



South Carolina

Full STEAM Ahead: Connecting Library of Congress Primary Sources and Graphic Novels

Lesson Plan Template

Author(s): Patti Barker and Jennifer Poole, Bryson Middle School (Simpsonville, SC)

Grade Level(s): 6

Subject: Science

Length of Class: 55 Minutes

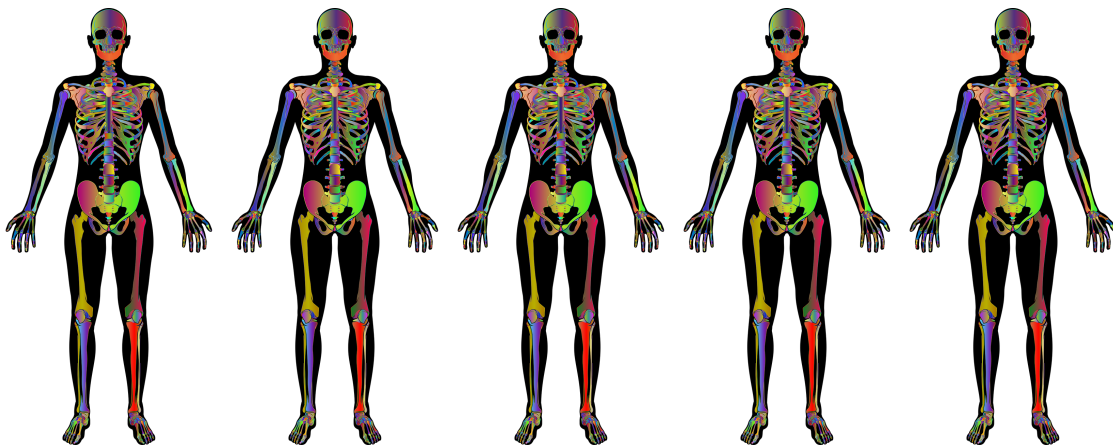


Image Citation:

Figure 1: Skeletal Bones Nature <https://pixabay.com/vectors/skeleton-bones-skeletal-6522594>
Gordon Johnon

Lesson Title:

The Skeleton Stations

<p>Overview: Brief and accurate description of the lesson plan in one sentence.</p>	<p>Students will use primary sources to link with the graphic novel, Human Body Theater. Students will research the use of skeleton's in bodies and the foods or nutrients that build out bones.</p>
<p>Learning Objective: Desired learner outcomes in precise, measurable, and obtainable terms. Limit your lesson to 1-2 objectives.</p>	<ul style="list-style-type: none"> ● Students are able to explain the purpose of the skeletal system within the human body. ● Students are able to identify the parts of the skeletal system. ● Students are able to recognize the need for nutrients in the skeletal system.
<p>Standards: Standards should be aligned with objectives</p>	<p>6-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.</p>
<p>Essential Question: The essential question should be student-friendly and academic. It should be inquiry-based and connected to standards and learning objectives.</p>	<p>How do cells within the skeletal system form, heal, and grow within the human body system?</p>
<p>Supporting Question(s): What two or three questions support students answering the essential question?</p>	<ul style="list-style-type: none"> ● How have skeletal system outlines changed over various generations? ● Which nutrients does NASA focus on for skeletal support while astronauts are in space? ● How are other animal's skeletal system designed to aid their personal adaptations?
<p>Digital Primary and Secondary Sources: List primary and secondary sources and include links.</p>	<ul style="list-style-type: none"> ● Proceedings of the First Biennial Space Biomedical Investigators' Workshop <ul style="list-style-type: none"> ○ https://ntrs.nasa.gov/citations/20000020485 <ul style="list-style-type: none"> ■ using pages 206-211 ● X-rays of Fish (Smithsonian): https://ocean.si.edu/ocean-life/sharks-rays/x-rays-fish-reveal-diversity ● Erie Zoo Animal Skeletons in X-Rays (Live Science): https://www.livescience.com/63906-zoo-animal-x-rays-photos.html ● Image from 1532 of skeletal system labeled in Latin/Spanish. From Library of Congress: "The Four Books on Medicine by Octavius Horatianus and the Three Books by Abū Al-Qāsim, Distinguished Among All Surgeons". <ul style="list-style-type: none"> ○ https://www.loc.gov/resource/gdcwdl.wdl_10682/?sp=290&r=-1.271,0.3.541,1.436.0
<p>Required Classroom Materials: What materials do you need (computer, projector, etc.)? What materials do the students need</p>	<ul style="list-style-type: none"> ● Poster Chart Paper ● Post It Notes ● Star Stickers ● Highlighters (yellow, pink, green) ● KWL Chart

(writing journals, laptop carts, textbooks, etc.)?	<ul style="list-style-type: none"> ● Print out of the skeletal image from 1532 by Octavius Horatianus ● Print outs of Live Science and Smithsonian animal x-rays ● Print pages 206-211 in Document ● Copies of “Human Body Theater” by Maris Wicks
Classroom Environment: How is the room arranged for the lesson? What considerations will contribute to the lesson --- interactive bulletin board, learning stations/centers, table for panel presentation?	Students would be in rotating learning centers around the room. At each center they would be comparing photos or reading excerpts from articles that compare with pages from the graphic novel, “Human Body Theater.” Students would be answering probing questions at each station.
Differentiation and Adaptations: In what ways will you differentiate for learners within the classroom? This is not how your lesson meets the needs of diverse learners, but how you could modify your lesson for a range of diverse learners.	<ul style="list-style-type: none"> ● I plan to use visuals in two of the sessions to aid my ELL students. The content vocabulary gains purpose with visuals for ELL students. ● Lower lexile readers will be able to process the NASA Primary source by reading with purpose. Students are reading for specific items (nutrients, medical issues, and attempts to prevent bone loss). ● KWL Chart differentiates the summarizing process for students.

Lesson Sequence/Procedures	
Estimated Time Needed	Detailed Description of Teaching and Learning
5 minutes	Prior Knowledge: Label the dancing skeleton with any bones you already know.
5 minutes	The teacher will explain the directions for the learning centers around the room. <ul style="list-style-type: none"> ● Station 1: Compare skeletal system labeled in 1532 to the skeletal system labeled in the graphic novel on pages 16-20. On the poster paper list similarities and differences you notice. Then reflect on the post- it note how you think the skeletal system was studied in 1532. ● Station 2: Look at the x-ray images and determine the animal behind them. Then read from the graphic novel pages 12-15 and 29-31. Use the evidence available to write the purpose of the skeletal system and joints on a post it note. Then add it to the poster paper. Add stickers to any prior post it notes you agree with. ● Station 3: Read pages 22-28 from “Human Body Theater.” List bone strengthening nutrients and foods on a post it note. Then highlight through the NASA document, identifying nutrients, medical

	conditions, and attempts to alleviate bone loss. Finally develop your own plan for astronauts to prevent bone loss.
10 minutes (8 minutes at station and 2 minute transition)	<p>Station 1:</p> <p>Compare the image from 1532 by Octavius Horatianus within the article on the skeletal system to the image in the graphic novel on pages 16-20.</p> <ul style="list-style-type: none"> • List similarities and differences you notice on the poster chart paper provided at the table. • On a post it note, make a prediction about how the skeletal system was studied in 1532.
10 minutes (8 minutes at station and 2 minute transition)	<p>Station 2:</p> <p>Look at the x-rays of various animal skeletal systems provided by Live Science and Smithsonian.</p> <ul style="list-style-type: none"> • Use the skeletal structure to try and determine the animal behind the x ray. <ul style="list-style-type: none"> ◦ Turn over the x-ray to verify if you are correct. • Read pages 12-15 and 29-31 in “Human Body Theater” graphic novel • Based on observations and reading explain in your own words the purpose of the skeletal system and joints on a post it note. Then post your note on the chart paper. • Read any previous post it notes written by peers and add star stickers to any you agree with.
10 minutes (8 minutes at station and 2 minute transition)	<p>Station 3:</p> <p>Read page 22-28 in “Human Body Theater” graphic novel. As you read, list foods and nutrients that the graphic novel claims to help bone strength.</p> <p>Skim through the NASA research documents Bone Session Summary.</p> <ul style="list-style-type: none"> • Highlight in yellow any nutrients mentioned in the document and mentioned in the graphic novel • Highlight in pink any medical conditions associated with the lack of nutrients • Highlight in green any attempts/ activities to prevent bone loss in space. <p>Based on the reading, what would you suggest for astronauts to do in order to prevent bone loss in space? Please write on a post it note and add to the poster paper. Place a star sticker next to any post it notes you agree with.</p>
1 minute	Transition back to whole group instruction
4 minutes	Go to each station and highlight exemplar responses on the poster paper.
5 minutes	Based on your research and graphic novel, complete the KWL chart .

Assessments:	Pre-Assessment: Dancing Skeleton
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<p>What are the evaluation (informal and formal) tasks for this lesson? How do the evaluation tasks connect with the learning objectives? How do the evaluation tasks demonstrate student learning? How will students receive feedback?</p>	<ul style="list-style-type: none"> • This activity connects with the content by determining the students prior knowledge of the skeletal system. • The task shows student prior knowledge to aid the teacher in personalizing future skeletal system lessons based on class needs. • Students will receive feedback from the teacher at the end of the skeletal unit when students revisit their dancing skeleton. <p>Formative Assessment: Poster paper and Post It Notes at each station</p> <ul style="list-style-type: none"> • This activity connects with the content by addressing parts of the skeletal system, purpose of the skeletal system, and nutrients that affect the skeletal system. • The evaluation task shows student learning by their ability to summarize their learning at each station. • Students receive verbal feedback from the teacher at the end of the lesson and peer feedback through the use of stars. <p>Post Formative Assessment: KWL Chart</p> <ul style="list-style-type: none"> • This activity connects with the content by addressing parts of the skeletal system, purpose of the skeletal system, and nutrients that affect the skeletal system. • The evaluation task shows student learning by their ability to summarize their learning at each station. • Students receive individual feedback from the teacher by next class. The teacher will also utilize the W section to plan future lessons.
<p>Learning Extensions: Ideas for extending the lesson or connecting to other curricular topics or lessons</p>	<p>The graphic novel, “Human Body Theater,” has sections on all of the body systems. Teachers can continue to follow the graphic novel and link it with primary sources while teaching each of the body systems.</p>