Designing a Design Challenge Template

1 Developing your Design Problem

Reflect on your learners and setting.

<table>
<thead>
<tr>
<th>Learners</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Areas of strength</td>
<td>• Learning goals and standards</td>
</tr>
<tr>
<td>• Areas of interest</td>
<td>• Additional program/organizational goals</td>
</tr>
<tr>
<td>• Areas for growth</td>
<td>• Allotted time</td>
</tr>
<tr>
<td></td>
<td>• Opportunities for connecting to curriculum or current projects</td>
</tr>
<tr>
<td></td>
<td>• Constraints</td>
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Brainstorm what will influence your design challenge and develop your design problem statement.

What **learning goals or standards** do I need to address?

What **REAL-WORLD problem** do I want learners to think about?

Is there a specific **DESIGN product** I want them to create?

Draft your design problem statement
Draft Criteria, Constraints and Testing Methods

Criteria (determines success of the design, ex: holds 3 passengers)

Constraints (design limitations, ex: can only be 3 inches tall)

Testing methods
Where and how will students test their solutions?

What data or feedback will students collect? When and how will students collect it?

Do you need to build a ‘test rig’? Or develop a mechanism for getting students feedback? If so, plan them here.

Materials for Engineering Design Challenge (What categories of materials and specific items will learners need?)

<table>
<thead>
<tr>
<th>Category</th>
<th>List items per category</th>
</tr>
</thead>
</table>
### Materials management strategies

<table>
<thead>
<tr>
<th>Materials storage</th>
<th>How are students accessing materials?</th>
<th>Clean-up strategy</th>
</tr>
</thead>
<tbody>
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### Resource type

<table>
<thead>
<tr>
<th>Resource type</th>
<th>Details</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expert guests</td>
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</tbody>
</table>
3 Test your Design Challenge and Iterate

Test that:
- The design problem is clear.
- Materials allow for multiple ways to solve the problem.
- Materials provide an appropriate level of difficulty for the participants.
- Testing procedure generates useful data for iteration.
- Testing procedure is accessible for all participants.

Take note of:
- Length of time it takes to build and test. (This will help inform your lesson flow.)
- Is your test group engaged?
- What questions arise as people do the challenge?

Testing notes:

Revise
Check back on your initial thoughts on the goals for your learners and setting.

Are you meeting those goals?

Do you need to adjust any aspects of your challenge?
4 Create your Lesson Flow

Use your own planning tools to draft a lesson. Try to include:

- Introduce the Challenge
  - Frame
  - Define the Problem
  - Criteria and Constraints
- Brainstorming
- Prototyping: Create, Test and Reflect (timing and structure for building, testing and iterating)
- Sharing Solutions (timing and format for sharing design products and process)
- Assessment

Consider student group size and processes. Recommendations: Groups of 2-4 students for engineering challenges and 4-6 students for systems challenges.

For sample design challenges and problems see the following lessons:

- [Solve the Fall](#) - Engineering Design Challenge
- [Vaccine Distribution Challenge](#) - Systems Design Challenge

5 Do the Challenge!

Record how it went! What went well? What would you adjust?

Share out

Share your process and successes with others in person or via social media.