

THE HUMAN BODY UNDER X-RAY

Skeleton,
systems,
functions
and vital organs



This game helps children to understand that the human body is a complex structure formed of different systems, organs and parts that enable our body to perform specific functions.

Puzzle

Begin by assembling the 84-piece puzzle. You'll see that there's a picture of a boy's body on the left, surrounded by a series of balloons with images of the various systems of the human body. On the other side, there's a picture of a girl surrounded by more balloons showing a selection of bones in the human skeleton.

Magic torch

Point the magic torch at the two large pictures to reveal a number of things which are invisible to the naked eye:

- The picture on the left reveals both the names of the organs pictured in the balloons and also their relative positions in the child's body. In this way, children can learn both the names of the body parts and organs and also where they are in the human body, like a real-life x-ray image.

- The picture on the left reveals the names of the bones pictured and shows where they fit into the skeletal system in the girl's body, which will be visible, as before, like an x-ray.

THE ORGANS OF THE HUMAN BODY

THE SKELETON AND THE BONES

MISSION 1

| | |
|-------------------|-----------------|
| BOAT PROPELLER | SMALL INTESTINE |
| LABIAL INVERTIBLE | STOMACH |
| BOAT VENTRIKLE | VEIN CAVA |
| TRACHEA | CAPILLARIES |
| BRAIN | PHARYNX |

MISSION 2

| | |
|---------------------|-----------------|
| LABYRINTH | LEFT VENTRICLE |
| VENTRICLE OF UTERUS | MANUBRIUM |
| VEIN | LEFT HEMISPHERE |
| THALAMUS | LEVEL OF ORBIT |
| KIDNEY | EPIDERMIS |

MISSION 3

| | |
|------------------|-----------------|
| URETER | BONES |
| NAVINA | CORTEX |
| CEREBELLUM | LEVEL OF NOSE |
| APPENDIX | NERVES |
| LEVEL OF HEARING | SMALL INTESTINE |

MISSION 4

| | |
|-----------------|-----------------|
| LEFT VENTRICLE | SMALL INTESTINE |
| MANUBRIUM | SMALL INTESTINE |
| LEFT HEMISPHERE | SMALL INTESTINE |
| LEVEL OF ORBIT | SMALL INTESTINE |
| EPIDERMIS | SMALL INTESTINE |

MISSION 5

| | |
|-----------------|-----------------|
| BOONES | SMALL INTESTINE |
| CORTEX | SMALL INTESTINE |
| LEVEL OF NOSE | SMALL INTESTINE |
| NERVES | SMALL INTESTINE |
| SMALL INTESTINE | SMALL INTESTINE |

MISSION 6

| | |
|-----------------|-----------------|
| SMALL INTESTINE | SMALL INTESTINE |

MISSION 7

| | |
|-----------|---------------|
| ESOPHAGUS | HYPOPHYSIS |
| VENA CAVA | LEVEL OF NOSE |
| VENA CAVA | HYPOPHYSIS |

MISSION 8

| | |
|---------------|------------|
| HYPOPHYSIS | HYPOPHYSIS |
| LEVEL OF NOSE | HYPOPHYSIS |
| HYPOPHYSIS | HYPOPHYSIS |

MISSION 9

| | |
|------------|------------|
| CORTEX | CORTEX |
| HYPOPHYSIS | HYPOPHYSIS |
| CEREBELLUM | CEREBELLUM |
| EPIDERMIS | EPIDERMIS |
| VEIN CAVA | VEIN CAVA |

MISSION 10

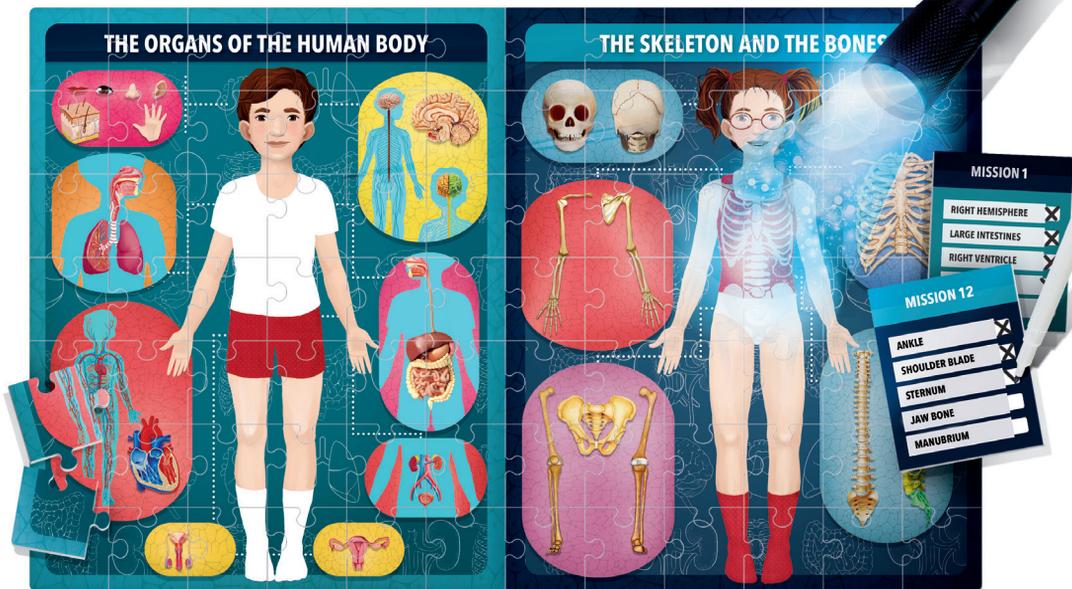
| | |
|------------|------------|
| CORTEX | CORTEX |
| HYPOPHYSIS | HYPOPHYSIS |
| CEREBELLUM | CEREBELLUM |
| EPIDERMIS | EPIDERMIS |
| VEIN CAVA | VEIN CAVA |

MISSION 20

| | |
|--------------|---|
| FRONTAL BONE | ✓ |
| ORBIT | ✓ |
| HYPOPHYSIS | ✓ |
| HELL BONE | ✓ |
| PHARYNX | ✓ |

Mission Cards for individual play or head-to-head with friends.

The mission cards can be used to organise games “to find parts of the human body”. Each card has a list of five body parts. Using the pen provided and shining the torch on the puzzle, look for both the names and the corresponding body part on the drawing of the boy or girl. When you’ve found it, be sure to “cross off” the name of the part located on the mission card. Timed games can be organised with multiple players: give each player one or more mission cards and establish the order of play.



Each player takes a turn to try and complete their mission (or missions) as quickly as possible. The winner is the person who was the fastest to locate and cross off all the body parts listed on his or her mission card(s). To keep track, one of the players will be tasked with keeping time on a stopwatch.

Systems of the human body

The human body can move, eat, breathe and reproduce thanks to the efficient function of its many organs and tissues which are organised into "apparatus", or more commonly "systems". The "apparatus" are formed of different organs and tissues, each performing a specific function. The "systems" are groups of organs with similar functions and structures. Let's take a closer look.

The **sensory system** includes all sense organs which transmit information from external stimuli through the five senses: sight, hearing, touch, taste, smell. Sense organs are the eyes (sight), ears (hearing), skin (touch), tongue and mouth (taste), and nose (smell).

The **respiratory system** is the group of organs and structures which enable humans to breathe, or more specifically, for carbon dioxide and oxygen to be exchanged with the outside environment. The respiratory system comprises the pharynx, larynx, trachea, lungs and bronchioles.

The **circulatory system** is a network of vessels carrying blood and nutrients. It comprises a pumping organ — the heart — and arteries, veins and capillaries. The heart is formed of a left ventricle and a right ventricle. The aorta is a large artery which branches off into arteries carrying blood to all parts of the body.

The **digestive system** is the group of organs and structures which enable us to eat, digest and assimilate foods. The digestive system comprises the mouth (where digestion starts), the oesophagus, the stomach, the liver, the large intestine, the small intestine, the appendix and the pancreas. Nutrients are absorbed on their journey through the intestine before waste products are expelled in faeces.

The **urinary system** is the group of organs and structures which enable the body to eliminate waste or harmful substances through urine. It consists of the kidneys, bladder, ureter and urethra. On the puzzle, which shows the urinary system, you can see the vena cava, the most important vein in the circulatory system which carries blood from the organs and tissues back to the heart.

The **reproductive system** is the group of organs which enable reproduction. In males, it consists of the penis and testicles. In women, it consists of the vagina, ovaries and uterus in which the embryo develops into the foetus and then to the birth of a child.

The **nervous system** coordinates all vital functions. It is split into the central nervous system, which comprises the encephalon, the spinal cord, and the peripheral nervous system comprising all the nerves outside the brain.

The brain - a mass of nervous tissue contained within the cranium - is located in the encephalon.

All cognitive, sensory, motor and regulatory functions of the human body are controlled by the brain. It is formed of cerebral cortex and other parts, each with a specific function:

the cerebellum (which coordinates movement), the thalamus, the hypothalamus and pituitary gland.

The brain is split into two parts: the right hemisphere and the left hemisphere.

Each hemisphere is responsible for a specific kind of activity.

The **skeletal system** is the rigid structure supporting the body and protecting the organs. It is made up of bones which connect to muscles and allow the body to move. The human skeleton consists of the bones of the skull (cranium and related parts), the upper limbs (clavicle, humerus, shoulder blade, radius, ulna, metacarpal, phalanx, etc.), the vertebrae and bones of the rib cage (manubrium, ribs, sternum), bones of the pelvis and lower limbs (femur, kneecap, tibia, fibula, ankle, heel, etc.) There are more than 200 bones, connected by 70 joints, in the human skeleton.

The **muscular system** comprises the voluntary muscles (the ones we move by ourselves, such as the calf muscles) and the involuntary muscles (on the walls of organs). The voluntary muscles are made of "striated" tissue whereas the involuntary muscles are formed of "smooth" tissue.

