Body Systems - digestion

Critical teaching ideas - Science Continuum F to 10
Level: Moving towards level 8

Student everyday experiences

Young and even older children, appear to have difficulty understanding that the human body relies on systems, which work independently and together e.g., circulatory, respiratory, nervous, digestive. It is common for students to note the qualities of the separate organs rather than seeing the interactions between the parts of a system, e.g. they tend to think each organ has its own independent function -the eyes are for seeing, the brain is for thinking, the stomach is for digesting food, etc.

For some young children their knowledge of the internal structure of the human body may be very simple, e.g. some imagine their bodies as hollow skin bags believing that food after swallowing, floats around in any area of the body. (Fleer & Hardy, 1996). These ideas may change for older primary students who begin to recognise the body has essential requirements and that the food they eat and the oxygen in the air they breathe must get around their bodies somehow, although many are unsure how this happens.

The scientific view

When two or more organs along with their associated structures work together they become component parts of a body system. Working together, systems inform and maintain the human body. Each system has an essential role and if one system fails the others are affected, either directly or indirectly. Some of these systems include: the circulatory system, the skeletal system, the muscular system, the respiratory system, and the nervous system, etc

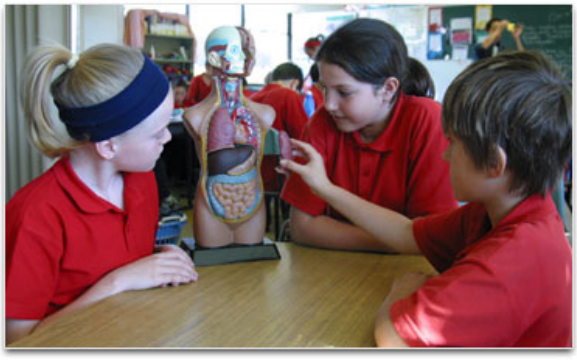
The digestive system is a series of connected organs from mouth to anus whose purpose is to break down, digest and excrete wastes from the food we eat. The digestive system breaks down complex food molecules into simple molecules, many of which are used by our bodies, so that these useful simple molecules can be absorbed easily into the bloodstream. These molecules travel in the blood to all of the body's cells, where they are used for growth, repair and energy. Those molecules that are not useful are excreted.

Critical teaching ideas

- The human body is very complex and relies on a variety of body systems for obtaining and deriving energy from food, for defence against biological attack and mechanical injury, reproduction and the coordination of body functions.
- These body systems must work together; if one system fails other systems are affected.
- Each body system has a particular function.
- Each body system consists of many parts comprising organs, tissues and cells which all work together and influence one another.
- All parts of a particular system must work together to carry out their vital function.

- Models and simulations provide useful visual representations, which can be used to assist understanding of the various changes and processes that take place in the digestive system.

Exploring the human body systems is challenging because of the dynamic, complicated, and often molecular nature of the processes within the human body. A further challenge is faced when attempting to relate the different systems in the body to the functioning of the body as a whole. It is important that the learning experiences provided work towards aiding an understanding that parts within a system usually influence one another and that a system may not work as well, or at all, if a part is missing, broken or worn out, or misconnected.

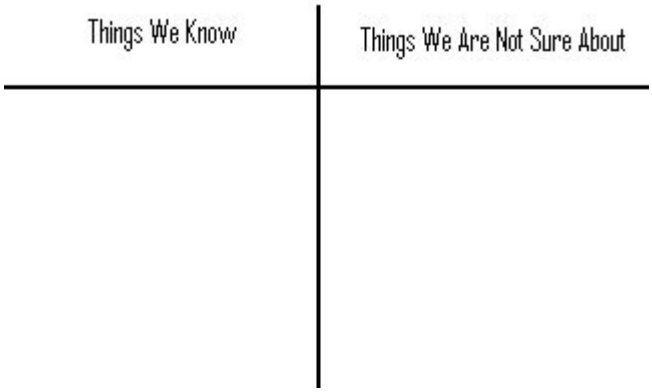


In working towards this understanding it may be more useful to focus on one system in detail exploring how component parts work together to carry out the vital functions. This may act as a model for further investigations into other systems. It is also important to highlight how this system works with and relies on other systems in the human body.

Teaching activities

Bring out students' existing ideas.
Provide an experience that invites students to explore their own understanding of what happens to food as it moves through the human body. Students bite a sample of food. Encourage observations of any changes in the food sample, e.g. teeth imprints; explore the mechanics of how the piece was broken off. Encourage students to discuss the role of the teeth, the tongue?
Focus students' attention to specific details.
Use questions to explore observed changes, e.g. describe the texture of the food item by the time it was swallowed and the possible causes. Why is it important that food is broken into smaller pieces as it moves through the body? How is this done in different parts of the digestive system? Where did this piece of food go? Explore and list ideas - use a body outline to map the movement of this food through the body. Students share their ideas about the body parts the food will move through and the changes that will occur as the food moves through the body.

Share intellectual control.
Provide an opportunity for students to consider their own ideas and track changes in their thinking and learning. Create a class thinking board headed 'Things we know' & 'Things we are not sure about'. Use this to guide further investigation of the digestive system. Return to this each session and add new information.



Help students work out some of the scientific explanations for themselves.
Provide models and simulations to investigate the various changes and processes that take place in the digestive system. These could include using a variety of materials including large boxes, balloons, and zip lock bags to create a life size model containing all the various parts of the digestive system. S, simple chemical and physical reactions can be used to explore the role of the stomach's digestive juices in the breakdown of food, using filters to explore what occurs in the intestines, using coloured streamers to create a model of the actual overall length of the various parts of the digestive system from mouth to anus. Work with students to design a role-play activity that demonstrates what happens to food particles as they move through the digestive system.

Provide an opportunity for students to clarify and consolidate their ideas.
Students are given the opportunity to make explicit connections between knowledge gained through previous activities and their developing understanding of the overall functioning of various parts of the digestive system. 'If …then' strategy: Use this strategy to explore the interdependency of the various parts of the digestive system. If we had no teeth then….. If we could not break down food then …. If the walls of the intestines allowed all digested materials to enter the blood stream then…etc.