

Robot ZONE [01]

A photograph of a dense forest with a large, moss-covered fallen tree trunk in the foreground. The trees are tall and thin, with sunlight filtering through the canopy. The ground is covered in green moss and small plants.

Risky
Rescue

Creative
Challenge

Image by [Karl Anderson](#)

Context

As you stroll through the forest near your camp, you think you hear a whimper. That's when you see a young Z-Rex in pain. It's impossible to help him in this state, however, as he doesn't appreciate you coming near him.

You've recently discovered that spira sap has healing properties. So, you want to give the Z-Rex three resources: water, food and spira sap to help him recover.

You need to calm him down with the tranquilizer darts you have, so you can assist him afterwards. Since he's a dinosaur, you need to hit him three times to make sure the tranquilizer takes effect, but beware, the dinosaur is frightened, and changes position every time you throw a dart!

Robot Description

Robots must comply with the following constraints:

1. The robot must completely enter the starting area, which is limited by the thin black line (see 2D view).
2. Only one controller (EV3 brick, Spike Prime).

Constraints

- Darts must be **thrown** from the safety zone.
- The robot's projection, including the firing mechanism, must always remain within the safety zone, which excludes the black line.
- The robot must be equipped with a touch sensor for the team to use.

Description of the Playing Field

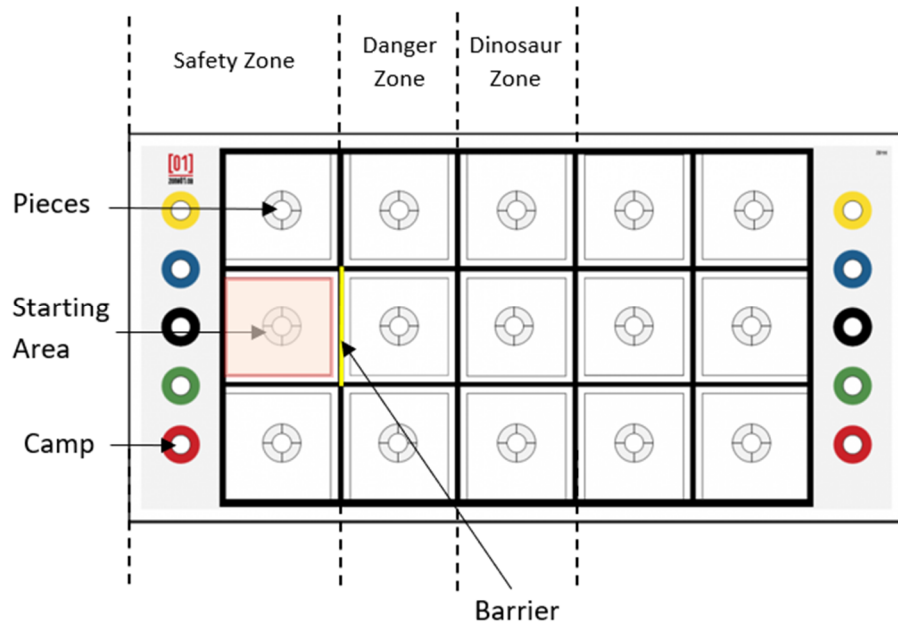
Surface used: Z01-H Mat

The mat is highly recommended for this challenge, as the mat lines and circles define the precise locations of the objects and zones.

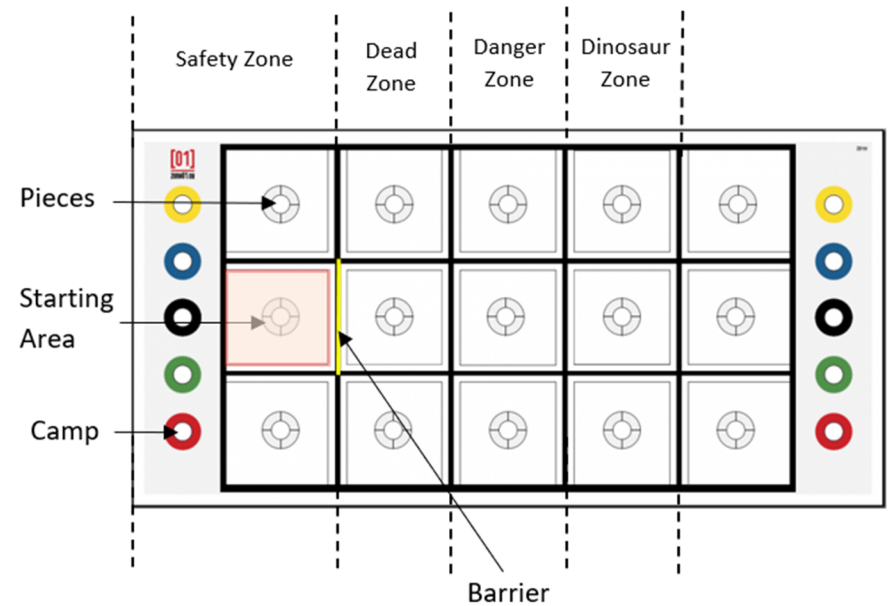
For this challenge, it's possible to practice with two robots at the same time, one on each side of the mat.

The mat is available at the [Zone01 shop](#).

View of the mat in 2D for elementary



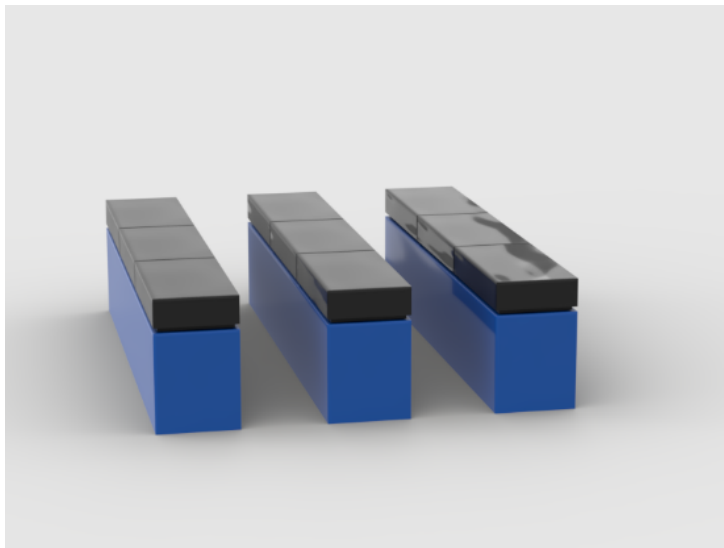
View of the mat in 2D for junior/senior



Description of the Accessories

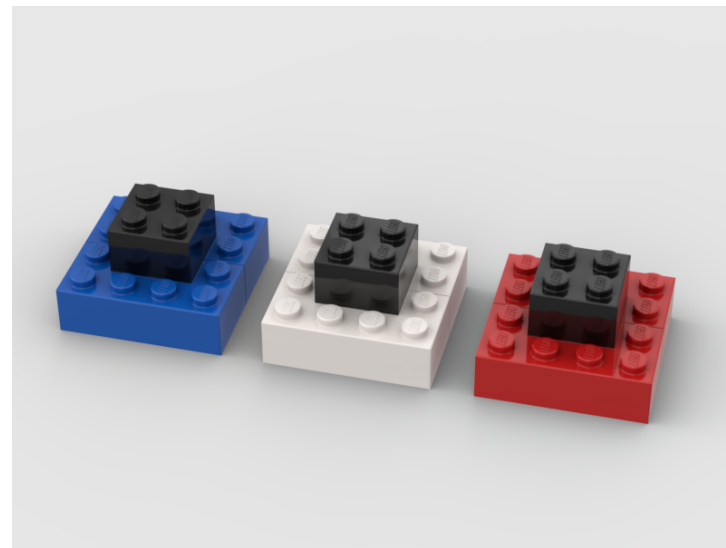
Tranquilizing darts

You've created tranquilizing darts thanks to the special properties of pompons, shrubs growing on Planet Z. They consist of a 1x6 LEGO brick and 3 flat 1x2 pieces.



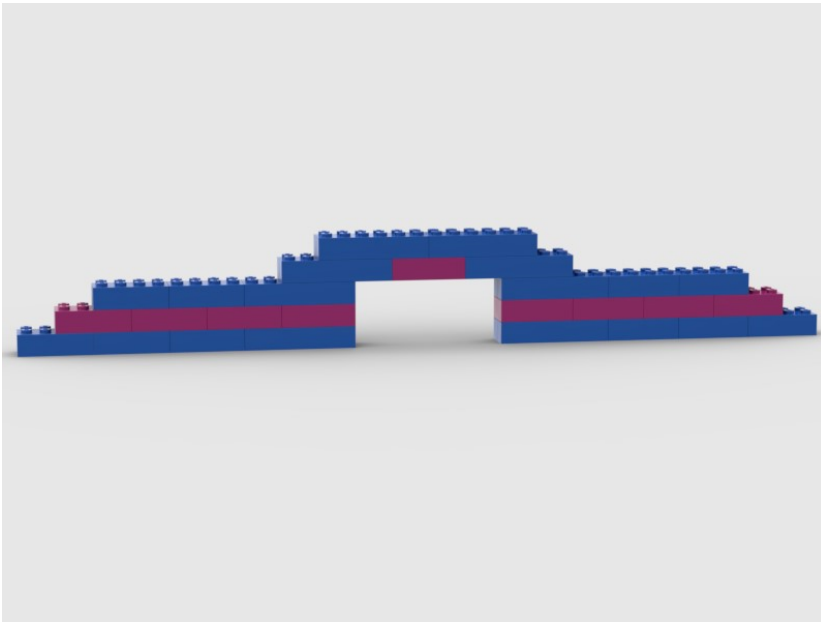
Ressources

Water, spira sap and food are placed in containers for delivery to the Z-Rex. They consist of one black 2x2 LEGO brick and two LEGO 2x4 bricks, blue for water, white for sap and red for food.



Barrier

There's a barrier in your path that you must not touch. The barrier is made up of LEGO 1x6 and 2x4 pieces.



Positioning of the Accessories

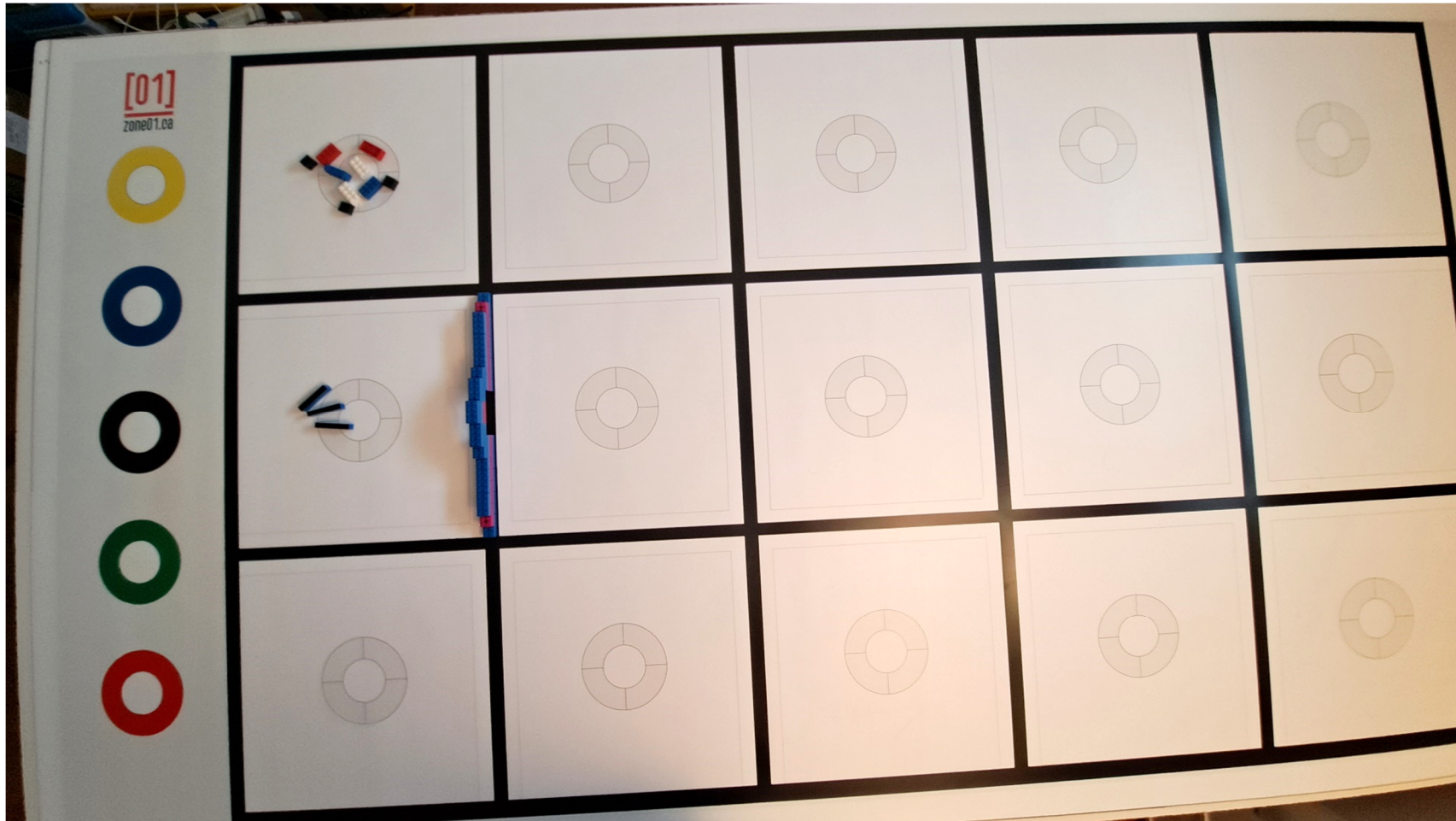
- Resources, i.e. sap, food, and water, must be built manually by the team once the challenge has begun. The team can then place the objects anywhere within the safe zone.
- The barrier is placed in the center on the black line between the safe zone and the zone to the right (the danger zone for the elementary level and the dead zone for the junior/senior level)

Elementary Level

- The team can manually place the darts on the robot during the challenge.

Junior/Senior Level

- The team places the three darts in the robot before starting the challenge.
- Danger and dinosaur zones are moved one row to the right.



Positioning of the accessories

Detailed Description of the Challenge

The robot is placed completely within the starting area, with the darts on it for junior and senior levels. Resources are placed in pieces in the top square of the safety zone.

At the judge's signal, the team starts the program, and the timer starts. The robot must be "waiting" for its touch sensor to be pressed before making any movement. Meanwhile, up to two team members must assemble and position the resources to be given to the dinosaur. When everything is ready, a team member can press the touch sensor to set the robot in motion.

From then on, no team member may touch the robot, any object, or the table, except to place the darts for the elementary level.

The robot's projection must always remain within the safety zone. If, during the trial, the projection lands on the black edge of the zone, the round is over.

The barrier must always remain completely on the black line. If the barrier touches the white area during the round, a large penalty will be given.

In any order, the robot must tranquilize the dinosaur by throwing a dart into each circle of the dinosaur zone, and must bring it resources by pushing water, food and spira sap into each circle of the danger zone.

The robot must then return to its camp, represented by the red circle. The challenge ends when the robot's projection is above the red circle.

Otherwise, the challenge is completed when a team member says "Stop" or when the time runs out (**max 2 minutes**).

Missions:

1. Throw a tranquilizer dart into each circle of the dinosaur zone.
2. Slide food, water, and sap into each circle of the danger zone.
3. Return to camp.

Scoring

Missions	Max Points
The resource touches the inside circle (15)	45
<i>The resource is partially within the circle (11)</i>	33
The dart is partially within its circle (20)	60
<i>The dart is completely within the square (16)</i>	48
The robot's projection is above the red circle	10

Penalty	Max Points
The barrier has been moved	-15

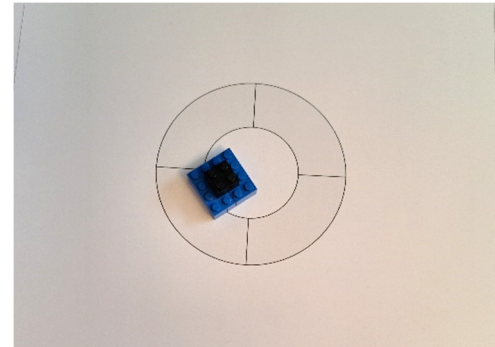
At the competition	Max Points
Solve the surprise rule	20

Total points max	135
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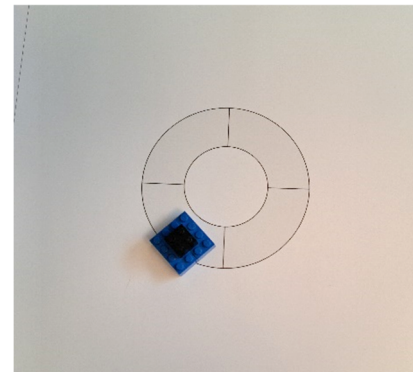
Score Interpretation

Sap, water, and food

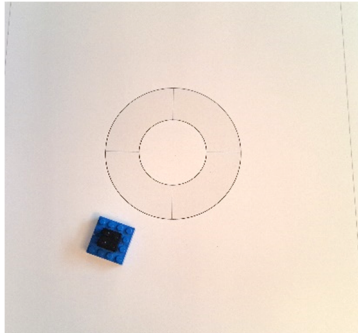
Touches the inside circle = 15 points



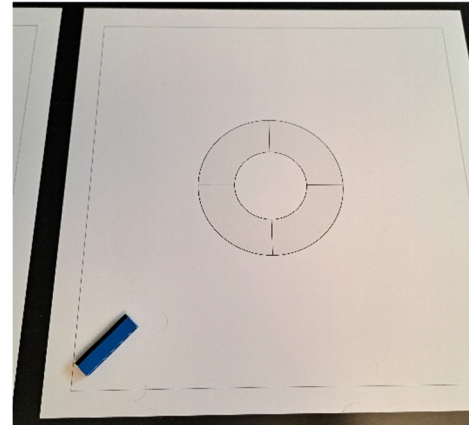
Partially within the circle = 11 points



Outside the circle = 0 points

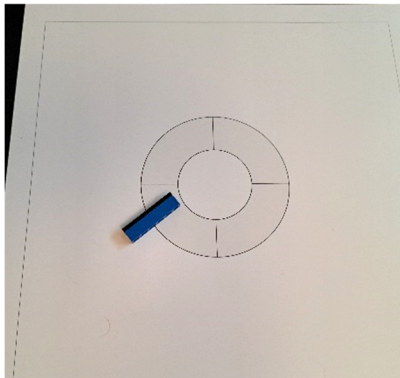


Completely within the square = 16 points

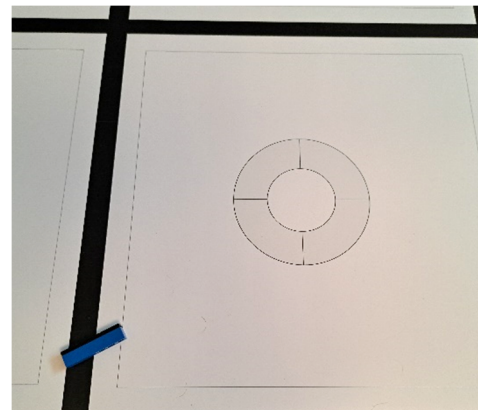


Darts

Partially within the circle = 20 points

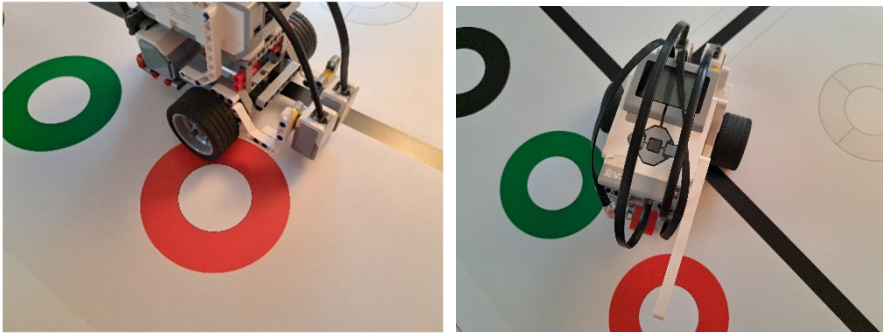


Touching the black border = 0 points

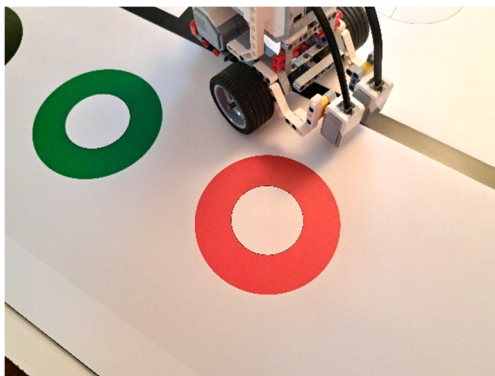


Camp

Projection above the camp = 10 points

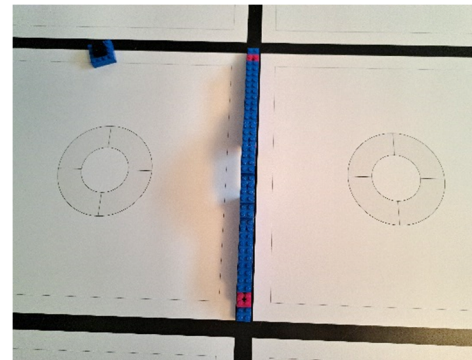


Outside the camp = 0 points



Barrier

Barrier on the black line = OK



Barrier touches white = -15 points

