

Engineering Opportunities in FOSS® Next Generation Middle School

** indicates the entire part is an engineering challenge/focus*

Grade 6

| Course | Engineering Opportunity |
|----------------------------|--|
| Variables and Design | <ul style="list-style-type: none"> • Inv. 1.1: Air Trolleys * • Inv. 1.2: Controlled Experiment • Inv. 1.3: Design an Experiment • Inv. 1 Extension: Research careers • Inv. 1 Extension: Test another variable • Inv. 2.1: Air-Trolley Design Challenge * • Inv. 2.2: Engineering Design Cycle * • Inv. 2 Extension: Develop new air-trolley designs * • Inv. 2 Extension: Learn about engineering opportunities worldwide * • Inv. 2 Extension: Research engineering careers * • Inv. 3.1: Define a Problem * • Inv. 3.2: Future Tech * • Inv. 3 Extension: Discuss the implications of solutions * • Inv. 3 Extension: Research careers * • Inv. 3 Extension: Support local solar energy innovation * |
| Diversity of Life | <ul style="list-style-type: none"> • Inv. 2.1: Meet the Microscope • Inv. 2 Ext.: Make a Water-Drop Microscope • Inv. 8 Ext.: Research How Cockroaches are Connected to Robots |
| Human Systems Interactions | <ul style="list-style-type: none"> • Inv. 3 Ext.: Research Different Kinds of Hearing Aids |
| Weather and Water | <ul style="list-style-type: none"> • Inv. 2 Ext.: Build a Wind Sock • Inv. 5.1: Fluid Conduction • Inv. 5.2: Insulation * • Inv. 5.3: Home Design * |

Grades 7-8 on next page

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Grade 7

| Course | Engineering Opportunity |
|----------------------------|--|
| Chemical Interactions | <ul style="list-style-type: none"> • Inv. 6.1: Insulation * • Inv. 6.2: Thermos Design * • Inv. 8.3: Freezing Water * |
| Earth History | <ul style="list-style-type: none"> • Inv. 6.1: Mapping Volcanoes and Earthquakes • Inv. 8.1: Introduction to the Project |
| Populations and Ecosystems | <ul style="list-style-type: none"> • Inv. 8 Ext.: Create a Wildlife Habitat at School • Inv. 9.1: Human Involvement • Inv. 9.2: Evaluating Solutions • Inv. 9.3: Presentations |

Grade 8

| Course | Engineering Opportunity |
|----------------------------|---|
| Electromagnetic Force | <ul style="list-style-type: none"> • Inv. 3.2: Building an Electromagnet • Inv. 3.3: Improving the Design * • Inv. 3 Ext.: Make a Rheostat • Inv. 3 Ext.: Build the Ultimate Electromagnet • Inv. 4.1: Electric Motors • Inv. 4.2: Electric Generators |
| Gravity and Kinetic Energy | <ul style="list-style-type: none"> • Inv. 4.1: Helmet Design Challenge * • Inv. 4 Ext.: Test Water Balloons |
| Heredity and Adaptation | <ul style="list-style-type: none"> • Inv. 3.3: Genetic Technology • Inv. 3.Ext: Research Ethical Concerns • Inv. 3.Ext: Follow up on Genetic Technology • Inv. 3.Ext: Research CRISPR, a Gene-Editing Tool • Inv. 3.Ext: Research Gene Drives |
| Planetary Science | <ul style="list-style-type: none"> • Inv. 5.2: Target Earth • Inv. 5.ext: Learn More About NASA DART Mission • Inv. 7.1: Where are the Planets? • Inv. 8.2: Explorations of the Solar System |
| Waves | <ul style="list-style-type: none"> • Inv. 2.2: Bridge Collapse * • Inv. 2.3: Energy in Sound Waves * • Inv. 3.1: Mirrors • Inv. 4.1: Optical Fibers • Inv. 4.3: Sending Images |