Educators, do not despair! You can still keep your students engaged during the closure and put your own innovator mindsets to use. Assigning your students design challenges and science projects is a great way to ensure they continue to use their creativity and critical thinking. Even if you have never taught an online class or your students don’t have the internet, these simple tips can help you adapt a STEM challenge to your own situation. For more information on design challenges and facilitation tools visit thetech.org/resources.

**STEP 1:** “Assign” the challenge.
Use the tools and resources you have available to you to share the challenge with your students. Make sure their caregivers receive all necessary information so they can support their children from home. This tip sheet will help them get started.

**Tip:** Add a fun spin to the introduction of the challenge. Share fun photos or videos of your own attempts at the challenge or use an engaging “hook” or story to make it even more relevant to students.

**STEP 2:** Encourage students to use the Innovation Design Process [PDF] [Video].
This means focusing on the process rather than the solution, and giving opportunities to share prototypes and peer feedback even though students are working remotely. Journals of brainstorm notes, build attempts and revisions are great ways to capture the design process as it unfolds.

**STEP 3:** Encourage collaboration.
Despite physical distance, remote learning allows for student collaboration. If they are unable to work with each other, this is a great opportunity for them to work with family members or others in their household.

**STEP 4:** Provide opportunities for authentic sharing and feedback.
Celebrate the accomplishments of your students and give them a chance to share their work with the rest of the class as well as a larger audience. If possible, make space for feedback and sharing of drafts and iterations as well as the final solution.

This might seem daunting, but remember the design process is iterative and all of this is a work in progress. So make sure you celebrate your own small accomplishments and focus on the process rather than the final solution! You’ve got this!

Share what you learn with us using the hashtag #thetechathome!
**STEP 1: Assign STEM Challenge**

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<tr>
<td>Leave caregivers a voicemail or send a text with instructions for a simple design challenge.</td>
<td>Send caregivers an email with the design challenge and directions.</td>
<td>Use your school’s learning management system to communicate daily or weekly challenges.</td>
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<tr>
<td><strong>Idea:</strong> Have a “kit” or packet of projects with some simple design challenges and materials for pick up at the school.</td>
<td><strong>Idea:</strong> Set up a shared documents folder for caregivers/students and post activity ideas and directions.</td>
<td><strong>Idea:</strong> If your school doesn’t have an online course platform but you’re eager to try something out, here are some useful tools: <a href="https://zoom.us">Zoom</a>, <a href="https://www.classdojo.com">Class Dojo</a>, <a href="https://www.seesaw.app">Seesaw</a> and <a href="https://hangouts.google.com">Google Hangouts</a> (users need a Google account).</td>
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**STEP 2: Use Design Process**

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<td>Have students use artifacts and evidence like journals to capture their process. Remind them that you are looking for multiple versions or iterations rather than a final fully functioning solution.</td>
<td>Use shared documents to capture ideas and steps in the process. Have shorter deadlines that encourage students to share drafts or iterations rather than waiting until a final submission.</td>
<td>Encourage revision and iteration. Have students create a “blog” or online journal which includes photos and videos to share their process. More technologically savvy students could even design a team website to share their work.</td>
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<tr>
<td><strong>Idea:</strong> Send prompts to scaffold journaling. Encourage them to reflect on what is working, challenges and next steps as well as real world applications of their ideas.</td>
<td><strong>Idea:</strong> Share different brainstorming techniques with students and have them try them and share their ideas with each other.</td>
<td><strong>Idea:</strong> If students are online at the same time, have them work remotely on pieces of the process at the same time, for example a timed prototyping session where they can share ideas as they work.</td>
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**STEP 3: Encourage Collaboration**

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<td>Caregivers and family members can do the challenge together as a team. Older siblings can help coach and support younger ones.</td>
<td>If students cannot “meet” at the same time, have them share and respond to each other’s ideas in a collaborative space (folder/document).</td>
<td>Have students use the platform and tools to give each other feedback and share ideas. Create smaller teams within a class and encourage students to use shared documents and video conferencing to work together.</td>
</tr>
<tr>
<td><strong>Idea:</strong> Set up a way for students to communicate ideas with each other. A classroom penpal process might be a fun way for them to share ideas and also stay connected.</td>
<td><strong>Idea:</strong> Virtual Telephone: Students take turns uploading ideas to a shared document. The document is passed around so each student has a chance to respond and add ideas. This works for any stage in the process: brainstorming, prototyping, sharing and feedback.</td>
<td><strong>Idea:</strong> Each student builds and tests a certain component separately. They share results and combine ideas for the final device.</td>
</tr>
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See next page for Step 4.
**STEP 4: Sharing and Feedback**

### No Tech

Have students bring evidence of what they did back to school when they return. This can include answering some **Sharing Questions** on paper and the solution itself or a photo of it.

**Idea:** Host a gallery walk so everyone can see solutions and provide positive feedback on each other’s work.

### Some Tech

Set up a social media channel/group or hashtag where parents or students can post and share their results.

**Idea:** Remote conferences: Schedule a phone or video check in with students and parents to find out what they’ve been learning and doing. Encourage students to share and explain their work in their own words.

### All Tech

Have students share their ideas on a digital platform. They should both share and comment on another person’s ideas. This is a great opportunity to teach positive social media interaction.

**Idea:** Find an authentic external audience for student work. For example, set up a video conference or letter writing project with a community stakeholder.

### Activity Spotlight

We’ve customized a few activities for families to facilitate easily **at home**. These STEM resources are ready to assign to students and use materials that can be found around the house. For deeper learning, add in reflections that connect the activities to your curriculum, concepts and vocabulary.

**Design a DIY inflatable!**

**The Tech Interactive at Home**

**DIY Inflatables**

**Who says all the fun has to happen at The Tech Interactive?**

This DIY engineering activity can be done with inexpensive store-bought supplies and things you find around the house!

**What are inflatables?**

One way stones move in nature is by water. When a river or stream flows over stones, the water spreads out and carries the stones over distances. This helps break down large rocks into smaller ones. Inflatable tubes are made to mimic the natural process of water movement.

**Materials**

- Large rubber bands
- Two small plastic cups
- Two large plastic cups

**Supplies**

- Two large rubber bands
- Two plastic cups
- Spout of water

**Instructions**

1. Set up the cups and rubber bands as shown in the image.
2. Fill one of the cups with water and block the spout of water with the rubber bands.
3. Observe how the rubber bands move as the water level rises and falls.

**Subject:** Design Thinking

**Age:** 3-12

**Objectives:**

- **Design:** Planning and problem-solving strategies
- **Engineering:** Understanding the properties of materials

**Create a wind-powered vehicle!**

**The Cupcake Delivery Design Challenge**

**Who says all the fun has to happen at The Tech Interactive?**

This DIY engineering activity can be done with inexpensive store-bought supplies and things you find around the house!

**Introducing cupcake flaws:**

We’ll use cupcake flaws to create and turn them into a project that is a perfect way to teach kids about recycling. This cupcake design challenge is a fantastic way to inspire kids to think big and big.

**Materials**

- Cupcake flaws
- White chocolate
- Red frosting
- Yellow frosting

**Supplies**

- Cupcake flaws
- White chocolate
- Red and yellow frosting

**Instructions**

1. Take the cupcake flaws and place them on a cookie sheet.
2. Melt the white chocolate and pour it over the cupcake flaws.
3. Chill the chocolate until it is firm enough to cut into shapes.
4. Using the red and yellow frosting, create designs on the cupcake flaws.

**Subject:** Engineering design challenge

**Age:** 3-12

**Key concepts:**

- **Engineering:** Understanding the properties of materials
- **Design:** Planning and problem-solving strategies
- **Math:** Understanding fractions

**Make your own zipline!**

**The Tech Interactive at Home**

**Zipline**

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**Grow a custom biomaterial!**

**The Tech Interactive at Home**

**Making with Microbes**

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**Subject:** Science

**Age:** 3-12

**Key concepts:**

- **Science:** Understanding the properties of materials
- **Design:** Planning and problem-solving strategies
- **Math:** Understanding fractions

**Design your own roller coaster!**

**The Tech Interactive at Home**

**Roller Coasters**

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