

## Introduction

This document tells you what's involved in this fascinating Challenge, helps you get started, and also tells you where to go for advice and support. The most important thing about this Challenge is that it's a Challenge for the students, not the teacher. We've given you as much information as we can to help you, but if you or your students get stuck either talk to the company you're working with, or you can also get advice from:

- Your Regional CITB Strategic Partnership Adviser. To find out your nearest Adviser please email [local.strategy@citb.co.uk](mailto:local.strategy@citb.co.uk)
- Your local Education Business Partnership (EBP), if there is one in your area
- Your CREST Local Co-ordinator see [www.britishscienceassociation.org/crestcontacts](http://www.britishscienceassociation.org/crestcontacts)

In the first instance it is probably easier for you to go through the CITB link.

## How the Challenge Works

The Sustainable Communities CREST Challenge is designed so that your students have the opportunity to demonstrate the skills and aptitudes we look for in the CREST Bronze Award. You can find a list of these in Appendix One.

The CREST Bronze Award requires students to complete a minimum of ten hours of work on a single project. The Award allows students to gain work related learning in addition to Science, Technology, Engineering & Maths (STEM) learning. This CREST Award has been designed for students either:

- Aged 11 – 14 studying KS3 programmes of study OR
- Students aged 14 -19 studying a Level 1 or 2 qualification

UCAS recommend that university applicants highlight their CREST award in personal statements.

CREST Bronze requires the students to do the work, with support from a teacher, and sometimes a mentor. In this case, you and the students will have some support from the construction company you visit, and hopefully that company and its staff will provide further support throughout the project.

At the end of the project, your students will produce a proposal for their development, as a team, and then an individual reflective report, which will tell us what they think they learned, and each individual's role in the team. Guidance on this is included later.

The Challenge has a number of phases:

1. Site visit and Challenge briefing
2. Project planning
3. Research
4. Designing the development
5. Producing the proposal
6. Completing reflective reports



These are designed to give a loose framework in which students make the decisions and plan their work, but you have sufficient information to have the right resources to hand throughout.

Below, we advise you on how to get started, and then go through each phase of the project to provide advice.

### **Getting Started**

There are three things you need to deliver this Challenge:

- A company to work with
- Sufficient time to deliver the Challenge for you and the students (it requires 10 hours of student work including the site visit, and you'll need some additional time for planning)
- A group of students who will complete the Challenge, aged 11-19 with the ability to tackle the project.

You won't need any special equipment for the Challenge, just space for the students to work, access to computers for most of the sessions (or all sessions if possible) and plenty of paper. It is best if you can tell students when they'll have computer access at the beginning as this helps their planning.

### **Finding a Company**

If you are interested in this Challenge and need help then to identify a company, we suggest you talk to your local CITB Strategic Partnership Adviser (SPA). They will be able to locate a willing company.

Before you start the Challenge, we suggest you have a meeting with the company to discuss the site visit, and the support they may be able to provide during the Challenge. If you have a work-related learning or enterprise co-ordinator in school, it may be worth involving them in that discussion.

### **Allocating Time**

The Bronze CREST Award requires 10 hours of work to complete.

We don't stipulate how the time for the Challenge is split up, as this will in most cases depend on your school's timetables, and your view of how long each task will take your students. However, we've given two examples below of how the Challenge could be broken down. The first session (the site visit) is not really divisible, so we've left this as an intact entity in both cases.



**Based on two hour slots after the site visit:**

| Session | Content   |
|---------|---|
| 1       | Site visit to sustainable housing development and/or sustainable building. Must include: experience of sustainable building techniques and/or adaptations and seeing a housing development, or an in-school talk from a construction company about how developments are planned. Ends with issue of Challenge and selection of company names. |
| 2       | Plan project. Research into types of housing on new developments in the area, based on development plans and house types. Also research sustainable technologies (team decides division of labour).   |
| 3       | Begin work on site plan – based on area of land, types of housing on nearby developments, sustainable technologies to use. Develop spec and physical plan.  |
| 4       | When do tasks need to be planned in? (Constrained Critical Path Analysis) Complete work on site plan.   |
| 5       | Production of proposal and reflective reports.  |

**Based on one-hour slots after the site visit:**

| Session | Content  |
|---------|--|
| 1       | Site visit – as above  |
| 2       | Plan project. Research types of housing on new developments in the area, based on development plans and house types      |
| 3       | Research into sustainable technologies   |
| 4       | Work on what should be placed on the site – identify types and number of dwellings, sustainable technologies to use etc. |
| 5       | Develop site plan  |
| 6       | Review and complete site plan, while beginning critical path analysis  |
| 7       | Complete critical path analysis  |
| 8       | Final tasks, begin proposal and reflective reports   |
| 9       | Complete all work  |

In our experience, the key to success is giving students a clear, up-front schedule of when they can work on their projects, and ensuring that during each session each team spends 5-10 minutes bringing together all of their tasks.

The activities which form the Challenge can be organised in several ways, as you wish, but we require the site visit to be at the beginning, as it forms part of the students' research and will have less impact if it happens later in the Challenge. You therefore need to schedule the site visit in parallel with scheduling the other sessions, so the students can start work on the Challenge shortly after the site visit.

### Selecting the Students

As the Challenge should include a site visit to a construction site, and is conducted in small teams, the maximum total group size will be determined by the company partner and how many students per visit and how many visits they can host. We suggest a team size of four or five students. To make the Challenge as fair as possible, we suggest each team contains the same number of students.

In each team, we expect each team member to take a defined role, based on the tasks they will perform. The idea of CREST is to let the students do the work, so we ask that you allow them to try to develop team roles for themselves, and provide assistance if they request it. Identifying team roles should be one of the things they look for on the site visit. The company will have been briefed to have relevant staff around on the site for the students to talk to them about their roles.



### Registering for your CREST Awards

Before your students start work on the Challenge, please register them with your CREST Local Co-ordinator. Their contact details can be found by following the link in the Introduction to this document. All CREST Local Co-ordinators have received guidance about this Challenge, and are aware of what is required.

### Site Visit

Once you have allocated time, and agreed with the company when the site visit will take place, you will need to support the company in planning for the visit, so your students get the greatest benefit from it. We suggest you read the 'Employer Site Visit Brief' before you meet the company as this tells the company what they need to do during the site visit.

Any personal protective equipment required for the visit should be provided by the company, and you should receive a full risk assessment in advance of the visit. You must then use this to create a risk assessment which is appropriate to your students, and taking them to a construction site.

**It remains your responsibility at all times to ensure the health, safety and welfare of your students. You must review the company risk assessment and ensure it meets the standards required by your school and / or local authority, adapt it to take into account the risks you perceive of taking a group of students on site, and put in place the required measures to safeguard your students against the risks of visiting the site.**

Before your students arrive at the site, it is crucial that you ensure your students will:

- Pay attention to any safety briefings – the stakes on a construction site can be very high
- Follow safety instructions, including wearing personal protective equipment
- Follow any instructions from the site representatives
- Maintain a level of courtesy and behaviour which can be expected by a company giving its time without charge

At the end or start of the visit, the company's personnel will deliver the presentation which sets the Challenge for the students. Please discuss with the employer when you think is the best time to deliver the presentation.

Before leaving or at the preparatory meeting confirm with the company the level of support they have agreed, and how further contact will take place.

### Starting Work

#### Planning

We have provided details of a simplified method of planning complex projects. There are various business techniques for planning projects, all of which rely on the basic mathematical technique of critical path analysis. This system is used to identify which tasks need to be completed in which order, and produce a plan which makes the best use of the available resources to complete any project in the shortest possible time. Please use the guide and resources provided to help students to plan their projects. We are confident your partner company will be able to assist with this if your students are having difficulties.

#### Research

There are two main research tasks involved in this Challenge. One is to look at the housing developments in the local area around the school. These can be found at the following website, run by the National Home Builders Federation: [www.new-homes.co.uk](http://www.new-homes.co.uk)



We suggest students search by postcode, as the town name search is unreliable in some areas. This gives properties available for sale on given developments. Clicking on the developer's logo will take the students to a national list of developments by that house builder, and they can find the development (and its website) in the alphabetical list. They'll then be able to see development plans and house designs, so we suggest advising students to select 3-4 developments in the area / town / city around the school to consider.

The second task is to research sustainable technologies for building. **Although these sites will be a useful start, we expect students to find, use and record other sources of information.**

[www.breeam.org/case-studies.jsp](http://www.breeam.org/case-studies.jsp) - BREEAM is the international standard for design of sustainable buildings, and this web page includes some case studies of excellence. Some of the language is technical, but overall the messages are fairly clear. We expect your company link may be able to help students where required, either by email or in person.

[www.suschool.org.uk](http://www.suschool.org.uk) contains information about sustainability for schools, and is managed by the Alternative Technology Centre in West Yorkshire.

[www.cat.org.uk](http://www.cat.org.uk) is the website of the Centre for Alternative Technology, in Machynlleth, Wales, which is one of the world's leading sustainability charities, and a demonstration site for technologies and techniques which advance environmental sustainability.

### **Developing Proposals**

The student team brief identifies the information we require from each team (or company). It does not indicate a format, as we require students to select this for themselves.

The key point we need students to remember in their proposals, and gain from completing this project, is that sustainability is more than an environmental concept. Most definitions indicate that there are three pillars or foundations for sustainability. A sustainable society is one in which economic, social and environmental impact of actions are properly evaluated and taken into account *before* action is taken, and plans adapted where further reductions in negative impact are possible.

In addition to proposals produced by each team, each individual needs to produce a reflective report. This should include:

- The role the student took in the team
- The tasks they undertook
- What they learned
- How the project has changed what they think of construction, and their career ideas, if at all

The length of this should be no more than half a page. An example of what we are looking for is provided on the next page. Please share this with your students.

### **Submitting Student Work**

All completed work should be sent to your CREST Local Co-ordinator. Each team needs to provide:

- A housing development plan
- A critical path analysis document
- A housing development proposal

A reflective report from each individual student





**Please note that your students do not need to complete a CREST Student Profile Form if they provide all of the items specified above. They cannot be assessed for a CREST Award if they do not submit all the information.**

**A good example of a reflective report would be:** I was the team's energy research manager. My first task after we agreed on our plan was to find out about solar energy, wind energy and hydroelectric power. After I had done my research I told the rest of the team what I found, and took part in the decisions we made. I then wrote the energy section of the report and listed the sources of information we used. I learned a lot about energy, how to use the internet to find reliable information, how to work in a team, and how to write really good reports. To improve our project I would have found out more about green energy schemes happening now in our local area because this would have helped us see what works near us and saved time.

### **Appendix One – CREST Assessment Criteria**

| <b>Assessment Criteria</b>   |
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| <b>Section 1 - Planning Process</b>  |
| a. Project aims and objectives (How clearly did you identify the Challenge given to you, and the way it broke down into achievable objectives?)    |
| b. Planning and organization (How well did you plan your project and organise yourselves and those who helped you to complete your project?)       |
| c. Use of material and human resources (How effectively did you decide when to ask for help, and how well did you use that help?)                  |
| <b>Section 2 – Project Process</b>   |
| a. Research (How did you find out about the background to and solutions to your project?)  |
| b. Project development (How did you develop the Challenge you were given into a plan?)   |
| c. Project methodology (Did you develop a sound method for your project, with appropriate components, and adapt to things that happened?)          |
| d. Evaluation and conclusions (Did your conclusions flow from your project, and how did you evaluate   |
| e. Quality of project outcomes (How eloquent and effective was your response to the Challenge?)  |
| <b>Section 3 - Project Context</b>   |
| a. Application to 'real world' context and implications (How well did you explain the business, environmental and social value of your project?)   |
| <b>Section 4 – Subject Understanding</b>   |
| a. Scientific and/or technical knowledge (Did you understand the science and technology behind your project, and make it clear in your responses?) |
| <b>Section 5 – Initiative and Creativity</b>   |
| a. Initiative (Did you take responsibility for solving problems yourselves?)   |
| b. Creativity (How well did you think outside the box when dealing with the Challenge and any problems you had?)                                   |
| c. Problem Solving (How well did you overcome problems you had during your project?)   |
| <b>Section 6 – Communication</b>   |
| a. Written and oral communication (How well did you tell us about your project, both in writing and speaking to us?)                               |

