

Teachers Guide

This CREST-accredited project can be put towards achieving a CREST Bronze Award



Background

How we design our civic architecture says a lot about us as a society. When travelling to a new town or city railway stations are the first places we see when we arrive and the last places we see when we leave, so they contribute greatly to our first impressions and lasting memories of a place.

As architectural statements railway stations offer a town or city the opportunity to show its aspirations, but these are often visions born in the past. Major city-centre stations can take decades in the planning and are engineered to have a lifespan of over a century. The Architects, Civil Engineers and Customer Experience Designers must work carefully to ensure that the finished project meets the needs of station customers, not just when the station opens but into the distant future.

This project encourages students to think about the future and how transportation and civic architecture plans can reflect our future visions for society. Students will have to think like real-life Architects, Civil Engineers and Customer Experience Designers and create a proposal that will meet the needs of local people, enhance their local area and stand the test of time.

Overview

In this project students will use their 'design and make' skills to design a futuristic railway station for their local area, to be opened in the year 2050. Students will choose the site where their station will be built, and research the needs of local people to inform their design thinking. They should also consider the context of the site and aim to create a station with minimal natural and historical environmental impacts.

If there is already a local train station students can take the opportunity to redesign it, taking into account the positive and negative design aspects of the old station.

Students should use the HS2 Design Vision to guide their thinking. We have shown how this can be applied to station design in the Student Handout Sheet 1. Student Handout Sheet 2 features an interview with a Customer Experience Designer to inspire students' design thinking. Student Handout Sheet 3 includes an example customer satisfaction survey for students to use or adapt.

This activity has been designed for student to work in teams of two to four students. Students may choose to work on their own, however they will not have the opportunity to use the essential skill of teamwork (see below).

Learning Objectives

Students will learn to:

- Use research and investigation to understand user needs;
- Develop and communicate design ideas using annotated sketches, detailed plans, digital presentations and computer-based tools.
- Reflect on their learning.

STATIONS OF THE FUTURE (DESIGN & MAKE PROJECT)

Essential Skills

This project incorporates the Skills Builder Framework for Essential Skills. Students will have the opportunity to use their essential skills of creativity, teamwork and speaking. See the Skills Builder Framework for Essential Skills for more information at <https://www.skillsbuilder.org/>.

Project Outcome

Students should produce three separate elements for the project outcome: a presentation drawing showing the floor plan of their station, a 3D model showing how the station will look when built and a digital presentation slide-deck explaining their design decisions. At the end of the project students should present their design to a group of local people; this could be a group of their peers, senior leaders of the school or in another setting, for example at an open evening.

The 3D model can be a practical model made with modelling materials, or a digital model made using computer-aided design (CAD). Students should take care to communicate their idea clearly and realistically, along with how their research informed their design thinking.

We have included suggested modelling materials below.

Assessing the Project

Stations of the Future can be put towards achieving a CREST Bronze Award. Students' project work should be accompanied by a CREST Student Profile (<https://secondarylibrary.crestawards.org/crest-student-profile-form/62632654>). Work should be assessed using the CREST Bronze criteria guidance (<https://help.crestawards.org/portal/en/kb/articles/criteria-for-bronze-silver-and-gold-crest-awards>). See the CREST website (<https://help.crestawards.org/portal/en/kb/articles/how-do-i-assess-a-bronze-project>) for more details on how assessment should be completed and submitted.

Supporting your students to complete their project

CREST Bronze Awards are student-led and should be completed over ten hours of student work. Your role as teacher or mentor is to:

- Encourage and nurture students ideas, and support them in developing them;
- Provide students with a range of materials and tools to create their model and presentation drawing;
- Provide students with an area to do their practical work and store their practical model;
- Encourage students' resilience and perseverance in the face of mistakes and setbacks;
- Provide access to useful and relevant learning resources;
- Support students to access professionals or experts who could support them;
- Help students to assess risk and to be responsible for the safety of the students as they complete the project. You could consult with CLEAPSS to help with this;
- Support students in developing their essential skills across the project;
- Support students in seeing the careers links between what they are doing and the work of real life professionals; Handout 2: Customer Experience Design has been designed to provide a careers link to the project;
- Provide a CREST Student Profile Sheet, Student Brief and Handout sheets;
- Support students to reflect on their learning.

STATIONS OF THE FUTURE (DESIGN & MAKE PROJECT)

As a further note, the most difficult part of this activity for some students will be actualising their design idea as a 3D model. Much of this success will depend upon which materials you provide them with and which they choose to work with. We recommend the following materials:

- Mixed coloured paper and card
- Thin, clear plastic such as acetate projector slides
- Junk modelling materials such as egg boxes, cardboard, plastic trays, small boxes and card tubes
- Mixed fasteners such as drawing pins, split pins, paper clips, staplers
- Pipe cleaners
- Wire
- Modelling straws, plain or coloured
- Lolly sticks
- Dowel rods
- Coloured modelling matchsticks
- Glue sticks
- PVA Glue
- Adhesive tape
- Masking tape

Students may also wish to use digital manufacturing techniques such as laser cutting and 3D printing to create design elements.

Success at modelling will depend on the students' ability to repurpose materials and work neatly with joining techniques. Encourage your students to treat their model with care as they are building it, and to try out techniques before applying to the model. For this reason the use of paint is not recommended, as a good model can easily be ruined by messy paint work during its final stages.

You could also inspire the students with this video of a station model made by a group of students from Northampton https://www.youtube.com/watch?time_continue=1&v=JdyLE-yznqU&feature=emb_logo&ab_channel=HS2Ltd.

An important area where you should support the students is by rewarding project completion. Like at the end of any big project, make sure that the students are properly rewarded with a letter home or other appropriate reward along with the presentation of their certificates. Recognition at this point is very important, especially if you want the students to progress onwards to a silver or gold award.

Health and safety

- Students should be encouraged to make their own risk assessment before they carry out any activity, including surveys. They can use the CLEAPSS student safety sheets to help them science.cleapss.org.uk/Resources/Student-Safety-Sheets/
- They should write out their project plan, identifying the risks involved in each stage and the control measures and precautions they will take.
- In all circumstances this must be checked by a competent person.
- Students using specialised equipment should be supervised at all times. Students may want to set up unorthodox experiments and you may need to seek specialist advice. Contact CLEAPSS directly cleapss.org.uk for advice if you are unsure. Teachers in Scotland should refer to SSERC sserc.org.uk.

STATIONS OF THE FUTURE (DESIGN & MAKE PROJECT)

Prompts

Use these questions to prompt your students thinking.

- How will you make sure that your station works for all customers?
- How will you make sure that your station is sustainable?
- How will your research inform your design thinking?
- How will your design meet the core values of people, place and time?
- How will your station celebrate the identity of its local area?
- How will your station improve the local area?
- What shops and restaurants will your station include?
- How can you design your station to meet your customers' religious needs?
- How will people with mobility impairment access all areas of your station?
- What will the interior of the station look like?
- What will it feel like to be in your station?
- How will people find their way around your station?
- How could your station use less energy?
- How could your station generate its own electricity?
- How will people get to and from your station?