, are really quite accurate representations of actual human organs in appearance and close to scale for a body as large as Stuffee's.

Because of Stuffee's internal integrity, it is possible to give as sophisticated a presentation as an audience may require. Stuffee was designed for The Children's Museum of Pittsburgh, which serves an audience of pre-schoolers through 8th graders. Presentations have been given very successfully to all grade levels, as well as to very diverse family audiences that may include a three year old, an eight year old, a twelve year old and a brain surgeon! The knowledge of the presenter, combined with the age, interest and knowledge of his/her audience, will dictate the level of a Stuffee presentation.

Our suggestions to you for a successful Stuffee presentation would be:

- know your anatomy! This doesn't mean that you need the knowledge of a medical person. The CMP has found that if you have a working knowledge of anatomy at the 7th grade level **it** will be enough, although most presentations will not be at that level of sophistication. Be encouraged to learn all you can. It will do much for your self confidence for the times when you are sharing Stuffee with four year olds, and you are presented with a question about liver transplants from their teacher and you can respond without skipping a beat.
- know your audience. If you have a group of preschoolers, incorporate songs, and finger games. Make the presentation a little shorter for a young audience than an older one. If you have a group of sixth graders who have just finished a unit on the body as a review, use their knowledge by making the presentation more of a dialogue. Ask questions such as "Why are the digestive organs called the alimentary canal?" and then demonstrate their answer by linking all the digestive organs together to form one long tube! When working with a family audience of many different ages, call upon parents or older children as well as the younger ones. Include people from all parts of the audience.
- get the audience involved. You can do this in many ways. Have a very young child help you unzip Stuffee, or zip him up again. Hand out the organs as you discuss them. Let them be passed around. Have a group of children simulate peristalsis (the wavelike muscular action that moves food through the digestive track.) You get the idea; use your imagination.

have fun You are passing on sound knowledge about the body, but who says it has to be somber and boring? have fun with Stuffee! Even though each presenter should bring his own personality to the presentation, let the actor in you come out a little bit. Have the children join you in the rumblings a stomach makes as it lets us know it is empty. Breathe in and out dramatically and get your audience to join you as you explain respiration. Jump up and down with the children to make your pulses race so you can feel how much faster the heart has to pump to get blood to the muscles. Again, use your imagination to develop ideas to bring Stuffee to life

## SAMPLE STUFFEE PRESENTATION

The Children's Museum of Pittsburgh  
(20-30 minutes for family audience)

<p>Hi, my name is _____ and this is Stuffee. Before we are through today, we are going to get to know Stuffee very well-from the inside out!</p>	
<p>First, I want to find out something about you. Is anybody here lucky enough to have had lunch yet? What did you have to eat?</p>	<p>Take a poll until you find a food you want to stick with, hot dog, hamburger, peanut butter sandwich as opposed to frosted flakes or tofu</p>
<p>Okay, (name) we're going to find what happened to that hot dog after you chewed it up and swallowed it down. Since we just met and you don't know too many people here, I don't want to embarrass you. So, let's pretend that Stuffee ate the hot dog and find out what happened to it.</p>	
<p>Does anybody know where the hot dog goes after Stuffee chews it up and swallows it? That's right-it goes into Stuffee's <u>stomach</u> (tummy or belly).</p>	<p>Gesture towards belly.  Unzip Stuffee and pull out stomach.</p>
<p>What happens to the hot dog once it arrives in the <u>stomach</u> is that the <u>stomach</u> starts to squeeze and churn and grind and mash the hot dog. Just like a food processor or blender. It squirts in a few digestive juices and mixes everything up until the hot dog doesn't look like a hot dog any more .more like hot dog soup!</p>	<p>Pass out each organ to a child in the audience as you go through the demonstration.</p>
<p>Does anyone besides me have a stomach that makes noises sometimes? What do you call it when your <u>stomach</u> makes noise? That's right, growling or grumbling</p>	<p>Raise your hand.</p>
<p>After the hot dog leaves the stomach, it goes into the <u>small intestine</u> When does your <u>stomach</u> growl? That's right, when you are hungry. What causes the growling is that the <u>stomach</u> starts to do a little churning and maybe squirts a few digestive juices to remind you to eat. "Hey, (<u>child's name</u>) remember me? Send down a hot dog!"</p>	<p>Exaggerate the pulling.  Pull out the small intestine slowly and laboriously, making the most of its very impressive length.</p>
<p>Whew! The fat part that (name) is holding onto is called the <u>duodenum</u>. When the hot dog gets there, the <u>small intestine</u> starts squeezing, sending the hot dog down its entire length. As it does this, the good stuff--vitamins, minerals and nutrients--that your body needs, passes into the bloodstream. The bad stuff- the waste that your body doesn't need--keeps right on going.</p>	

(child's name) will you help me pull out Stuffee's <u>small intestine</u> ? This is Stuffee's <u>small intestine</u> . Don't stop now,(name).keep pulling: All of this is Stuffee's <u>small intestine</u> !	
When what's left of the hot dog leaves the <u>small intestine</u> , it passes into the large intestine. Are you ready for this? Okay, (name) help me pull it out!	Pull it out rather abruptly or stall so that audience expects great things.
Wait a minute! Is anyone else besides me disappointed by the <u>large intestine</u> ? how can this be large when it's so much shorter than the <u>small intestine</u> ? That's right--the intestine is thicker or we could call this the fat intestine and this the skinny intestine. OR, this is the short intestine and this is the long intestine.	Hold a segment of each intestine up in each hand
OKAY, Now there isn't much left of that hot dog any more, but as it passes through the <u>large intestine</u> , all that liquid is removed from it, and the solid waste leaves your body when you go to the bathroom.	
That's right--the <u>liver</u> . The <u>liver</u> is a very important organ with many complicated jobs. One of its jobs is to produce a digestive juice called bile. These are called <u>bile ducts</u> D-U-C-T-S not ducks:) Your body needs Bile to digest fat.	
Now, I'm going to pull out the largest, heaviest organ in the body. Can anyone guess what it is? It's got the same name as a food that lots of kids don't like.	
Does anyone here eat fat? Not just the kind that you're supposed to cut off the edge of your steak or ham... Do any of you put butter on your toast? Does anyone eat cheese? how about ice cream?	Pretend to munch on pancreas.
We all eat fat and that's okay. Our bodies need some fats and oils, just not a whole lot of them. BUT, our bodies can't digest fat without the <u>bile</u> that the liver makes. NOW, I'm going to pull out the funniest looking organs in the body. What in the world are these? You're right, this looks like a carrot and this looks like a pea (or lima bean or pear). You may not have heard of these organs--do any of you grown-ups know what they are?	
This is the pancreas and this is the gall bladder. People don't talk about these organs a lot. They have more than one job. One of the <u>pancreas</u> ' jobs is to produce a digestive juice and the gall bladder stores the bile that the <u>liver</u> makes and the <u>small intestine</u> needs to digest fat	
Here is a very important pair of organs. The <u>Kidneys</u> . Kidneys clean the blood. They filter it, separating wastes from the nutrients and minerals your body needs. The <u>kidneys</u> return the good stuff to the blood stream and send	Pull out kidneys

the waste out of the body, (via the bladder) when you urinate.	
NOW, we're going to get to the exciting stuff What is this? You're right! It's the <u>heart</u> . How big is your <u>heart</u> ? About as big as your fist. What does the <u>heart</u> do? It beats as it pumps blood throughout the body, through your <u>veins</u> , <u>arteries</u> and <u>capillaries</u> -your <u>blood vessels</u> .	Pull out heart
OR, look at your neighbor and do this.	Pull down your lower eyelids.
OR, do this...	Stick out your tongue and curl it up toward you nose.
We have <u>blood vessels</u> all over our bodies. Does anyone know how many? That's sort of a trick question--the answer is ONE because all the <u>blood vessels</u> are connected.	
BUT, if we could pull all the <u>blood</u> vessels in our bodies out in one big, long, string--which I can't--that string would be 60 thousand miles long That's long enough to go around the world two and a half times:	PULL. .PULL.. PULL with emphasis.
That still amazes me! Your <u>heart</u> is a muscle--the strongest muscle in your body. It has to work very hard to pump blood all that distance and you should take good care if it!	
What are these? Your <u>lungs</u> What do you do with your lungs? You breathe with them. What do you breathe? Air. The good air your body needs is called oxygen and the waste air your body doesn't need is called carbon dioxide. These little things are called air sacs or <u>alveoli</u> . We have millions of them. Do you know what your <u>lungs</u> are like? They're like balloons. Everyone put your hands on your chest. Now I'm going to ask you to do something a little bit uncomfortable. Get empty! Blow out all the air inside your bodies. Now, fill up slowly, getting as full as you can without popping. Bigger... Bigger.... .Bigger. Okay, let it all out. Every time you breathe in, your lungs fill up like this. Every time you breathe out, they get empty--like a balloon.	Pull out the lungs  Demonstrate yourself.  Sputter like a balloon.
All right, now it's time to get Stuffee back together. Who has the liver? The pancreas? The gall bladder? The kidneys? The large intestine? The short intestine? The <u>heart</u> ? The <u>lungs</u> ?	Gesture to children, encourage them to come up as you call off the organ they have been holding
Where did we begin? Oh, yes--the <u>stomach</u> . Now that's just about all the stuff that Stuffee has except for one last thing.	
Has anyone here ever choked when you were eating? What do people say when you choke? "Uh, oh It went down the wrong pipe." (Or tube,, way, etc.) Different families say different things.	
This is the food pipe or esophagus. That's actually where the hot dog starts down after you chew it up and swallow it.	Pull out esophagus. (This can be done in the beginning prior to the stomach)

<p>Do you want to see the wrong pipe? It's called the wind pipe or <u>trachea</u>. You do not want hot dugs your lungs--you want air in your <u>lungs</u>. But, your body takes pretty good care of itself. Most of the time, if food starts to go the wrong way, your body sends it right back up--choking--without you even having to think about it.</p>	
<p>That's everything that Stuffee has and it's a lot. However, we have more stuff inside us. <u>Bones</u>, <u>muscles</u>, spleen, tongue, and the <u>BRAIN</u>. We don't only think with our <u>brains</u>. Our brains control all the other organs and systems in our bodies--making our <u>hearts</u> pump, our <u>stomachs</u> churn, our <u>intestines</u> squeeze, and our <u>ears</u> hear. Thanks for your help.. Does anybody have any questions?</p>	<p>Children enjoy getting close to Stuffee and giving him a hug before leaving.</p>

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