



## Unit Map

### What is causing Elisa, a young patient, to feel tired all the time?

Through inhabiting the role of medical students in a hospital, students are able to draw the connections between the large-scale, macro-level experiences of the body and the micro-level processes that make the body function as they first diagnose a patient and then analyze the metabolism of world-class athletes. They uncover how body systems work together to bring molecules from food and air to the trillions of cells in the human body.

#### Chapter 1: Why does Elisa feel tired all the time?

**Students figure out:** Elisa feels tired because her cells aren't getting the molecules they need from food and air, which are necessary for her cells to function, grow, and repair.

**How they figure it out:** They make observations in the Simulation and read a short article to discover which molecules are taken in by the cells.

#### Chapter 2: What is happening in Elisa's body that could be preventing molecules from getting to her cells?

**Students figure out:** Elisa's cells are getting enough oxygen and amino acids, but not enough glucose. Her digestive system should break down starch molecules into glucose molecules, which are small enough to get into cells, and her circulatory system should deliver the glucose to cells. Students diagnose Elisa with diabetes.

**How they figure it out:** They explore several medical conditions with the Sim and through text. They conduct a hands-on investigation and participate in a Classroom Body Systems Model. They explain how diabetes affects Elisa's body systems and the molecules that get to her cells.

#### Chapter 3: How do molecules in the cells of the body release energy?

**Students figure out:** Elisa feels tired because her cells need both glucose and oxygen to release energy, in a process called cellular respiration.

**How they figure it out:** They explore the effects of activity on their own bodies, observe a chemical reaction that represents a model of cellular respiration, read an article, and conduct additional investigations in the Simulation.

#### Chapter 4: Students apply what they learn to a new question—How did the athlete increase his cellular respiration and improve his performance?

Students consider cellular respiration in the context of high-performance athletes, and read an article about a controversial practice called blood doping, which is used to enhance athletic performance. Jordan Jones finished 35th in a competitive bike race last year and 1st in a similar race this year. Was he blood doping? Students consider alternative claims and review the available evidence to make an argument. They engage in oral argumentation in a student-led discourse routine called a Science Seminar and then individually write their final arguments.