



# Mapper's Interstellus

## Round

1

The first round, crowned “**London Eye**”, challenges delegates to design a DC-motor-powered Ferris wheel capable of carrying loaded cabins without tipping or disrupting rotation. Teams must control torque, manage load distribution, and set an accurate centre of gravity to ensure smooth and continuous motion. This round focuses on achieving stable rotation, preventing structural wobble, and maintaining proper cabin alignment throughout operation. Delegates must also ensure a secure motor-axle connection, consistent rotational speed, and a frame strong enough to support weighted cabins. Hand in hand, these requirements come together to test each team’s ability to build a functional and reliable rotating system under realistic engineering constraints. This round remains an obstacle that you must traverse to view the land thriving because of your success—from the very top!

2

A true test of engineering precision that commences alongside the second round titled “**Clawquest Showdown**”, requires delegates to master the principles of fluid mechanics and hydraulic control. Teams will construct a fully functional claw machine, powered entirely by hydraulic pressure. Delegates will be required to engineer a mechanism capable of smooth three-dimensional movement to securely grip, lift, and deposit objects into a designated target zone. The machine must maintain structural stability, while ensuring efficient force transmission, accurate motion, and reliable grip performance. This challenge tests understanding of theoretical ideas such as Pascal’s law, fluid pressure, mechanical linkages, energy transfer, and

grip optimization, transforming theoretical physics into practical engineering, with intellectual values like creativity, precision, smart design choices, and teamwork being critical to victory!

### 3

The third and most rigorous round; “**Breakpoint Offense**” places delegates in a combined structural and mechanical challenge that mirrors a real-life siege scenario. Teams must build a fortified tower able to withstand hefty weights and strong vibrations, while also creating a rubber-band powered catapult capable of delivering accurate, powerful hits onto opposing structures. Both builds follow strict limits on height, width and materials, pushing teams to think creatively within realistic engineering constraints.

On the defensive side, delegates must design a tower with stable weight distribution with a reliably low center of gravity, along with enough reinforcement and stiffness to survive high-frequency shaking and impact forces. The structure should remain upright and functional even under added load, demonstrating a practical understanding of stability & strength.

On the offensive end, teams must construct a medium-sized catapult that consistently launches the assigned weights with maximum range, accuracy and impact force. Success depends on controlling tension properly, choosing a suitable firing angle, and managing projectile motion so that elastic energy is converted efficiently into kinetic output.

After all builds are completed, delegations are paired randomly to attack each other’s towers, testing both offensive precision and defensive resilience, in a powerful battle of wit, and brute strength of their mechanical genius.

***Note: The information in this document is subject to changes.***