

# Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM/BETT Lesson Plan

Systems - The Musculoskeletal  
**Lesson Title:** System      **Lesson #** 2      **Date:** April 16, 2025  
**Name:** The Human Musculoskeletal System      **Subject:** Science      **Grade(s):** 5

**Rationale:**

This unit plan is important because it introduces human systems that are responsible for living and remaining healthy throughout life. When students learn and understand how these systems work, they start to understand themselves better, why the systems are important for survival, and also how to stay healthier throughout life.

This lesson is important because it educates students about how their bodies muscles & skeleton enable them to move, jump, and do other amazing things. Students will understand more about their muscles and skeleton so they will be better informed as to how to take care of themselves for lifelong health and activity.

**Core Competencies:**

Communication	Thinking	Personal & Social
<ul style="list-style-type: none"> <li>• <b>Collaborating – Working Collectively:</b> Students combine their efforts with those of others to effectively accomplish learning and tasks. As members of a group, they appreciate interdependence and cooperation, commit to needed roles and responsibilities, and are conscientious about contributing. They also negotiate respectfully and follow through on plans, strategies, and actions as they share resources, time, and spaces for collaborative projects.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Critical &amp; Reflective thinking – Reflective &amp; Assessing:</b> Students apply critical, metacognitive, and reflective thinking in given situations, and relate this thinking to other experiences, using this process to identify ways to improve or adapt their approach to learning. They reflect on and assess their experiences, thinking, learning processes, work, and progress in relation to their purposes. Students give, receive, and act on feedback and set goals individually and collaboratively. They determine the extent to which they have met their goals and can set new ones.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Positive Personal &amp; Cultural Identity – Recognizing Personal Values &amp; Choices:</b> Students define who they are by what they value. They understand how what they value has been influenced by their life experiences. They identify how their values help to shape their choices, in all contexts of their lives.</li> <li>• <b>Personal Awareness &amp; Responsibility – Self-advocating:</b> Students who are personally aware and responsible have a sense of self-worth and a growing confidence in a variety of situations. They value themselves, their ideas, and their accomplishments. They are able to express their needs and seek help when needed, find purpose and motivation, act on decisions, and advocate for themselves.</li> <li>• <b>Social Awareness &amp; Responsibility – Building Relationships:</b></li> </ul>

		<p>Students build and maintain diverse, positive peer and intergenerational relationships. They are aware and respectful of others' needs and feelings and share their own in appropriate ways. They adjust their words and actions to care for their relationships.</p>
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### Big Ideas (Understand)

<p><b>Science:</b> Multicellular organisms have organ systems that enable them to survive and interact within their environment.</p> <p><b>PHE:</b> Understanding ourselves and the various aspects of health helps us develop a balanced lifestyle.</p> <p><b>Arts Education:</b> Engaging in creative expression and experiences expands people's sense of identity and belonging.</p> <p><b>ELA:</b> Questioning what we hear, read, and view contributes to our ability to be educated and engaged citizens.</p>
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### Learning Standards

(DO)	(KNOW)
<p><b>Learning Standards - Curricular Competencies</b></p> <p><b>Questioning and predicting:</b></p> <ul style="list-style-type: none"> <li>Identify questions to answer or problems to solve through scientific inquiry</li> </ul> <p><b>Processing and analyzing data and information:</b></p> <ul style="list-style-type: none"> <li>Demonstrate an openness to new ideas and consideration of alternatives</li> <li>Identify patterns and connections</li> </ul> <p><b>Applying and innovating:</b></p> <ul style="list-style-type: none"> <li>Transfer and apply learning to new situations</li> </ul> <p><b>PHE:</b></p> <p><b>Healthy and active living:</b></p> <ul style="list-style-type: none"> <li>Describe the impacts of personal choices on health and well-being</li> </ul> <p><b>Arts Education:</b></p> <p><b>Exploring and creating:</b></p> <ul style="list-style-type: none"> <li>Create artistic works collaboratively and as an individual using ideas inspired by imagination, inquiry, experimentation, and purposeful play</li> <li>Explore connections to identity, place, culture, and belonging through creative expression</li> </ul> <p><b>ELA:</b></p> <p><b>Comprehend and connect (reading, listening, viewing):</b></p> <ul style="list-style-type: none"> <li>Access information and ideas from a variety of sources and from prior knowledge to build understanding</li> </ul>	<p><b>Learning Standards - Content</b></p> <ul style="list-style-type: none"> <li>Basic structures and functions of body systems: <ul style="list-style-type: none"> <li>Musculo-skeletal</li> </ul> </li> <li>Benefits of physical activity and exercise</li> <li>Image development strategies - processes that transform ideas and experiences into visual images</li> <li>Symbolism and metaphor to explore ideas and perspective</li> <li>Strategies and processes - focusing on the speaker, asking questions to clarify, listening for specifics, expressing</li> </ul>

<ul style="list-style-type: none"> <li>• Consider different purposes, audiences, and perspectives in exploring texts</li> <li>• Use personal experience and knowledge to connect to text and develop understanding of self, community, and world</li> </ul>	<p>opinions, speaking with expression, staying on topic, taking turns</p>
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### Instructional Objectives & Assessment

Instructional Objectives (students will be able to...)	Assessment
<ol style="list-style-type: none"> <li>1. For students to gain an education on the basic components of the human Musculo-skeletal system &amp; how those parts allow movement</li> <li>2. For students to participate in an activity to make a working arm that shows how the muscles &amp; tendons allow an arm to move by using basic materials</li> </ol>	<p><b>Observation:</b></p> <ul style="list-style-type: none"> <li>• Willingness to do the activities</li> <li>• Ability to work with a partner to make an arm &amp; hand model</li> </ul> <p><b>Conversation:</b></p> <ul style="list-style-type: none"> <li>• Asking questions that they have</li> <li>• Attempts to answer questions from the teacher</li> </ul> <p><b>Product:</b></p> <ul style="list-style-type: none"> <li>• Making an arm &amp; hand model (or Q-tip skeleton &amp; labeling if the TM thinks it is a better fit for some students' abilities)</li> </ul>

### Prerequisite Concepts and Skills:

<ul style="list-style-type: none"> <li>• Basic knowledge of system existence in the human body</li> <li>• Willingness to learn about new things</li> </ul>
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### Indigenous Connections/ First Peoples Principles of Learning:

<p><b>Learning involves recognizing the consequences of one's actions</b> – When we treat ourselves badly, our health can suffer. For instance, lack of exercise will eventually affect one's health and mobility leading to health issues.</p> <p><b>Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectiveness, on reciprocal relationships, and a sense of place):</b> Students learning about themselves is natural &amp; interest based. Students will reflect on what they have learned and what it means to them. The human Musculo-skeletal system presents a real-life scenario to students in which they will explore &amp; learn.</p> <p><b>Learning involves patience and time:</b> Learning new things will take time to understand and we often need patience to give the information the time to do that. When something is new, it can cause anxiety but by taking the time to absorb the information and understanding why we are learning it makes it more relevant.</p>
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### Universal Design for Learning (UDL):

<p><b>Multiple Means of Representation:</b></p> <ul style="list-style-type: none"> <li>• Use of texts, video, visuals, model (if available from the Henry Grube Centre), and visuals to cater to different learning styles and sensory preferences.</li> <li>• Use of scaffolded activities to cater to different levels of ability.</li> </ul> <p><b>Multiple Means of Action and Expression:</b></p> <ul style="list-style-type: none"> <li>• Providing students with opportunities to demonstrate their understanding and engage with the material in this lesson plan by producing a model of a full arm, conversations during instruction &amp; building, and taking part in the hook which is an activity directly related to the musculoskeletal system and how it works.</li> </ul> <p><b>Multiple Means of Engagement:</b></p> <ul style="list-style-type: none"> <li>• Using multiple ways to express learning in watching a video, doing a hands-on activity, and discussion.</li> </ul>
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- Making the lesson motivating and engaging for students through activities, making learning about the human musculoskeletal system relevant to real-world applications, and fostering collaboration in pairs of students.

**Differentiate Instruction (DI):**

- Using a scaffolded activity to produce a product that is hands-on and real-world relevant
- Using a video to engage the students and appeal to those that are visual learners
- Using a real-world activity as a hook to engage the students from the beginning of the lesson
- Using a life-sized skeleton model for students to visually see and touch

**Materials and Resources**

- Word search
- Crossword puzzle
- Construction paper
- Labels for Q-tip skeletons
- Straws
- Scissors
- Markers
- Pens, pencils, & erasers
- String
- Q-tips
- Liquid glue
- Glue sticks
- Skeleton template
- Double-sided tape
- Laptop
- Projector
- Skeleton (from home)
- Other model(s) if available at the Henry Grube Centre

**Lesson Activities (60 minutes):**

Teacher Activities	Student Activities	Time
<p><b>Introduction</b> (anticipatory set – “HOOK”):  <b>Stand up &amp; move!</b> (5 minutes):</p> <ul style="list-style-type: none"> <li>• Get everyone to stand up “Alright everyone stand up!”</li> <li>• Ask them to jump as high as they can “Now...jump as high as you can!”</li> <li>• Great! Now wiggle your fingers... touch your toes... give your neighbor a high-five!”</li> <li>• “Awesome moves! But have you ever wondered how you’re able to do all that? What’s letting you jump, bend, wiggle, and move like that?”</li> <li>• “It’s not magic—it’s your musculoskeletal system! That’s a big word for your muscles and bones working together like a superhero team. Without it, you’d be like a jellyfish on land—squishy, floppy, and totally stuck!”</li> </ul>	<ul style="list-style-type: none"> <li>• Students will participate in the hook activity and be ready to hear more</li> </ul>	<p>5 minutes</p>

<ul style="list-style-type: none"> <li>• "Today, we're going to uncover the secrets of this amazing team inside your body, and you might even learn how to become stronger, faster—or at least better at high-fives!"</li> </ul>		
<p><b>Body:</b> Show <b>video</b> about the musculoskeletal system: <a href="https://www.youtube.com/watch?v=ynVRDsDC-84">https://www.youtube.com/watch?v=ynVRDsDC-84</a></p> <p><b>Direct Instruction:</b></p> <ul style="list-style-type: none"> <li>• Put the diagram of the skeleton up on the screen <a href="https://www.crayola.com/free-coloring-pages/print/human-skeleton-coloring-page/">https://www.crayola.com/free-coloring-pages/print/human-skeleton-coloring-page/</a> &amp; go through the bones listed with the class asking questions using the diagram and the skeleton model to show &amp; label: <ul style="list-style-type: none"> <li>○ The skull, femur, shoulder joint, rib cage, patella, spine, clavicle, pelvis, metatarsals, fibula, tibia, humerus, radius, ulna, and metacarpals</li> <li>○ Skeleton: Structure, protection, and shape</li> <li>○ Why is our skeleton so important for us?</li> <li>○ Can you name some organs that our skeleton protects?</li> <li>○ Who would like to come up and point out some bones on the skeleton?</li> <li>○ What helps us move our bones?</li> </ul> </li> </ul> <p>Move into muscles: Put the diagram of the muscular system up on the screen:</p> <ul style="list-style-type: none"> <li>• <a href="https://www.teacherspayteachers.com/Product/Label-the-Muscular-System-Anatomy-Coloring-Activity-End-of-year-FREEBIE-11656887">https://www.teacherspayteachers.com/Product/Label-the-Muscular-System-Anatomy-Coloring-Activity-End-of-year-FREEBIE-11656887</a> &amp; go through the muscles listed with the class asking questions using the diagram and the muscular model to show &amp; label: <ul style="list-style-type: none"> <li>○ The glutes, abdominals, side abdominals, chest, biceps, shoulders, upper back, calves, hamstrings, neck, triceps, quadriceps, forearms, lower back, &amp; middle back</li> </ul> </li> <li>• Ask students questions: <ul style="list-style-type: none"> <li>○ How do muscles help us move our bones?</li> <li>○ Can anyone name some common muscles that we have? Where are they in the body? Can you point them out on the skeleton?</li> <li>○ When you do sit-ups, what muscle set are you using?</li> <li>○ When you run, what muscles are you using?</li> <li>○ Move into joints: <ul style="list-style-type: none"> <li>○ When I bend my elbow like this (show the kids elbow movement), what is the angle called where the bones meet &amp; allow movement? (Joint)</li> <li>○ Do you think joints are important? Why?</li> <li>○ What other joints do we have in our body?</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Students will watch the video</li> <li>• Students will raise their hands and ask questions when they have them</li> <li>• Students will raise their hands to answer the teacher's questions throughout the lesson</li> </ul>	<p>5 minutes</p> <p>20 minutes</p>

<ul style="list-style-type: none"> <li>● *Briefly go into tendons &amp; ligaments (*if there is time): <ul style="list-style-type: none"> <li>○ Show diagram of knee showing ligaments &amp; tendons</li> <li>○ Does anyone know what attaches the bone to the muscle? (tendons)</li> <li>○ Tendons are strong, rope-like tissues that connect muscles to bones, allowing us to move our bodies</li> <li>○ Tendons transferring the force of muscle contractions to bones, enabling movement and stability.</li> <li>○ The other tissue that connects things in our bodies are ligaments</li> <li>○ Ligaments connect bones to bones at joints and they allow you to move and play</li> </ul> </li> <li>● Use the skeleton and other model(s) (if available) to review the system by asking questions to the students</li> <li>● Ask if they have any questions</li> </ul> <p><b>Product Activity:</b></p> <ul style="list-style-type: none"> <li>● Show students the model that was built</li> <li>● Let students know that we will be building this model in pairs and explain it briefly</li> <li>● Use popsicle sticks to choose student pairs</li> <li>● Let students know that they have 25 minutes to build the model</li> <li>● Give out supplies to the student singles &amp; pairs for the activity</li> <li>● Begin the activity: <ul style="list-style-type: none"> <li>○ Get everyone working on their arm model giving directions, a bit at a time so everyone keeps up with the teacher's instructions</li> <li>○ Trace a hand onto a coloured piece of paper</li> <li>○ Cut the traced hand out of the paper with scissors</li> <li>○ Cut small sections of double-sided tape (~ 1 cm) &amp; add them to the hand: 2 on the thumb and 3 on each of the fingers evenly spaced</li> <li>○ Add strips of double-sided tape for the tendons for the thumb and 4 fingers</li> <li>○ Peel off the paper on the upper side of the tape to reveal the sticky tops</li> <li>○ Cut small portions of straw to fit on the tape: Small for the fingers &amp; thumb and full length along to cover the tendon tape</li> <li>○ Cut off 3-foot sections of string (5x)</li> <li>○ Thread the string through the top of the fingers and knot on the first tape portion so it is secure</li> <li>○ Continue to thread through the straws for each finger continuing through the individual tendon straws to the wrist area</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Students will ask any follow-up questions that they may still have by raising their hand</li> </ul> <ul style="list-style-type: none"> <li>● Students will add their names to their projects &amp; start to assemble while working with the teacher as they demonstrate it step by step</li> </ul> <ul style="list-style-type: none"> <li>● Students will do the activity step by step in pairs as the teacher demonstrates each step</li> </ul>	<p style="text-align: center;">25 minutes</p>
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<ul style="list-style-type: none"> <li>○ After threading all 5, you should have 5 strings hanging down through the wrist area</li> <li>○ Tie all 5 strings together at the wrist</li> <li>○ Thread the 5 strings through a full straw until they are pulled through the end of the straw</li> <li>○ Once done, you can pull on the strings and see the fingers &amp; thumb move!</li> </ul> <p><b>Alternative Activity as the TM sees fit:</b>  <b>Q-Tip Skeleton &amp; Parts Labeling:</b></p> <ul style="list-style-type: none"> <li>● Students will use Mr. Skelly to make a Q-tip skeleton model and label the parts as given <ul style="list-style-type: none"> <li>○ Students will be given a template for their skeleton</li> <li>○ Students will cut up Q-tips as they wish to make the bones of their skeleton</li> <li>○ Students will glue the Q-tips onto the template where they think they should go using Mr. Skelly as a reference</li> <li>○ Students will cut-out the labels provided and glue or tape them to their Q-tip skeleton on the bones that are indicated showing their learning</li> </ul> </li> <li>● The teacher (plus other adults in the room) will rotate around the room &amp; help where needed</li> <li>● Remind students to add their names to their projects</li> <li>● At the 20-minute mark, announce to students that they have 5 minutes remaining</li> </ul>		
<p><b>Closure:</b>  <b>Clean-up:</b></p> <ul style="list-style-type: none"> <li>● Tell students that time is up</li> <li>● Let students know that it is time to clean up, make sure their names are added to their models, &amp; put them over on the side counter</li> <li>● Request that students clean up their area &amp; put unused supplies back on the teacher's desk</li> </ul>	<ul style="list-style-type: none"> <li>● Students will clean up their area &amp; get ready to continue to the next scheduled item</li> </ul>	<p>5 minutes</p>

**Organizational Strategies:**

<ul style="list-style-type: none"> <li>● Students will be coming back from recess, so they have had a good break outside for them to sit again and learn</li> <li>● When students are at their desks, they will be asked to listen without talking</li> <li>● When students have questions or want to contribute to the class discussions, they will raise their hand and wait for the teacher to call on them before speaking out</li> <li>● Supplies will not be distributed to the students until after the instruction and right before their activity time</li> <li>● Students that are talking without raising their hand will be asked to raise their hand if they want to contribute to the class discussions</li> <li>● Students that are not cooperating or working well together during the activity and instruction will be separated</li> </ul>
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### Proactive, Positive Classroom Learning Environment Strategies:

- The teacher will give students a lot of opportunities to engage with the subject matter & ask questions
- There will be a demonstration on each step of the activity on the human Musculo-skeletal system & the students will follow along with the teacher
- Other adults in the room will help the students with the activity steps if needed
- The teacher will make behaviour expectations clear – sit quietly and listen attentively without distracting other students, only speak if the teacher calls on you – by stating them before the lesson – pairs will get along and cooperate or they will be separated
- The teacher will verbally acknowledge and thank students who are on task and will verbally address students who continue to distract others
- The teacher will, if necessary, separate students who continue to distract each other

### References:

Video for hand model: <https://www.youtube.com/watch?v=u4EtIGrUfUA>

Video for Q-tip skeleton: <https://www.youtube.com/watch?v=K-VYUtKhvXY>

Skeleton Q-tip template: <https://www.teacherspayteachers.com/Product/Halloween-Activities-FREEBIE-6158081>

Word search & crossword puzzle: <https://www.teacherspayteachers.com/Product/Human-Body-Skeletal-System-4-Science-Review-Puzzles-Moving-and-Growing-12272397>

Video on the human musculoskeletal system: <https://www.youtube.com/watch?v=ynVRDsDC-84>

Skeleton diagram for instruction: <https://www.crayola.com/free-coloring-pages/print/human-skeleton-coloring-page/>

Muscle diagram for instruction: <https://www.teacherspayteachers.com/Product/Label-the-Muscular-System-Anatomy-Coloring-Activity-End-of-year-FREEBIE-11656887>

### Extensions:

**Early finishers** can choose from fun sheets to do such as the **crossword puzzle**, **word search**, or a “Is it a muscle or bone” **sorting game**

### Reflections (if necessary, continue on separate sheet):

Bringing in Mr. Skelly was a huge hit and it worked really well for students to see a tangible form of the skeletal system. I would absolutely do this lesson again.