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Organ-izing the Human Body System [7th Grade]

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I have used 3 resources from Teachers Pay Teachers. These definitely do not *need* to be used. But I did not feel that I needed to “recreate the wheel” and create resources that others have already created. Other resources could easily be substituted in place of these resources. I also included a resource from UT Health San Antonio Teacher Enrichment Initiatives which is free and available for download through the link provided.

Resources Purchased from Teachers Pay Teachers:

Human Body Life Size Project by Stephanie Elkowitz \$10.00

Nervous System Exhibition Stations by Biology Roots \$8.99

Basic Biology: Frog Dissection Lab by Gnature with Gnat \$7.50

Body Systems UbD

Stage I – Desired Results		
<p>Established goals</p> <p>7.7 Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. (A) illustrate the transformation of energy within an organism such as the transfer from chemical energy to thermal energy; and (B) demonstrate and illustrate forces that affect motion in organisms such as emergence of seedlings, turgor pressure, geotropism, and circulation of blood.</p> <p>7.12 The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. The student is expected to: (B) identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems; (C) recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms; (E) compare the functions of cell organelles to the functions of an organ system;</p> <p>7.13 The student knows that a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli. The student is expected to: (A) investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and (B) describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance.</p> <p>7.14 The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. The student is expected to: (B) compare the results of uniform or diverse offspring from asexual or sexual reproduction</p>	<p style="text-align: center;">Transfer</p> <p><i>Students will independently use their learning to...</i></p> <ul style="list-style-type: none"> Understand and empathize with all organisms which share common features and experiences that maintain life 	
	Meaning	
	<p>Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> Organisms maintain complex processes to maintain life Complex systems rely on simple parts 	<p>Essential Questions</p> <ul style="list-style-type: none"> What does our body do to keep us healthy? Why do we have organs?
	Acquisition	
	<p>Knowledge <i>Students will know...</i></p> <ul style="list-style-type: none"> different body tissues and organs are made up of different kinds of cells a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli how organisms respond to external stimuli found in the environment reproduction is a characteristic of living organisms human body is made up of systems that have different structures and functions 	<p>Skills <i>Students will be able to...</i></p> <ul style="list-style-type: none"> illustrate the transformation of energy within an organism demonstrate and illustrate forces that affect motion in organisms identify the main functions of the systems of the human organism recognize levels of organization compare the functions of cell organelles to the functions of an organ system describe and relate responses in organisms that may result from internal or external stimuli that allow them to maintain balance

<p>Process Standards Addressed:</p> <p>7.1 (A) demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards</p> <p>7.2 (B) design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology; (C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers</p> <p>7.3 (B) use models to represent aspects of the natural world such as human body systems and plant and animal cells (C) identify advantages and limitations of models such as size, scale, properties, and materials</p> <p>7.4 (A) use appropriate tools, including life science models, hand lenses, stereoscopes, microscopes, beakers, Petri dishes, microscope slides, graduated cylinders, test tubes, meter sticks, metric rulers, metric tape measures, timing devices, hot plates, balances, thermometers, calculators, water test kits, computers, temperature and pH probes, collecting nets, insect traps, globes, digital cameras, journals/notebooks, and other necessary equipment to collect, record, and analyze information; and (B) use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.</p>	<ul style="list-style-type: none"> • human body systems work together to maintain the body’s homeostasis, growth, and reproduction • the energy required to carry out human body processes comes from the food we eat • a combination of parts can perform functions that the single parts cannot perform alone 	<ul style="list-style-type: none"> • compare the results of uniform or diverse offspring from asexual or sexual reproduction
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Vocabulary: digestion/digestive, energy transformation, organism , transfer/transform, blood, blood vessel, circulatory system, force, motion , endocrine, gland, excrete/excretion/excretory, integumentary, muscle/muscular, nerve/nervous, physiology, reproduce/reproductive/reproduction, respiratory, skeletal, function, system, external/internal, stimuli, feedback mechanism, homeostasis, response, in/stable, diverse offspring, genetically identical, uniform offspring, variation, asexual reproduction, diversity, sexual reproduction, trait

Stage II – Acceptable Evidence

<p>Evaluative Criteria (for rubric)</p>	<p>Rubric for PT in <u>Body Systems Performance Task</u></p>
	<p>Performance Task(s) <i>Students will demonstrate meaning-making and transfer by...</i></p> <p>Part 1: Dissect a frog. Identify, label and photograph the frog’s body systems. Part 2: Show how the structure and function of the body systems contributes to a normal day for a frog in a student selected mode of communication (powerpoint, video, poster, etc.). Part 3: Receive a stimulus and detail their prediction of how the frog would respond to that stimulus.</p> <p>-----</p> <p>Other Evidence (e.g., formative) Circulation of Blood Lab Human Body Life Size Project Kidneys Lab Interdependence of Systems Writing District Common Assessment</p>

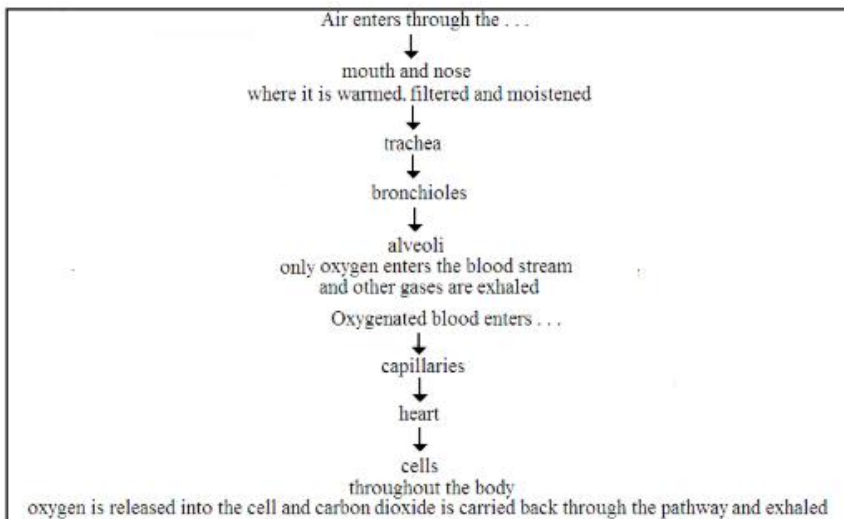
	Notebook check
Stage III – Learning Plan	
CODE (A, M, T)	<p style="text-align: center;">Pre-Assessment</p> <p style="text-align: center;"><i>How will you check students' prior knowledge, skill levels, and potential misconceptions?</i></p> <p>Misconceptions:</p> <ul style="list-style-type: none"> • Systems operate in isolation from each other. • Food turns into energy in our body. • Running a fever or vomiting is bad for their body, rather than a natural response by the body to maintain homeostasis. <p>Pre-Assessment: Each student gets a sticky note to record an answer to each question: How does information found within cells ensure the survivability of our species? What do cells do to maintain life? What does our body do to keep us healthy? Student write initials on the back and place on large paper. As a class organize and look for trends.</p>
<p>Learning Activities</p> <p>5 weeks</p> <p>Week 1</p> <p>Day 1: Pre-assessment, Vocabulary sort</p> <p>Materials:</p> <ul style="list-style-type: none"> • Sticky notes • <u>Vocabulary Sort</u>, cards cut and put in envelopes for each group • Group students, each group will receive set of cards <ul style="list-style-type: none"> ○ After reviewing cards, group will work to organize cards into thoughtful groupings ○ Record groupings and group title ○ In SNB record predictions about what we will be learning in this new unit <ul style="list-style-type: none"> ▪ Record in SNB <p>Day 2: Levels of Organization, Cells in Organs</p> <p>Materials:</p> <ul style="list-style-type: none"> • <u>Levels of Organization</u> • iPads • HW: skeletal and muscular part of Body Systems HW • Complete chart with levels of organization (starting at organelles and ending at organism) and create analogy to school (student, class, gradelevel, school, cluster, district, city). <ul style="list-style-type: none"> ○ Glue in SNB • Have students come up with another analogy for the levels of organization. Meet with lab group and work together to refine and come up with 1 analogy to share. Record (video or drawing) upload to google classroom shared google slides (each lab group gets a slide) <ul style="list-style-type: none"> ○ Optional HW: look at each of the analogies your classmates have created. Which one do you think is the best analogy to the levels of organization we are studying? Why? • Create logical transition from cells (previous unit) to body systems • Discussion? Do you think there is something smaller than organelles/larger than organisms? <p>Day 3: Skeletal and Muscular Systems</p> <p>Materials:</p> <ul style="list-style-type: none"> • Skeleton arm • Rubber bands <p>HW: circulatory and respiratory part of Body Systems HW</p> <ul style="list-style-type: none"> • In science notebook: draw how the arm/hand move • Use skeleton and rubber bands to demonstrate how each movement is the pull of a muscle on a bone • Again illustrate forces that affect motion of arm 	

- Discuss how muscles interact with organs to move other parts of your body (breathing, circulating blood, excretion). These will be talked about more in-depth later
- Add labels and notes of muscular and skeletal system to SNB
- Make sure to define terms in addition to skeletal and muscular systems: tendon, cartilage, ligament

Day 4: Circulatory and Respiratory Systems

Materials:

- HW: integumentary part of Body Systems HW



- As you go over each step, have students touch the corresponding area on their bodies and imagine “zooming-in”
- Examine the heart muscle and diagram of the arteries and veins
- Label and record notes in SNB

Day 5: Circulation of Blood

Materials:

- Per group
 - Plastic tubing
 - water
- have groups design/engineer a way to move water up hill
- relate how the blood pumps heart to different places in the body sometimes against the forces of gravity
- explore the ways the body moves blood throughout the body
- illustrate forces that affect motion

Week 2

Day 6: Start Human Body Life Size Project ([TPT](#)), Integumentary system

Materials:

- Human Body p. 34, 39-43, 50-51
- Butcher paper or chart paper
- Scissors
- Glue
- HW: Nervous part of Body Systems HW
- Give each lab group a large piece of butcher paper or chart paper
- Trace one member of lab group
- Review each of the body systems we have already covered and add the structure and corresponding function flap to the torso
- Roll large papers into tubes and store for additions to project
- Discussion: what is the purpose of skin?

- [Examine](#) and discusses how the skin system begins to fail in the elderly

Day 7: Nervous System Exhibition Stations ([TPT](#))

Materials:

- [Nervous System Stations](#) p. 2-6, 9-12, 14-15
- [Answer Sheet Nervous System Exhibition Stations](#) p. 1-4
- HW: Endocrine part of Body Systems HW
- Stations 2, 3 & 4 (combined), 5 & 6 (combined), 9, 10 & 11 (combined), 12, 14
- Since the answer document and stations are editable, I modified the numbers on the station cards and only included the stations I needed on the answer document
- 5-8 minute rotations
- Stations uploaded to class's google classroom to complete for homework if necessary

Day 8: Endocrine system

Materials:

- Human Body Life Size Project
- Scissors and glue
- HW: reproductive part of Body Systems HW
- Label endocrine system and define functions in SNB
- Add integumentary, nervous, and endocrine systems to Human Body Project

Day 9: Reproductive system

Materials:

- HW: digestive and excretory part of Body Systems HW
- Label notes and diagram

Day 10: Sexual v. asexual reproduction

Materials:

- [Sexual v. Asexual Reproduction](#)
- Asexual reproduction will be covered in the following genetics unit but since it's a readiness standard I like to discuss it throughout the year
- Use graphic organizer to compare the results of uniform or diverse offspring from asexual or sexual reproduction

Week 3

Day 11: Digestive and Excretory Systems

Materials:

- Label and record functions of both systems
- Discuss and illustrate forces that affect motion within the body

Day 12: (food digestion)

Materials:

- HW: Student Information Pages from Kidney Lab p.1-3
- Explore how cells are responsible for our ability to get energy from food
- illustrate the transformation of energy within an organism

Day 13: [Kidneys Lab](#)

Materials:

- Per group
 - Colander
 - Rice/birdseed
 - Bar magnet in a zip lock bag
 - Large bowl
 - Graduated cylinder
 - Red kidney beans
 - White lima beans
 - Iron filings
 - Stopwatch
- Student information page
- Student data page

- In lab groups complete trials and record data
- Respond to reflection questions
 - What role do kidneys play in the excretory system?
 - What other body systems could affect the kidney? Or what body system does the kidney effect?
 - What do you think will happen to the kidneys if they must keep responding to the excess of waste products over a long period?
 - Why might high blood pressure impair kidney function?

Day 14: complete Human Body Life Size Project

Materials:

- Cell Organelles v. Organ System
- Human Body Life Size Project p. 44-49, 51-53
- Scissors and glue

- add all remaining systems to the model
- discuss: advantages and limitations to our life size model
- use chart compare the functions of cell organelles to the functions of an organ system, add to SNB

Day 15: Writing

Materials:

- google docs or writing paper

- Describe how body systems work together.
 - Use science notebook

Week 4

Day 16: Scenario/Stimulus

Materials:

- Scenario and Stimulus

- Complete if then If.../then... chart as a class, add to SNB
- Focus on external stimuli

Day 17: Continued Scenario/Stimulus

Materials:

- Scenario and Stimulus

- Focus on internal stimuli

Day 18: Begin Performance Task

Materials:

- Per group
 - Frogs
 - Dissecting pan

- Scalpel/scissors
- Tweezers
- Labeling pins
- iPad or camera
- [Basic Biology: Frog Dissection Lab](#) Student p. 2-4, 7
- Focus on Section 2 (we will quickly discuss external anatomy, but I am not providing my students with the lab sheet or labeling page for the external anatomy) dissect frogs and identify body system structures as lab group
- Take pictures of labels and upload to google drive, share between lab partners

Day 19 and 20: Part 2 of Performance Task

Materials:

- [Body Systems Performance Task](#)
- Materials for student presentation (computers, poster paper, etc)
- Students will plan and implement how to demonstrate their knowledge of the frog's body systems by choosing a mode of presentation that shows how the structure and function of the body systems contributes to a normal day for a frog.

Week 5

Day 21: Part 3 of Performance Task

Materials:

- [Body Systems Performance Task](#)
- scenarios that would affect a frog's body systems cut and crumpled
- Draw stimulus from bowl/hat, glue stimulus, and describe how the frog would respond to that stimulus using CER framework

Day 22: Baseball Review Game

Materials:

- projected image of baseball field
- "single" "double" and "triple" level questions
- Organize students into 2 groups. Have groups create a list/batting order of teammates. Flip a coin to see who goes first.
- Call a student up "to bat." Student selects a single, double or triple.
- Continue until a team has 3 strikes (or 5 runs)

Day 23: District Common Assessment

Day 24: Reflective Writing

Materials:

- Google docs or writing paper
- Compare and contrast the things a person that takes care of their body systems does each day with a person who does not.

Day 25: Ketchup

- Catch up on any work

Questions for further exploration:

- Do different kinds of animals need different organs?
- Which body systems are shared by all animals?

