Subject: Living Environment Grade: 9 Unit #: 5 Title: Development: Growth and Differentiation

UNIT OVERVIEW

STAGE ONE: Identify Desired Results

Established Goals/ Standards

Perf Ind 1.2	Describe and explain the structures and functions of the human body at different organizational levels (e.g., systems, tissues, cells, organelles).
Key Idea 2	Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.
Perf Ind 2.2	Explain how the technology of genetic engineering allows humans to alter genetic makeup of organisms
2.2e	Knowledge of genetics is making possible new fields of health care; for example, finding genes which may have

Long-Term Transfer Goal

At the end of this unit, students will use what they have learned to independently… reflect on the influence of culture on growth and development, and vice versa.

Meaning

Enduring Understandings

Students will understand that…

- Cells divide through a process called mitosis
- Embryonic development involves processes of growth and differentiation
- Humans grow and develop in different ways through life (physically, cognitively, emotionally, and socially)
- Culture influences how human life stages are interpreted and experienced
- As scientists answer specific questions, knowledge accumulates to address larger questions

Essential Questions

Students will consider such questions as…

What makes you who you are?

Acquisition

What knowledge will students learn as part of this unit?

- *Accumulation of scientific knowledge*
- *Patterns of animal development*
- *Cell division*
- *Cell differentiation*
- *Differential gene expression*
- *Regulation of development*
- *Cell-cell interactions (induction)*
- *Interaction of growth and differentiation*
- *Genetic and environmental influences on development*
- *Birth defects*
- *Cancer*
- *Stages of human life*
- *Human cognitive development*
- *Human social development*

What skills will students learn as part of this unit?

- Interpreting diagrams and videos of processes
- Observing natural phenomena
- Creating a concept map
- Interpreting line graphs
- Creating physical models
- TSAR strategy
- Evaluating written statements for correctness
- Using news articles for research
- Making observations of human behavior (using a form to track information)
- Interviewing human subjects
- Summarizing a reading using a table

		mutations that can cause disease will aid in the development of preventive measures to fight disease. Substances, such as hormones and enzymes, from genetically engineered organisms may reduce the cost and side effects of replacing missing body chemicals.	● *Human physical development* ● *Human emotional development* ● *Genetic and environmental influences on human development and variation* ● *Cultural influences on human life stages* ● *Ethical study of humans*	
	2.1a	Genes are inherited, but their expression can be modified by interactions with the environment (mutations)		
	3.1d	Mutations occur as random chance events. Gene mutations can also be caused by such agents as radiation and chemicals. When they occur in sex cells, the mutations can be passed on to offspring; if they occur in other cells, they can be passed on to other body cells only		

	5.2i	Gene mutations in a cell can result in uncontrolled cell division, called cancer. Exposure of cells to certain chemicals and radiation increases mutations and thus increases the chance of cancer.		
	4.1f	The structures and functions of the human female reproductive system, as in almost all other mammals, are designed to produce gametes in ovaries, allow for internal fertilization, support the internal development of the embryo and fetus in the uterus, and provide essential materials through the placenta, and nutrition through milk for the newborn.		
	4.1h	In humans, the embryonic development of essential organs occurs in early stages of pregnancy. The embryo		

		may encounter risks from faults in its genes and from its mother's exposure to environmental factors such as inadequate diet, use of alcohol/drugs/ tobacco, other toxins, or infections throughout her pregnancy.		
	4.1b	Cloning is the production of identical genetic copies.		

STAGE TWO: Determine Acceptable Evidence	
	Assessment Evidence
Criteria to assess understanding: *(This is used to build the scoring tool.)* **Concept-- Showing understanding of the big picture in this chapter:** Presentation clearly summarizes a strong example of how biological processes interact with cultural factors in shaping human development. Presentation also effectively explains and refers to the example throughout the presentation.	Performance Task focused on Transfer: Ch. 14: "Cultural diversity in the human life span" p. 746--Reflect on similarities and differences in the process of development as it takes place in different cultures and explain the characteristics of biological development that underlie them focus question: "How do developmental processes interact with cultural factors to affect the physical, cognitive, social, and emotional growth of humans?" ● Identify a culture for the multicultural fair and join a group based on what culture you want to research ● Study the culture on your own then work with a team to create a fair entry--make a list of information you want to find out, focusing on the focus question ● Assemble resources then divide among team members; share with team ● Look at/discuss rubric ● Develop a specific design for your entry in the muticultural fair, prepare entry, practice presentation ○ Overview of culture, including where they live or lived and description of way of life ○ Information about each life stage: infancy and childhood,

Explanation for human life stages in a cultural context,including specific evidence to support ideas: Presentation includes detailed and culturally relevant information about all 4 human developmental stages. Presentation includes detailed information on geography, climate, language, and way of life. Presentation includes detailed information about cultural expression, rites of passage, and male and female differences. **Creativity**: Presentation is original and creative. Classmates and teacher are genuinely interested in hearing and seeing this presentation. **Presentation**: Presentation was obviously planned ahead of time and is well delivered. Presenter speaks expressively to the audience and maintains good eye contact when talking. Presentation lasts an appropriate length of time. Presentation has both an introduction and a conclusion.	adolescence, adulthood, old age-- ■ Physical and social setting that is predominant at each stage ■ Cultural practices for individuals at each stage ■ Cultural values surrounding each stage (how are they perceived) ○ Explore some aspect of cognitive development that seems significant to the culture--explain why you think it's highly valued and describe the underlying biology that allows for this aspect of development ○ Choose and complete each of the following ■ Describe the forms of cultural expression that seen to be significant during any life stage (such as music, art, dance, mythology, religion, or dress) ■ Describe the celebration of at least one of the following rites of passage: birth, puberty, marriage, death ■ Describe the differences in growing up male from growing up female in the culture you are studying ○ Some part of entry should be a presentation ● Analysis: individual questions: ○ Write 2-3 paragraphs about how a person from the culture would view modern American culture--which aspects would seem similar and different? ○ Reflect on focus questions with respect to all the cultures you learned about--what have you learned about biological development in humans that may help explain both the similarities and differences between different human cultures?
	Other Assessment Evidence: Ch. 13: "Development in your critter" p. 713 Describe a developmental scheme for your critter to show what you have learned ● Summarize what you have learned about how the body's tissues and organs are formed (not just getting bigger) ● Read the "patterns of development" essay and consider developmental stages you might see in your critter AND one other multicellular organism ○ Identify as many significant developmental events or stages as you can that might take place in the lifetime of these two organisms and record in notebook with specific examples

	■ when does it happen and what does it accomplish? ● Look at rubric and participate in class discussion ● Consult resources provided/online to learn more about your critter's developmental stages; make notes ● Analysis: ○ Use answers to draw critter in its various developmental stages; label with enough detail that someone can understand what is happening; include definitions ○ Write a detailed description of your critter's developmental processes, including growth and cellular differentiation ■ Explain how genetic plan may interact with environmental conditions to direct and regulate development ■ Describe how errors might cause disruptions in your critter's development ● Possibly "Further Challenges" section p. 719

T, M, A *(Code for Transfer, Meaning Making and Acquisition)*	**STAGE THREE: Plan Learning Experiences**	
	Learning Events:	Evidence of learning: *(formative assessment)*