Stable Table Activity

Preparation: 5 minutes
Duration: 60 minutes

Context and background

In this workshop activity, the participants undertake a short challenge: they make a structure that can hold a tray with drinks. They discover that when undertaking this challenge or solving other problems, it is very natural to use some form of design cycle. While most people instinctively use a design cycle, most of the time they are unaware of this. This activity is used to introduce the engineering design process and allow people to experience it for real.

Objectives, the participants will:

- succeed or fail in undertaking this challenge;
- find out that the design process is instinctive and used frequently in daily life;
- learn the different steps of the design process.

Preparation

1. Organise the materials so that you can distribute them easily.

Resources

- ☐ 12 newspapers (one for each group)
- ☐ tape
- ☐ tray with two drinks (for example, two coffees) and a plate of cookies
- ☐ six pairs of scissors
- ☐ hairdryer (optional)
- ☐ six rulers
- ☐ large illustration of the design process (on a PowerPoint slide or poster)
- ☐ flip chart with markers

Tip – You can give the groups a maximum length of tape; for example, 15 cm.

Tip – To make it even more challenging, you can use a hairdryer to test whether the structures are stable.

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Introductory activity – the challenge – whole group discussion

Imagine that you're relaxing in a designer lounge chair. It's lovely weather, and you're enjoying your book and a nice drink! But when you want to place your drink on the ground, you find you can't reach it. Clearly, the designer chair has not been designed well.

- How might you solve this problem? Let the participants respond.
- The challenge is to build a structure that can hold a tray with two cups of coffee and a plate of cookies.

Tip – To give the participants ownership, decide together what should constitute a successful challenge; for example, how high the structure should be.

Ask, imagine, plan and create – whole group discussion/in groups

Do the following in the group as a whole:

- What do you need to know? Ask the participants and write the questions on a flip chart.
- Are there any further questions? Answer participants' questions about criteria and restrictions.
- Explain how the structure will be evaluated. It will be successful when the cups can hold their contents and the structure has a minimum height of 30 cm. Will the hairdryer be used?
- Make sure all of the groups know which materials they can use and how much time they have.

Do the following in groups:

- The groups have 15 minutes to create their table.
- While the participants are building, walk between the groups, observe, and ask what they are doing and why.
- Warn the participants when they have five minutes left.
- After 15 minutes, the participants should stop building.
- Evaluate each structure. Get all of the participants to gather round a structure, and ask what this group has done and why. Test the structure. What would they have done differently if they could repeat the challenge? Do this for all of the structures.

Conclusion and reflection – whole group discussion

The participants can return to their seats.

- Thinking about the process, what have you done? Each group discusses this and writes down, in five or six action words, which actions they undertook to complete the challenge.
- Once all of the groups have done this, ask them which words they have written down and write them on a flip chart. Rather than writing them in one long list, try to group similar words. For example, put 'brainstorm' and 'think' in the same group; the same goes for 'build' and 'make'.
- Once all the words are on the flip chart, link the groups of words to the design process. Go through every step of this cycle. Explain that they all undertook the challenge in a form of design process. Perhaps the order was slightly different or some steps were merged, but this doesn't matter. Also tell the participants that most people – especially pupils – need additional structure and help during the 'ask' and 'plan' steps.

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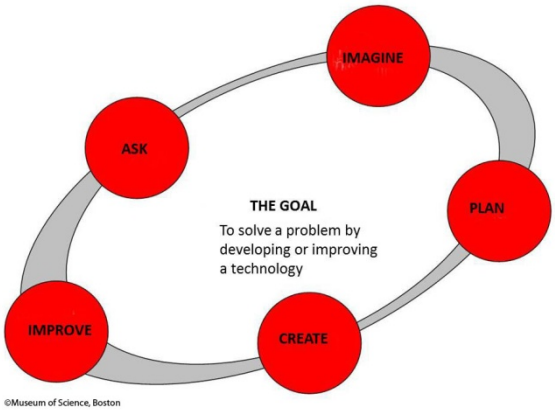

Design process	Description of the step
Ask	What is the problem? What kind of science do we need? What are the restrictions (materials, time, cost)?
Imagine	What might the solution be? Brainstorm ideas. Choose the best one.
Plan	Draw a diagram. Make a list of materials you'll need.
Create	Follow your plan and create it. Test it out!
Improve	Make your design even better. Test it out!

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