

VEX “Theme it Up” Challenge: Spark Up

Team 99157A

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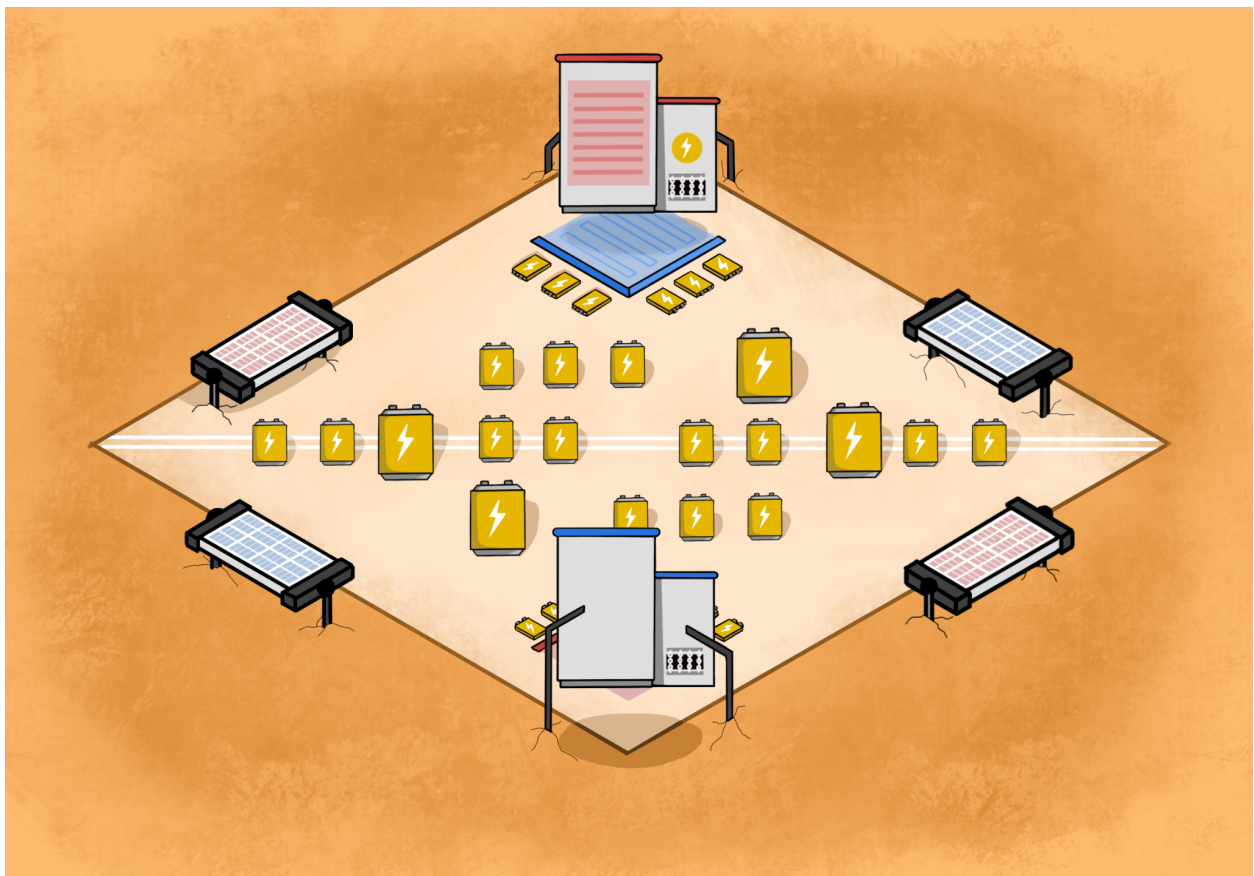
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01 | The Current Situation

Energy is vital to humans. We use it on a daily basis, whether it's to charge our phones, turn on a light, or heat up food in a microwave. We can't live without it. Except now, we're forced to. The situation on Earth has declined to the point where the main method we rely on to produce energy is failing us. We have almost completely run out of fossil fuels. Pollution and dirt are also huge issues and have rendered other technologies to gather energy, such as windmills, useless as well. All that is left are the few large capacity batteries and their solar panel chargers. While the solar panel chargers are helpful, the pollution prevents full sunlight from reaching the panels, reducing the amount of power they can provide.

Luckily, as a result of a mysterious asteroid that hit the Earth, small energy production fields have been created. These can be used to provide additional power to the batteries which are then used to restore the land back to a usable state as it once was long ago. The population has split into various guilds, competing to collect the most energy for themselves, so they can sustain their population and restore their land.



02 | Extended Script

The year is 2082 and climate change has reached its tipping point, an energy crisis causing havoc worldwide. Due to the irresponsible use of energy, conventional energies like fossil fuels are no longer viable options. Energy has become a rare resource that guilds race to collect. However, a mysterious asteroid hitting the Earth has led to the creation of collection fields — spaces that produce small bits of high energy capsules.

The energy fields are spread out over a 16 square acre area. Two guilds have placed batteries on opposite corners of the field. Due to the precarious state of the earth, the collection fields are only open for 2 minutes at a time so the limited resources can respawn for further collection. Due to the asteroid, it is unsafe for humans to enter the fields; they must send robots in to do the job for them. During the first 15 seconds of the collection field opening, humans cannot communicate with their collection robots, as startup interferes with the connection from the guild. After the autonomous period, each guild can start operating their 2 robots to start collecting resources for the remainder of the time.

When the asteroid struck, it produced energy capsules (discs). The high energy concentration of the capsules limits each robot to only be able to carry 3 at a time. Carrying any more could cause damage to the robots. The robots need to collect and send them to their respective stations to fill up their battery as much as possible before the field's respawn process. Each capsule powers 5 kilojoules of energy.

But be careful! The batteries have built in resistance so it can handle large amounts of energy, but too much or too little voltage can cause the energy to bounce out or miss containment entirely. Any energy capsules that fall under the battery are collected by a backup battery owned by the opposing guild, though at a lower energy concentration, at 1 kilojoule. To optimize collection, the two guilds must make sure their robots have accurate designs.

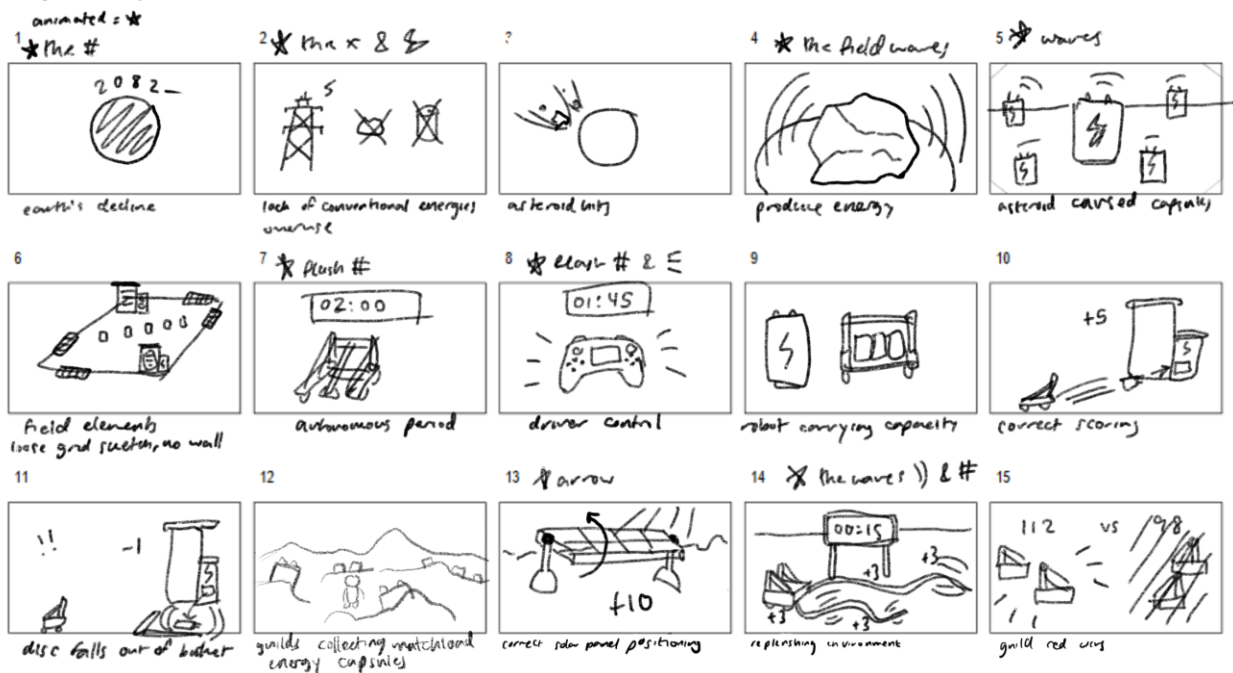
Each guild also has members working outside the collection field. There, members of each guild have found 7 additional energy capsules, which the guild may incorporate into the collection field for additional chances at gaining energy.

On the outskirts of the field, each guild's solar panels are fitted back to back. If a guild's solar panel is facing towards the sun, they receive enough energy to power an additional 10 kilojoules of energy.

And let's not forget what caused the energy crisis in the first place! To keep harvesting energy, robots must be sure to replenish the fields. In the last 10 seconds (endgame), robots can expand to restore the land they are on. The more acres you cover, the more bonus kilojoules you get for staying sustainable!

The state of the world makes survival seem difficult, but by no means is it impossible. With the right robot designs and features, the land can be saved and start to thrive like it once did. Good luck to each guild trying to save their land and ensure a bright and energy-filled future!

03 | Storyboard



In order to create the video, we developed this storyboard with a layout of the frames we would include in the video. This was a general layout of the video without colors and included notes on the scenes that would include animations. Each frame was intended to align with a certain part of the script. Afterward, this storyboard was followed to create the graphics used in the video. We then recorded the script and adjusted the lengths of each frame to match the dialogue.

The graphics in the video describe many of the relationships between the official game and our themed version of the game. These correspondences be seen in full below:

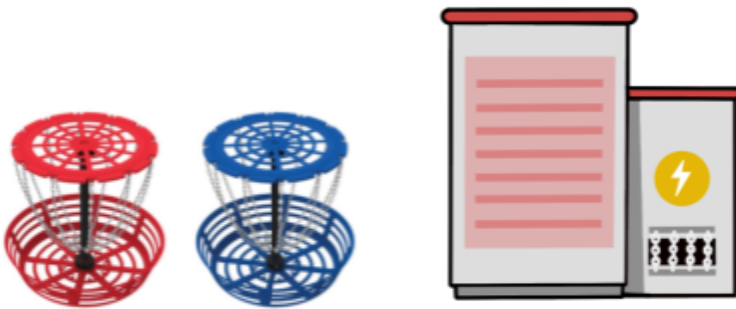
04 | Game Objects

The robot - robots used by the two groups to collect energy capsules

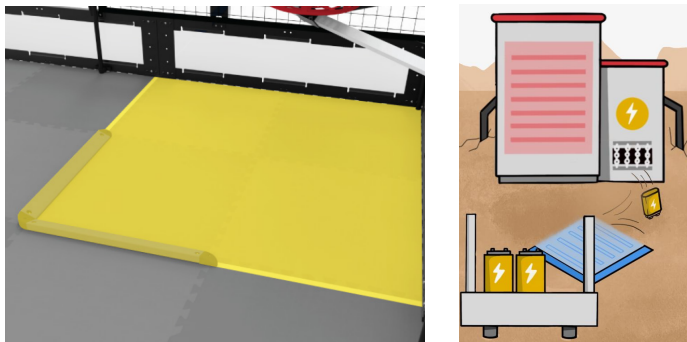
Rollers - Solar panels that must be adjusted to face the sun in order to collect energy to power the batteries.



High goals - batteries that need to be charged with energy in order to repair the land.



Low goals - an energy collection mechanism that the other team has used to try to harvest energy from the opposing group's battery



Discs - Energy capsules with large amounts of focused energy

