

## **LEGO® ENGINEERING LABS**

Wednesdays, September 16-December 16

No class October 14 or November 25

11:00am-12:15pm

Ages 8-10

Students learn fundamental engineering principles related to force and motion, explore how simple machines and mechanisms reduce the effort needed to move objects, and design and construct structures and machines out of LEGO® to investigate how design affects functionality.

Instructor: Tina Oresteen

Location: Science Center (suite 5)

Full Series - \$220 OR \$20/lab

10% off sibling discount

### **LAB SCHEDULE:**

#### **LEGO® BRIDGES**

Wednesday, September 16

11:00am-12:15pm

Students learn about design and construction of bridges as they learn about tensile and compression forces acting on structures, and build a bridge that holds significant weight.

#### **LEGO® MAZES**

Wednesday, September 23

11:00am-12:15pm

This week, students are challenged to design and build a three-dimensional marble maze with multiple layers and hidden obstacles.

#### **LEGO® MACHINES: WHEELS AND PULLEYS**

Wednesday, September 30

11:00am-12:15pm

We investigate how two simple machines, wheels and pulleys, reduce the amount of effort needed to move an object as we build a pulley system.

#### **LEGO® POWER CRANES**

Wednesday, October 7

11:00am-12:15pm

Students build a motorized crane out of LEGO®, complete lifting challenges, and design modifications to create a more efficient machine.

## LEGO® MACHINES: LEVERS AND WEDGES

Wednesday, October 21

11:00am-12:15pm

We investigate the physics of levers and wedges to design, construct and test simple LEGO® machines to create the best design to lift a heavy load.

## LEGO® CHAIN REACTIONS

Wednesday, October 28

11:00am-12:15pm

Students use their creativity and engineering skills to design and build a series of simple machines to create complex chain reactions.

## LEGO® MACHINES: INCLINED PLANES AND SCREWS

Wednesday, November 4

11:00am-12:15pm

This week, we study how inclined planes reduce the effort needed to move a heavy load, and learn how a screw is a modification of an inclined plane.

## LEGO® MECHANISMS: GEARS

Wednesday, November 11

11:00am-12:15pm

Gears are modified wheels that efficiently transfer force and motion. We experiment with different gear combinations to determine the best system for the job.

## LEGO® POWER CARS

Wednesday, November 18

11:00am-12:15pm

Students learn about gears and wheels as they build a motorized LEGO® car, and modify it to complete driving challenges involving different effects of gravity and other forces.

## LEGO® SWEEPER

Wednesday, December 2

11:00am-12:15pm

We build and modify a sweeping machine which incorporates gears, wheels and pulleys to effectively clean up a dirty path.

## LEGO® DRAGSTER

Wednesday, December 9

11:00am-12:15pm

This week, we build a dragster and launcher to test different wheel combinations for their effects on speed and distance on a vehicle.

## LEGO® DOGBOT

Wednesday, December 16

11:00am-12:15pm

Students build a mechanical toy using levers, pulleys and gears to learn the basics and challenges of robot design.

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