6.6B Cells and Systems

Content Area: **Science**
Course(s):
Time Period: **Marking Period 4**
Length: **8 weeks**
Status: **Published**

Course Pacing Guide

Unit	MP/Trimester	Weeks
Intro to MS Science and Light	1	5
Thermal Energy	1	8
Weather and Climate	2	9
Plate Tectonics	2, 3	6
Natural Hazards	3, 4	6
Cells and Systems	4	6

Unit Overview

In this unit, students engage in an anchoring phenomenon around a injury. Students use medical images and cross sections to figure out how parts of the body interact. They investigate the structures that are present in each part of the body at both the cellular and sub-cellular level. Throughout these investigations, students ask questions that arise from careful observation of an example of healing to seek additional information about how healing happens. They plan and carry out investigations to observe the microscopic structures of cells and what is happening inside living systems and subsystems, at different scales. They critically read scientific tests adapted for students to obtain information about the structure and function of systems in the human body as well as unicellular organisms. They develop and use models to explain the healing process and related phenomena, and they engage in argument from evidence that single-celled organisms grow and split in similar ways to animal cells.

Enduring Understandings

- All living things are made up of cells, which is the smallest unit that can be alive.
- An organism may consist of one single cell (unicellular) or many cells (multicellular).
- Within cells, different structures are responsible for different functions; the cell membrane forms the boundary that controls what materials enter and leave the cell.
- In multicellular organisms, the body is a system of multiple interacting subsystems.
- These subsystems are groups of cells working together to form tissues and organs that are specialized

for particular body functions.
- New cells are made from old cells, which use food as building blocks, to make more cell parts.

Essential Questions

- What do our bones, skin and muscles do for us?
- What connections can we see between the structures inside the body?
- Why is there blood in all of these places in the body?
- What do nerves do and why are they in different parts of the body?
- What will we see if we look at skin, bone and muscle with the microscope, too?
- How does what we figured out about the different parts of our body help us identify similar structures in other living things?
- What happened as the skin on top of the foot healed?
- What happens at the site of injury to fill the gap?
- What do cells need to grow and make more of themselves?
- How do cells get what they need to grow?
- How do the structures and systems in the body work together to heal the injury?
- How do actions that people do support healing inside the body?
- How is the process of growing similar to healing?
- How do other living things heal and grow?

New Jersey Student Learning Standards (No CCS)

SCI.MS-LS4-3	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
SCI.MS-LS1-8	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
SCI.MS-LS1-2	Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.
SCI.MS-LS1-1	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Interdisciplinary Connections

LA.RI.6.1	Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.
LA.W.6.1	Write arguments to support claims with clear reasons and relevant evidence.
MA.6.EE.C.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent

	variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.
LA.SL.6.5	Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

Technology Standards

TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

21st Century Themes/Careers

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Instructional Strategies & Learning Activities

Throughout this unit, students will:

- View medical reports of an injury
- View medical images (X-rays and MRIs) and cross-sections
- Read non-fiction excerpts
- Use microscopes to view prepared blood, muscle, skin and nerve samples
- Use microscopes to view plant and bacteria samples
- Plan and carry out multiple investigations
- Develop and use models to show increased understanding as unit progresses
- Write scientific explanations

Differentiated Instruction

- Inquiry/Problem-Based Learning
- Learning preferences integration (visual, auditory, kinesthetic)
- Sentence & Discussion Stems
- Tiered Learning Targets
- Meaningful Student Voice & Choice
- Relationship-Building & Team-Building

- Self-Directed Learning
- LMS use
- Student Data Inventories
- Mastery Learning (feedback toward goal)
- Grouping
- Rubrics
- Jigsaws
- Assessment Design & Backwards Planning

Formative Assessments

Including, but not limited to:

- Science notebook entries
- Scientist circle
- Initial models
- Google reflection forms/exit tickets

Summative Assessment

- Final Model and final Scientific Explanation (CER)

Benchmark Assessments

- Fall/Winter LinkIt Assessments

Resources & Technology

Adapted from Nextgenstorylines unit, "How do eggs become chickens and other living things?"

- Student chromebook use
- (optional) incubator
- Microscopes, prepared slides

BOE Approved Texts

N/A

Closure

Individual classes and lessons will end with a closure activity that reinforces what students figured out during class, and helps navigate toward next steps.
Closure activities may include:

- Scientists' Circle
- Post-it reflection
- Google form exit ticket
- Group performance reflection
- Science notebook jot

ELL

- Alternate Responses
- Extended Time
- Teacher Modeling
- Simplified Written and Verbal Instructions
- Frequent Breaks
- Google Translate

Special Education

Accomodations will be made in accordance with students' IEPs. The following list provides examples:

- Shorten assignments to focus on mastery of key concepts.
- Substitute alternatives for written assignments (clay models, posters, panoramas, collections, etc.)
- Keep workspaces clear of unrelated materials.
- Provide a computer for written work.
- Seat the student close to the teacher or a positive role model.
- Provide an unobstructed view of the chalkboard, teacher, movie screen, etc.
- Keep extra supplies of classroom materials (pencils, books) on hand.
- Maintain adequate space between desks.
- Give directions in small steps and in as few words as possible.
- Number and sequence the steps in a task.
- Have student repeat the directions for a task.

- Provide visual aids.
- Go over directions orally.
- Allow the student to complete an independent project as an alternative test.
- Show a model of the end product of directions (e.g., a completed math problem or finished quiz).
- Stand near the student when giving directions or presenting a lesson.
- Mark the correct answers rather than the incorrect ones.
- Use a pass-fail or an alternative grading system when the student is assessed on his or her own growth.

504

Examples of accommodations in 504 plans include but are not limited to:

- preferential seating
- extended time on tests and assignments
- reduced homework or classwork
- verbal, visual, or technology aids
- modified textbooks or audio-video materials
- behavior management support
- verbal testing
- excused lateness, absence, or missed classwork
- pre-approved nurse's office visits and accompaniment to visits

At Risk

Examples may include:

- Have student restate information
- Provision of notes or outlines
- Concrete examples
- Assistance in maintaining uncluttered space
- Weekly home-school communication tools (notebook, daily log, phone calls or email messages)
- Peer or scribe note-taking
- Use of manipulatives
- No penalty for spelling errors or sloppy handwriting
- Follow a routine/schedule
- Teach time management skills
- Verbal and visual cues regarding directions and staying on task
- Adjusted assignment timelines
- Visual daily schedule
- Immediate feedback
- Work-in-progress check
- Pace long-term projects
- Preview test procedures

- Film or video supplements in place of reading text
- Pass/no pass option
- Cue/model expected behavior
- Use de-escalating strategies
- Use peer supports and mentoring
- Have parent sign homework/behavior chart

Gifted and Talented

Examples may include:

- Offer choice
- Speak to Student Interests
- Allow G/T students to work together
- Tiered learning
- Focus on effort and practice
- Encourage risk taking