



Ambassador delivery pack

ICE 16-18s careers campaign

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Aims and objectives

We're trying to interest young people in careers in civil engineering and deliver the following positive messages:

- ✓ **Civil engineering is relevant to you**, whoever you are i.e. that it is about transforming people's lives and safeguarding our futures
- ✓ Civil engineering qualifications lead to **well paid, interesting and worthwhile careers**
- ✓ Although maths and science are core to studying civil engineering at college or university; **creativity and innovation** are also highly valued
- ✓ If you do come into civil engineering you will **change the world**
- ✓ You can study civil engineering both at university and on vocational courses including apprenticeships

We're also trying to overcome potential negative stereotypes about the industry including:

- ✗ Civil engineers work on muddy, dangerous building sites all day long
- ✗ Civil engineering isn't creative – it's just building things following an architect's plans
- ✗ It's a better career for men than women, and women might be made to feel uncomfortable in the work environment

We launched this special campaign to target 16-18 year old students because there has recently been a period of decline in applications for civil engineering courses at university. We hope that by concentrating our efforts on students who are interested in maths and sciences at the time when they are making important further study and career decisions, that we can increase the numbers choosing civil engineering degrees, apprenticeships and further learning courses.

About the sessions – everything you need to know

This pack outlines two options for running a careers engagement – depending on what your school/college has requested. We are aiming primarily to give careers talks to groups of students studying the right kind of subjects as this gives us more opportunity to deliver all our key messages and convince about the attractiveness of civil engineering careers, hopefully even giving the students a chance to try out some civil engineering practice tasks. Some schools however may find it difficult to fit such sessions into their programme and so you may find yourself attending a careers fair instead and talking to student individuals or very small groups. By building relationships with schools at their careers fairs we hope to persuade some more to give us the opportunity to run longer engagements with their students in the classroom.

We've tried to make our engagement plans as comprehensive as possible so you've got everything you need to present a session without having to put lots of your own time into creating materials. You're welcome however to adapt the contents to suit your delivery, experience and the situation and to use alternative materials you feel would be more appropriate or effective. Please let us know if you have a good idea too!

Our delivery materials can be found on the [STEM Ambassador Resource Sharing Centre](#) (referred to as 'Sharing Centre') throughout the document. You might need to email us to get access to this: careers@ice.org.uk

Before you run your session we recommend to also read our '[Guidance for working with children and young people](#)' document to get tips on safeguarding and make it a smooth and fun experience.

Classroom session delivery format

Length	Session part	Tips
5 mins	Introduction	We suggest using just your first name is fine, who you work for and your job title or a <u>very short</u> description of your role. Then an introduction to the session e.g. "I've come to see you today to tell you about careers in civil engineering so I'll talk about those first and in a while we'll have a go at a civil engineering challenge."
5 mins	Show 'What's your story' film	This can be found online at https://www.youtube.com/watch?v=Rib0qYXsPY or a file is available to download from Sharing Centre. It provides a very short intro to what civil engineering is and gives a positive message about careers.
20 mins	Presentation and talk	Available in the Sharing Centre. Please read the notes on the front cover of the slide pack (which doesn't show in the 'live' presentation to understand how to use them and where to personalise the content. For more background information on the content also check the hidden 'notes' on many of the slides. Allow 5 minutes at the end for questions from the students. If they ask anything tricky about qualifications and career routes you could refer to the careers cheat sheet we've put together.
15 mins	Hands on activity	We've put together a list of activities for you to choose from for your session – see Appendix 1 or you're welcome to run something you've come up with yourself or use regularly. It's your choice. You might also want to involve the school in deciding what they'd like you to do with the students (see activity arrangements below).
5 mins	Evaluation, literature and session end	Give out copies of the student evaluation form to fill in and collect back (found at the end of this document), and also the teacher evaluation form which can be found in the Sharing Centre. Also hand out copies of the ICE 16-18s Careers Guide and QUEST Undergraduate and Technician scholarship leaflets . You can order these for free from careers@ice.org.uk or pick up from your regional office. Thank everyone for listening and participating.
50 mins	Total	

Careers fair delivery format

Taking part in a careers fair is a very different type of engagement because you'll be doing/showing everything all at once. Unless there are very few pupils attending the event, it is usually a good idea to have two or more ambassadors present so you can make the most of opportunities to talk to the young people and to have fun running some civil engineering challenges with them.

The hands-on engagements in this environment should be kept very short – no more than 5 minutes each ideally – so as many pupils as possible can have a go. You'll find that conversations with interested students can by comparison be quite long!

Component	Tips
Identifying yourself	Your local office will have a portable banner that you can use next to a table to show that you represent ICE. They might also have other lendable equipment for making your 'stall' look professional such as a plain tablecloth. It's also a good idea to get yourself a name badge too – either your work badge if you have one or ask us to provide an ICE badge.
Literature	<p>We recommend taking the following leaflets to give out – all available free from careers@ice.org.uk:</p> <ul style="list-style-type: none"> ICE 16-18s Careers Guide QUEST Undergraduate scholarship flyer QUEST Technician scholarship flyer
Show on laptop / projector screen	<p>If you want to you could use some of our materials on a screen on the stand to add interest. This could include:</p> <ul style="list-style-type: none"> The PowerPoint presentation created for this campaign (remember to edit it first to remove/hide the slides that need personalisation) Our 'What's your story' film (https://www.youtube.com/watch?v=Rib0qYAXsPY (also available to download from the sharing centre) Our 'what is civil engineering' website: ice.org.uk/wice
Hands on activity	<p>We've put together a list of suitable activities you can choose from if you wish for your session – see Appendix 1.</p> <p>You're also welcome to run something you've come up with yourself or you use regularly. It's your choice.</p> <p>Your regional ICE office may be able to help you by loaning equipment too for some further 'short turnaround' activities which may be more suitable for the careers fair style engagement.</p>

Answering careers questions	Our careers advice webpages ice.org.uk/wice have a wealth of information to help students with decision-making. If you have a laptop or tablet with you then you can refer to these during conversations if you find it useful. If the students ask anything tricky about qualifications and career routes you can also refer to the careers cheat sheet we've put together.
Evaluation	Please ask the coordinating teacher or careers advisor to fill in a copy of our evaluation form, and also the young people can complete student feedback forms if time allows. These can be found in the Sharing Centre.

Pre-event arrangements

You will either have been asked to attend an interested school or you might have suggested a particular school which you have already made contact with. It is your responsibility to make arrangements for the visit with the school but your regional contact will do their best to support you if you ask for their help.

Equipment arrangements

You'll need to discuss your requirements in advance with the teacher or careers advisor to make sure everything ready on the day. For example, who is providing and setting up the equipment to show the PowerPoint presentation and film on if you're doing so (i.e. laptop computer with connected screen)?

Find out how many young people will be attending the session and check you've got enough sets of the activity materials and printed literature to give away ('The guide' and QUEST scholarship flyers which can be ordered from careers@ice.org.uk).

Activity arrangements

It's up to you whether you'd like to give the school/college a choice of which activity you'll run or whether you'll choose this yourself. Either way it would be good to discuss the choice with them and to check practical considerations for running it e.g.:

- Is there enough space in the classroom / venue and will it be quiet/comfortable enough to deliver the session?
- Layout of the classroom / venue – if your chosen activity is going to need tables to work on make sure the school knows this in case they book your session into a theatre-style room
- Can you have access to the room at least five minutes before the session to get set up?
- Will there need to be any cleaning up and will this be a problem if another class needs the classroom straight away after?

Pre-event checklist

- ☐ **Presentation and video:** Make sure the PowerPoint presentation is loaded and ready to run. It is a good idea to check the video link/file before starting – it can be helpful to have it open in a minimized window on the computer and paused at the beginning ready to go.
- ☐ **Activity materials:** Have the activity materials organised so they are ready to hand out – it might not be a good idea to put them on student's desks before beginning the session as it could distract their attention.
- ☐ **Leaflets and evaluation forms:** Think about how you are going to distribute the leaflets and the evaluation forms at the end of the session – perhaps the teacher/careers advisor will do this for you. Make sure the teacher/careers advisor is aware that you need the students to fill in the evaluation forms before leaving the room. If you think it would be useful, you could ask them to do a time check for you at 5 minutes before the end of the session.

At the end of the session...

After your session we need you to complete a short online evaluation for us please. In order to be prepared for the questions on it would be useful to note down the following info before you leave the classroom:

Date.....

The name of school (or STEM Fair).....

Postcode (or town/area if not known).....

Age of students/year group(s) (most probably 16-17 yrs).....

Number of students who took part and

an estimate of the number of **girls**.....

an estimate of the number of **black or minority ethnic** (BAME) students.....

You can find the survey at surveymonkey.co.uk/r/ICEambassador

The information and feedback you'll give us in the survey helps us improve what we do. It also means we can include your efforts on the Tomorrow's Engineers schools database which is how we track which schools have been engaged by different engineering organisations and how many STEM activities have been delivered by ICE members.

Thank you!

Post-event check-list

- ☐ Fill in our online survey to tell us what you did and how it went (surveymonkey.co.uk/r/ICEambassador)
- ☐ Follow up with the teacher to get the session assessment completed and returned before you leave / or by the end of term if they want to email it back.

More resources on civil engineering for teachers/students

After the session has finished we hope that you'll find the teacher(s) / students are keen to know more about civil engineering. Here is a handy list of resources to direct them to:

Careers advice for becoming a civil engineer: ice.org.uk/beacivilengineer

Careers and activity resources on our website: ice.org.uk/educationresources

Civil engineering project case studies: ice.org.uk/what-is-civil-engineering/what-do-civil-engineers-do

Civil engineer (people) case studies: ice.org.uk/what-is-civil-engineering/who-are-civil-engineers

Info about all types of engineering careers (not just civil): Tomorrow's Engineers
tomorrowsengineers.org.uk

A civil engineering reading list for young people:
ice.org.uk/ICEDevelopmentWebPortal/media/Documents/what-is-civil-engineering/ICE-pre-college-or-university-civil-engineering-reading-list.pdf?ext=.pdf

FAQs

We've put together a list of FAQs to help you deliver this campaign – see [Appendix 2](#).

Appendix 1: Sixth form careers session activities

The following pages feature five activity options which are designed to be run in a very short time. They have been created to demonstrate to students a particular aspect of civil engineering careers such as problem solving, new technologies and its relevance to our modern world.

You're welcome to adapt these activities or to use your own activity. The key thing would be to give students in this age group a good 'challenge' as they have the knowledge and skills essentially of young adults. We're also keen to promote civil engineering as a creative career so whatever activity you run, do think about how this can be highlighted.

Some of the activities need visual images to accompany them – these can be found in the Dropbox folder (please ask your ICE representative for access to this if you haven't already got it).

Time to run: 15 mins

Suitable for: classroom session and careers fairs

Activity: Civil engineers ‘make it happen’

Slides/cards (print out the slides to give out to each group):

Hyperloop
Bridge
Wind turbine
Sports stadium

Job roles on slides/cards:

Designer
Structural engineer
Construction engineer

Suggested materials for each group:

Cardboard tube from a kitchen roll or similar
Small sellotape
2-3 A4 pieces of lightweight card
A biro pen
A pencil
1 A4 piece of paper
Supermarket carrier bag
2-3 pipecleaners – suggest same colour in grey or black

1. **Introduce the challenge.** “We’re all going to become civil engineers for 10 minutes now. I want you to get into groups of 3-4 people and your task is to make a model of whatever is on the card I give you.”
2. **Add the condition about job roles.** “You’ve also got to assign everyone in the group a team role for the project. You can have more than 1 person in a particular role if there is 4 in your group.”
3. **Set the timings.** “When we’re ready you’ll have five minutes to build your model.” [Check the clock or watch in your room – tell the students what time the finish will be if they can see the clock, or give them regular updates on how the time is going if there isn’t a clock they can see.]
4. **Let them get organised.** Give them 2-3 minutes and then give a short countdown to begin. As the build progresses try to go around to each group and give them a quick tip on their build.
5. **End the build and finish up.** “Well done everyone – we’ve got some brilliant models here. What did you find were the challenges?” Use their responses to talk briefly about how civil engineers face and overcome challenges and how it is satisfying of course to see ideas come to life.

Time to run: 15 mins

Suitable for: classroom session and careers fairs

Activity: Propping up Pisa

Materials:

A3 sheets of paper – enough for each group

Slide showing image of the tower (see activities PowerPoint in the Dropbox)

1. Organise the class into groups of 3-4 students, or get the teacher to do this
2. Show image of the leaning tower of Pisa on screen
3. “You’re civil engineers working to save the tower from falling down. You’ve got 5 minutes work out how to stop it falling over and draw your answer
4. Do a time-check and start them off. You might want to visit each group briefly to give them tips but try not to lead them to a solution.
5. When time’s up, ask each group in turn to explain their solution. Comment on the solutions giving any real-life examples of when something similar has been done or when you think this would be most appropriate if you can.
6. You could award ‘virtual prizes’ for e.g.:
 - Most creative
 - Most secure
 - Most elegant
 - Least disruptive for the historic surroundingEmphasise civil engineering’s creative side, the application of maths and science, team work, etc.
7. Finish by showing how saving the Pisa tower was done in practice (see second slide). “Civil engineers extracted around 70 tonnes of earth from the northern side of the tower, causing it to sink on that side. Before the digging started, the tower was anchored with steel cables and 600 tonnes of lead weights.”

Time to run: 15 mins

Suitable for: classroom session and careers fairs

Activity: Guide the TBM

Equipment (for each team)

- Biscuit tin (drive site)
 - Egg (TBM)
 - Sellotape
 - Pipe cleaner
 - Cardboard
 - Toilet roll tubes
 - Balloons (uninflated)
- Stopwatch and tape measure (for you!)

“TBM stands for tunnel boring machine which is what is used then engineers need to bore tunnels under the ground; they are used to make underground trains and sewers. The first thing engineers do in a project like this is they dig a giant hole in the ground called a drive shaft then they slowly lower in parts of the TBM build it in the drive shaft.”

1. Split the class into groups of 4-5 students and distribute the materials.
2. Introduce the task: “What we are going to do today is work in teams to see if you can lower a TBM part (the egg) into the drive shaft without it breaking. To make sure our TBMs survive the drop you will need to devise a protective cover out of the material provided. Just to make it harder you will have to drop the egg into the drive shaft from a height of 1 metre.” (Note TBMs aren’t dropped in real-life but carefully lowered of course!)
“You’ve got 5 minutes to make the protective cover and after that we’ll have a 5-minute testing session.”
3. Check the time and start them off. Visit each group in turn during the development time to give any tips or guidance.
4. Keep the class aware of how much time they have left and end the session on time.
5. Test each construction in turn by getting the students to drop it from 1m height. Congratulate any ‘winners’ whose construction keeps the egg safe and unharmed.

Appendix 2: Frequently asked questions

I've got an event already planned with a school 16-18 age group / I've just done an event with this age group – does this count as part of the campaign?

Yes it would – as long as the teacher and yourself could complete the evaluations shortly afterwards.

Can I organise an event with a school/college that I know?

Yes absolutely. Feel free to make contact with a school sixth form you have links with or that is nearby. We don't mind which schools/colleges participate in this initiative but would especially encourage contact with those who haven't heard of ICE or don't have a strong link with civil engineering. You might want to check with your local ICE office before contacting schools to see if we're already engaging with them.

How will the session be organised?

Your regional education coordinator will contact you when they've got a school in your area that would like a session. See also the previous FAQ about organising your own visit. Once you've been 'matched' with a school – arranging the details of the session, time, date, equipment etc will be between yourselves unless you need more support from us.

How many pupils can attend a session?

We'd recommend to have at least one person per 30 pupils to facilitate a session – if bigger group then two or more ICE ambassadors will be needed so that activities can be run with enough support. Note that you and any fellow ambassadors are there to run the session, not to be responsible for the students. A teacher should be present at all times.

Do I need to be a STEM ambassador to get involved?

You need to be a current STEM Ambassador or hold an up-to-date DBS check from a similar organisation – this is free from [STEM Learning UK](https://www.stemlearninguk.org/) and the online training required to gain your certification takes about an hour.

During the session a teacher should be present at all times to take responsibility for the management, safety and discipline of the students. It is a good idea to make sure a teacher will be in charge when speaking to the school about the organisation of the session.

Can I claim back expense costs for travel and/or activity materials?

The sessions are designed to be run with readily accessible materials. However, if you need financial support to run the session, you must agree this with your ICE regional contact first before making any purchases.

Appendix 3: Careers cheat sheet

We're hoping the students and teachers will be very interested in civil engineer careers and have lots of questions for you. However we realise you're not a careers advisor and so there might be one or two that could be tricky to answers so we've put together a quick 'cheat sheet' to cover off some of the most likely queries.

If there is something you're not sure of then the answer is to email careers@ice.org.uk with as much detail as possible about the question or situation and we'll get back to the asker soon with advice.

Apprenticeship types

Apprenticeship type	Level	Time and how completed
Level 2	GCSE	12-18 months to complete.
Level 3	Equivalent to A-levels. You need at least five relevant GCSEs or equivalent including English, maths and science.	Usually college one day and work for rest of the week. 1-4 years to complete – usually 2 years.
Levels 4 & 5	Higher – leads to qualification of foundation degree, NVQ level 4 or HND.	Part-time at university/college split with work. 1-5 years to complete.
Levels 6 & 7	Degree level – bachelors or masters	3-6 years to complete. Part-time at university/college split with work.

Applying for apprenticeships

No-one should do an apprenticeship that isn't a real job (these exist in other sectors). Only apply directly to companies - do not go through training groups/agencies. Degree level apprenticeships can be applied for through UCAS.

Work experience as part of degree course / scholarships

Most universities have good links with employers for paid summer placements, and some have formal placement offices. Some universities offer employer-linked scholarships (e.g. Southampton, Surrey, Loughborough) as does QUEST. Some universities offer sandwich degrees, and others will allow students to arrange a year in industry even where no formal sandwich degree exists.

Where to find work experience

Unfortunately there is no formal list of work experience. The best thing to do is to google companies that are local or easily accessible to you and contact them to ask. Some job websites (e.g. indeed.co.uk glassdoor.co.uk etc) have listings for summer holiday placements but these are usually available only to those already studying at university.

Scottish and other curriculums

If you're not familiar with the Scottish education system it's worth noting that there is a different curriculum and set of qualifications which can be mapped against those in the rest of the UK as follow:

England, Wales and Northern Ireland	Scotland
GCSE	Standard grade
AS Level	Higher
Full A level	Advanced higher

There are now less commonly used qualifications available at many schools too including International Baccalaureate diplomas and many more. For more information understanding what level a group of students is studying at this webpage is helpful: reed.co.uk/career-advice/levels-of-education-what-do-they-mean/