See how this **example filled-in unit template** looks on the TeachEngineering website:
https://www.teachengineering.org/curricularunits/view/cub_biomed_curricularunit

Biomedical Engineering and the Human Body (unit)

Curricular Unit Title Biomedical Engineering and the Human Body

Header Insert image 1 here

Image 1

Image file: cub_biomed_unit_image1web.jpg

ADA Description: Five images: man blowing into a spirometer, assorted pills and tablets, man taking a step with on his artificial leg, black and white sonogram shows shape of fetus, drawing of DNA double helix.

Source/Rights: (left to right) Medline Plus, US National Library of Medicine, National Institutes of Health; Maine Center for Disease Control and Prevention; Walther Thill, U.S. Department of Veteran's Administration; Jim Gathany, U.S. Department of Health and Human Services; President's DNA Initiative, US Department of Justice
http://www.nlm.nih.gov/medlineplus/ency/imagepages/1142.htm
http://www.maine.gov/dhhs/boh/images/VariousPills.jpg
https://www.myhealth.va.gov/mhvPortal/anonymous.portal?_nfpb=true&_nfto=false&_pageLabel=spotlightArchive&contentPage=spotlight/spotlight_prosthetics.html
http://phil.cdc.gov/PHIL_Images/04182000/00005/Ultrasound_lores.jpg
http://www.dna.gov/training/evidence/

Caption: Engineers are increasingly involved in design for the human body.

Grade Level 7 (4-7)

Summary

Human beings are fascinating and complex living organisms—a symphony of different functional systems working in concert. Through a 10-lesson series with hands-on activities students are introduced to seven systems of the human body—skeletal, muscular, circulatory, respiratory, digestive, sensory, and reproductive—as well as genetics. At every stage, they are also introduced to engineers' creative, real-world involvement in caring for the human body.

Engineering Connection

Engineers are increasingly involved in design for the human body. Biomedical engineers create artificial limbs using materials and sensors to replicate natural function and movement. Understanding the muscular system enables engineers to design everyday tools, appliances and products. Other engineers design medical solutions to improve health and address disorders. This may take the form of devices, implants, machines, medicines and technologies (diagnostic equipment, pacemakers, surgical techniques, hearing aids, laser eye surgery, ultrasound, amniocentesis, in-vitro fertilization, pain medicine). Engineers also apply their understanding of DNA to numerous real-world applications. As part of their design work, engineers create flow charts, prototypes and models, and make technical presentations, to learn, test and communicate their work.

Engineering Category = #1 Relating science and/or math concept(s) to engineering

Subject Area
life science

Keywords
bioengineering, biomedical, biomedical engineering, biotechnology, body, health, human, human body, medical

Educational Standards

NGSS Grades 6-8 (Science)
MS-ETS1-1; Engineering Design
Students who demonstrate understanding can: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. ID# = S2454533

CCSS: Math
CCSS.Math.Content.6.NS.B.3 aka 6.NS.3 (Grade 6)
The Number System: Compute fluently with multi-digit numbers and find common factors and multiples.
Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
ID# = S11434D3

Related Lessons & Activities

Related Lessons

1. Engineering Bones
2. Muscles in Motion
3. Body Circulation
4. Breathe In, Breathe Out
5. Digestion Simulation
6. My Mechanical Ear Can Hear!
7. Biomedical Devices for Your Ears
8. We've Come a Long Way, Baby!
9. DNA: The Human Body Recipe
10. Bone Fractures and Engineering

Related Activities

- Prosthetic Party
- Sticks and Stones Will Break That Bone!
- The Artificial Bicep
- Measuring Our Muscles
- Clearing a Path to the Heart
- Polluted Air = Polluted Lungs
- Protect That Pill
- Living with Your Liver
- Sounds All Around
- Protect Those Eyes
- You're the Expert!
- Who Robbed the Bank?
- DNA Build
- Repairing Broken Bones

Time Required
1400 minutes

Time Required Note

(230 minutes for the lessons + 1170 for all the activities)

Unit Overview

Overview of topics by lesson: 1) skeletal system, 2) muscular system, 3) circulatory system, 4) respiratory system, 5) digestive system, 6) auditory-hearing sensory system, 7) vision sensory system, 8) reproductive system, 9) genetics, and 10) skeletal system.

Unit Schedule

Day 1: Engineering Bones lesson
Day 1-3: Prosthetic Party activity
Day 4-5: Sticks and Stones Will Break That Bone! activity
Day 6: Muscles, Oh My! lesson
Day 7: The Artificial Bicep activity
Day 8-9: Measuring Our Muscles activity
Day 10: Body Circulation lesson
Day 11: Clearing a Path to the Heart activity
Day 12: Breathe In, Breathe Out lesson
Day 12-13: Polluted Air = Polluted Lungs activity
Day 14: Digestion Simulation lesson
Day 15: Protect That Pill activity
Day 16: My Mechanical Ear Can Hear! lesson
Day 17: Sounds All Around activity
Day 18: Biomedical Devices for the Eyes lesson
Day 19: Protect Those Eyes activity
Day 20: We've Come a Long Way, Baby! lesson
Day 20-21: You're the Expert activity
Day 22: DNA: The Human Body Recipe lesson
Day 23: Who Robbed the Bank? activity
Day 24: DNA Build activity
Day 25: Bone Fractures and Engineering lesson
Day 26-30: Repairing Broken Bones activity (requires multiple 60-minute periods to complete; suggest 60 minutes on five different days)

Summary Assessment

None

Attachments

None

Other

None

Redirect URL

None

Contributors

See individual lessons and activities.

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Supporting Program

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Key: Yellow highlight = required component