

Rules

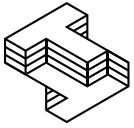
The Tech Challenge 2026: Raise the Roof

Table of Contents		
	Scenario	2
	Teams	2
	Advisers	2
	Construction Site (Test Rig)	3
	Lifting Device	7
	Final Showcase	7
	Team Journal	8
	Team Interview	8
	Device Demonstration	8
	Spirit of the Challenge	9
	Diagrams	10



Important Note About the Rules

Clarifications and additions to the rules may be made. When changes occur, registered teams will be alerted by email. See the website for more information: thetech.org/thetechchallenge/rules



Scenario

The Bay Area is in need of low-cost housing!

This year's challenge is to design a device that easily builds affordable housing for all people. How might you accurately lift housing modules into place?

The Challenge

Design, build, test, and demonstrate an innovative lifting device that transfers housing modules from one place to another at a construction site.



What is modular construction?

For this building method, factories make big pieces of the home in a factory and then assemble them later onsite. These pieces, called modules, can be walls, rooms, or even entire floors. Huge machines lift the modules into place at the construction site.



Teams

1. A Tech Challenge team is a group of at least two but no more than six students.
2. Your team level is set by the highest grade represented in your group.
3. Every team member has a responsibility to follow all safety instructions and use tools with care!



See the [website](#) to print out and post the **Team Safety Rules Poster** and review the **Team Guide**.



Advisers

1. Each team must have an adult adviser.
2. The adviser will encourage your team and help everyone stay safe while you design, build, and test your solution for The Tech Challenge. Note: Team solutions must be completely designed, built, tested, and demonstrated by team members.
3. The adviser cannot be a Tech Challenge judge.



For more information on this role, see the **Adviser Guide** on the [website](#).

Construction Site (Test Rig)

The Tech will provide a Construction Site (test rig) for use during the Test Trials and the Final Showcase.

The Construction Site Includes:

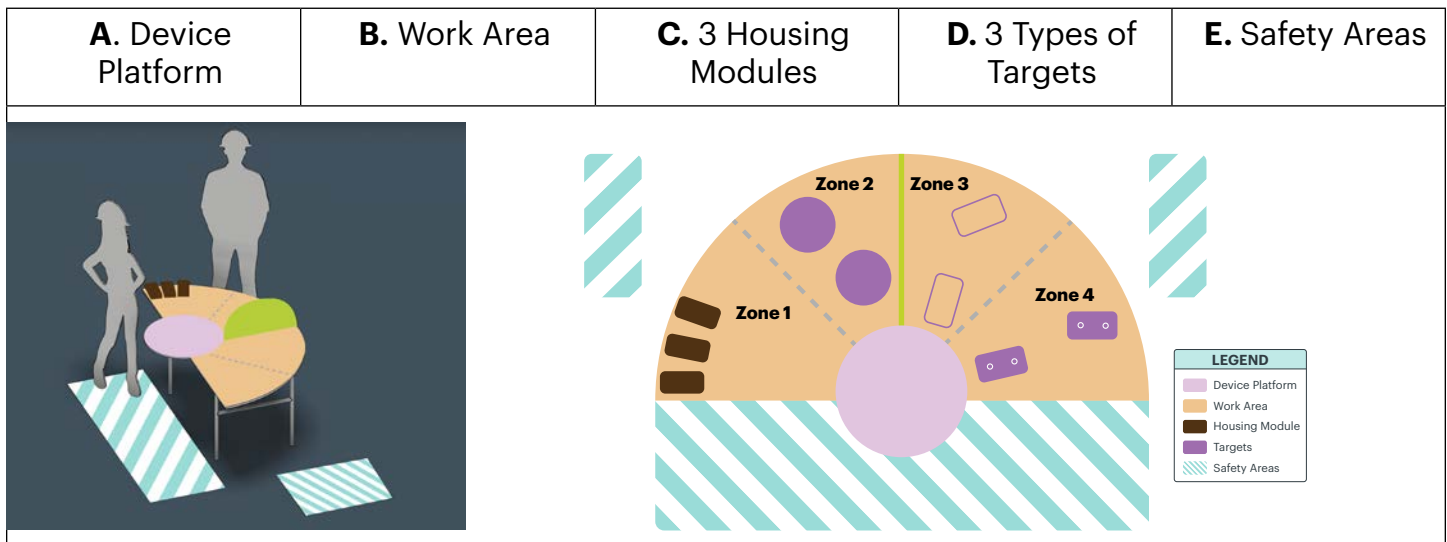


Figure 1: Diagram of Construction Site

At the Test Trials and Showcase, the Construction Site Rig will be 28 inches (71.12 cm) above the floor. Home testing can be done on any table or on the floor.

A. In the middle of the Construction Site, there is a raised circular **Device Platform**.

- It is 4 inches (10.16 cm) above the Work Area.
- And 24 inches (60.96 cm) in diameter.

B. The **Work Area** is a 6-foot-wide half-circle (1.83 m).

- The work area is divided into four equal zones as shown in the diagram.
- There is an obstacle that is a half-circle (12 inch radius by ½ inch thick) (30.48 cm by 1.27 cm) in the middle of the work area (shown in light purple).

C. Three **Housing Modules** are positioned at the edge of the work area. (See the next page for more details).

D. The rig includes six target options (two of each type) which teams will use to show where the three different modules will be set down.

- Target Zones will be drawn on the work area to help with placement.

E. Team safety areas are marked out behind the device platform and around the work area.

See the [Diagrams](#) of the construction site for detailed dimensions.

Housing Module Details

A Housing Module is a piece of a house manufactured in a factory and assembled with other modules at a construction site.

In this challenge, modules are represented by identical seven-inch sections cut from wooden “two by fours” (actual size is 3.5 inches by 1.5 inches) (8.89 cm x 3.81 cm). (See [Diagram of module with dimensions.](#))

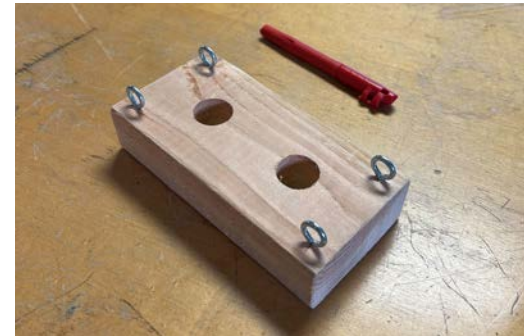

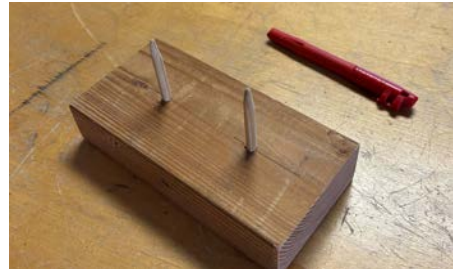


Figure 2: Photo of Sample module

- The module features four 0.5 inch (1.27 cm) “lifting eyes” to make it easier to lift and move.
- The module has two 1 inch (2.54 cm) diameter holes through the middle.
- Each registered team may receive **one sample module** from The Tech for use during brainstorming and home testing. (See the [webpage](#) for details.) Teams may fabricate additional modules if desired.
- Modules will be supplied on test rigs at the Test Trials and the Showcase.

Target Details

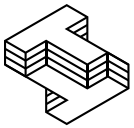
- There are three types of targets.
- Each team is responsible for placing their three targets at the beginning of the timed demonstration. They may place each target anywhere inside its Target Zone (see page 13 for rules on target placement and zones).
- Once the first housing module transfer has begun, targets may not be re-positioned.

LARGE Targets 1 and 2	SMALL Targets 3 and 4	STACK Targets 5 and 6
		
Cardstock circle 10 inches (25.4 cm) in diameter.	Thin piece of cardboard or mat board with a rectangular hole cut in the middle.	Stack targets are the same size as housing modules

- Targets will be supplied on test rigs at the Test Trials and the Showcase.

(See website for details of all target types: [Diagrams of Targets](#) with dimensions.)

Note: Stack targets require teams to place a module more precisely. Each stack target has two pins that align with two holes in the module. The pins help guide the module to the correct position.



Targets by Grade

The goal for each team is to transfer the three housing modules to different locations. Teams have different targets based on their grade level:

Grades 4-5	Grade 6	Grades 7-8	Grades 9-12
Transfer 3 different modules from their starting points to:	Transfer 3 different modules from their starting points to:	Transfer 3 different modules from their starting points to:	Transfer 3 different modules from their starting points to:
Target #1 (Large)	Target #2 (Large)	Target #3 (Small)	Target #4 (Small)
Target #2 (Large)	Target #3 (Small)	Target #4 (Small)	Target #5 (Stack)
Target #3 (Small)	Target #4 (Small)	Target #5 (Stack)	Target #6 (Stack)

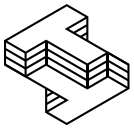
Lifting Device

Each team must design and build its own Lifting Device. It can be anything you can imagine, as long as it meets these criteria and constraints:

Design Criteria and Constraints	Demonstration Criteria and Constraints
<ol style="list-style-type: none"> Operate safely Device Base fits completely on platform “No Touch” controls Built by the team Fits through a doorway 	<ol style="list-style-type: none"> Accurately transfer three modules Complete the challenge (including set-up) in four minutes and 30 seconds. Cause no damage to the rig

Here are additional details:

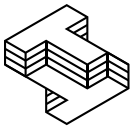
- Safety:** Team members must follow all safety rules. ([Review the detailed Safety Guidelines for Showcase.](#))
 - All team members must be in a safety area while a team member is touching the controls of the device.
 - Judges may stop your device before or during demonstration if they determine it is unsafe to continue.
- Base:** The base of your device needs to fit completely on the Device Platform.
 - Clamps will be available for use at Test Trials and the Final Showcase and can extend beyond the platform.
 - Consider bringing weights or additional clamps if needed to make sure the base does not fall or tip over.



- The base may not be manually repositioned during a transfer.
- No Touch:** The Lifting Device must be operated using indirect methods such as flexible strings or rigging, motor drives, hydraulic tubes, etc.
 - Teams may not move their devices directly with their hands. **Consider the small size of a human next to a large housing module. In the real world you would not be able to pick a house up with a long stick you are holding in your hands.**
 - When a module is lifted off the test rig, it must be lifted vertically. Modules may not be dragged across the surface.
 - **Attach/Detach:** Team members are allowed to attach the lifting device to each module by hand.
 - The module must not be lifted off the table or moved during attachment or detachment.
 - During the transfer process, the module must remain horizontal with the lifting eyes facing up.
 - If a team member needs to leave a safety area to attach or detach a module, team members must not touch the device controls during this time.
 - Built by your team:** Purchased components may be part of your device. Purchased kits are not allowed.
 - Transport:** All materials brought to the Showcase must fit through a standard single doorway. Teams need to be able to move their devices throughout the Showcase area without the assistance of others outside the team.
 - Up to Three Transfers:** The [Targets by Grade diagram](#) shows the specific transfers for each grade level.
 - When modules are set down on a Small or Large target, they must be inside the edge (not resting on it) to count. Similarly, the module must be set down on both pins for a Stack to count.
 - Time:** During the Showcase, teams will have **four minutes and 30 seconds** in total to accomplish up to three transfers. The time includes set-up and re-sets (if any).
 - Damage:** Your device must not damage the test rig. Devices with sharp edges, unstable towers, spillable liquids, etc., will not be allowed on the test rig.
 - Modules must be moved carefully and in a controlled manner; they must not be dropped or thrown.
 - For safety, drones and other flying devices are not permitted.



Tip: Attending a **Test Trial** is a good way to make sure your device meets all the requirements! See the [website](#) for in-person and virtual options.



Final Showcase

This is your team’s chance to share your final design with hundreds of excited parents, industry volunteers, and fellow students. Judges are interested to learn about these aspects of your project:

Team Journal	Team Interview	Device Demonstration
---------------------	-----------------------	-----------------------------



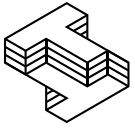
Team Journal

Start the Team Journal when you first begin thinking about the Challenge. Make a journal entry every time something important happens (meeting held, decision made, action taken, etc.). Your completed journal should feature well-organized notes, photos, sketches, and dimensioned drawings.

1. Prior to the Showcase, each team must submit one (only) PDF copy of their Team Journal.
 - It may be typed or handwritten. Legibility and organization are important!
2. During the Showcase, teams are encouraged to bring a hard copy of their journal (or a collection of sketches, dimensioned drawings, photos, calculations, etc.) to share with the Interview Judges.
3. In your journal, you must identify any content that was generated using AI tools.

Before turning in your journal, make sure it covers these topics:

- Team Roles and Goals:** Explain how your team worked together and list the goals you set for yourselves.
- Problem:** Include details on how your device solves the real-world problem.
- Research:** Share important facts you learned while researching the Challenge. List your sources. Include information about what you learned about engineering in the real world.
- Requirements:** Summarize the rules and what your device needs to do to be successful.
- Brainstorming:** Include your brainstorming methods and the ideas that you shared and explored.
 - Evaluation of Brainstorming Ideas:** Explain how you selected the ideas to prototype as a team.
- Device Development:** Share sketches and drawings of devices as they are developed. Be sure to include dimensions, materials, and who worked on them.
 - Multiple Prototypes:** Include all the different device prototypes in your Team Journal. Be sure to note what you changed and how and why the changes worked - or didn't.
- Safety!** Describe the role of your safety manager and share examples of safe procedures you used.



- Testing:** Test everything! Record your results. Consider developing a worksheet or scoresheet to help keep track of testing. Be sure to include all test sessions and the conclusions from them in your Team Journal.
- Failure:** Write stories about the failures that your team experienced along the way and what you did when that happened.
- Final Device:** Identify that best device you designed in your Team Journal and include the reasons why it is the best. Include detailed drawings or photos of the device you will take to the Showcase.
- Final Reflection:** Share insights gained and lessons learned during this project. These may be individual and/or team reflections. Include what you will remember about The Tech Challenge experience.



See the [Team Guide](#) for more information about the journal.



Interview

During the showcase interview, tell our volunteer judges how your team made plans, worked together, and solved problems.

- Every team member should be ready to describe the work they did.
- It is fine if some team members speak a language other than English.
- Please let The Tech know in advance if any special accommodations are needed.

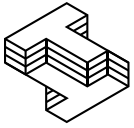


Device Demonstration

When your team demonstrates your device on Showcase Day, keep these requirements in mind:

1. Every team member should have a role in the device demonstration. Be sure all members stay within the designated safety zones adjacent to the test rig.
2. Ideally, your lifting device will be able to complete all of the tasks for your grade level (See the [Targets by Grade diagram](#)).
3. The total time from set-up to completion of the last task your team is able to complete is limited to **four minutes and 30 seconds**.
4. If there is a serious problem during a transfer, teams must re-set.
 - The judges will return the module to its starting position and the transfer must be attempted again.
 - Note that the clock continues to run during this time. Re-sets should be avoided

This is the perfect time for your team to celebrate your success! Whether your final device worked or not, remember that device performance is just one of many things the judges will notice about your team. Every team excels in its own way.



Spirit of the Challenge

A final note... The Tech admires every student who tackles The Tech Challenge. We value your creative thinking and encourage teams to pursue surprising solutions that are better than anything we might imagine.

Remember that this is a challenge, not a competition. Teams work to beat the challenge, not other teams. Work together and keep trying when the going gets tough. Failures are a normal part of the process. Be ready to tell us about your journey, even the times when your team felt like quitting. Your journal, interview, and device demonstration do not need to be perfect to be amazing!



See The Tech Challenge website for additional information including:

- Registration!
- Answers to frequently asked questions (FAQs) which are posted and updated periodically.

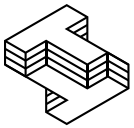
thetech.org/thetechchallenge



Important Note About the Rules

Clarifications and additions to the rules may be made. When changes occur, registered teams will be alerted by email. See the website for more information:

thetech.org/thetechchallenge/rules



Diagrams

Construction Site Test Rig

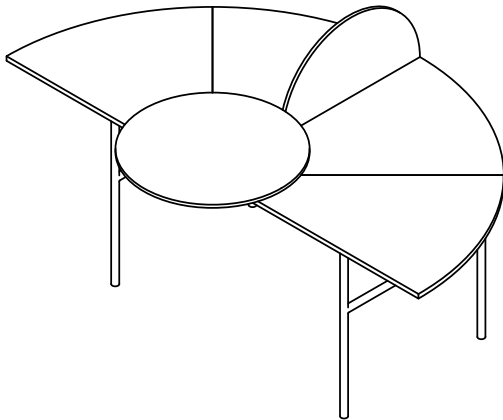


Figure 1: Isometric view of Construction Site Test Rig

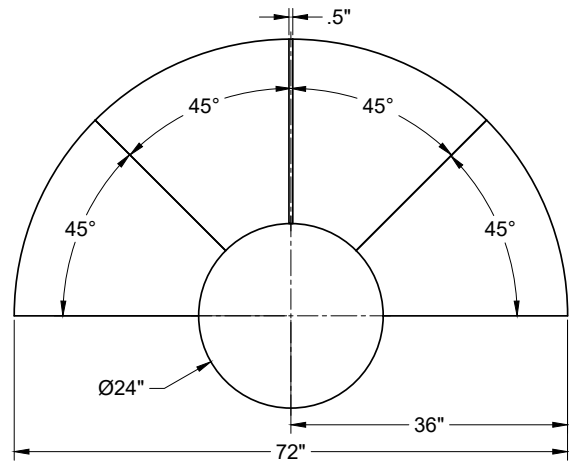


Figure 2: Aerial view of Test Rig

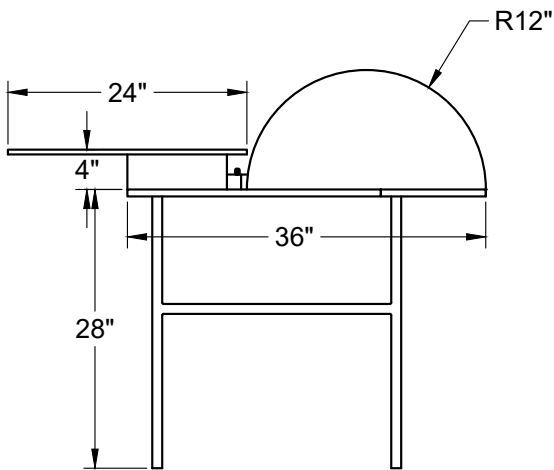


Figure 3: Side view of Test Rig

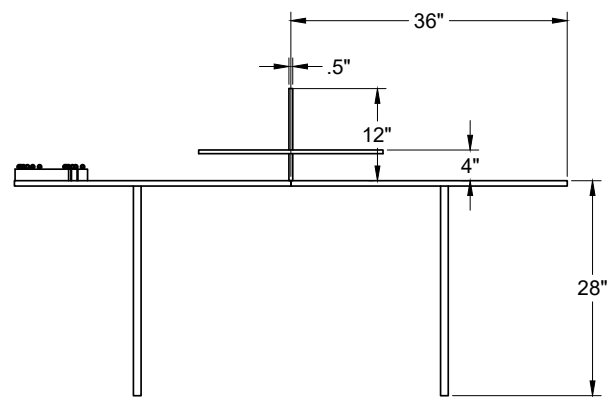
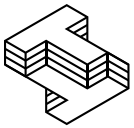


Figure 4: Alternate side view of test rig of Test Rig

Note: There is an allowance of 1/4 inch measurement on all of these dimensions.



Housing Module

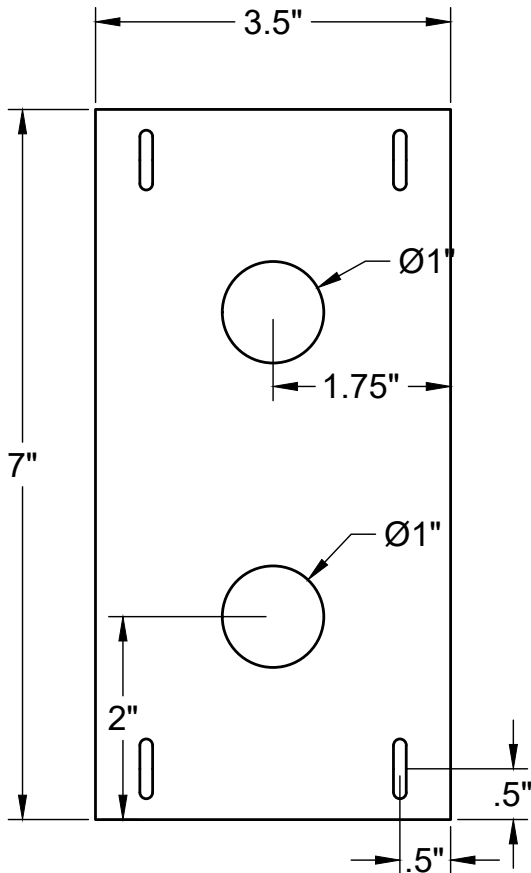


Figure 5: Aerial view of Housing Module

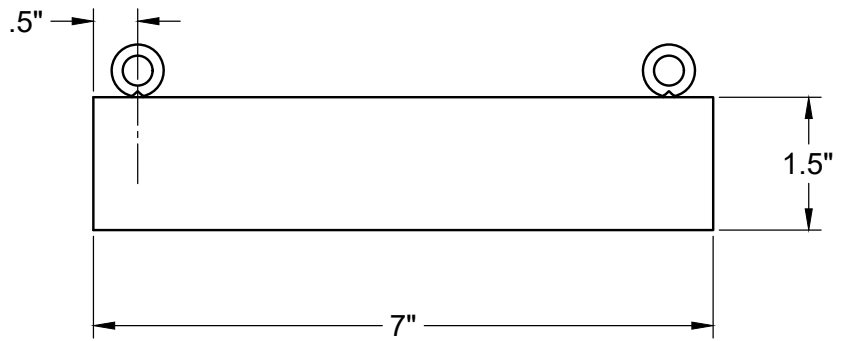


Figure 6: Side view of Housing Module

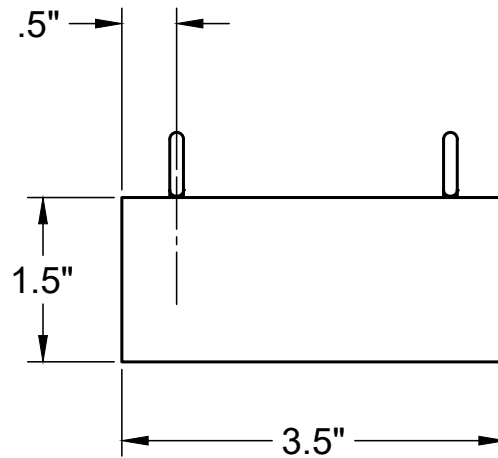


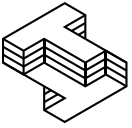
Figure 7: Alternate side view of Housing Module



Screw Eyes

- #10 Everbilt Screw Eyes

Figure 8: Photo of Screw Eyes
Holes for eye-screws are pre-drilled to prevent wood from splitting



Targets

Large Target Dimensions

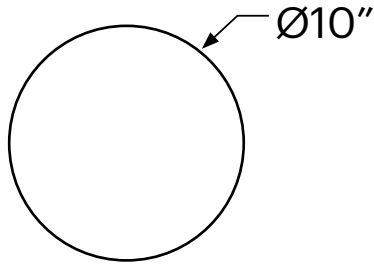


Figure 9: Measurements of Large Target

Small Target Dimensions

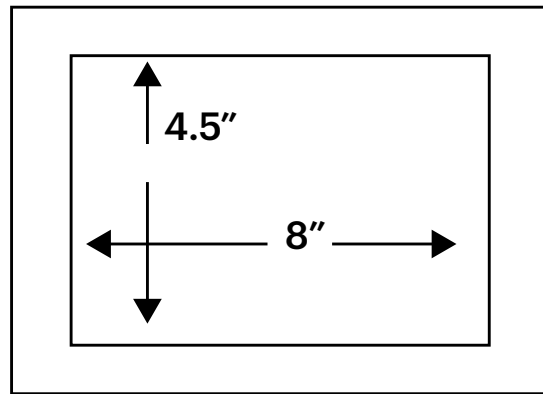


Figure 10: Measurements of Small Target

Stack Target Dimensions

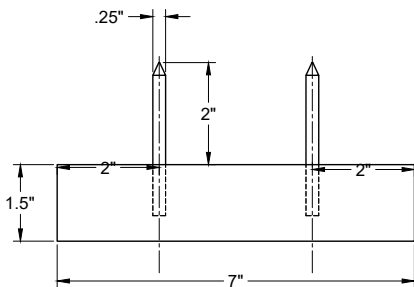


Figure 11: Side view of Stack Target

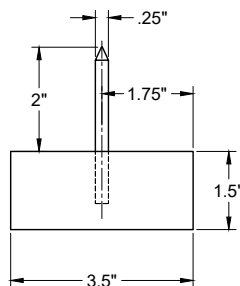


Figure 12: Side view of Stack target

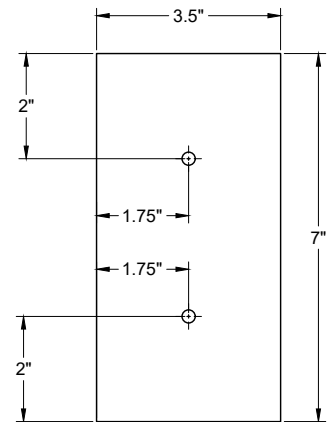
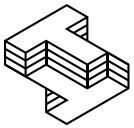
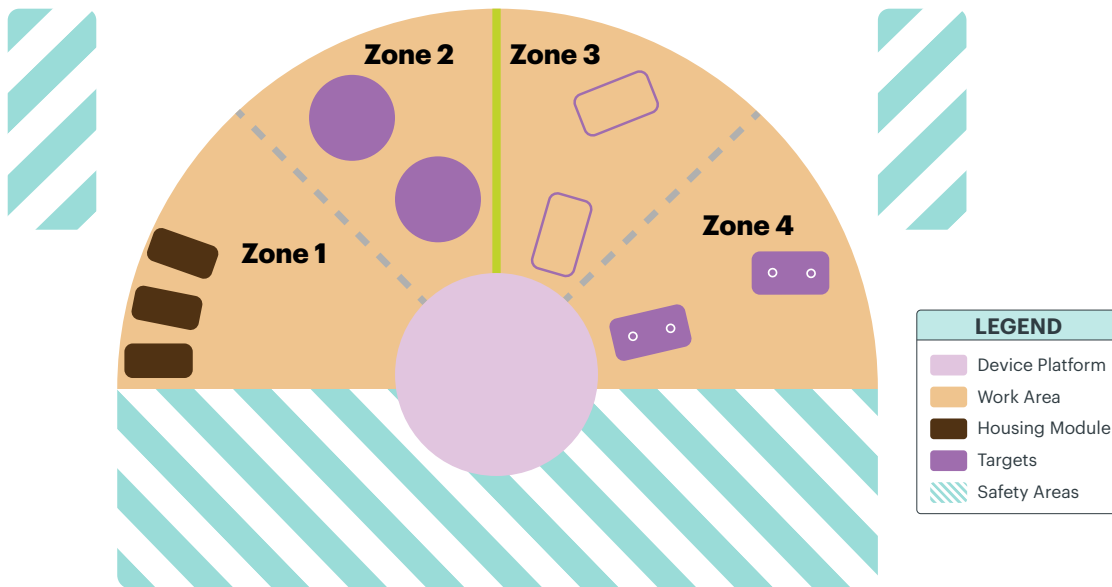


Figure 13: Aerial view of StackTarget



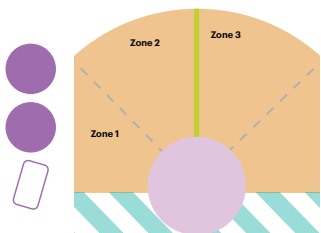
Transfer Goals

- The three housing modules must begin in their designated start positions in Zone 1.
- Teams can place the three targets anywhere they like within the zones for their grade.
- The transfers can be completed in any order.
- **Once the transfers begin, targets may not be re-positioned**



- Large targets should be placed in Zone 2
- Small targets should be placed in Zone 3
- Stack targets should be placed in Zone 4

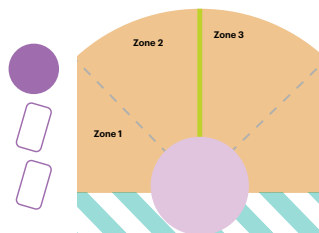
Grades 4-5



Step 1: Place two large targets in Zone 2 and one small target in Zone 3.

Step 2: Move the three housing modules in Zone 1 onto the targets.

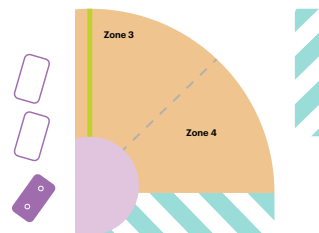
Grades 6



Step 1: Place one large target in Zone 2 and two small target in Zone 3.

Step 2: Move the three housing modules in Zone 1 onto the targets.

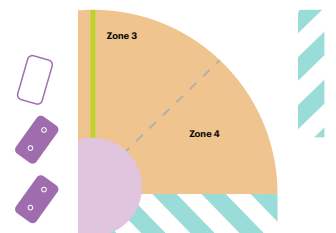
Grades 7-8



Step 1: Place two small targets in Zone 3 and one stack target in Zone 4.

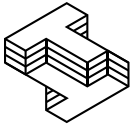
Step 2: Move the three housing modules in Zone 1 onto the targets.

Grades 9-12

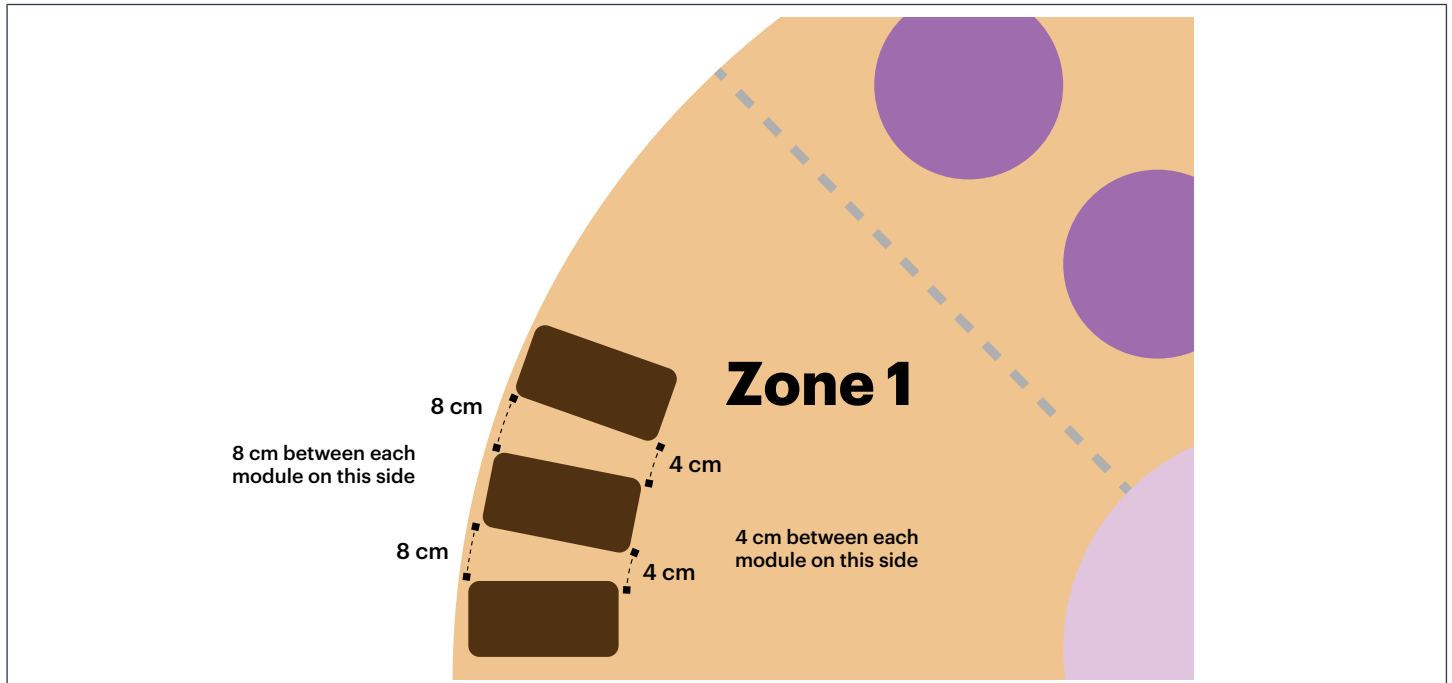


Step 1: Place one small target in Zone 3 and two stack targets in Zone 4.

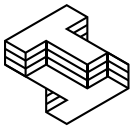
Step 2: Move the three housing modules in Zone 1 onto the targets.



Starting position of the Housing Modules



- The first module is flush with the flat edge of the rig.
- The other modules are distributed radially from the module so that one end aligns with the curve of the rig and the other points to the center of the device platform.
 - Each module is 8 cm apart at the curve, and 4 cm apart on the end closer to the device platform.
- See the diagram above for the detailed placement.



Tips for testing your device

1. Just try it!

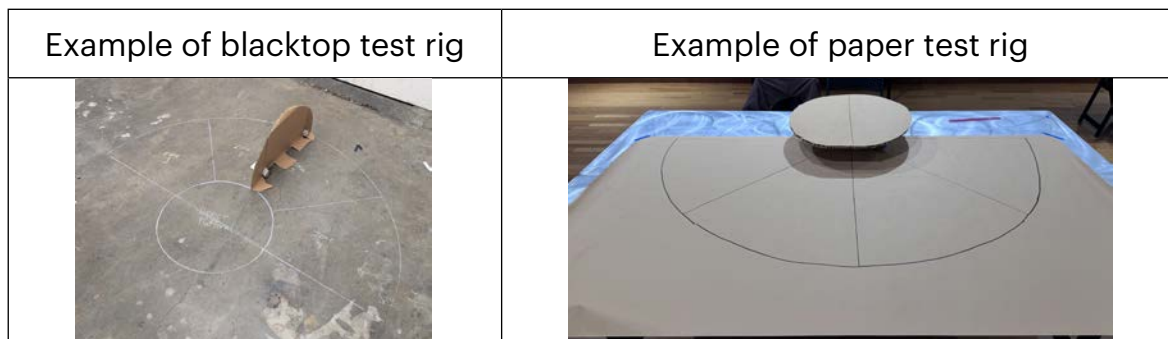
- Test parts of your device as you build.
 - *Do the connections work like you planned them to?*
 - *How much weight can your chosen material hold?*
- See how your device operates without building a full construction site test rig.
 - *Can your device lift a module?*
 - *Can it move a module to a target?*

Remember

Every registered team gets one (1) wooden module for testing at home or at school! See [the website](#) for more details on how to pick up your module.

2. Mock-up a Test Rig

- When you need more detailed measurements to understand how your device works, create a test rig at home or at school.
- Starting with a simple outline of the test area can help you understand where you will place your device and how far it will need to lift the module.



More tips and tricks



Interested in more detailed directions for creating accurate testing conditions with limited materials? [See our website](#) for some photos and videos of strategies we used when building the blacktop and paper test rigs.

3. Test with The Tech!

- When in doubt, come in-person! Test your device on our rigs in-person. Check the website for local [Test Trials events](#) and sign-up to test your device and get feedback from volunteers and professionals.



Tip: If you want support building your own home test rig sign up for one of our [Team and Adviser Challenge Kick-off Events](#).