

**KnightKrawler  
FRC Team 2052**

**2021 Game Design Submission**

introducing....

# Maritime Mayhem!

## **Game Overview (500 words)**

The factory on the shore is dumping plastic bottles into the ocean, harming the wildlife! In Maritime Mayhem, diving robots are deployed to rescue animals, gather plastic bottles, and power their ship so they can set sail to the next cleanup location!

Robots start against the alliance wall and can be preloaded with up to one Animal, either a Turtle or a Duck. The game starts off with a 15 second autonomous period. Robots earn points by passing the Auto Line, pressing Wind Turbine buttons, and rescuing Turtles and Ducks by placing them into the Animal Sanctuary.

During the 2:15 teleoperated portion of the game, Robots collect plastic dispensed from the Factory and rescue Animals. Bottles and Jugs are reintroduced to the field via Human Players through the Factory. They are put onto the field as more Bottles and Jugs are scored. Animals are not reintroduced to the field. Turtles and Ducks start near the factory and become covered over time with the plastic dispensed from the factory. Bottles and Jugs are scored into goals located on each alliance's Ship. There is a low goal in the Cargo Bay located on the Ship's deck. Two high goals are located on the Ship's wall. Teams can also recycle plastic bottles into the Factory's recycling slots. The alliances race to be the first to recycle ten Bottles into the Factory. Turtles and Ducks need to be rescued from the polluted site around the factory and placed into the Animal Sanctuary in their respective habitats. Ducks are placed into the water and Turtles are placed on land. They can also be scored in the Animal Sanctuary's lake section. The Wind Turbines in the two halves of the field are used to power the alliance's Ship to replace energy produced by the factory. There are two Wind Turbine phases, and bonuses are earned for their completion.

During the 30 second Endgame, robots climb aboard their ship to set sail to the next location. They can park on the Ship Deck, climb the Cargo Net, or scale one of the Ropes to earn points. The alliance that earns the most points wins the match!

## **Description of Notable Field Elements. (300-word limit)**

Ships are perpendicular to the alliance wall on the audience side of the field. Robots can drive up the ramps on either side of the Ship to reach the Ship Deck and score Bottles and Jugs into two 3 foot high goals on the back of the Ship. Another goal, called the Cargo Bay, is on the floor at the front of the Deck. At the end of the match, Robots can climb the Ship Ropes that drop down from the Ship wall or Cargo Nets to the right and left sides of the Ship.

Wind Turbines are in the middle of each alliance's half of the field. The Turbine's cylindrical base

contains three buttons separated by walls. Once each button has been pressed, the Turbine activates, completing Phase 1, and starts spinning. Phase 2 is completed when robots press two buttons on their Turbine simultaneously, causing the Turbine to spin faster.

The Animal Sanctuary is in the middle of the field against the audience sidewall. It's a three-tiered semi-circle where robots can place Turtles and Ducks. The bottom level represents an Ocean, the middle Land, and the upper a Lake. Alliances earn more points when placing an animal on its correct habitat; the Turtles' natural habitat is the Ocean, and the Ducks' natural habitat is the Land. Placing either animal into the Lake earns the maximum number of points.

The Factory is against the wall opposite the Animal Sanctuary. It has two chutes for human players to reintroduce Bottles and Jugs onto the field and two slots for robots to recycle Bottles. The first team to recycle ten Bottles, signaled by Factory lights turning on, earns 20 points. This also causes the Factory to stop producing smog (a fan stops blowing grey streamers into the air).

### **Description of Expected Robot Actions (300-word limit)**

Robots control two types of animals - Turtles and Ducks - and two types of plastics - Bottles and Jugs. The Animals are rescued to be scored in the Animal Habitat. Turtles are scored in the bottom ocean section and Ducks are scored in the middle land section. If scored correctly, six points are earned; if scored incorrectly, three points are earned. If either Animal is scored in the top Lake section, ten points are earned. Bottles and Jugs are taken from the Factory and scored into the Ship. Scoring them in the top two goals above the deck earns three or ten points for Bottles and Jugs respectively. Scoring into the bottom goal located on the Ship Deck earns one point for Bottles and two for Jugs. The first alliance to recycle ten Bottles into the Factory earns 20 points.

Robots can also interact with the Wind Turbine. Two Wind Turbines are located in the middle of each half of the field. There are two phases, and each of the three buttons can be pressed once per phase for five points. When Phase 1 is completed, the alliance earns 20 points. If Phase 1 is completed in Auto, the alliance earns one ranking point. Phase 2 of the Turbine is only available when both alliances complete Phase 1. Completing the second phase earns the alliance 30 points.

In Endgame, Robots go back to their ship for points. Scaling the Cargo Net located on the sides of the Ship earns the alliance 25 points. Robots that climb the Ropes hanging from the Ship wall receive 10 points. Finally, five points are earned for parking on the Ship deck. If the game ends with one robot on each endgame spot, that alliance earns a ranking point.

### **Description of How the Chain is Used (300-word limit)**

Our use of the element is a cargo net made of chain. It is used as the ultimate climbing challenge for the robots as it sways back and forth, unlike a ladder. It is located on the side of each Alliance's ship and climbed in endgame. Scaling the Cargo Net earns the alliance the most endgame points.