Teamwork is key to success (and key to being a good engineer)!

It is important that each team member takes on a specific role to ensure that a safe and smooth transport system is provided for the 'Make it 2 Mars' mission. Each role is crucial in developing a solution with each role requiring different strengths.

Project Manager - Specialist briefing sheet

To be successful a team needs to have a strong project manager. The project manager needs to have a clear overview of what the team is trying to achieve, the budget they have and the time they have available.

Duties:

- Check out the assessment information so you know how to score maximum marks.
- Timekeeping - keep an eye on the clock and make sure jobs get completed on time.
- Track the overall progress of the activity of the team to make sure everyone is on task.
- Be flexible and give help where it is needed.
- Prompt the team: Have you thought about the size of each part and how they will fit together? What materials will we need? What is the best material for each part? What part needs to be made first? How are we going to fix each part? What tools will we require? Remember there is a cost involved.
- Keep your team's reflections up to date. You can do this yourself or delegate to a team member.
- With the support of your team, you will take the lead in organising and presenting the 3 minute presentation to the judges at the end of the day. You will present this yourself or delegate to a team member with strong communication skills.
- Your role is to lead, and to manage your team effectively.

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Accountant - Specialist briefing sheet

Working successfully with *'Make it 2 Mars'* needs not just clever engineering but great accounting to make sure you don't go over budget.

Duties:

- You must keep accurate records of what has been bought and sold back using the accounting sheet in the engineer rescue team brief.
- Decide what materials need to be bought and do the buying.
- Find the options that will be the most appropriate. Some options do the same jobs but vary in cost.
- Be the expert on the prices of all the materials and advise which are best to use in terms of their cost. Keep looking at alternatives.
- You will get a chance at the end to negotiate with the supply centre to sell back (at a discounted rate) any materials you have not used or any equipment for which you have found an alternative.
- At the end you will need to present an accurate final copy of your accounting sheet.
- You cannot sell Faradays to other teams.
- You cannot borrow Faradays from other teams.

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Electrical Engineer - Specialist briefing sheet

Your role is to ensure power and the correct voltage is supplied to the prototype. Understanding what will work and what won't is key to solving the problem.

Duties:

- Lead the team in engineering an electrical circuit. Your final solution must include an electrical component otherwise marks will be deducted.
- Keep in mind different solutions require different amounts of power to function.
- Determine how you will supply energy to your solution.
- Ensure, where possible that the most sustainable way to power your solution has been used.
- Determine if a switch to turn power on and off is required or if there is an alternative.
- Remember to be resourceful with materials and always be on the lookout for cheaper alternatives.
- *'Make it 2 Mars'* are looking for innovation so be creative with your solution.

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Mechanical Engineer x2 - Specialist briefing sheet

There is the need for two mechanical engineers within the team. You will work closely with the aerospace engineer to construct the rocket and you will lead the team in design and construction work on the transport system.

Transport System
Your system must transport supplies 1 metre under test situations. Your solution must be automated (it isn't manned).

Rocket
Your rocket must be built using only the resources supplied by '*Make it 2 Mars'* for this purpose. The rocket needs to attach to the launch system provided, the manufacturing quality needs to be high and the rocket needs to be robust enough to survive a launch and landing. In the real situation the launch will be vertical however in the test environment the flight of the rocket will be checked by launching at an angle to land in a designated area.

Duties:

- You will lead the team in design and construction work.
- Check out the assessment information to make sure you build your prototypes to gain maximum marks.
- Consider if speed of transit is important.
- Consider if your solution deals with the difference in terrain and temperature.
- Consider how you will get your transport system to start and stop.
- Consider how your transport system would be powered in real life, how would the electricity be generated? Would you use renewable energy sources?
- *'Make it 2 Mars'* are looking for innovation so be creative with your solution.

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Aerospace Engineer - Specialist briefing sheet

This role requires you to lead the rocket build. You will be responsible for using the materials in the most efficient way to ensure a safe, stable flight. Aerospace engineers are specialist engineers who deal with the design, development, construction and testing of aircraft and spacecraft.

Duties:

- Lead the team in designing and constructing the rocket.
- Determine how to use the materials supplied by *'Make it 2 Mars'* efficiently.
- Consider how the shape, size and weight of the rocket affect the flight of the rocket.
- Consider how the prototype will be launched and how your solution will fit onto the launch system.
- Consider the launch position and the landing position.
- Ensure that a high manufacturing quality is maintained throughout the build.
- Think about how robust your prototype rocket is, remember it has to survive a simulated launch and landing with little or no damage.
- Assist the mechanical and electrical engineers with the transportation system if time allows.