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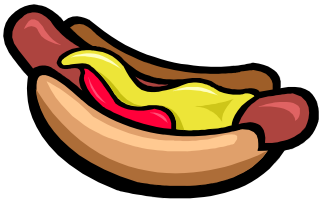
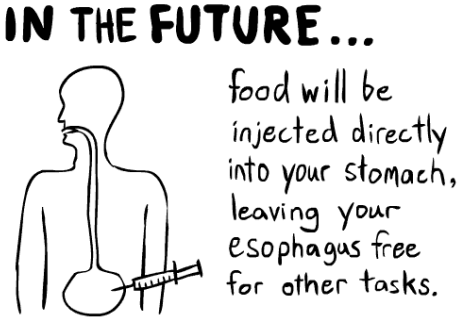
Down the Hatch

Through the process of digestion, your body breaks the food down into the basic blocks of life and then rebuilds them by incorporating them into your body; just like if you were to take apart a Lego dinosaur so that you could use the blocks to build your castle. Your body is constantly breaking food down, and then using the pieces to build, repair, and grow your body. There are many parts, or organs, utilized by your digestive system. The job of each of these organs is to break food down into smaller pieces, or smaller blocks, so that by the time the food reaches the cells of your body, they are nothing more than tiny molecules. Let's consider a delicious hotdog for a moment. On a warm afternoon, nothing is more appetizing than a roasted hotdog. Placed in a soft bun with ketchup and mustard, this treat is almost irresistible. Grumble… there goes your stomach again. Although it smells really good, in its current form, that hotdog will not do your body much good. It is much too large to squeeze into your tiny cells. Even if you could get it into one of your cells, that cell would not be able to use it. What do we need to do to the hotdog before we put it into your cells? That's right!! We need to break it down into smaller pieces.



As you lift the hotdog up towards your mouth, what is the first thing you do to begin breaking it down into smaller pieces? That's right, you bite it. The hotdog is too big to swallow in one giant gulp, so you bite the end off. Already you have begun breaking it down, haven't you? But wait! Now what are you doing? You are still breaking it down into smaller pieces. You are squishing it, and grinding it, and cutting it using your teeth. Something else very important is also happening. Your mouth produces a chemical called saliva, which is more commonly referred to as spit. Saliva is produced by your salivary glands, and is released as you begin to chew. It can also be released when you smell something yummy. Saliva has a couple of important jobs to perform. First, it moistens your food. This makes it easier to chew and helps lubricate it so that it can travel through your body more easily. Saliva also contains chemicals that begin to break your food down into smaller pieces through the process of chemical digestion. Now you are holding a hotdog in your hand with a bite missing out of it. In your mouth you have a small wet ball of mashed up hotdog, bun, ketchup, mustard, and saliva. So what's next?

Uh Oh!! Here it comes. Wait… you swallow it. That wet ball of broken up hotdog begins a long journey towards the cells of your body. At this point it is still much too big to fit inside any of your tiny cells. Even the smallest pieces would be far too large to do your cells any good. After swallowing your hotdog bite, it enters into your esophagus. The esophagus is like a long slippery waterslide. Muscles within your esophagus squeeze the food down towards your stomach. Whether you are standing up, laying down or hanging upside down, you can safely swallow a bite of food, because the muscles within your esophagus know that their job is to send food in only one direction… towards your stomach. Imagine sliding down a waterslide. Now suppose that you



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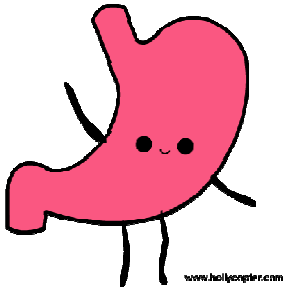
stick out your arms and legs to stop yourself. You then turn around and start to climb back up the slide. If the waterslide were like your esophagus, it would squeeze down, closing in front of you. It would then squeeze closer and closer to you, forcing your to start sliding down again.



As that hotdog bite falls into the stomach, a round muscle called a sphincter closes behind it. This protects the esophagus from having food or other chemicals splash back into it. The single hotdog bite is soon joined by other bites as you continue eating. After a few minutes your stomach is completely full. Because you feel full, you stop eating, and run off to play with your friends. As you play, you don't think about the food or what it is doing inside of you, but your body does not forget about it. Deep within you, your body continues the process of breaking your food down into smaller and smaller pieces. For the next couple of hours your stomach muscles churn and grind the food in your stomach, causing it to roll over and over again. Glands within your stomach release a variety of powerful chemicals which help to further break down the food within you. The two most important chemicals are hydrochloric acid and pepsin. Together these chemicals break the hotdog down into a slush known as chyme.

Once the chyme is ready, a valve opens in your stomach and releases the chyme into your small intestine. The small intestine is where most of the digestion process takes place, and is about 22 feet long!. Although the slushy chyme is much more broken down than the original hotdog, the small pieces floating in the chyme are still too large to fit inside your cells. They must be broken down even further. As the chyme enters your small intestine it is mixed with a variety of chemicals, whose job it is to further break down the hotdog. Your liver adds a liquid known as bile which helps to neutralize the acids from your stomach, so that digestion can continue to take place. By now, you are done playing with your friends, and are back at home watching television. The chyme is slowly moving further along in your small intestine. As it moves along, the process of digestion is almost complete. Your small intestine is lined with tiny folds called villi. The muscles within your small intestine squeeze and roll the food about. As it sloshes around, these villi quickly absorb the nutrients from the chyme, leaving behind the materials that are not nutritious.

As chyme enters your large intestine, there are virtually no nutrients left. The job of the large intestine is to remove water from the remaining waste. Water is very important to your body, and it cannot afford to allow water to leave unnecessarily. Slowly the chyme passes through your large intestine becoming dryer and harder. Eventually, after about 24 hours, your body no longer needs what remains of that hotdog. It has traveled from your mouth to your large intestine, getting smaller and more broken down each step along the way. Because all of the nutrients and water have been removed from the food, all that remains is to get rid of the waste that has been left behind.

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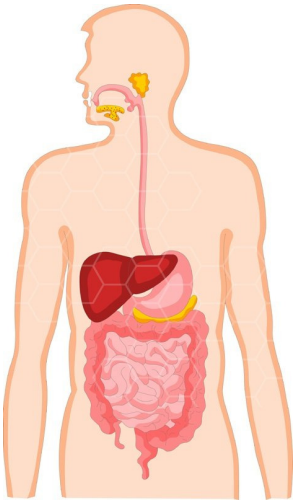

Comprehension Questions:

1. What is the major function of the digestive system?

2. Name 5 parts of the digestive system and briefly describe their function.

3. From the reading, what do you think are the functions of hydrochloric acid and pepsin?

4. What kind of chemicals do you think saliva contains? What is the function of these chemicals?

5. How do you suppose food moves down the esophagus to the stomach? Can swallowed food reach the stomach if you are standing on your head?

VOCABULARY SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backwards.

WORD BANK

bile
carbohydrates
esophagus
gallbladder
lipids
liver
pancreas
peptides
proteins
starches
stomach
villi

A	C	D	T	E	E	L	I	B	B	I	L	W	N	O
D	X	S	S	R	E	I	L	E	R	A	L	H	N	P
G	G	A	L	L	B	L	A	D	D	E	R	R	E	D
H	R	S	S	I	A	E	T	U	V	O	V	V	L	I
J	I	P	E	P	E	P	T	I	D	E	S	I	E	S
C	P	K	L	I	A	O	L	B	E	S	N	M	L	B
U	E	R	A	D	W	L	O	S	S	E	K	N	S	A
L	H	S	O	S	I	T	O	U	L	H	I	L	S	E
A	C	E	S	T	T	E	G	G	A	C	L	I	A	S
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W	M	Q	I	A	H	I	L	U	X	A	M	E	R	T
T	O	O	Z	P	M	N	N	A	E	T	C	P	C	Y
R	T	A	O	B	C	E	S	S	L	S	W	I	N	L
D	S	S	E	T	A	R	D	Y	H	O	B	R	A	C
U	E	M	L	O	I	R	X	C	A	N	O	L	P	E