

Biomechanical Innovators (4-5)

Hello! This document includes a brief outline of our Biomechanical Innovators workshop, as well as relevant BC curriculum connections. In this workshop, students explore the world of biomedical engineering and will learn the fundamentals of the human body by completing a medicinal project and an assistive device.

<p>BC Curriculum Ties (In addition to satisfying multiple core competencies)</p>	<p><u>BC Science Links 4-5:</u></p> <p><i>Content</i></p> <ul style="list-style-type: none"> • <i>Basic structures and functions of body systems:</i> <ul style="list-style-type: none"> ○ <i>Circulatory, digestive, musculo-skeletal</i> • <i>Solutions and solubility</i> <ul style="list-style-type: none"> ○ <i>Solubility of solids, liquids, and gases (e.g. carbon dioxide [gas in water makes pop])</i> ○ <i>Dissolving: process of forming a solution</i> • <i>Properties of simple machines and their force effects</i> <ul style="list-style-type: none"> ○ <i>The lever is the basis of nearly every aspect of the musculo-skeletal system</i> <p><u>BC ADST Links 4-5:</u></p> <p><i>Designs can be improved with prototyping and testing & The choice of technology and tools depends on the task.</i></p> <ul style="list-style-type: none"> • <i>Applied Design:</i> <ul style="list-style-type: none"> ○ <i>Defining – Identify the main objective for the design and any constraints</i> ○ <i>Ideating – Generating potential ideas and add to others’ ideas, Screen ideas against criteria and constraints, & choosing an idea to pursue.</i> ○ <i>Making – Identify use of appropriate tools, technologies, and materials for production, & Making a plan for production and carrying it out, making changes as needed.</i>
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	<ul style="list-style-type: none"> ○ <i>Sharing – Demonstrate their process, using appropriate terminology and providing reasons for methodology, Reflect on their design thinking and processes.</i>
Grade Levels	4-5
Time	1~1.5 Hours
Goals of the Workshop	<ol style="list-style-type: none"> 1. Understand the role of biomedical engineers within the healthcare system 2. Understand the effect of the digestive system on medicine 3. Learn how muscles work and how engineering can be used to aid those with mobility issues

Activity Descriptions

Protect the Pill

Objective: To teach students about solubility and how medicine is designed to resist stomach acid

Participants will:

- Learn about medicine metabolization and what factors influence solubility
- Protect an Alka-Seltzer tablet by coating it with a variety of common food products
- Compete against their classmates to slow down the dissolving of the tablet

Heart Rate Race

Objective: To teach students about the circulatory system, heart rate, and medical devices that assist the heart

Participants will:

- Learn how to measure their heart rate
- Understand what factors influence heart rate
- Learn about medical devices that help the circulatory system

Prosthetic Power

Objective: To teach students how the musculo-skeletal system allows us to move and how engineering can help those with mobility issues

Participants will:

- Learn how muscles flex and how physics and forces influence movement
- Learn how insects use hydraulics to move
- Create a prosthetic/assistive device using hydraulics to aid someone with mobility issues

We can't wait to connect with your school & expose your students to the STEM field with our exciting, hands-on STEM activities!

