Gregory Reeves

Empowerment High School
Southwest Schools - Charter

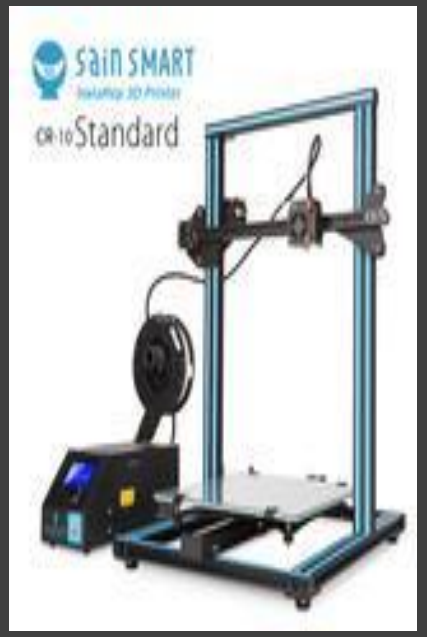
Introduction To Engineering & Design (IED)

Grades: 9th – 12th

Product Design & Fabrication Activity Proposal

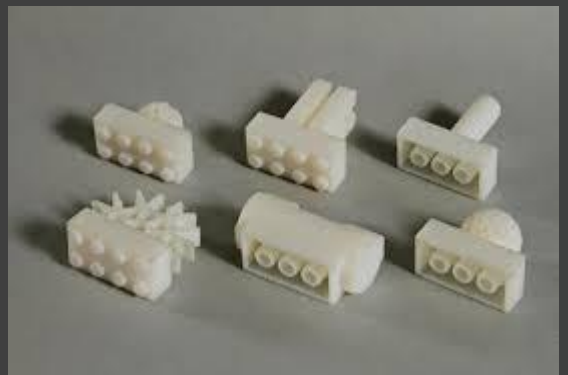
LEGO KEYCHAIN PROJECT

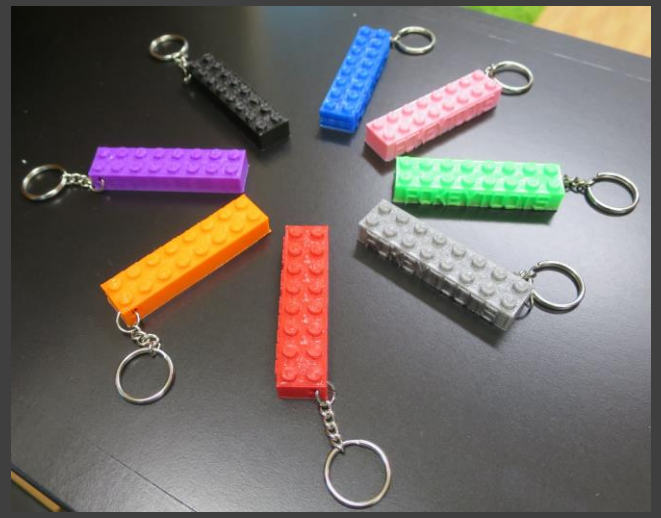
An Introduction To Engineering & Design Project For 9th – 12th Grade



- Problem Statement
  - Create a Lego Keychain with your name.
- Design Statement
  - Design and 3D print a Lego using Fusion. Modify it by adding name and school.
- Constraints
  - Footprint of overall design should be exactly like model Lego.
  - Annotated sketch with dimensions in engineering notebook
  - Autodesk Fusion taught by instructor
  - 5 to 6 weeks timeframe for the entire project
  - Present at District Project Based Learning (PBL) Night
  - Groups of 2 to 3 students
- Benefits of the project
  - Demonstrate mastery of engineering design process
  - Hands-on aspect using dial caliper Lego measurement
  - Enhances previous knowledge of Fusion & 3D printing
  - Prototype testing
  - Tangible experience for students

AUTODESK® FUSION 360™





Lego Keychain Project Details Page 2

- Materials Used
  - Autodesk Fusion Software
  - 3D printer - (School has 4 3d printers)
  - PLA Filament
  - Key Ring and Key Chain
  - Dial Calipers - (School has 60)

- Budget/Cost - $600 for the school year
  - PLA Filament - $540 for 12 rolls
  - Key Ring & Chain - $15 a container of 150

- Student Success
  - Measured with a rubric
  - Based on fabrication and functionality

- Other Concerns
  - Class is not semester based
  - Estimated 75 to 120 students in class