Internal Body Organs

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

Student everyday experiences

Younger primary students may have little knowledge about internal bodily organs. They tend to think the contents of the body are what they have seen being put into or coming out of it (e.g., food, blood). Their experiences with everyday cuts, scratches and bruises seem to reinforce a view that blood is below the surface of the skin, filling the spaces inside the body (like a bag of blood) (Fleer & Hardy, 1996).

Older children are more likely to be able to list a large number of organs (Gellert, 1962) but may not fully understand the function or interconnected nature of these., e.g. students at these levels may realize that the heart is a pump, but not realize that the blood returns to the heart (Carey, 1985), or they may believe that the brain helps the body parts but not always realize that the body helps the brain.

The scientific view

To survive and reproduce the human body relies on major internal body organs to perform certain vital functions. When two or more organs along with their associated structures work together they become component parts of a body system.

Some of the easily recognisable internal organs and their associated functions are:

The brain: the control centre of the nervous system is located within the skull. Functions include muscle control and coordination, sensory reception and integration, speech production, memory storage, and the elaboration of thought and emotion.

The lungs: two sponge-like, cone-shaped structures that fill most of the chest cavity. Essential function is to provide oxygen from inhaled air to the bloodstream and to exhale carbon dioxide.

The liver: lies on the right side of the abdominal cavity beneath the diaphragm. Main function is to process the contents of the blood to ensure composition remains the same. Process involves breaking down fats, producing urea, filtering harmful substances and maintaining a proper level of glucose in the blood.

The bladder: a muscular organ located in the pelvic cavity. It stretches to store urine and contracts to release urine.

The kidneys: two bean-shaped organs located at the back of the abdominal cavity, one on each side of the spinal column. Function is to maintain body's chemical balance by excreting waste products and excess fluid in the form of urine.

The heart: is a hollow, muscular organ that pumps blood through the blood vessels by repeated, rhythmic contractions.

The stomach: a muscular, elastic, pear-shaped bag, lying crosswise in the abdominal cavity beneath the diaphragm. Main purpose is digestion of food by producing gastric juices which break down, mix and churn the food into a thin liquid.

The intestines: located between the stomach and the anus is divided into two major sections: small intestine and large intestine. The function of small intestine is to absorb most ingested food. The large intestine is responsible for absorption of water and excretion of solid waste material

Critical teaching ideas

- Humans may look different but inside they share identical component parts
- The human body contains major internal organs or body parts which can be easily identified. These organs differ in size, shape, location and function
- Each organ has a specific role which contributes to the overall well being of the human body
- A group of organs whose jobs are closely related is often referred to as a system

Building students' understanding of internal body organs, how these are linked and why they work together as systems is a complex process. A useful starting point is to identify students' existing ideas and understandings about what is inside the body. Using everyday experiences to draw out these ideas is always powerful, e.g. recalling visits to the doctors, medical operations/procedures, injuries, medical imaging/scans, posters, advertising images, etc.

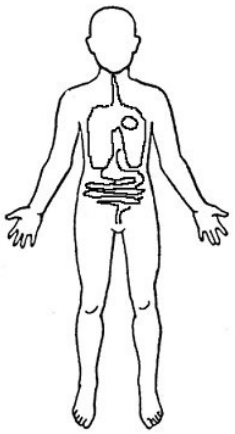
It is useful to explore what internal organs look like and where they are located in order to understand the specific function of each and how each contributes to keeping the body alive and well. Experiences should begin to encourage students to consider how organs work together, i.e. how the work of one organ is similar or contributes to the work of another. Leading to the more complex idea that body parts form systems that contribute to the functioning of the body as a whole.

Teaching activities

Bring out students' existing ideas.
Encourage students to work in small groups to create a common drawing of what they know about the inside of the human body. Consider providing each group with an outline of a human body or have students trace around a group member lying on a large sheet of paper. Ensure students consider the location, size and shape of body parts in their drawings. Have students include labels naming each internal part and consider getting the groups to research information about each organ.

http://www.bfawu.org/health-bodymapping_files/image001.gif

Share intellectual control.
Provide each student group with at least 3 strips of paper. Have each group list 3 questions that arose as they were completing their drawings, i.e. things they realized they didn't know. Display body drawings and discuss similarities and differences between each group's representations. Display questions. Add further questions to the list as they arise from these discussions and observations. As a class complete a bundling activity sorting the questions. Use these questions to inform planning of further investigations related to this topic. Revisit these questions at the end of each session and respond where appropriate with new information.



Clarify and consolidate ideas for/by communication to others.
By using a jigsaw strategy, students move from 'home' groups to 'expert' groups, and then back to 'home' groups to collect and share more detailed information about internal body organs. Working in 'expert' groups students research a specific internal organ of the human body. As a result of the experiences provided in this 'expert' group this team member must be able to explain where the organ is located, describe/represent the observable features of the organ, what the organ does for the human body and why the organ is important.

When working in expert groups it may be useful for students to access useful websites, science texts and visual images; explore scientific models; examine animal organs (following regulated health protocols); construct simple models e.g. using plasticine and complete simple investigations, which demonstrates key features and functions of the organ they are investigating. Each member then returns to the 'home' group shares their expertise being ready to 'teach' their colleagues this new information. Following expert presentations the 'home' group returns to their original body drawing and adds new information. These changing body displays become an integral part of the ongoing investigation and demonstrate a dynamic, changing display.

Promote reflection on and clarification of existing ideas.
To assist students to construct richer personal meanings for ideas and concepts related to internal body organs use sentence stems, incomplete statements designed to provide a structure for insights and observations, e.g. The liver is… The liver can… A heart has… The lungs can…

Students write stories to convey "A day in the life of …. " (one of the organs that has been investigated.)

Challenge some existing ideas and focus attention on hitherto overlooked.
When students are familiar with a variety of major internal organs provide activities that encourage students to consider how one organ is similar to or contributes to the work of another organ. How is this like/not like a similar organ? This encourages students to consider similarities and differences which they may normally overlook. How are the stomach and bladder alike? How do they differ? How are the kidneys and the liver alike? How do they differ? How is the large intestine like a tea strainer? How is the heart like a bike pump?

Identify diseases and conditions commonly associated with each major organ, e.g. heart attack, asthma, stomach ulcer, etc. Discuss contributing factors to these e.g. diet, inherited

conditions, etc. Explore how medicine has developed effective treatments for many of these e.g. transplants, mechanical heart, medication etc.

Further resources

Science related interactive learning objects can be found on the FUSE Teacher Resources page. To access the interactive learning object below, teachers must login to FUSE and search by Learning Resource ID:

- **Human Body** – students work through a series of four learning objects about the structure and function of the human body. They compare humans with other animals to explore adaptation to environments.
  Learning Resource ID: K6MKAS