

Middle School Project Ideas

Project Division	Project Idea	Overview	Possible Materials
Maker Division - Model	Human Heart Pump Model	Construct a working model of the human heart using syringes and tubing to show how blood moves through chambers.	Balloons, tubing, red-dyed water, syringes, cardboard
Maker Division – Model	Bridge Engineering Challenge	Design and build a bridge that can hold weight using principles of tension and compression.	Popsicle sticks, glue, string, small weights, ruler
Maker Division – Model	Eco-Friendly City	Build a scale model of a sustainable city that includes renewable energy sources, green spaces, and waste management systems.	Recycled boxes, toy cars, cardboard, paint, clay
Maker Division – Model	Mars Habitat Model	Design a model habitat for astronauts living on Mars. Explain how it provides oxygen, water, and shelter.	Plastic domes, clay, cardboard, paint, recycled bottles.
Maker Division – Model	Renewable Energy in Motion	Build a working model of a wind turbine or water wheel to demonstrate how renewable energy can be converted into motion or light. Test how blade size or flow rate affects energy output.	Cardboard, small motor, plastic spoons, string, glue, LED light, fan, or water source
Maker Division – Model	Model the Greenhouse Effect	Students build a model showing how heat is trapped in the atmosphere	Clear containers, lamps, thermometers, soil
Maker Division – Engineering/Invention	Hydration Station	Engineer a water bottle filling station that filters, measures, or reminds users to stay hydrated.	Tubing, plastic bottles, sensors (optional), cardboard, duct tape, labels
Maker Division – Engineering/Invention	Accessible Door Opener	Design a device to help people with limited mobility open doors easily. Include mechanical or sensor-based options.	Motors, string, gears, cardboard, switches, Arduino (optional)
Maker Division – Engineering/Invention	Storm-Resistant Shelter	Build a prototype of a shelter designed to withstand extreme weather events. Test for strength and stability.	Foam board, wood sticks, plastic wrap, tape, weights, fan

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Maker Division – Engineering/Invention	Plastic to Purpose	Engineer a small device or process that repurposes plastic waste into something useful.	Recycled plastic, molds, heat-safe materials, glue, poster board
Maker Division – Engineering/Invention	Smart Traffic System	Design a system that improves traffic flow and safety using lights, sensors, or coded signals.	LEDs, cardboard roads, toy cars, batteries, wires, tape.
Maker Division – Engineering/Invention	Crash Cushion Challenge	Students design a device that minimizes force during a collision	Foam, cardboard, marbles, ramp, measuring tape
Maker Division – Engineering/Invention	Clean Energy Collector	Students create a device that captures renewable energy (wind, solar, or water) to power a small light	Small motor, fan, solar panel, wires, light bulb
Maker Division – Engineering/Invention	“The Lightning Thief’s Safety Raft” – <i>Percy Jackson and the Olympians</i>	Percy and his friends often travel by water and face dangerous storms and creatures. Students design a self-righting raft or survival floatation device to help them stay safe during their sea adventures.	Plastic bottles, duct tape, string, cardboard, foil, small toy figures
Maker Division – Engineering/Invention	“Charlotte’s Web Communicator” – <i>Charlotte’s Web</i> by E.B. White	Charlotte uses her web to communicate important messages. Students invent a new way for animals and humans to communicate—perhaps through sound, light, or movement.	Yarn, paper circuits, LEDs, cardboard, glue, recycled materials
Maker Division – Engineering/Invention	“Hidden Tunnel Escape System” – <i>Number the Stars</i> by Lois Lowry	Annemarie helps her friend Ellen escape danger during WWII. Students design a secret escape tunnel, coded map, or alarm system to ensure safety.	Cardboard boxes, paper tubes, string, flashlights, paper, tape
Experiment	How Does Water Temperature Affect Dissolving Rate?	Students test how quickly sugar dissolves in hot, warm, and cold water.	Beakers, thermometers, sugar, water, stopwatch, stirrers

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Experiment	Do Different Music Genres Affect Concentration?	Students test how listening to different types of music influences focus while completing a task.	Music playlist, stopwatch, reading passages, data chart
Experiment	How Does pH Affect Plant Growth?	Students water identical plants with different pH solutions to observe growth differences.	Vinegar, baking soda, water, pH strips, pots, ruler
Experiment	Does the Angle of a Ramp Affect Speed?	Students change the slope of a ramp to test how it affects the travel speed of a toy car.	Toy cars, ramps, ruler, timer, protractor.
Experiment	Which Insulator Keeps Ice from Melting the Longest?	Students compare materials (foil, fabric, foam) to see which insulates best.	Ice cubes, cups, foil, fabric, timer, thermometer
Experiment	Do Natural Cleaners Kill Germs as Well as Chemical Ones?	Students test lemon juice, vinegar, and soap against a standard cleaner on safe surfaces.	Swabs, petri dishes (optional), cleaning solutions, paper towels
Experiment	Does Sugar Type Affect Yeast Growth?	Students test how different sugars (white, brown, honey) affect yeast activity.	Yeast, sugar, warm water, balloons, bottles, measuring cups
Experiment	How Does Light Color Affect Plant Growth?	Students grow identical plants under colored lights to see which wavelength promotes most growth.	Light filters, lamps, pots, soil, seeds, ruler
Experiment	Chemical Energy Reactions	Students test which variables affect how fast an effervescent tablet reacts in water	Beakers, tablets, thermometer, stopwatch
Experiment	Recycled Water Filter	Students design and test different natural materials to filter dirty water	Sand, gravel, charcoal, bottles, funnel