Strand Map: Cells As Systems

Introduction

These interconnected sequences of benchmarks lead to the concept that a cell can be thought of as a system by itself and as part of a larger system, the multicellular organism (*Benchmarks for Science Literacy,* Chapter 5, Section C: Cells). In grades 3-5, the idea that living things are made of parts illustrates the component nature of systems. In grades 6-8 the hierarchy of organism-organs-cells serves as an example of systems and subsystems. In grades 9-12 the importance of interactions among cells and between molecules within the cell reinforces the idea of relationships among parts of a system and between systems.

Benchmarks that directly contribute to the understanding of cells as systems were included in this strand map. Additional benchmarks that can contribute to this understanding can be found in *Benchmarks for Science Literacy,* Chapter 8, Section F: Health Technology (replacing of body parts equivalent to the general idea that systems may not work as well if a part is missing or broken), and in Chapter 6, Section C: Basic Functions (the brain and the hormones in equivalence to the general notion of feedback and control).

To simplify the diagram, the 6-8 benchmarks are enclosed in circles. Dashed arrows coming to or from the circles represent connections to all benchmarks within that circle.

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