

Minnesota Academic Science Standards Alignment with BrainU Activities - August 2009

| | Attention, Illusion and Your Brain | Bead Neurons | <i>C. elegans</i> & Alcohol | Caeno-WHAT?? | Chemotaxis using <i>C. elegans</i> | Close-up of the Nervous System | Connect the Neurons! | Dendritic Spines: Dry Lab | Caterpillar Diss. | <i>Manduca sexta</i> Wax Model | Memory Items | Mirror Image | Motor Learning and Memory | Neurotransmission | Neurotransmission | Neuropathfinding: Kinesthetic Model | Open Inquiry using <i>C. elegans</i> | Recency and Primary Effects | Sheep Brain Dissection | Virtual Neurons | Whose Choice is it Anyway? | Your Incredible Memory! |
|--|------------------------------------|--------------|-----------------------------|--------------|------------------------------------|--------------------------------|----------------------|---------------------------|-------------------|--------------------------------|--------------|--------------|---------------------------|-------------------|-------------------|-------------------------------------|--------------------------------------|-----------------------------|------------------------|-----------------|----------------------------|-------------------------|
| Seventh Grade | | | | | | | | | | | | | | | | | | | | | | |
| 1. The Nature of Science and Engineering | | | | | | | | | | | | | | | | | | | | | | |
| 7.1.1.1 Science is a way of knowing | | | | | | | | | | | | | | | | | | | | | | |
| 7.1.1.1.1 ...prior expectations create bias | | | X | X | | | | | X | | | X | X | | | | X | | | X | X | |
| 7.1.1.1.2 ... when similar investigations give different results | | | X | X | | | | | | | | | X | | | | X | | | | X | |
| 7.1.1.2 Scientific inquiry uses multiple interrelated processes | | | | | | | | | | | | | | | | | | | | | | |
| 7.1.1.2.1 Generate and refine a variety of scientific questions | | | X | X | | | | | | | | | | | | | X | | | X | X | X |
| 7.1.1.2.2 Plan and conduct a controlled experiment | | | X | X | X | | | | | | X | X | X | | | | X | | | X | X | X |
| 7.1.1.2.3 Generate a scientific conclusion | | | X | X | X | | | X | | | X | X | X | | | | X | | | X | X | X |
| 7.1.1.2.4 Evaluate explanations proposed by others | | | X | X | X | | | X | | | X | | | | | | X | | | X | X | X |
| 7.1.3.4 Current and emerging technologies | | | | | | | | | | | | | | | | | | | | | | |
| 7.1.3.4.1 Use maps ... and other data sets to describe patterns | | | | | | | | X | | | | | | | | | | | | | X | |
| 7.1.3.4.2 Determine and use appropriate safety procedures, tools, measurements, graphs | | X | X | X | X | X | X | X | X | X | | | | X | | | X | X | X | X | X | X |
| 4. Life Science | | | | | | | | | | | | | | | | | | | | | | |
| 7.4.1.1 Tissues, organs and organ systems | | | | | | | | | | | | | | | | | | | | | | |
| 7.4.1.1.1 Recognize that all cells do not look alike | | X | | | | X | X | X | X | X | | X | | X | | | | | X | X | | |
| 7.4.1.1.2 Describe how the organs ... interact in the vertebrate | X | X | | | | X | X | X | X | X | X | X | | X | | | | | X | | | X |
| 7.4.2.2 All organisms are composed of one or more cells | | | | | | | | | | | | | | | | | | | | | | |
| 7.4.1.2.1 Recognize that cells carry out life functions | | X | | | | X | X | X | X | X | | X | | X | X | | | | X | X | | |
| 7.4.1.2.2 Recognize that cells repeatedly divide | | | | | | | | | | | | | | | | | | | | | | |
| 7.4.3.1 Reproductions is characteristic of all organisms | | | | | | | | | | | | | | | | | | | | | | |
| 7.4.3.1.1 Recognize that cells contain genes | | | | | | | | | | | | | | | | | | | | | | |
| 7.4.3.1.3 Distinguish... inherited and those acquired through environmental | | | | | | | | X | | | | X | | | | | | | | | | |

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| 7.4.3.2 Individual organisms with certain traits | | | | | | | | | | | | | | | | | | | | | |
| 7.4.3.2.2 Use internal and external anatomical structures to compare | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | X | X | | X |
| 7.4.4.2 Human beings are constantly interacting with other | | | | | | | | | | | | | | | | | | | | | |
| 7.4.4.2.1 Explain how viruses, bacteria, fungi and parasites | | | | | | | | | | | | | | | | | | | | | |
| 8.1 The Nature of Science and Engineering | | | | | | | | | | | | | | | | | | | | | |
| 8.1.1.1 Science is a way of knowing | | | | | | | | | | | | | | | | | | | | | |
| 8.1.1.1.1 Evaluate the reasoning in arguments in which fact and opinion are intermingled | | | | | | | | | | | | | | | | | | | | | X |
| 8.1.1.2.1 Use logical reasoning and imagination to develop descriptions... and models | X | X | X | | X | | X | X | | | X | | X | X | | | | X | X | X | |
| 8.1.3.2.1 Describe examples of important contributions... by individuals | | | | | | | | X | | | | | | | | | | | | | |
| 9.1 The Nature of Science and Engineering | | | | | | | | | | | | | | | | | | | | | |
| 9.1.1.1 Science is a way of knowing | | | | | | | | | | | | | | | | | | | | | |
| 9.1.1.1.2 Understand that scientists conduct investigations | | | X | X | X | | | X | X | | | | | | X | | | X | | | X |
| 9.1.1.1.3 Explain how the traditions and norms of science define the bounds of professional scientific | | | | | | | | X | | | | | | | | | | | | | X |
| 9.1.1.1.4 Explain how societal and scientific ethics impact research practices | | | X | X | X | X | | X | X | | X | | | | | | | X | | | X |
| 9.1.1.1.5 Identify sources of bias and how bias | X | | | | | | | | | | | | | | | | | | X | | X |
| 9.1.1.1.6 Describe how changes in scientific knowledge occur in incremental steps | | | | | | | | | | | X | | | | X | | | | | | |
| 9.1.1.1.7 Explain how scientific and technological innovations... can challenge theories or models | | | | | | | | | | | | | | | | | | | | | |
| 9.1.1.2 Scientific inquiry uses multiple interrelated processes | | | | | | | | | | | | | | | | | | | | | |
| 9.1.1.2.1 Formulate a testable hypothesis, design and conduct | | | X | | X | | | X | | | X | | X | | X | | | | X | X | |

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|--|------------------------------------|--------------|-----------------------------|--------------|------------------------------------|--------------------------------|----------------------|---------------------------|-------------------|--------------------------------|--------------|--------------|---------------------------|-------------------------------------|-------------------|--------------------------------------|-----------------------------|------------------------|-----------------|----------------------------|-------------------------|
| 9.1.1.2.2 Evaluate the explanations proposed by others | | | X | | X | | | X | | | X | | X | | | X | X | | X | X | |
| 9.1.1.2.3 Identify the critical assumptions and logic | | | X | | X | | | X | | | X | | | | | X | X | | X | X | |
| 9.1.1.2.4 Use primary sources or scientific writings | | | | | | | | X | | | | | | | | X | | | | X | |
| 9.1.2.1 Engineering is a way of addressing | | | | | | | | | | | | | | | | | | | | | |
| 9.1.2.1.1 Understand that engineering designs and products | | | | | | | | | | | | | | | | | | | | | |
| 9.1.2.1.2 Recognize that risk analysis is used | | | | | | | | | | | | | | | | | | | | | |
| 9.1.2.1.3 Explain and give examples of how... engineers consider how it is to be manufactured etc... | | | | | | | | | | | | | | | | | | | | | |
| 9.1.2.2 Engineering design is an analytical and creative process | | | | | | | | | | | | | | | | | | | | | |
| 9.1.2.2.1 Identify a problem ... or possible design solutions | | | | | | | | | | | | | | | X | | | | | | |
| 9.1.2.2.2 Develop possible solutions to an engineering problem | | | | | | | | | | | | | | | X | | | | | | |
| 9.1.3.1 Natural and designed systems | | | | | | | | | | | | | | | | | | | | | |
| 9.1.3.1.1 Describe a system | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X |
| 9.1.3.1.2 Identify properties of a system that are different | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X |
| 9.1.3.1.3 Describe how positive or negative feedback | | | | | | | X | X | | | | | | | | | | | | | X |
| 9.1.3.3 Science and engineering operate in context of society | | | | | | | | | | | | | | | | | | | | | |
| 9.1.3.3.1 Describe how values and constraints affect science and engineering | | | | | | | | | | | | | | | | | | | | | X |
| 9.1.3.3.2 Communicate, justify and defend the procedures | | | X | | X | | | X | | | | X | X | X | X | X | X | | X | X | |
| 9.1.3.3.3 Describe how scientific investigations and engineering require multi-disciplinary | | | | | | | | | | | | | | | | | | | | | X |
| 9.1.3.4 Science, technology, engineering and math | | | | | | | | | | | | | | | | | | | | | |
| 9.1.3.4.1 Describe how technological problems... often create a demand for new scientific knowledge | | | | | | | | | | | | | | | | | | | | | |
| 9.1.3.4.2 Determine and use appropriate safety | | | X | X | X | X | | | X | | | | | | | X | | | X | X | |

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| 9.1.3.4.3 Select and use appropriate numeric, symbolic, pictorial, or graphical representation | | X | | | | | X | X | X | X | X | | X | | X | X | X | | X | X | |
| 9.1.3.4.4 Relate the reliability of data to consistency of results | | | | | | | | X | | | X | | X | | X | X | X | | X | X | |
| 9.1.3.4.5 Demonstrate how unit consistency and dimensional analysis | | | | | | | | | | | | | | | | | | | | | |
| 9.1.3.4.6 Analyze the strengths and limitations of ... models | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | | | | X | |
| 9.4 Life Science | | | | | | | | | | | | | | | | | | | | | |
| 9.4.1.1 Organisms use interaction of cellular processes | | | | | | | | | | | | | | | | | | | | | |
| 9.4.1.1.1 Explain how cell processes... homeostasis | X | X | X | X | X | X | X | X | X | X | | X | ? | X | X | X | | | X | | |
| 9.4.1.1.2 Organ systems and Homeostasis | X | X | X | X | X | X | X | X | X | X | | X | X | | | X | | X | X | | X |
| 9.4.1.2 Cells and cell structures have specific functions | | | | | | | | | | | | | | | | | | | | | |
| 9.4.1.2.4 Explain the function and importance of cell organelles | | X | | | | X | X | X | X | X | | | | X | X | | | | X | | |
| 9.4.1.2.5 Compare and contrast passive transport with active | | X | X | | X | X | X | X | | | | | | | X | X | | | | | |
| 9.4.4.1 Human activity has consequences | | | | | | | | | | | | | | | | | | | | | |
| 9.4.4.1.1 Describe the social, economic and ecological risks | | | | | | | | X | | | | | | | | X | | | | | |
| 9.4.4.2 Personal and community health | | | | | | | | | | | | | | | | | | | | | |
| 9.4.4.2.1 Describe how some diseases can sometimes be predicted | | | | | | | | | | | | | | | | | | | | | |
| 9.4.4.2.4 Explain how environmental factors and personal decisions | | X | X | | X | | | | | | | | | | | X | | | | X | |

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| Chemistry | | | | | | | | | | | | | | | | | | | | | |
| 9C.1.3.3 Developments in chemistry affect society | | | | | | | | | | | | | | | | | | | | | |
| 9C.1.3.3.1 Explain the impacts of chemical products | | | X | X | | | X | | | | | | | | X | | | | | | X |
| 9C.1.3.4 Physical and mathematical models | | | | | | | | | | | | | | | | | | | | | |
| 9C.1.3.4.1 Use significant figures and an understanding of accuracy and precision | | X | X | X | | X | | | X | | X | | X | | X | | X | X | X | X | |
| 9C.2.1.2 Chemical and physical properties of matter result... bonds | | | | | | | | | | | | | | | | | | | | | |
| 9C.2.1.2.2 Compare and contrast the structure, properties, and uses of organic compounds | | | X | X | | | | | | | | | | | X | | | | | | |
| 9C.2.1.3 Chemical reactions describe a chemical change | | | | | | | | | | | | | | | | | | | | | |
| 9C.2.1.3.6 Describe the factors that affect rate of a chemical reaction | | | | | | | | | | | | | | | | | | | | | |