



## **5<sup>th</sup> Grade Body Systems Unit Student Misconceptions**

### **Scientific Inquiry (AAAS, 1993, pp. 332 & 360)**

Students of all ages may overlook the need to hold all but one variable constant, although elementary students already understand the notion of fair comparisons, a precursor to the idea of “controlled experiments” (Wollman, 1977a, 1977b; Wollman & Larson, 1977).

Students tend to look for or accept evidence that is consistent with their prior beliefs and either distort or fail to generate evidence that is inconsistent with these beliefs. These deficiencies tend to mitigate over time and with experience (Schauble, 1990).

### **Diversity of Life (AAAS, 1993, pp. 340 to 343)**

Preliminary research indicates that it may be easier for student to understand that the cell is the basic unit of structure (which they can observe) than that the cell is the basic unit of function (which has to be inferred from experiments) (Dreyfus & Jungwirth, 1989).

Some students of all ages have difficulty in identifying the sources of energy for plants and also for animals (Anderson 1990). Students tend to confuse energy and other concepts such as food, force and temperature. As a result, students may not appreciate the uniqueness and importance of energy conversion processes like photosynthesis and respiration (Anderson, 1990).

### **The Human Organism (AAAS, 1993, pp. 344 & 345)**

Upper elementary students can list a large number of organs (Gellert, 1962); however, a sizeable 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) (Blum, 1977).

Upper elementary-school students realize that the heart is a pump, but they are not aware that the blood returns to the heart (Carey, 1985). 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 (Arnaudin & Mintzes 1985, 1986).

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 (Carey, 1985).

**Habits of Mind (AAAS, 1993, p. 361)**

Middle-school students tend to invoke personal experiences as evidence to justify a particular hypothesis. They seem to think of evidence as selected from what is already known or from personal experience or second-hand sources, not as information produced by an experiment (Roseberry, 1992).