

**The Tech
Challenge**

GRAVITATE



to **NAVIGATE**

2025

Test Rig & Specifications

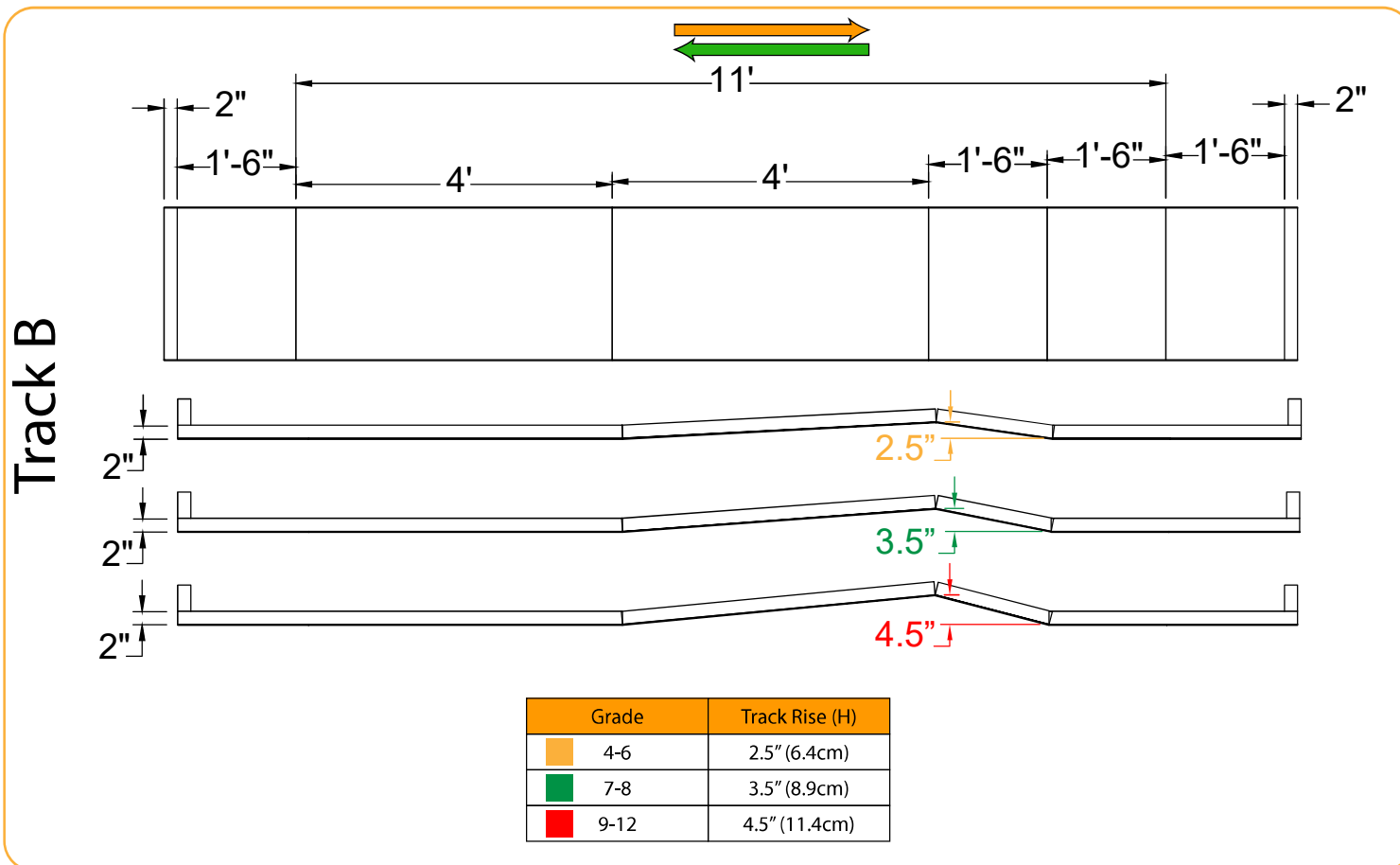
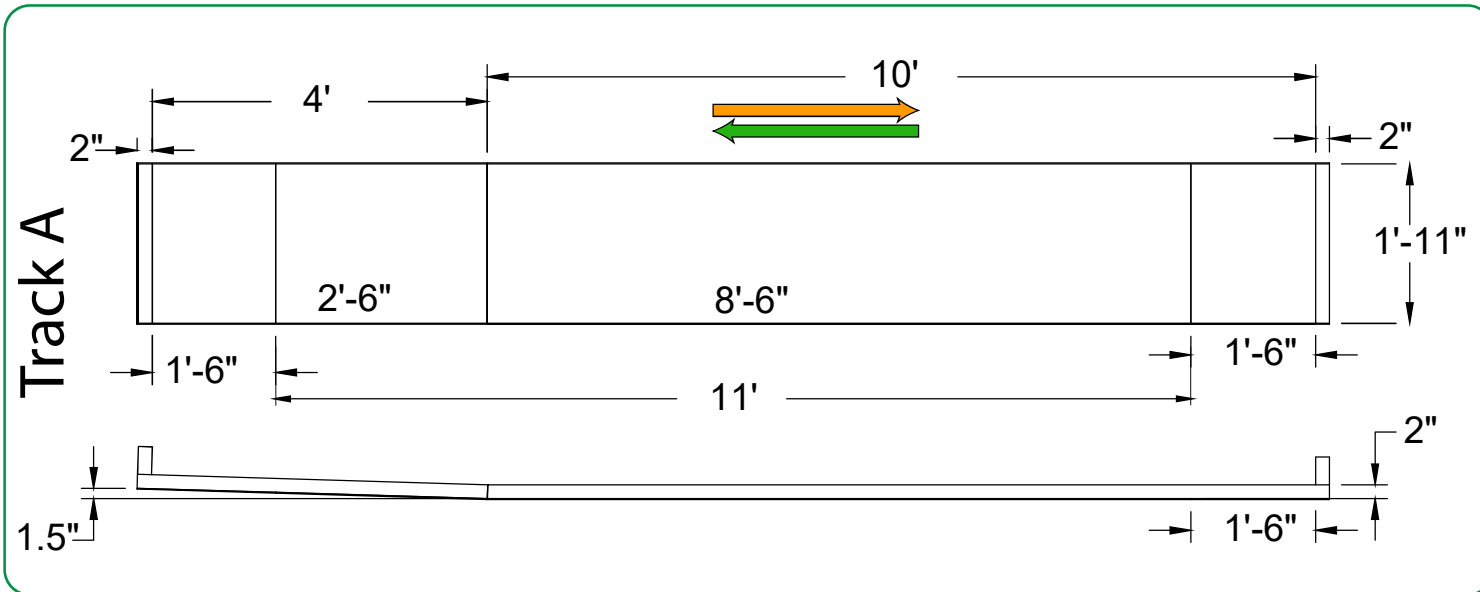
Oct. 18 Rev.

Table of Contents

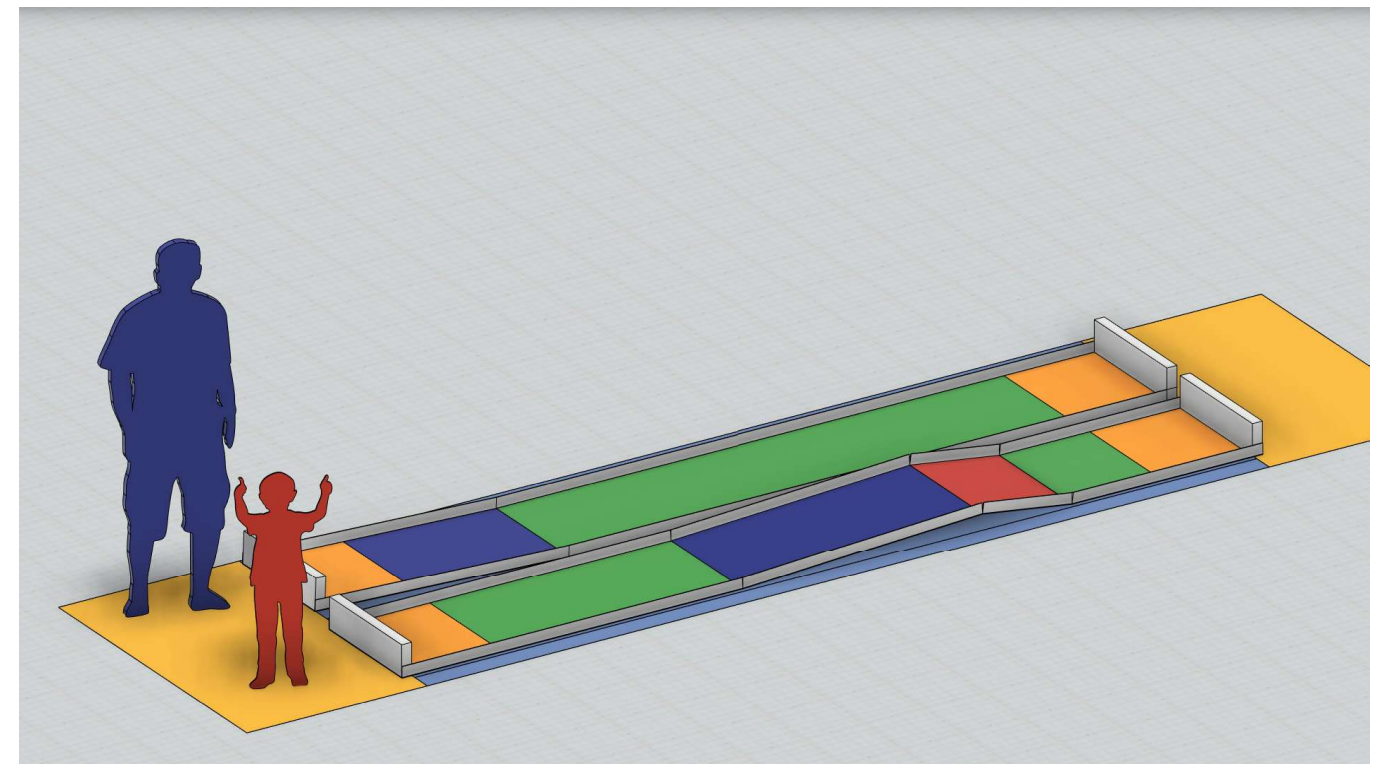
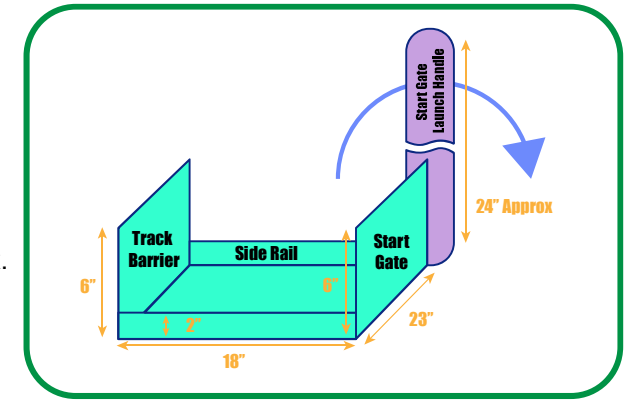
01 - Test Rig Plan and Elevation View

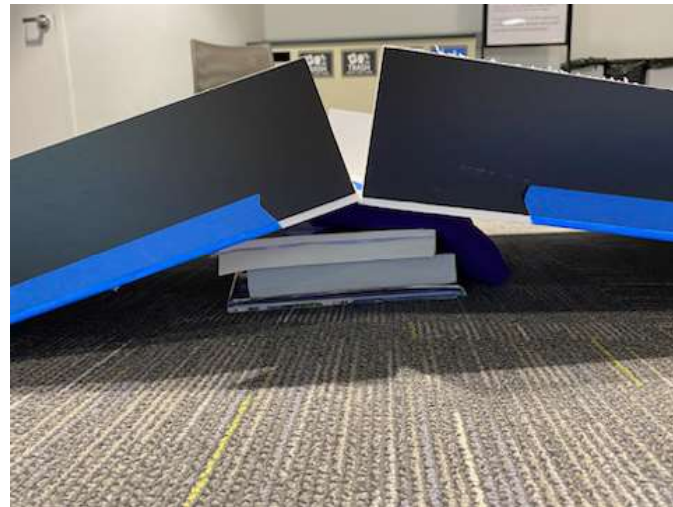
02 - Home Test Rig

The challenge consist of 4 runs total.
One direction and back, 2 times



- **Start box** = space before the start gate where teams set up their devices:
- The start box is 18 in (45.7 cm) long and 23 in (58.4 cm) wide.
- **End box** = space past the finish line:
- The end box and start box are the same size, 18 in (45.7 cm) long and 23 in (58.4 cm) wide.
- **Track** = space between the start box and end box.
- The track is 11' (3.35 m) long.
- **Inside track width** = 23" (58.4 cm).
- **Side rail height** = 2" (5.1 cm) above the track surface.
- **End barrier height** (foam covered) = 6" (15.2 cm) above the track surface.
- **Start gate height** (located on start line) = 6" (15.2 cm) above the track surface.
- **Track A incline** = 1.5" (3.8 cm) track rise starting at the end of the track.
- **Track B hill rise (H)**: see chart in Track B section below





Fabrication Directions:

- See detailed rig drawings in this file for additional measurements.
- Tracks need to be 23 inches wide. Build with cardboard or foamcore wider than 23 inches and use the excess to fold up and make rails. The widely available 20" x 30" size works very well.
- Measure 23 inches in the middle of your cardboard or foamcore to create the track. Mark both sides of the track with a pencil.
- Use your ruler or yardstick to draw two guidelines, one for each side of the track.
- Using the ruler or yardstick as a guide, score your cardboard or foamcore with the box cutter. Don't cut all the way through!
- Fold up the edges into rails.
- If you did cut the pieces off the sides, you can always tape them back on.
- Repeat this process with additional pieces of cardboard or foamcore to create a 14 foot track.
- Cut two additional pieces of cardboard or foamcore to use as the rails at the ends of each track or use a pool noodle.
- Tape everything securely.
- Turn your track over. Teamwork! Don't try to do it yourself or it may twist and come apart.
- Attach the paint sticks or yardsticks to the other side of your track, across the seams between cardboard or foamcore pieces, to reinforce it. This will help it stand up to multiple tests over time.
- Track A — 4 foot slope that is 1.5 inches high at the start then a 10 foot flat track.
- Track B — 5.5 foot flat track, then a hill followed by a flat section. Hill is a 4 foot slope on one side and an 18 inch slope on the other side. Check the rig drawings or rules for the correct hill height for your division. The track ends with 3 ft of flat track.
- Mark the start box and end box with tape or a marker.

Materials and tools:

- Cardboard or foamcore board
- Duct tape or masking tape
- Measuring tape, yardstick or ruler
- Box cutter
- 8 long paint sticks or 4 yardsticks per track
- Materials to build rails - pool noodles or foam core/cardboard work great
- 2x4's, books or t-shirts to create the sloped portion of the track (we used a combo of books and t-shirts)
- For simple home testing any smooth floor will also work.

Masonite is a type of wood that's made by squishing tiny pieces of wood together until they stick and become a flat, strong board. It's kind of like taking a bunch of paper and pressing it down until it turns into one thick piece. People use it to make things like doors or the back of picture frames because it's smooth and easy to work with. We use the smooth side up and the rough side down on the rigs.



Fairfield Nu Foam Batting 27"x 2".
Sold by the yard in 2 foot cuts at
Joann Fabrics



Title The Tech Museum of Innovation			Copyright 2024 / 2025 The Tech Museum of Innovation®
Drawing Number	Drawn By J. Bowen	Date 10/18/24	All of the concepts, designs, and plans represented by this document are the property of The Tech Museum of Innovation and are for use on the project specified in this document. No concepts, designs, or plans shall be used by any person, firm, or corporation for any purpose without the prior written permission of TTM.
Page 2 of 2			