

*(These two sessions available via Remote Instruction as well as In-Person)*



*An introduction to soldering.*

## Quizboards

9<sup>+</sup>yrs

Students design the quiz questions and learn how to cut and strip wire to make electronic connections using a variety of electronic components. Then, each student solders their electrical connections together (when available). Students wire the board together and take their completed quizboard home. *Ages 9 and up*

## Flashlight Building

9<sup>+</sup>yrs

The electrical components and connections within a flashlight are explored as students assemble and solder (when available) their own circuit and then place the circuit into the flashlight casing. *Ages 9 and up*



Register on-line at:  
<http://edgerton.mit.edu/outreach>



## LEGO Car Rally

8<sup>+</sup>yrs

Students are challenged to build a car from LEGO bricks, systematically altering variables as they modify their cars, considering trade-offs between different design elements, and the effects of friction and center of gravity. This fun activity provides students with a beginner's understanding of potential and kinetic energy, and a hands-on, mechanical engineering design experience. *Ages 8 and up*

## Gear Up, Gear Down

10<sup>+</sup>yrs

Pairs of students are challenged to build a slow car after being introduced to the concepts of gearing down and gear ratios. Students are encouraged to modify and alter their design throughout the lesson. This activity provides students with a hands-on, mechanical engineering design experience. *Ages 9 and up*



*Building a LEGO car*

## Laser Mazes

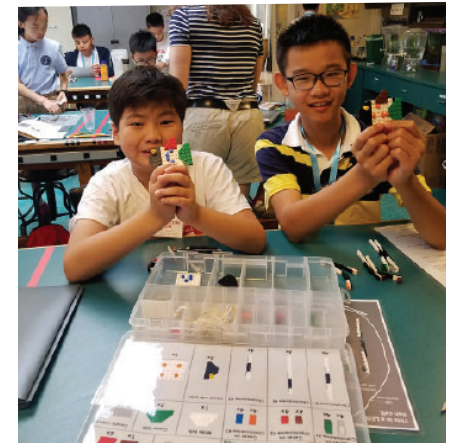
11<sup>+</sup>yrs

Teams of students are challenged to direct a laser beam through a maze using mirrors. By experimenting with mirrors to hit a bullseye with laser light, concepts of angles and how light interacts with various materials are reviewed. Students first model with protractors and then implement the path of the laser light through the different mazes. *Ages 11 and up*

## The Shape of Life: from helix to chromosome

12<sup>+</sup>yrs

Using LEGO bricks to model the basic structural elements of DNA, students model the steps of somatic cell division. Students then use LEGO bricks that represent the components of DNA nucleotides (sugars, phosphates and bases). Each group will then use these models to understand the base pairing rule and replication of the DNA strands in the double helix. *Ages 12 and up*



*LEGO fish phenotypes*

## Living LEGO

12<sup>+</sup>yrs

Students work with "LEGO fish" cells to understand the process of gamete cell division and the ways that genes can be expressed through modelling the steps of meiosis with LEGO bricks, and predict the phenotype and genotype of possible offspring for two parents with a known genotype. Students discuss how the environment interacts with and affects the gene pool of a given population. *Ages 12 and up*

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## Edgerton Explorations

all  
ages

An Edgerton Center classic, this activity introduces students to the technology of strobe photography. A visit to the Edgerton exhibit at the MIT Museum is a good way to end the day.

*Warning: Strobe lighting is used in darkened conditions. Adults/children prone to epileptic seizures should inform instructor.*



## CSI: MIT *(5th grade and up, independent readers only)*

Crime Scene Investigation: MIT presents an introduction to forensics with the unsolved case of an MIT "hack" - a fun, harmless practical joke performed by MIT students. Students will use blood typing, fingerprinting, chromatography, and microscope examination of hair and fiber samples to analyze clues found at the crime scene and determine the culprit.

*Maximum of 16 participants*

## Grungy Groundwater

10<sup>+</sup>  
yrs

Groups of students observe how water and "contaminants" (water tracing dyes) flow through different soils. A model of a groundwater system is used to demonstrate how water contamination moves through an aquifer. Students consider the implications of the pollutant from the point of view of town leaders, scientists, and citizens.

*Ages 10 and up*

## LEGO® Chemistry

11<sup>+</sup>  
yrs

LEGO Chemistry is an introduction to chemistry in two parts: the Wet Lab, in which students learn proper lab technique as they observe chemicals throughout a chemical reaction, and the LEGO Lab, revisiting the reaction using LEGO bricks to model the elements. *Ages 11 and up*



*Chemicals before & after a reaction*

Each program is described in detail on our website. Access to our on-line calendar is available on our website as well.

<http://edgerton.mit.edu/outreach>



**Edgerton Center Outreach Programs are available both as In-Person sessions (on-campus only) and via Remote Instruction. Not all content is offered for Remote, only Electrical Engineering sessions are available.**

Contact Amy Fitzgerald at [amyfitz@mit.edu](mailto:amyfitz@mit.edu)



## 2023-2024 Field Trip Programs Hands-On Science & Engineering Programs for Upper Elementary - Middle School Groups



*Supported in part by the  
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