

**SCIENCE/DESIGN (Grade 8)**

**[Addendum to SCIENCE (Grade 8) | Curriculum Map and Pacing Guide]**

**COURSE DESCRIPTION:**

This course engages students in making connections and using technology to solve meaningful and challenging problems. Students learn the same content as students in SCIENCE 8; however, students in this course make continual applications of an engineering design process. Students will use science and mathematics in independent investigations that require demonstration of increased understandings and will create interactive notebooks, modeled after scientific journals to help them develop their communication and cognitive organizational skills, promoting a sense of responsibility for their own learning. In these notebooks, students will gather information from multiple sources and create lines of evidence in order to answer critical problems and to support or refute scientific and mathematical ideas. Further, students will cultivate intellectual tools needed to gather and make sense of information to apply their understandings in new and novel situations.

**Engineering Design Process**



**Essential Investigations:**

This course is aligned to Ohio science learning standards (2018) and to Ohio technology standards (2017). Students will use scientific processes with appropriate laboratory safety techniques to construct their knowledge and understanding in these investigations:

Ohio Science Standards (2018) / Scientific Inquiry and Applications	Essential Investigations
Identify questions that can be answered through scientific investigations. (SIA.1)	Working with Questions Mind Swaps
Design and conduct a scientific investigation. (SIA.2)	Grand Canyon Rocks (ESS.4) Air Trolleys (PS.1) Motion Controlled Experiment (PS.1) Electromagnetic Controlled Experiment (PS.2)

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Ohio Science Standards (2018) / Scientific Inquiry and Applications	Essential Investigations
Use appropriate mathematics, tools and techniques to gather data and information. (SIA.3)	Hubble Ultra Deep Field (PS.2) Liquid Layers (ESS.1) Earth's History Geological Timelines (ESS.4)
Analyze and interpret data. (SIA.4)	Mysterious Events (PS.2) Plotting the Evidence (ESS.2) Larkey Simulation (LS.3) Natural Selection (LS.2)
Develop descriptions, models, explanations and predictions. (SIA.5)	Solar System Model (PS.2) Plate Movement Simulation (ESS.2) Radioactive Decay Model (ESS.4) Relative Dating (LS.1)
Think critically and logically to connect evidence and explanations. (SIA.6)	Independent Studies* Cube Investigations Continents Puzzle (ESS.2)
Recognize and analyze alternative explanations and predications. (SIA.7)	Stream Table (ESS.3) Super Genetics (LS.3) GMO Debate (ESS.2)
Communicate scientific procedures and explanations. (SIA.8)	Gizmos Reflections AHA Connections
Ohio Technology Standard (2017)	Essential Investigations
Identify a problem and use an engineering design process to solve the problem.	Solar Collector (PS.1, PS.2, PS.3) Friction Rollers (PS.1, PS.2, PS.3)

**District Instructional Resources:**

*Science Fusion* (2017) / Houghton Mifflin Harcourt (6-year online subscription: 2019-2020 to 2024-2025)

Gizmos (online simulations – annual subscription) - <https://www.explorellearning.com/>

GEMS® *Space Science Sequence for 6-8* / Carolina Biological Supply Company

FOSS Next Generation Middle School Earth History Lite Kit - #1584912 / Delta Education

FOSS Next General Middle School Gravity and Kinetic Energy Complete Kit - #1465618 / Delta Education

FOSS Next Generation Middle School Electromagnetic Force Complete Kit - #1465615 / Delta Education

FOSS Next Generation Middle School Waves Complete Kit - #1465617 / Delta Education

FOSS Middle School Populations and Ecosystems (2<sup>nd</sup> Ed.) - #1533039 / Delta Education

FOSS Next Generation Middle School Heredity and Adaptation Complete Kit - #1465620 / Delta Education

FOSS Next Generation Middle School Chemical Interactions Complete Kit - #1558463 / Delta Education

**Ohio Science and Technology Standards:**

Ohio Learning Standards for Science (2018) – retrieved Jan. 23, 2019

<http://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Science/Ohios-Learning-Standards-and-MC/SciFinalStandards121018.pdf.aspx?lang=en-US>

Ohio Learning Standards for Technology (2017) – retrieved Jan. 23, 2019 <https://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Technology/Ohio-s-2003-Academic-Content-Standards-in-Technolo/The-2017-Ohio-Learning-Standards-in-Technology.pdf.aspx>