A SPACE TO GROW

JACOBS

Glasgow CITY COUNCIL

WHAT IS STEM THE FLOW?

Climate Change is one of the biggest challenges the world faces and has an effect on everything from flooding to air quality and even green space. The impact it will have on us all needs creative, innovative and exciting ideas and solutions and we want you to be part of that process!

Glasgow City Council and Jacobs Engineering are joining forces to support "STEM the Flow", three STEM challenges (Science, Technology Engineering and Maths) that will suggest engineering solutions to help tackle these climate issues in Glasgow. Climate change has caused major problem for the city and its residents and we need to continually look at new ways to protect ourselves from extreme weather and atmospheric events.

We are looking for you to research and develop your own ideas about tackling these issues. This could be flood prevention schemes, ways to measure air quality or creating new green spaces within the city. We're also looking for your solution to collect data and then display this for the people of Glasgow to see.

You will have to work as a team to create a timeline, conduct research, draw conclusions and build a model/produce a display to showcase your idea.

OUR INDUSTRY PARTNER: JACOBS ENGINEERING

This year we are lucky to have top Engineering firm JACOBS work with us as our Industry Partners. Jacobs is committed to developing long lasting sustainable solutions that improve people's lives all over the world and one of the areas in which they do this is through flood and costal management.

Planning is the Key to Success!

Before you get started there are a couple of planning activities your team should complete:

1. You should use the template at the back of this booklet to construct a Gantt Chart. This will give you a solid timeline to work to over the next 8 weeks.

2. Decide how often the team should meet and when. After school once or twice a week, during lunchtime?

3. You should choose team roles so that everyone knows what their responsibilities are within the team.

4. How often are you going to meet with your industry mentor and how will you keep in contact with them?

Good planning at the beginning means you will be more organised and structured as you move through your project. This will not only ensure that you finish the project on time but also make your team more likely to succeed!

A SPACE TO GROW: PROJECT OVERVIEW

Sustainable Food

The challenge is to **design** and **create** a community garden that will be an engaging and interactive place for people to spend time, learn about how to be more environmentally conscious and house a sustainable food programme. The team will have to; identify a plot of land in the city to build on, ensure there are no water or gas mains underneath that might damage, source materials for your design and make the layout original and engaging for the people who will use it.

For this project the best approach is to think outside of the box. A few ideas you may want to consider are listed below:

- Does the community garden have to be all on one level or could you create multiple levels for people to enjoy
- Does the sustainable food have to be grown in the ordinary way or could you use something like aquaponics?
- Could other features be included such as a sitting area, play park, gym or even a classroom?
- Are people going to learn about the community garden through ordinary plaques or could you think of a more innovative way to display the information e.g. digital billboards?

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Getting Started

Identify a Space

Before beginning to design the community garden teams first need to identify a plot of land within the city. Only certain plots of land are approved to grow food on so that is something that will need to be researched carefully. Teams may need to cast their net wide across the city but any plot that was once a school is approved to grow on so looking for old school buildings is a good place to start.

Who is it for?

To make sure the community garden is fit for purpose teams need to identify who it is for. Who do you want to use the garden and what are their needs. It does not just need to be used for growing food but could be a place to learn, exercise or spend free time.

What are you going to grow?

When designing how the community garden will look teams might want to think about what you actually want to grow. Some fruit and vegetables only grow at certain times of the year so you may want separate sections in the garden for this. Use the 'Ready, steady, lets grow' section on Glasgow Online to find out what grows when.

Existing Community Gardens

This is a chance for the team to visit some community gardens around the city. You may have some local to the school but if you get a change have a look at Glasgow's Hidden Garden in the south side.

Innovative Design

This is a chance for teams to get really creative with their design. It does not have to look like a normal garden and can have multiple levels, be inside or have a secret entrance.

Materials

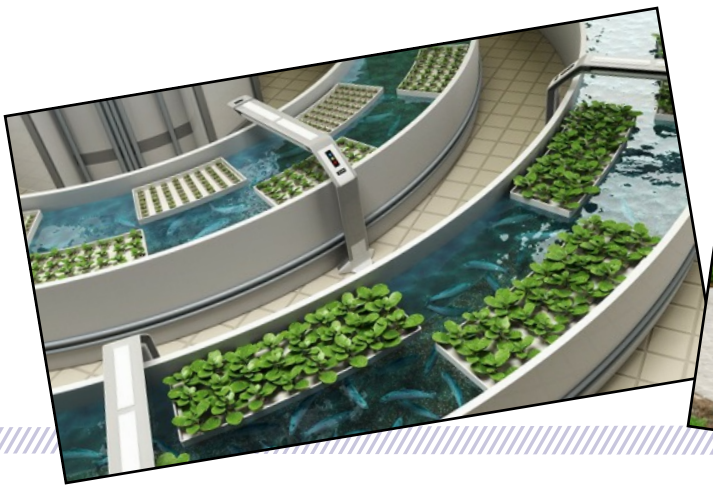
What materials are you going to use? Is your focus going be on the strongest materials available, the most financially efficient or a balance of the two?

Costing

How much will the garden cost to construct?

Sustainability

How are teams going to keep the garden flourishing and who will be in charge, could you use modern technology like Aquaponics?



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Summary of Project

Write a Report

Write a report about your chosen project. The easiest way to tackle the report is to write it as you go instead of leaving it to the last minute!

Create a Display

Make sure you have time to create an engaging display of everything your team has done. Sizes of the display board will be given to your teacher.

Prepare a Presentation

Your team will also have to prepare a presentation. The presentation should last no longer than 10 minutes and teams should be prepared to answer questions at the end.

Hints and Tips

- HAVE A WELL STRUCTURED PLAN FROM THE BEGINNING OF THE PROJECT
- WRITE THE REPORT AS YOU GO

- USE PHOTOGRAPHS AND SKETCHES TO HELP TELL YOUR STORY
- BUILD A MODEL TO VISUALLY DEMONSTRATE HOW YOUR PROJECT WILL WORK
- YOU CAN EVEN USE POWERPOINT OR VIDEOS IF YOUR SCHOOL HAS A LAPTOP YOU CAN USE!

- YOU CAN USE POWERPOINT OR VIDEO IF THEY ARE AVAILABLE
- ALL TEAM MEMBERS MUST CONTRIBUTE
- IT SHOULDN'T LAST LONGER THAN 10 MINUTES
- BE PREPARED FOR QUESTIONS!

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SUGGESTED TIMELINE

Week 1	Decide team roles and a team name. Complete Gantt Chart as a team and begin to discuss initial ideas and start to conduct research. From your initial research decide as a team areas which you are going to focus on. Why do our cities drains overflow? Where are the main problem areas. What possible ways can we get rid of water?
Week 2	What are the main objectives of your drain relief system? Will it be aesthetically pleasing, hidden from view or have a secondary purpose such as city centre seating?
Week 3	Start to look further into materials and costing. This would be a good time to contract your Industry Mentor for some advice and information that you may not be able to find on the Internet!
Week 4	Begin to test some of your material choices. Look at aspects such as stress, strain, durability and water resistance. Start to write your report.
Week 5	You now have enough information to begin work on your model. How will you and your team best represent your idea? What materials do you think you'll need?
Week 6	Continue to work on model and report. Be sure to include any issues you have faced and how you overcame these as a team. Don't be afraid to alter your design as you go. This is all part of the learning process!
Week 7	Draw conclusions on what you have all learned. How did you work as a team and is there anything you would do differently next time?
Week 8	Finish Report
Week 9	Start to think about your display. How are you going to tell your teams journey though this project. Do you want to use PowerPoint or video? Have you taken any photographs while your team has worked through the project?
Week 10	Prepare your presentation and finalise your display and model!.

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Below is a suggested format for your team's Gantt Chart. It will help you plan out your week to week activities and give your project some structure. Whether you use this template or make your own you should include the final Gantt Chart in your written report.

Tasks	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Team Name and Team Roles										
Initial Ideas										
Research										
Site Visit										
Idea Generation										
Calculations and Experiments										
Analyse and Evaluate										
Draw Conclusions										
Report Writing										
Build Model										
Display										
Presentation										

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School Name

Industry Mentor and Contact Details

Important Dates

Some Useful Websites

1. http://www.glasgowharbour.com/
2. http://www.sepa.org.uk/environment/water/
3. http://www.jacobs.com/
4. https://www.youtube.com/watch?v=rAQu-3L-2VI
5. http://www.sln.org.uk/geography/enquiry/we30.ht