

Balancing Bridges

STEM Activity guide

E: careers@ice.org.uk W: ice.org.uk/wice

Aim

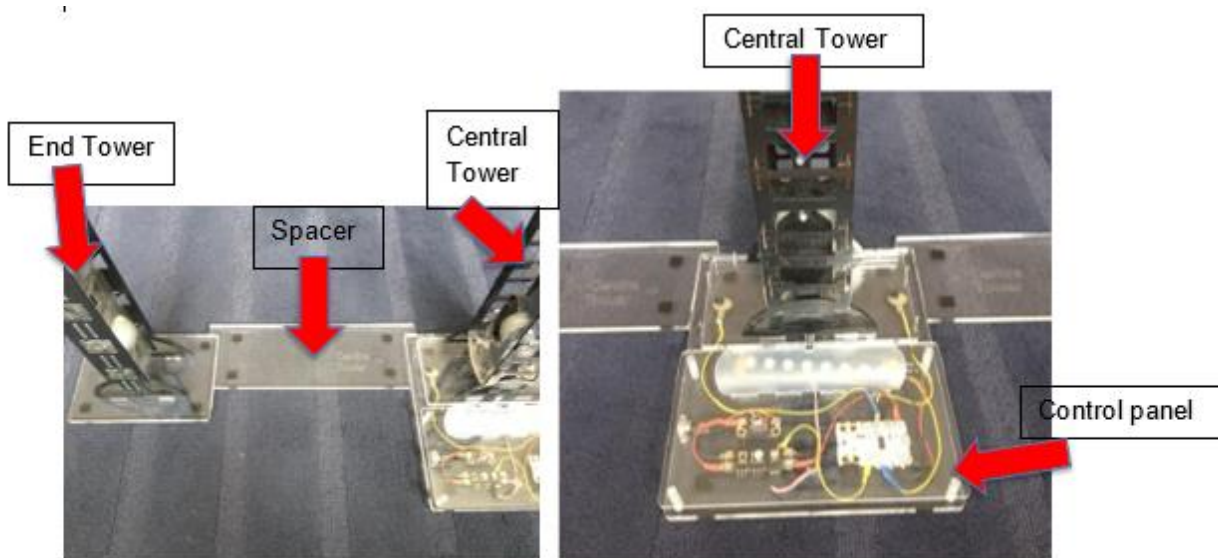
This activity is intended for use as a drop-in engagement at careers conventions. It shows how civil engineers have to balance forces during the construction of a bridge like the Queensferry crossing (which is a cable stayed bridge). It also teaches participants how good communication is vital to civil engineers working in teams.

Setup

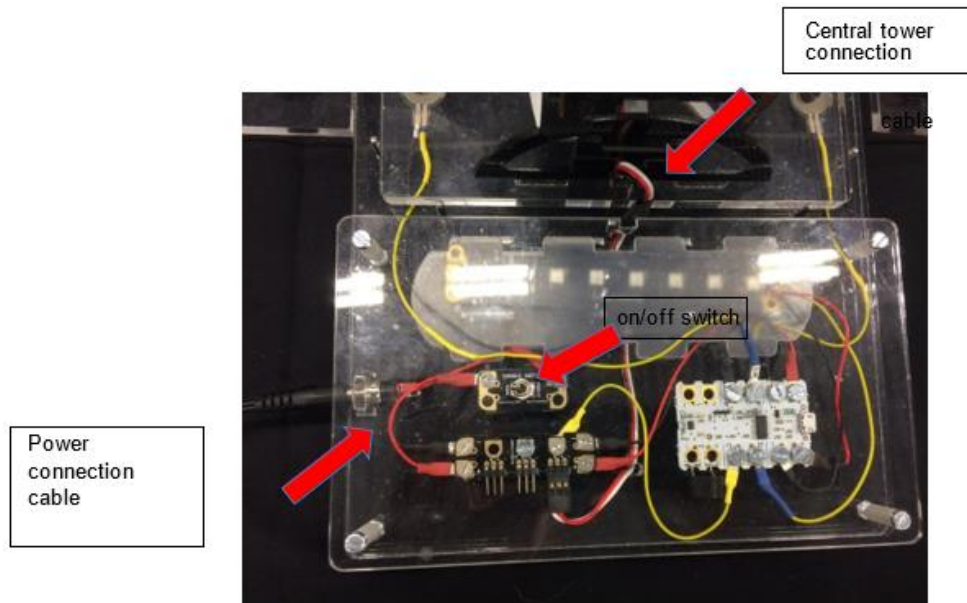
Unpack the box carefully. There should be:

- 1 x central tower with connecting lead
- 2 x end towers
- 2 x clear Perspex spacing panels
- 1 control panel
- 1 x set of magnetic connecting struts and balls

Arrange the towers and spacing panels as below:



The control panel requires to be connected to a power source and also to the central tower as shown below:-



Setup the bridge towers and spacers away from the edge of the table but still accessible by your audience (who may be smaller than you). Arrange the magnetic struts and connecting balls where the participants can reach them.

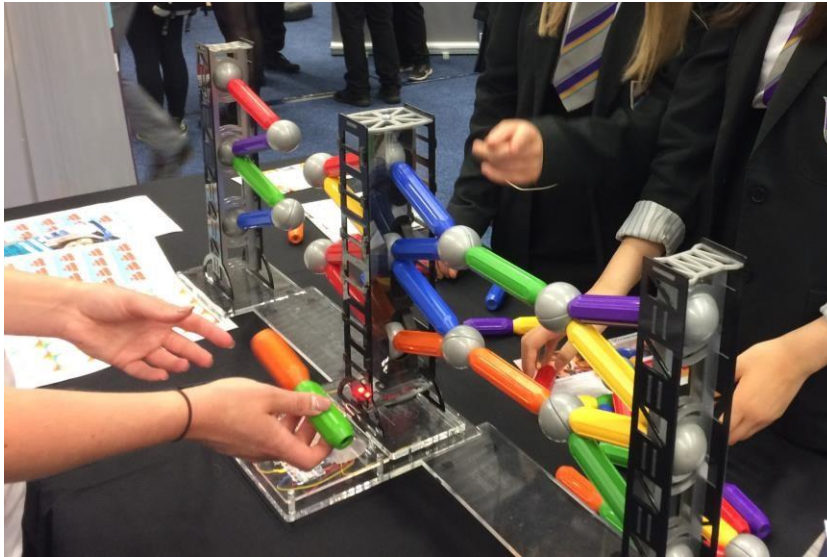
Running the activity

Explain to the participants that their challenge is to build a bridge starting at the middle tower and working out towards the two outside towers. Explain to them that they must keep both sides of the bridge perfectly balanced or disaster will strike!

You can demonstrate what will happen if they don't keep it balanced by attaching magnetic struts to one side of the main tower causing the balance sensor to trigger the light and sound alarms and the motor to collapse the construction.

If they are struggling, you can give them a clue about a pattern of construction for the struts framework.

Discuss the importance of communication with the participants. They need to work together to make sure that they are putting the same segments on each side of the central tower to keep it balanced. Explain that although civil engineers need to be technically competent, that's not enough as they also have to be really good communicators.



Reset the activity by pulling off the struts ready for the next group.

At the end of the session, carefully repack the box following the instructions contained within it. Failure to do so may damage the activity.

Borrowing the Balancing Bridges kit

If you want to borrow the Balancing Bridges kit please contact us at careers@ice.org.uk

You will need to commit to return the kit safely back to ICE following your event.