

# MINDS-i ENGINEERING

## Construction System: Catapult Lab

MCK-CKWM-001



### MINDS-i STEM INTEGRATED ROBOTICS: CATAPULT LAB

The Catapult Lab is a great entry point to the MINDS-i system. The provided exercises focus on the creative build process, data collection and the PDSA cycle (Plan, Do, Study, Act) used in the industry for decades, for design engineering, product troubleshooting & problem solving.

### | DESIGN ENGINEERING

Learn the basics of construction and design while expanding your creativity with the MINDS-i Robotics platform. The MINDS-i quick lock system makes it easy to design, build, test and redesign.

### | LAB DESIGN

Each lab is designed for 2-3 students and includes 10 curriculum hours of building and data collection.



CONSTRUCTION PIECES

DESIGN ENGINEERING

EXPERIMENTATION

ANALYSIS & COMPARISON

OPTIMIZATION

FIND YOUR MINDS-i SALES REPRESENTATIVE AT:

[mindsieducation.com](http://mindsieducation.com) »

[info@my minds i.com](mailto:info@my minds i.com) »

# CURRICULUM OUTLINE - 10 HOURS

## Unit 1: Design Engineering

- 1.1 Model for Inquiry
- 1.2 The Importance of Data
- 1.3 Parts & Purposes
- 1.4 Simple Machines

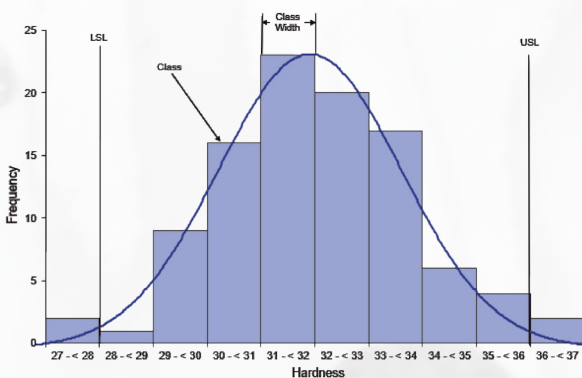
## THE BUILD PROCESS

- » We utilize the PDSA cycle and the process of continual improvement to help your students creatively achieve the goal.
  - » **Plan:** What is the function or goal?
  - » **Do:** Carry out design, experiment, or test and collect data.
  - » **Study:** Analyze the data.
  - » **Act:** What did we learn from the data? Was the objective met?
- » The MINDS-i Construction System allows for rapid building, testing and improvements, perfect for the classroom setting.
- » The target mat is designed to physically represent a histogram and allows students to visualize the data.
- » Keeping real world relevance in mind, the different zones of the mat represent a specification with its corresponding tolerances.

## HISTOGRAMS & DATA COLLECTION

Histograms are an easy visualization of the data.

- » A histogram is a graph that uses one axis for frequency and the other for equal intervals of value.
- » Removes extraneous detail and allows the user to focus on the important information the data is conveying.
- » Shows the pattern of variation in the context of its measured or counted values.
- » Visually shows the average, variation and shape of the data.



### CATAPULT KIT



### QUICK LOCK & UNLOCK



### TARGET MAT



### SUB-OPTIMIZED OPTIMAL PERFORMANCE SUB-OPTIMIZED

