

## The Human Organism > Basic Functions

### Research on Student Learning

Lower elementary-school students may have little knowledge about internal bodily organs and think the contents of the body are what they have seen being put into or coming out of it (e.g., food, blood). Upper elementary students can list a large number of organs. [1] A sizable proportion of adults has little knowledge of internal organs or their location (for example, few adults can draw the stomach and the liver in reasonable positions). [2]

By the end of 2nd grade, students know that thought is needed for different kinds of activities (e.g., motor acts) and as a result know the brain is required for these activities. [3] Fourth-graders know the brain helps the body parts but do not always realize that the body also helps the brain. [4] Whether upper elementary-school students can achieve this understanding with adequate instruction needs further investigation. Upper elementary-school students attribute to nerves the functions of conducting messages, controlling activity, and stabilizing the body. [5] Even after traditional instruction about the brain and the nervous system, 5th-grade students appear not to understand yet the role of the brain in controlling involuntary behavior. [6]

Lower elementary-school students know about circulation and something of the blood's relation to breathing. Upper elementary-school students realize that the heart is a pump, but they are not aware that the blood returns to the heart. [7]

Students of all ages hold wrong ideas about the structure and function of blood, the structure and function of the heart, the circulatory pattern, the circulatory/respiratory relationships, and the closed system of circulation. Misconceptions concerning the circulatory pattern, the circulatory/respiratory relationships, and the closed system of circulation are difficult to change. [8]

Lower elementary-school students know food is related to growing and being strong and healthy, but they are not aware of the physiological mechanisms. By 5th grade, students know that food undergoes a process of transformation in the body. [9]

Lower elementary-school students may not know what happens to air after it is inhaled. Upper elementary-school students associate the lungs' activities with breathing and may understand something about the exchange of gases in the lungs and that the air goes to all parts of the body. [10]

### References

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