



HEALTHCARE SCIENCE

COURSE: 25.562 Concepts of Emergency Medicine

UNIT: 7.1 Skeletal System



INTRODUCTION

Annotation:

This unit will cover the anatomy, physiology, and pathophysiology of the human skeletal system. Students will learn basic level management of injuries related to the skeletal system. This unit should be taught before the muscular system unit because of a connected activity.

Grade(s):

	9 th
X	10 th
X	11 th
X	12 th

Time: Six 50 minute periods.

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Students with Disabilities:

For students with disabilities, the instructor should refer to the student's IEP to be sure that the accommodations specified are being provided. Instructors should also familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation.



FOCUS STANDARDS

GPS Focus Standards:

HS-CEM-5:

Students will demonstrate knowledge of the different systems of the body and how they relate to patient care.

- a. Summarize the importance of the Emergency Medical Services Provider's knowledge of the body's anatomy and physiology in relation to providing competent care and accurate communication to other health care providers.
- b. Demonstrate knowledge of the body's anatomy and physiology to provide competent patient care and accurate communication to other health care providers.

GPS Academic Standards:

SAP1: Students will analyze anatomical structures in relationship to their physiological functions.

SAP2: Students will analyze the interdependence of the integumentary, skeletal, and muscular systems as these relate to the protection, support and movement of the human body.

ELA11SLV: The student participates in student-to-teacher, student-to-student, and group verbal interaction.

ELAALRC3: The student acquires new vocabulary in each content area and uses it correctly.

ELA11C1: The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar in both written and spoken formats.

National / Local Standards / Industry / ISTE:



UNDERSTANDINGS & GOALS

Enduring Understandings:

- Emergencies may arise when patients are injured or develop a disorder of the skeletal system.
- It is important for the First Responder to understand the anatomy and physiology of the skeletal system, common diseases and injuries that can affect bones or joints and how these injuries and diseases are treated.

Essential Questions:

- What are the primary functions of the skeletal system?
- What common disorders, diseases, or injuries can affect the skeletal system?
- How should I provide emergency care for patients with diseases, disorders or injuries to the skeletal system?

Knowledge from this Unit:

- Student can identify structures of the skeletal system.
- Student can explain the functions of the skeletal system.
- Student can describe the cause(s), signs/symptoms, and treatment of three disorders or diseases related to the skeletal system.
- Student can describe three injuries related to the skeletal system and the proper emergency management for each injury.
- Students can identify items that can be used to treat a skeletal injury.

Skills from this Unit:

- Student can demonstrate techniques to immobilize injuries using a variety of splinting devices.
- Student can use proper medical terminology to communicate information about a patient's condition and treatment to other health care providers.



ASSESSMENT(S)

Assessment Method Type: Select one or more of the following. Please consider the type(s) of differentiated instruction you will be using in the classroom.

- ☐ Pre-test
- ☒ Objective assessment - multiple-choice, true- false, etc.
 - ☐ Quizzes/Tests
 - ☐ Unit test
- ☒ Group project
- ☐ Individual project
- ☐ Self-assessment - May include practice quizzes, games, simulations, checklists, etc.
 - ☐ Self-check rubrics
 - ☐ Self-check during writing/planning process
 - ☐ Journal reflections on concepts, personal experiences and impact on one's life
 - ☐ Reflect on evaluations of work from teachers, business partners, and competition judges
 - ☐ Academic prompts
 - ☐ Practice quizzes/tests
- ☒ Subjective assessment/Informal observations
 - ☐ Essay tests
 - ☐ Observe students working with partners
 - ☐ Observe students role playing
- ☐ Peer-assessment
 - ☐ Peer editing & commentary of products/projects/presentations using rubrics
 - ☐ Peer editing and/or critiquing
- ☐ Dialogue and Discussion
 - ☐ Student/teacher conferences
 - ☐ Partner and small group discussions
 - ☐ Whole group discussions
 - ☐ Interaction with/feedback from community members/speakers and business partners
- ☐ Constructed Responses
 - ☐ Chart good reading/writing/listening/speaking habits
 - ☐ Application of skills to real-life situations/scenarios
- ☐ Post-test

Assessment(s) Title:

- "Skeleton Beauty Contest" Grading Rubric
- Skeletal System Exam

Assessment(s) Description/Directions:

- "Skeleton Beauty Contest" Grading Rubric (attached) -- should be distributed when project is assigned.
- Skeletal System Exam: to be administered upon completion of the unit.

Attachments for Assessment(s):

- "Skeleton Beauty Contest" Grading Rubric
- Skeletal System Exam



LEARNING EXPERIENCES

Instructional planning: Include lessons, activities and other learning experiences in this section with a brief description of the activities to ensure student acquisition of the knowledge and skills addressed in the standards. Complete the sequence of instruction for each lesson/task in the unit.

Sequence of Instruction

1. Identify the Standards. Standards should be posted in the classroom for each lesson.

HS-CEM-5:

Students will demonstrate knowledge of the different systems of the body and how they relate to patient care.

- a. Summarize the importance of the Emergency Medical Services Provider's knowledge of the body's anatomy and physiology in relation to providing competent care and accurate communication to other health care providers.
- b. Demonstrate knowledge of the body's anatomy and physiology to provide competent patient care and accurate communication to other health care providers.

2. Review Essential Questions.

- What are the primary functions of the skeletal system?
- What common disorders, diseases, or injuries can affect the skeletal system?
- How should I provide emergency care for patients with diseases, disorders or injuries to the skeletal system?

3. Identify and review the unit vocabulary.

- Diaphysis
- fontanel
- osteoporosis
- Endosteum
- sinuses

- dislocation
- Epiphysis
- sutures
- fracture
- Medullary canal
- foramina
- arthritis
- Periosteum
- sprain
- bursitis

4. Assessment Activity.

Lesson One/Two/Three/Four

- Ask students to describe any skeletal injuries (fracture/strain/dislocation) they have experienced. What caused the injury? What was the treatment? How long did it take to heal?
- Begin Skeletal System slideshow to introduce the functions of the skeletal system and the names of the bones. Show slides 1-13 only (remainder of presentation will be shown in later lesson) and have students take notes. Brainstorm tricks to remember the names of the bones.
- Explain project "Skeleton Beauty Contest:"
 - Goal is to reinforce learning of names of the major bones.
 - Project will be done in pairs that will be assigned through an activity to be done at the beginning.
 - Project will take remainder of this class period + three additional class periods.
 - Each pair of students will be given a sheet of art-roll paper (also called bulletin board paper) the size of their height, and they will create a life-size skeleton. Each bone must be labeled at least once on the poster (ex: can label just one femur rather than both).
 - Let students know that they will have the opportunity to judge the skeletons in a "beauty contest" at the end of the project, and the winning skeleton team will earn prize (teacher choice: points on project, points on upcoming test, piece of candy, etc).

- **NOTE: Keep student projects as they will be used again for a project in the muscular system unit.**
- Teamwork activity to assign pairs: have students sort themselves *by height from tallest to shortest* to determine pairs (two tallest work together, and pair off down the line). Once pairs are determined, have students cut art paper by their "wing span," noting that wing span approximately equals height. Have student hold arms wide. Unroll the art paper to that length and cut off the sheet of paper. One partner is to trace other student's outline on paper to create shape for skeleton.
- Give students remainder of class period to work on skeletons. Encourage creativity and "accessorizing" as this is a beauty contest.
- DAY TWO and THREE: full class period to work on skeletons.
- DAY FOUR: 30 minutes to finish skeletons. Hang skeletons on wall and number each one. Give each student a slip of paper and have them assess each skeleton. Students write their vote on the slip of paper.
- While teacher tallies scores: Have students stand at their desks. One student leads game of Simon Says using names of major bones. Example: "Simon Says point to your right humerus....Simon Says point to your left femur....." Students sit down when they're "out" by missing the name of bone or by missing the Simon Says.
- Wrap-Up Activity: Announce Runner Up # 3, Runner Up #2, and the WINNER IS.....

Lesson Five

- Review names of major bones.
- Slideshow presentation. Begin on **slide 14** and continue through **slide 30**, having students take notes.
- Ask students to choose a partner and decide who is the "victim" and who is the "rescuer." Have the victim simulate that he or she has suffered a simple fracture to the radius/ulna. Tell the rescuer that he or she must immobilize the injury using ordinary items found in the classroom (make certain NOT to have commercial immobilization devices within reach). Encourage students to be creative but practical, reminding them that commercial immobilization devices are not always readily available in an emergency. Remind them to assess circulation, sensation, and movement before and after splinting. Have students switch roles and repeat exercise. (Suggestion: leave

rulers and magazines lying around room--if students don't find these on their own, show how they could have been used at end of practice session).

- Return to slideshow presentation on slide 31 and show remainder of slides, having students take notes.
- Wrap-up Activity: Have students stand at desks. Very quickly (similar to a spelling bee), have each student attempt to name a bone that you point to (on a picture, skeleton model, or yourself). If the student can name the bone within 5 seconds, they remain standing. If not, they sit down and the next student takes a turn. The last student standing wins the game.

Lesson Six

- Remind class that unit exam will be given on following class day. Tell class that today will be a review in the form of a game. Assign students into groups of approximately 4 students each.
- Play Skeletal System Jeopardy review game (attached). Keep track of team scores on board. Give winning team extra credit points on test.
- Wrap-Up activity: Ask if there are any final questions before the exam day. Offer study tips and advice about getting a good night's sleep before a test, eating a healthy breakfast, etc. Remember to take skeletons down from wall before the exam and KEEP THEM for another exercise to be completed during the muscular system unit.

Attachments for Learning Experiences:

- Skeletal System Slideshow
- Skeletal System Jeopardy review game

Notes & Reflections:



CULMINATING PERFORMANCE TASK (Optional)

Culminating Unit Performance Task Title:

Culminating Unit Performance Task Description/Directions/Differentiated

Attachments for Culminating Performance Task



UNIT RESOURCES

Web Resources:

Attachment(s):

Materials & Equipment:

- Rolls of bulletin board sized paper
- scissors
- markers
- Magazines and rulers for splinting exercise if desired

What 21st Century Technology was used in this unit:

<input checked="" type="checkbox"/>	Slide Show Software	<input type="checkbox"/>	Graphing Software	<input type="checkbox"/>	Audio File(s)
<input type="checkbox"/>	Interactive Whiteboard	<input type="checkbox"/>	Calculator	<input type="checkbox"/>	Graphic Organizer
<input type="checkbox"/>	Student Response System	<input type="checkbox"/>	Desktop Publishing	<input type="checkbox"/>	Image File(s)
<input type="checkbox"/>	Web Design Software	<input type="checkbox"/>	Blog	<input type="checkbox"/>	Video
<input type="checkbox"/>	Animation Software	<input type="checkbox"/>	Wiki	<input type="checkbox"/>	Electronic Game or Puzzle Maker
<input type="checkbox"/>	Email	<input type="checkbox"/>	Website		