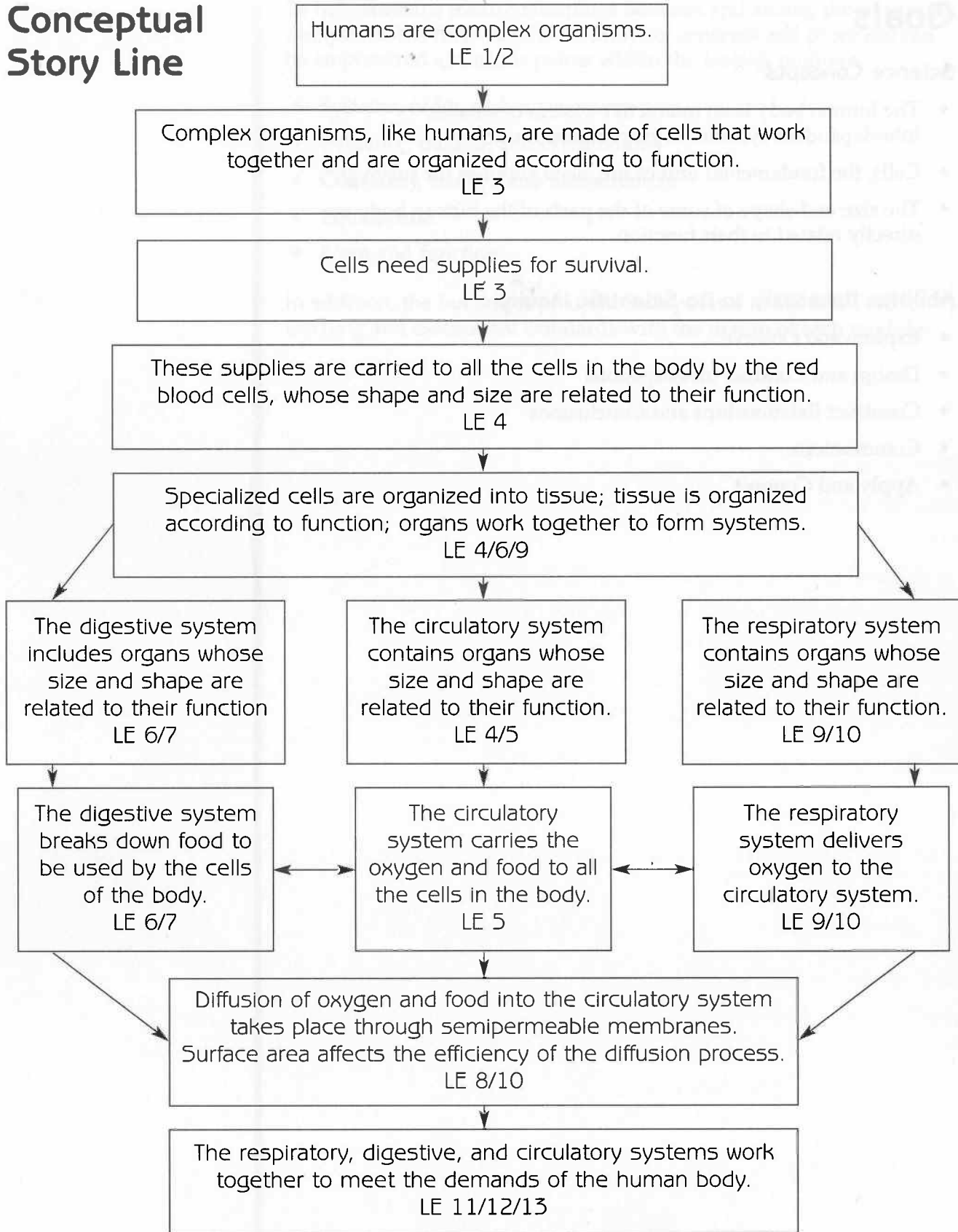


Conceptual Story Line



Summary of Learning Experiences

Learning Experience 1—What Does Your Body Do?

Students begin this module by observing some of the ways their bodies work to complete a variety of tasks. Using these observations as a basis for discussion, students share what they already know about the needs of their bodies and how their complex bodies work.

Learning Experience 2—What Do I Already Know? The Me I Can See . . . The Me I Can't See

Students build on the observations made in Learning Experience 1 and move from visual observations to questions about complex movements within their bodies. Students formulate questions about the internal workings of their bodies and compare their questions with those of scientists in the past by researching early scientific thinking. They begin to view science as a human endeavor, with information and tools that change over time.

Learning Experience 3—What Are Cells?

Students are then introduced to the idea that their bodies are like machines, with parts that work together to take in food, process food to get usable fuel for energy, and get rid of the resultant wastes. Students begin their investigations of this big “machine” by learning about its smallest component, the cell. Students expand their use of scientific tools for understanding the human body by using microscopes to look at the “building blocks” of life. They observe onion and human epithelial cells and are introduced to the vital role cells play in our complex bodies.

Learning Experience 4—Blood and the Heart

After becoming familiar with cells, the students concentrate on a particular type of cell: the red blood cell. They are introduced to the role of the red blood cell as carrier of supplies for the body. They also look closely at the structure and function of the heart. This learning experience challenges students to think about relationships of structure to function, a theme that resonates throughout this module.

Learning Experience 5—The Transportation System

Students begin exploring how individual systems work to meet the body's needs by focusing on the components of the circulatory system. They compare veins and arteries, explore how valves function in the veins, and examine the importance of the circulatory system as a closed system. They follow a red blood cell on its journey through the circulatory system and discover that some factors can cause vessels to become smaller and clogged.

Learning Experience 6—Food and Fuel: The Digestive System

Students are introduced to the role of the digestive system in processing food for the body. Starting in the mouth, students follow the path of food, through wavelike muscular contractions of peristalsis and into the digestive organs until the food is small enough for the red blood cells to carry. The students investigate models as tools for representing real systems and evaluate fictional accounts as ways to communicate descriptive information.

Learning Experience 7—What Happens in the Digestive System? Breaking Down the Food

Students explore the mechanical and chemical processes that digest food as it moves through the body. They continue their study of the organs in the digestive system and learn that additional organs help with supplying chemicals for further breakdown of the food. They design and conduct their own investigations with enzymes and different foods.

Learning Experience 8—How Does Food Get Out? Membranes and Digestion

Students explore the process of diffusion and the role of the semipermeable membrane in determining what gets in the blood and what doesn't. They are required to make careful, detailed observations of an experiment so that they can share results with other groups. They continue to develop their skills of drawing conclusions based on careful observations.

Learning Experience 9—Breathing: Getting Air into the Body

Students are introduced to the respiratory system and its organs by using a model of the trachea, lungs, and diaphragm. They compare breathing rates and lung capacity, and graph data as a method of visualizing and sharing information.

Learning Experience 10—Getting the Most Out of Your Air and Food: Surface Area

Students focus on how oxygen enters the blood and the importance of the enormous surface area of both the lungs and the small intestine. They review diffusion and relate diffusion with the need for increased surface area.

Learning Experience 11—What Goes In Must Come Out: Tying It All Together

Students are given an organizational strategy to help them synthesize the information they have learned about the respiratory, circulatory, and digestive systems working together. Then they develop their own

strategy for thinking about human body systems. In addition, they write a children's book about one of the systems and share their books with younger students.

Learning Experience 12—What Happens When You Exercise? (Embedded Assessment)

Students extend and apply their understandings by investigating how their body systems accommodate the demands of a variety of exercise activities. Students investigate how their bodies react to exercise by collecting data, using graphs to represent data, and drawing conclusions based on evidence.

Learning Experience 13—Case Studies: Linking the Systems

Students apply what they have learned about the circulatory, respiratory, and digestive systems to a case study. After reading about children with physical challenges, they work in groups to create a fictional character and describe some of the interactions that take place in the character's body in the course of a day. In addition, they speculate about the role of other body systems and the effect special characteristics like allergies or special illnesses can play—speculations that create opportunities for exploring the human body system in greater depth.

Class Record Human Body Systems

Science Concepts—page 1

Student Name	The human body is an interactive system of smaller, interdependent body systems with specialized functions.								Cells, the fundamental unit of life, need supplies for survival.			The shape and size of some of the parts of the human body are directly related to their function.				
	LE 1	LE 2	LE 3	LE 4	LE 5	LE 6	LE 3	LE 4	LE 5	LE 6	LE 4	LE 4	LE 4	LE 5	LE 6	
	Humans are complex organisms.	Some bodily functions are voluntary while others are involuntary.	Humans are made of cells that work together and are organized according to function.	Specialized cells are organized into tissue according to function; tissue is organized into organs according to function.	The circulatory system carries food and oxygen to all the cells in the body.	The digestive system breaks down food so that it can be used by the cells of the body.	Cells need supplies for survival.	The supplies needed by the cells are carried through the body by the red blood cells.	Food must be small enough to be used by the cells.	The heart, with its unique structure, continuously pumps blood through the body.	The circulatory system contains organs whose size and shape are related to their functions.	The digestive system includes organs whose size and shape are related to their functions.				

