



Logical Learning Lab
www.LogicalLearningLab.com

Featuring **LEGO®** and **K'NEX®**

Mechanical & Structural Engineering: Hands-on Courses!

Mechanical Principles Ages 8 - 88

Introduces 1st, 2nd, & 3rd class levers, fulcrums, wheels & axles, steering, movement, rotation & speed, drivers, followers, idlers, gearing up & down, pulleys, gear & pulley ratios, open & cross belting

Exploring Mechanisms Ages 8 - 88

Build fundamental mechanisms that use mathematical & experimental concepts to highlight physical science & the process for calculating mechanical advantage

Engineering Connections (prerequisite – Mechanical Principles)

Think critically & logically to make connections between evidence and explanations. Use physical models, algebraic, graphical & numerical representations to relate linear functions, formulas, averages, graphs, and proportional reasoning

Mind Masters Mechanisms Ages 8 - 88

Build fully functional mechanisms that highlight mechanical concepts of machine operation and the math of mechanical advantage

Simple & Motorized Machines I & II (prerequisite -- Mechanical Principles) Ages 8 - 88

Promotes the awareness of technology for deeper understanding of mechanical principles adding structures & forces, linkages, flywheels, compound gearing, & ratios. Demonstrates design in the technology of manufacturing, transportation, construction, and bio-technology

Design, Application, & Problem-solving (prerequisites: Simple & Motorized Machines I & II) Ages 8 - 88

Motion, forces, transfer of energy, and principles of simple machines are studied through the application of key mechanical concepts. Students identify a problem; then design, implement, and evaluate solutions

Engineering Machines Ages 8 - 88

Explore the concept & use of "end effectors" in robotics to create practical machines to grip, grab, scoop, & pull while learning about automation & the architectural maxim "Form Follows Function"

Robotics Labs (available only to those who have completed courses requiring prerequisites)

Integrate math, science, and technology to design, build, and program autonomous robots. Robotics builds mathematical competency and technological literacy through cross-discipline connections. These disciplines combine mechanical advantage, design engineering, basic electronics, programming, digital control, applied algebra & geometry, systems, equilibrium, conversion of units, ratios & proportions, decimals, fractions, constancy, change, and measurement



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All courses 7 hours.
Certificates issued upon completion.

Current program locations:
FL, NJ, MO, GA, WA.
LLL looks for new program locations where the conditions are right. Contact us with ideas.

Language Arts -- Hands-On!

ALSO! Courses emphasizing the writing process, vocabulary, research, and analytical thinking

Hands-on courses using **LEGO®** and **K'NEX®**

Essential Communication Ages 8 - 88

Introduces communication terminology while engaging students in public speaking, descriptive, auditory & inquiry-based communication, forensics, mime, tactile sensation, verbal dependence, misinterpretation, & free association

Creative Communication Ages 8 - 88

Write, build, & learn with multiple forms of communication. Decipher hieroglyphs, phonograms, ideograms. Explore American sign language, Braille, representation/replicas in modeling, duplication, and even the Semaphore codes used in the battle of Waterloo

Core Construction Ages 8 - 88

Language arts is learned with walls, dams, arches, buttresses, pyramids, castles, and pagodas constructed by the students

Architectural Design Ages 8 - 88

Language arts will be demonstrated & practiced with post & lintel bridges, cantilevers, floor plans, urban planning, and Greek architecture

Meaningful Math (using language arts!) Ages 8 - 88

This language arts course will use cubes, circles, circumferences, Pi, trapezoids, line intersections, tessellations, and estimation to teach language arts

Measurement Matters Ages 8 - 88

Language arts course covering measurement, bar graphs, line plots, frequency, tables, mean, median, mode, and probability

Speaking of Physics Ages 8 - 88

Language arts course researching gravity, force, mass, volume, density, and the coefficient of friction

Additional courses

Ages 3-5: alphabet, vocabulary, early reading skills, recall, sorting, patterns, numbers, building & creating. **Ages 5-7: these hands-on classes introduce concrete math and science principles.**

___ Alpha Adventures
___ Omega Adventures

___ Pulley Power Plus
___ Super Solvers
___ Critter Creations
___ Early Machines
___ Fun Time Gears

(New courses are added from time to time.
For more complete descriptions and additional courses, see www.LogicalLearningLab.com)

Other courses include:

___ Chess (a series of progressing courses!)
___ Mind Masters Math (ages 7-10)
___ Bridges & Beyond (ages 8-88)
___ Structural Engineering (ages 8-88)
___ Biochemistry (middle school - college)
___ Molecular Biology (middle school - college)

Want courses for your group? Your area? Perhaps others want courses, too. Tell us at www.LogicalLearningLab.com fill out a "course interest survey."

ALL COURSES 7 HOURS.
CERTIFICATES OF COMPLETION ISSUED.

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TUITION FOR EACH COURSE
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