

Mission to Mars (M2M) Ultimate 2.0 Curriculum Plan
Build a Mars Habitat with the Ultimate Robot



1. M2M TRAINING

Mission to Mars Readiness
Challenge

Unit 1 - Mission to Mars (M2M) Intro

We need to establish some mission protocols (order of operations) and prepare the Engineers and Teams on the Engineering and Design process, the operational capabilities, and how to interact and control the Ultimate 2.0.

Outline:

M2M Introduction 1 - What is the Mission to Mars Challenge?

We are sending an autonomously and remotely operated robot to Mars to find a suitable and safe location for a Mars habitat for humans. We will need the habitat before humans arrive. First you will need to construct the Ultimate 2.0 robot and learn about its capabilities and ability to be controlled remotely and autonomously. You will need to investigate how to get everything to Mars, establish a good landing site, and find the best location for the habitat. You will need to make a model of the area on Mars and create a map that has a landing site, place where materials are stored, and the habitat site in addition to hazards such as impact craters, boulders, cliffs, mountains, and valleys. After completing those missions, your challenge is to design and construct the habitat with the Ultimate 2.0 robot. The Ultimate 2.0 robot has several sensors on board and can be controlled remotely using Bluetooth (**Makeblock APP**) or autonomously through **mBlock program** coding. You will create a scaled physical map and a digital map to test the Ultimate 2.0 capabilities for completing each mission and the Mars habitat challenge. Final documentation of mission preparation and completion will be in digital format for video and audio, covering all aspects in your notebook of the **Ultimate 2.0 Mars Mission**.

M2M Introduction 2 - Meet the Ultimate 2.0

- Activity 1 - What is the Ultimate 2.0 and what can it do?
- Activity 2 - How will the Ultimate be used to complete the Mars Mission?
- Activity 3 - What skills are needed?
- Activity 4 - Safety issues
- Activity 5 - Storing and maintaining the Ultimate 2.0

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1. M2M TRAINING

Mission to Mars Readiness Challenge

Unit 2 - Mission to Mars (M2M) Teams

We need a fully operational Ultimate 2.0 robot for the Mars Mission. Unit 2 contains all the activities for: 1) applying engineering design principles to solve a problem 2) safety and maintenance procedures, 3) describing each team member's role: Project Manager, Materials Engineer, Construction Engineer, Electrical Engineer, Computer Engineer, and Programmer, 4) using an Engineering Notebook 5) modeling notebook entries, and 6) matching scientists to their discoveries.

Outline:

M2M Training - Engineering Challenge

Activity 1 - Form Teams

Activity 2 - Who can build the tallest Tower using only 10 pieces of cardstock or 10 index cards and a pair of scissors; No Tape, No Glue, No Fasteners of any kind.



2. M2M EQUIPMENT

Software and Hardware Overview

Unit 3 - Mission 2 Mars (M2M) Software

We need to build expertise and understanding of electronic and digital communications, coding and problem solving with code, and all the components of the Ultimate 2.0.

Outline:

M2M Equipment 1 - Ultimate Software, MBlock program

Activity 1 - Algorithms and Sequences

Activity 2 - Write your Algorithm!

Activity 3 - Code Algorithms

Activity 4 - Ultimate 2.0 mBlock Software

Activity 5 - Software Show & Tell

Activity 6 - What is Pseudocode?