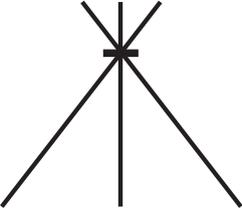
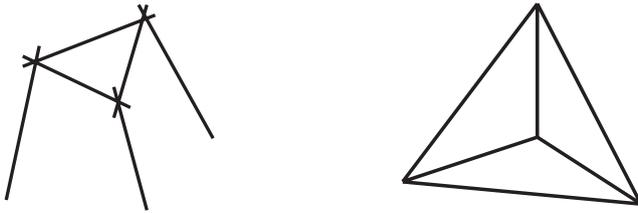
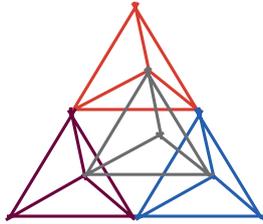
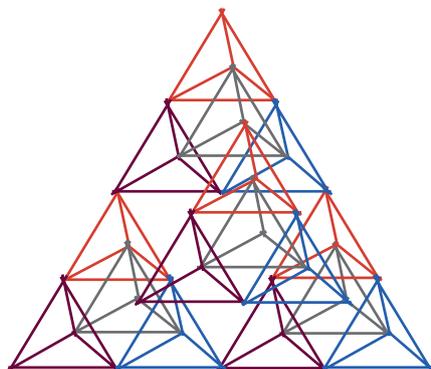


Activity name	GIANT TETRAHEDRON
<p>Activity Descriptor</p>	<ul style="list-style-type: none"> • The Giant Tetrahedron is an impactful activity, creating a 4 metre x 4 metre structure using only dowels and elastic bands. • The emphasis is on teamwork and listening to, and following, instructions. • Many roles in the construction industry can be incorporated into the activity and the building process, making it an excellent illustrative and fun activity. • The finished tetrahedron is very versatile and can be used as a whole or in part for a variety of events. • Please refer to the PDF 'Guide to Building the Giant Tetrahedron' to support these delivery notes.
<p>Industry Ambassador Support</p>	<p>The experience of building the giant tetrahedron will be greatly enhanced by the support of a Construction Industry Ambassador. Ideally, you should ask for a quantity surveyor, structural engineer, construction manager, or another role with an understanding of the whole construction process. The Industry Ambassador should present their own career story before introducing the activity to the participants. To request Industry Ambassador support please email experience@goconstruct.org.</p> <p>If you are an Industry Ambassador leading this activity</p> <p>Start the activity by delivering a 5–10 minute presentation covering:</p> <ul style="list-style-type: none"> • what sparked your interest in the industry • your career pathway, including your qualifications • your current role and responsibilities • any additional skills and attributes required for your role, e.g. time management, good communication skills, good IT skills and analytical thinking. • your future ambitions • the benefits of working in the construction industry. <p>The presentation can be formal or informal, depending on the situation.</p>
<p>Introducing the Activity</p>	<ul style="list-style-type: none"> • Explain to participants that they will build a 4m high giant tetrahedron as a team, using two simple resources: dowels and elastic bands. • Check their understanding of what a tetrahedron is (a triangular-based pyramid). • It can be presented as a challenge – can it be done? • Explain that construction often involves working as part of a large team, with each role being equally important. By completing this activity participants will demonstrate their co-operation skills, problem-solving capabilities, ability to work as a team, and other skills which are crucial to the world of work. • You should include or allude to as many careers in construction and the built environment as possible during the instruction stage and assembly of the giant tetrahedron. Some careers have been included and are highlighted in bold. However, many more could be referred to.
<p>Setting and Delivering the Activity</p>	<ul style="list-style-type: none"> • Ideally, all participants should be given clear, step-by-step demonstrations and instructions together as one large group. • It is acceptable for participants to form smaller groups to carry out stages of the build but it is advisable for the activity lead to draw the group back together for further instruction or discussion.

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	<p>The following script gives detailed instructions for the build and delivery of the tetrahedron.</p> <p>Health and safety</p> <ul style="list-style-type: none"> • Explain that health and safety is critical in the construction industry and that everybody is responsible for their own health and safety and the health and safety of others. • Many careers in construction are focused on health and safety e.g. Health and safety manager or officer. Large construction companies may have a whole team of people dedicated to health and safety. • Ensure that all participants understand health and safety when building the structure. Participants must treat the dowels and elastic bands with respect. They are resources that carry a cost, which is an important aspect of the construction industry. • Participants must be aware of dowels on the floor which may cause slips, trips and falls. • Participants must be aware of others working close to them. • Participants must report any accidental breakages immediately. • Ask participants if they have listened and have understood the briefing. • You may wish to appoint a designated health and safety officer at this point. <p>1. First stage of the build – small tetrahedron</p> <ul style="list-style-type: none"> • Explain that it is important that anyone considering a career in construction can listen and follow instructions. • Teamwork should be encouraged. Participants should ask their peers for assistance if they cannot remember all the instructions. • Explain that the group is going to build a giant tetrahedron which is made up of lots of small tetrahedrons. • Start by fastening three dowels together with an elastic band. Explain the correct positioning and tension of the band. Explore the concept of shape and explain that architects and designers often take a basic shape or a material and explore its potential to give them inspiration for designs. This first structure looks like a wigwam or tepee. Ask the participants what buildings they can think of which use this shape. • The elastic band should be approximately a thumb width (when the thumb is horizontal) from the top of the cane.  <ul style="list-style-type: none"> • Add the next two dowels and again explore shape. Discuss form. Introduce the concept of structural engineering. 

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	<ul style="list-style-type: none"> • Add the last cane.  <p>2. Second stage of the build</p> <ul style="list-style-type: none"> • Remind participants of the need for communication, teamwork and effective use of resources, in order to be to be successful. • Explain that some medium-sized tetrahedrons need to be assembled, which are twice as wide and twice as high as the small ones but retain the tetrahedron shape. Ask if anyone knows how this might be achieved. If necessary, give a hint of ‘four’ – this is the number of small tetrahedrons that form the medium-sized one). Do not let participants struggle – demonstrate the assembly and the fastening.  <p>The bottom three tetrahedrons should be fastened together before the top one is placed and fastened.</p> <p>It is best for participants to work in small groups to complete this stage of the build so that they can hold the small tetrahedrons in place.</p> <ul style="list-style-type: none"> • Ask participants to continue assembling these medium tetrahedrons until all the small ones have been used. Refer to the PowerPoint ‘Guide to Building the Giant Tetrahedron’ for further information. • By this point, participants have usually realised that the final build takes the same pattern and will continue with minimal instruction.  <p>The bottom three medium-sized tetrahedrons should be fastened together before the top one is placed and fastened.</p> <p>This is half the height of the final structure and should be 1–2m high.</p>

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	<p>3. Post-assembly</p> <ul style="list-style-type: none"> • This is an excellent opportunity to discuss a range of careers in construction – and also an opportunity for photographs to be taken. (Ensure permissions to take photos have been granted where appropriate.) • Test the structure(s) for quality. This can be done by lifting it and gently shaking it in a controlled way (structural engineering). • Discuss the role of a quantity surveyor. Ask participants to calculate number of dowels and elastic bands used. • Discuss the importance of timescales in the construction industry, e.g. if it has taken 20 participants an hour to build, how long would it take 10 participants? • Consider some of the crafts and practical careers which would be required to make the tetrahedron a usable building. Suggestions might include glazier, engineering services (heating, lighting and utilities), interior finishes, plastering, painting and decorating etc. <p>4. Disassembly</p> <ul style="list-style-type: none"> • Introduce the participants to demolition and discuss the role. Stress that this is a specialist area of the construction industry and that it is tightly controlled by health and safety. • Ask the participants who put the top section on to start by taking this section off. • Appoint several participants to collect the elastic bands and dowels and put them away neatly. • Remind all participants that they should: <ol style="list-style-type: none"> 1. not misbehave with the dowel and elastic bands 2. not step on and break the dowels 3. be aware of the participants around them when they are pulling the tetrahedrons apart.
<p>Feeding Back on the Activity</p>	<ul style="list-style-type: none"> • Ask participants if they have ever worked together in such a large team. Discuss the importance of teamwork and of sequencing tasks in the construction industry. • Where appropriate, discuss modern methods of construction and off-site manufacturing and relate this to the construction of the small tetrahedrons. • Discuss the ‘soft’ skills that participants have used to complete the activity, e.g. communication, problem-solving, using their initiative, working to instructions, working to deadlines and teamwork. Explain that these are all essential for working in the construction industry. • Ask the participants what occupation careers have been mentioned during the activity and remind them of any they may have missed.
<p>Concluding the Activity</p>	<ul style="list-style-type: none"> • Reinforce the skills participants have used during the activity and what they have learnt about the construction industry. • Thank them for their teamworking skills and say you hope they enjoyed the task.

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<p>Extension Ideas</p>	<ul style="list-style-type: none"> • You may wish to introduce the concepts of procurement, percentage waste and resource costs (including materials and person costs) alongside this activity. Dowels may also be colour coded and a cost assigned to each to introduce tendering and emphasise quantity surveying. • If you have previous experience of delivering this activity and have more time or are working with older or more able participants, you may ask two teams to build a tetrahedron each and then compare the teams in terms of organisation, quality of product etc. Please note that this is dependent on the space and equipment being available. If this activity is run as a competition, explain that you will be judging them on the challenge that we face in the construction industry everyday i.e. constructing a building or structure as quickly as possible but still adhering to high quality standards. You will be judging their structures on time and quality but those who finish first will not necessarily win. • If a more challenging activity is required, assembly instructions can be printed onto flashcards and no verbal instructions given. <p>Wider project opportunities The activity could be used in conjunction with a Careers in Construction presentation.</p> <p>If a school wishes to link this activity to other curriculum areas, they may consider these:</p> <ul style="list-style-type: none"> • Design and technology: Developing marketing materials for their construction company or team, including logos, letterheads and folders. • English: Drafting letters to accompany a bid, writing reports and newspaper articles, presentations by teams to the whole class. • Science: Investigating materials and structures. • Art: Researching interior design and the use of buildings. • Maths: Quantities and shape are an integral part of the tetrahedron build (see the PDF document).