

## Food, Energy and Water Learning Module Workbooks - Spence et al. Appendix Table B. Middle School NGSS.

**Table B.** *Middle School Youth (6th – 8th grade) Next Generation Science Standards. (National Research Council, 2013; NGSS Lead States, 2013).*

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**Middle School Youth (6<sup>th</sup> – 8<sup>th</sup> grade) Next Generation Science Standards**

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***Scientific Inquiry with Decimals and Fractions through the Colorful World of m&m's Workbook***

***Exploring Scientific Inquiry and Mathematical Thinking with Skittles Workbook***

- Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS1-2)
- Analyze and interpret data to determine similarities and differences in findings. (MS-PS1-2)
- Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles. (MS-PS2-3)

***My Sprouting Bean Seeds Scientific Workbook***

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- Analyze and interpret data to determine similarities and differences in findings. (MS-PS1-2)
- Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles. (MS-PS2-3)
- Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2)

***Let's Take a Biochemical Journey Through Osmosis with a Naked Hen Egg Workbook***

- All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1)
- Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2)
- Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. (MS-PS3-4)
- Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1)
- Small changes in one part of a system might cause large changes in another part. (MS-LS2-4)

***The Beneficial Health Impacts of Fruits and Vegetables Workbook***

- Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2)
- Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and control(s), what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. (MS-PS3-4)
- Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1)
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***Exploring the Link Between Land Management, Plant Growth and Water Quality Using a Mini-Garden Model Workbook***

- Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)
- Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)
- Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (MS-LS2-5)
- Develop a model to describe phenomena. (MS-LS2-3)
- Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS1-2)
- Analyze and interpret data to provide evidence for phenomena. (MS-LS2-1)
- Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2)
- Science disciplines share common rules of obtaining and evaluating empirical evidence. (MS-LS2-4)
- Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-LS2-5)

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*Note: NGSS Lead States. 2013. Next Generation Science Standards: For States, By States. Washington, DC. The National Academies Press. <https://www.nextgenscience.org/>.*