Rover In-House

Game Rules

2024

WORLD ROBOT OLYMPIAD ™

WRO®

SOUTH AFRICA
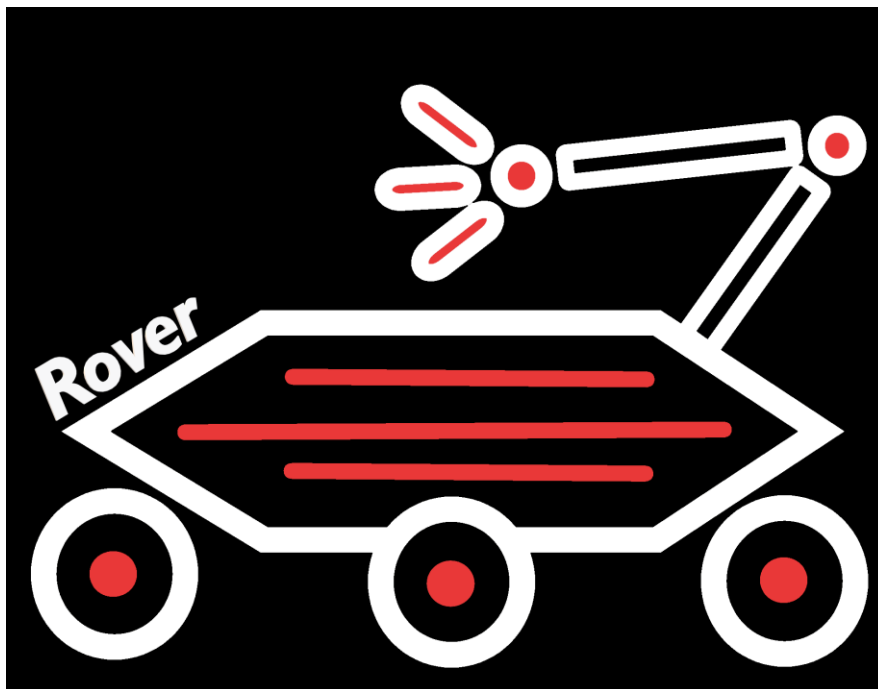
Date: 24 May 2024

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PART ONE – GAME DESCRIPTION

1. Introduction

The Rover In-House challenge is for children from the ages of 6 years to 10 years. The Rover In-House challenge is developed in South Africa and has no international or national final component. The In-House challenge is unique in that coaches run and score their own competition event during the challenge week and upload the teams highest score to the WRO SA website to receive certificates based on the teams achievements.

The Rover In-House challenge is designed in a way to make robotics fun and accessible to as many young roboticists as possible. The challenge is open to any robotics hardware from LEGO Spike Essential to Bee-Bots, teams may use any robot and programming software they are comfortable with.

The 2024 challenge week is set from the 10th of October to the 21st of October. Coaches have until midnight on the 20th of October to submit their team scores to the WRO SA website. In order to participate in the Rover In-House challenge coaches must register their school or club with WRO SA and pay the entry fee. Schools or clubs not registered will not receive certificates and teams will not appear on any achievement lists.

The Rover In-House challenge is designed to encourage participation in robotics. As such coaches may adjust the game rules to suit their teams as long as all teams are given the same challenge and treated fairly. Teams are challenging themselves to score the highest number of points possible. We encourage coaches to inspire, nurture and care for a team's interest in robotics, if there are items which are too difficult for your teams simply change the challenge, your submitted team scores will still be accepted by WRO SA.

Please check the website www.wrosa.co.za for the latest event updates.

General rules

There are a few rules within the Rover category which must be adhered to.

1. Teams consist of a maximum of three (3) team members and a minimum of two (2) team members.

2. Competitions must take place between the set competition dates the 10th to 21st of October 2024.

3. All scores must be submitted before the closing of the online score submission system at midnight on the 21st of October. No video evidence or score sheets will be required to submit scores.

4. All schools/clubs participating must be registered using the WRO SA registration system and fees paid before participating in the Rover event.

5. LEGO elements from the WRO Elements box 45811 are used to construct the table elements for the Rover competition.

6. Any robotic device and programming software may be used to compete in the Rover In-House challenge.

Game Story

A hurricane has damaged the local area. Some local zoo animals have escaped and were found stranded on the surrounding islands. Rescue teams have managed to contain the animals but require resources to be delivered before they can begin planning the safe return of the escaped animals. To make matters worse it is the nesting season for the local turtles, there are reports of injured turtles which must be rescued and be brought back to the launch boats for treatment. Meanwhile some turtles have made it safely to their nesting sites, these turtles must not be disturbed, or they may destroy their nests.
It is up to you and your team to design, build and program a robot to help these rescue teams and animals.
Are you up for the challenge?

2. Game Field

The following graphic shows the game field with the different areas.
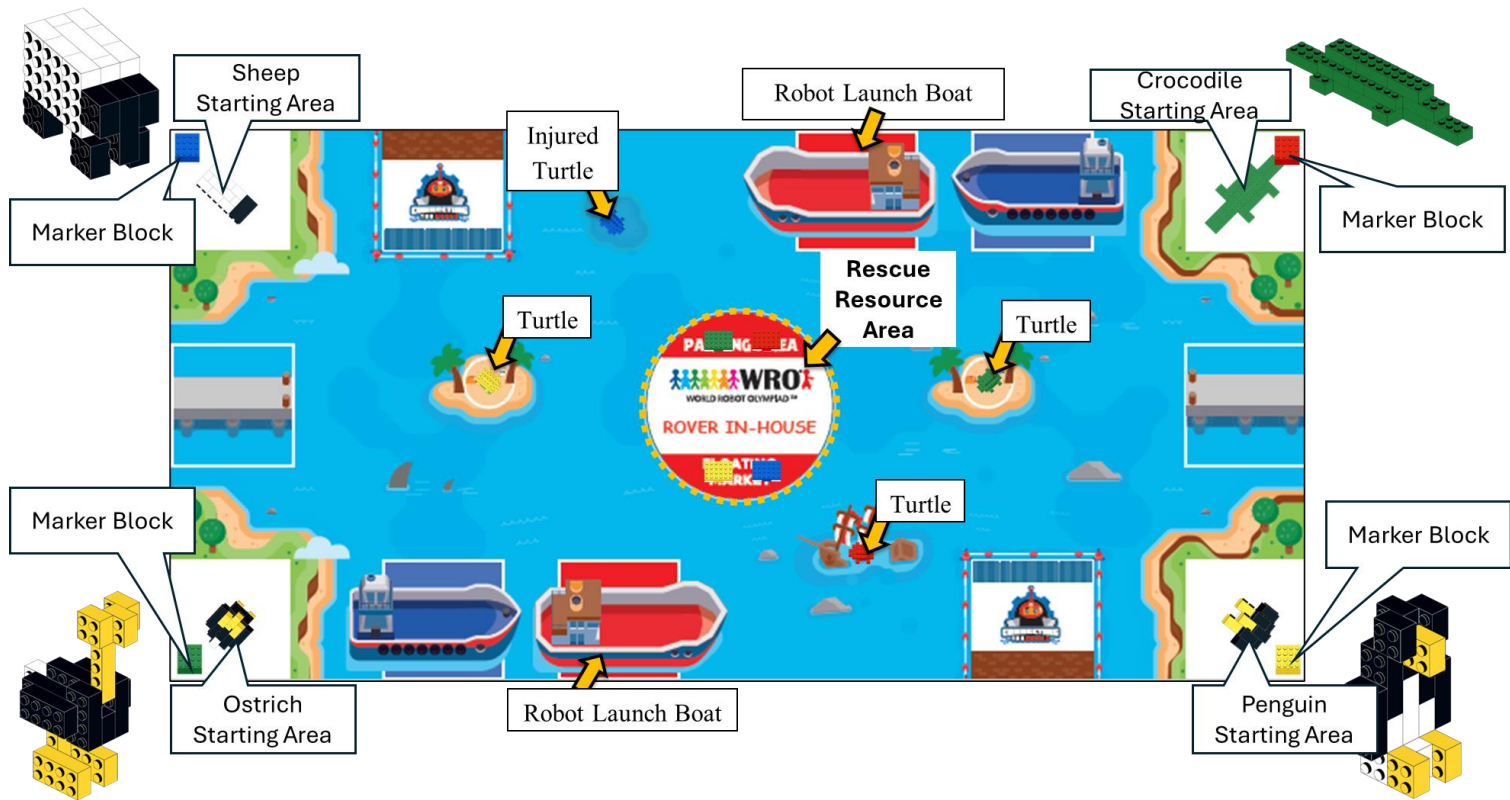

Brief explanation of tasks:

1. Collect the Red Resource and deliver it to the animal with the red marker block.
2. Collect the Green Resource and deliver it to the animal with the Green marker block.
3. Collect the Blue Resource and deliver it to the animal with the Blue marker block.
4. Collect the Yellow Resource and deliver it to the animal with the Yellow marker block.
5. Collect the Blue Injured Turtle and bring it back to a Robot Launch Boat.
6. Collect the Red Injured Turtle and bring it back to a Robo Launch Boat.
7. Finish with your robot inside the Rover In-House circle.
8. Yellow and Green turtles must not be moved outside of the white circle.
9. Animals must not be touching the mat outside of their white starting areas.

3. **Game Objects, Positioning, Randomization**

Animals (x4)

There are four animal elements. One ostrich, one crocodile, one sheep and one penguin. The below images show the starting positions of each animal element.
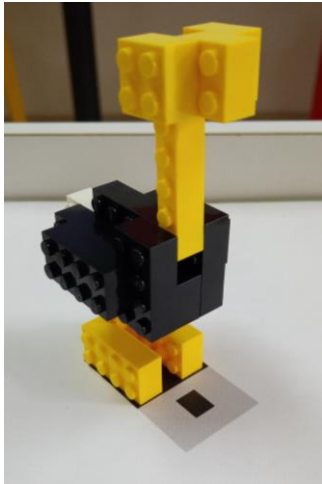
Ostrich starting area. (Black)
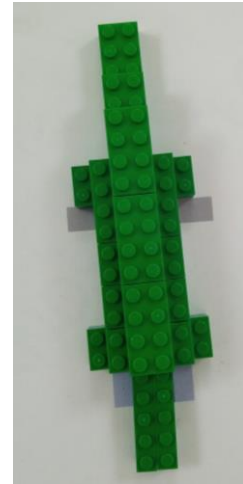
Crocodile starting area. (Blue)
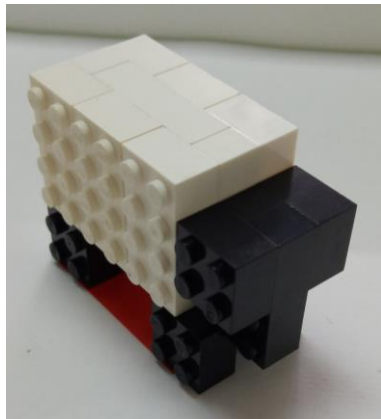
Sheep starting area. (Red)
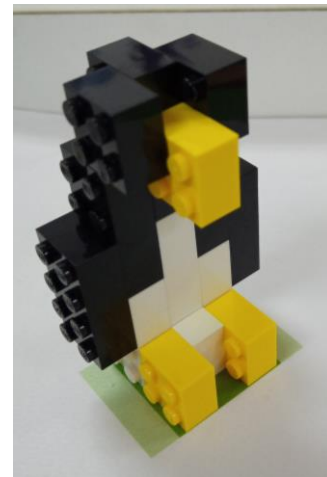
Penguin starting area. (Green)

Turtles (x4)

There are four turtles placed on the game mat.

The green and yellow turtles start on the islands.
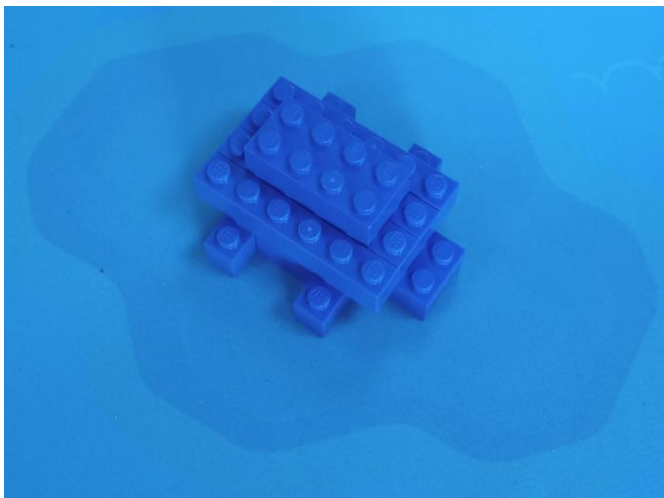
The blue turtle starts in the dark blue water area to the right of the sheep starting area.
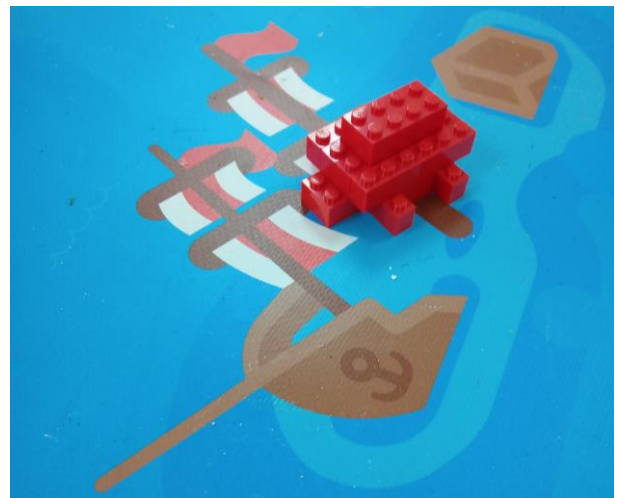
The red turtle starts on the shipwreck. It can be placed touching any part of the shipwreck.

Marker Blocks (x4)

There are four marker blocks. One red, one green, one yellow and one blue marker block. Each block is **randomly placed** inside each animal starting area.

Four marker blocks.

The four marker blocks indicate which rescue resource must be delivered to which animal. Once the marker blocks are placed that is the resource that must be delivered to the animal for the entire competition time and must not change.

Rescue Resources (x4)

There are four rescue resource blocks. All four blocks start in the Rover In-House circle in the middle of the game mat and can be placed in any orientation.
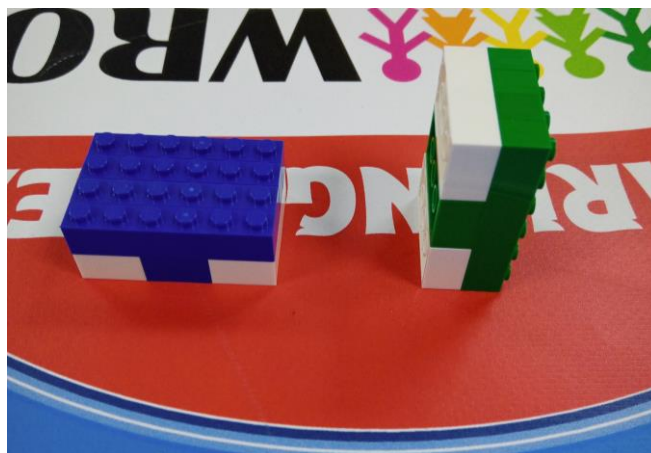
The rescue resources may start in any orientation and be placed anywhere inside of the Rover In-House circle.

4. Robot Missions

4.1 Collect and deliver the rescue resources.

Collect the four rescue resources and deliver them to the four animals with the matching marker block. The animal may be moved but must not be broken or touching outside of its white area.

4.2 Rescue the injured turtles.

The red and blue turtle have been injured and must be taken to the launch boat for treatment.

Collect the red and blue turtles and deliver them to a red launch boat.

4.3 Finish in the rescue resources area.

The robot must finish inside the Rover In-House circle in the middle of the mat. The robot must be completely inside the circle and have stopped to count as finished. A team does not need to have completed all tasks to score these finishing points. If a team completes one task and moves their robot into this area the team will score points for finishing.

4.4 All resources have been delivered correctly.

All of the resources must have been delivered correctly to the animal with the matching marker block.

4.5 Don't disturb the green and yellow turtles.

The green and yellow turtles must not have been moved outside of the white circle in their starting area.

4.6 Surprise Rule

Your coach will come up with a surprise rule for the day, this can be anything but should not affect the original game elements. The surprise rule could be as simple as High Fiving the judge when the red resource block is delivered or could be the inclusion of a new element on the game mat. The element does not have to be made of LEGO.

WRO SA will provide some suggestions of surprise rules closer to the WRO event.

5. **Special Conditions**

5.1 Robot launch Boats.

Teams may start their robot in any of the two robot launch boats. Teams may also move their robot from one launch boat to the other by picking the robot up and placing it in the new launch boat. A team may only move their robot from one launch boat to another if their robot is touching a launch boat.

5.2 Rescue Resources.

Teams may place the rescue resources by hand onto the robot when the robot is completely inside the Rover In-House circle. Teams may move any of the rescue resources inside of the Rover In-House circle by hand as long as the resource is inside of the Rover In-House circle and still touching the game mat.

5.3 Variations & Changes.

Coaches may change and alter the challenge any way they like making it more difficult or easier for their teams. WRO SA does not need to be notified if you make changes to the challenge.

Rover In-House Scoring

The scoring for Rover In-House is designed to allow teams to score multiple times. A team must ask the judge when they would like to score. Once the run has been made and total counted the judge will record the result. A score may only be recorded if it is higher than the last scoring attempt. For example, if a team's first run scores 60 points and the second run scores 30 points the second run will not be recorded giving the team another chance to score.

6. **Scoresheet**

Rover In-House

Team Name:

Team Member 1:

Team Member 2:

Team Member 3:

Task	Each	Points	1st Score	2nd Score	3rd Score	4th Score
Red resource collected and delivered to the animal with the red marker.	Yes / No	25				
Blue resource collected and delivered to the animal with the Blue marker.	Yes / No	25				
Yellow resource collected and delivered to the animal with the yellow marker.	Yes / No	25				
Green resource collected and delivered to the animal with the green marker.	Yes / No	25				
Saved the blue injured turtle and delivered it to a robot launch boat.	Yes / No	30				
Saved the red injured turtle and delivered it to a robot launch boat.	Yes / No	30				
All resource blocks have been delivered to the correct animal with a matching marker block.	Yes / No	40				
Robot finishes in the centre Rover In-House circle. All parts of the robot are inside the circle.	Yes / No	10				
Surprise Rules	Yes / No	30				
Bonus Points: Awarded once the robot has stopped moving. The robot does not have to have scored any points for the bonus points to be awarded.						
Animals not touching outside of their white starting area.	0 1 2 3 4	**10** each (max 40)				
Green turtle not moved outside of the white circle.	Yes / No	10				
Yellow turtle not moved outside of the white circle.	Yes / No	10				
Time is the time the score was recorded. For example 14:37	Total:	300 Max:				
Scores must be submitted during the scoring week. 11 October - 21 October 2024		Time:				

Diamond 300 points

Gold 221 - 299 points

Silver 141 - 220 points

Bronze 60 - 140 points

Team Member Signature: _____

Judge Signature: _____

7. Scoring Interpretation

Robot Launch Boats

There are four (2) possible robot launch areas. The robot must start completely inside of these areas and can be moved from one area to another if the robot has entered a launch area. For example, a robot that enters a launch boat area can be picked up by a team member and taken to another launch area to continue the table missions.

Robot Launch Boat

Robot Launch Boat with robot.

Rescuing the injured turtles

The red and blue turtle must be brough to a Robot launch boat.
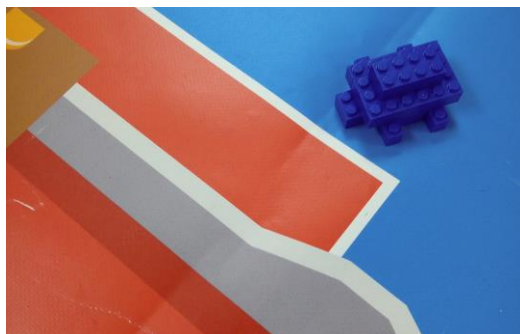
Blue turtle not inside a Robot Launch Boat

0 points
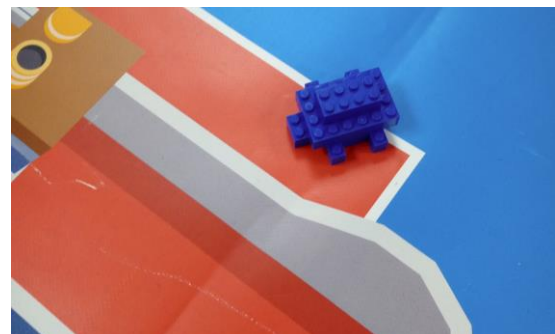
Blue turtle touching a robot launch boat.
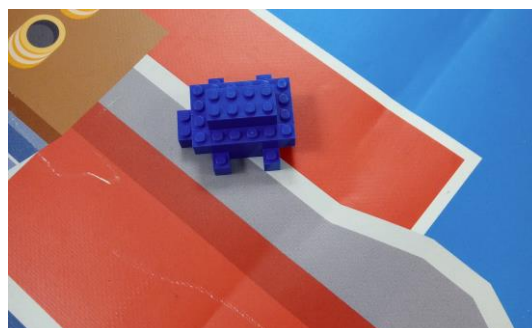
30 points

Blue turtle completely inside a robot launch boat.

30 points

Resource Block Scoring

The four resource blocks should be collected and delivered to the animal with the matching marker block colour.
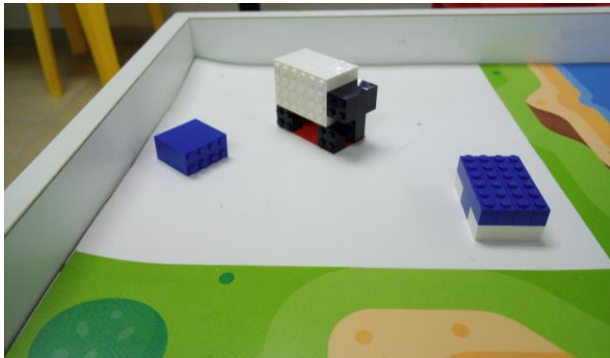
Blue resource block delivered to the animal with a matching marker block.

25 points
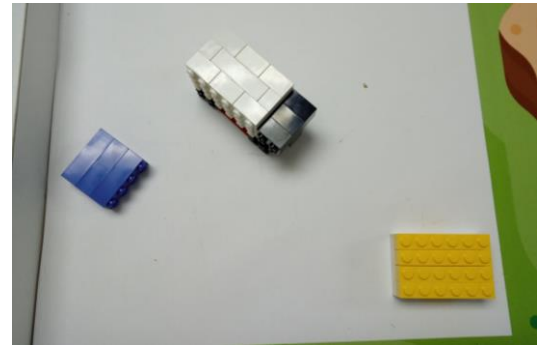
Yellow resource block delivered to an animal with a different colour marker block.

0 points

Blue resource block delivered to the animal with a matching marker block. Resource block is not completely inside of the white area.

0 points
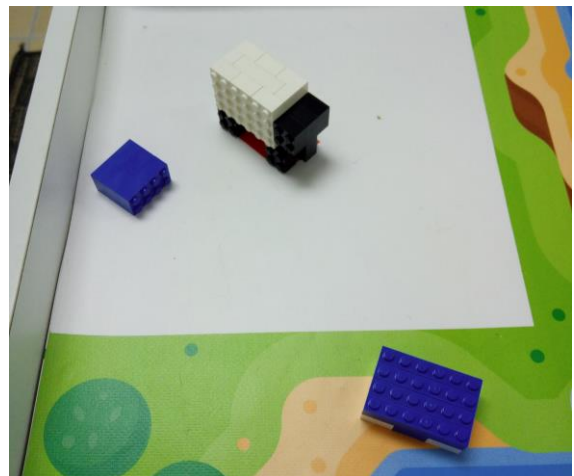
Blue resource block not inside of the white area with a matching colour marker block.

0 points

Nesting Turtles

The Green and Yellow turtles must not be disturbed and must remain inside of their surrounding white circle.

Green Turtle completely inside of its surrounding white circle.

10 points

Green Turtle touching the surrounding white circle, not touching outside of the white circle.

10 points

Green Turtle touching outside of its surrounding white circle.

0 points

Green Turtle completely outside of its surrounding white circle.

0 points

Animals

The animals must remain inside of the their white starting areas and must not touch anywhere outside of their white starting area.

Animal (ostrich) completely inside its original starting area.
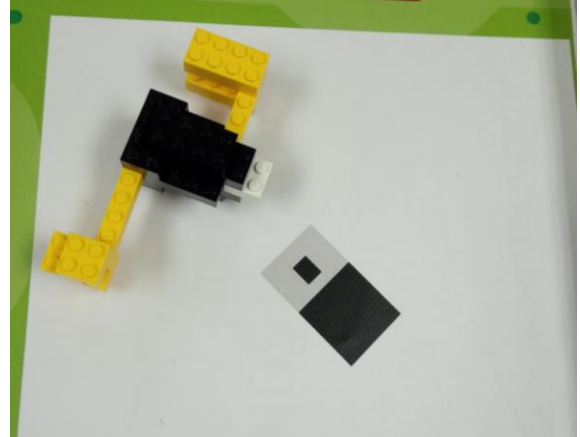
10 points

Animal (ostrich) moved and completely inside its original starting area.

10 points

Animal (ostrich) moved and touching outside its original starting area.
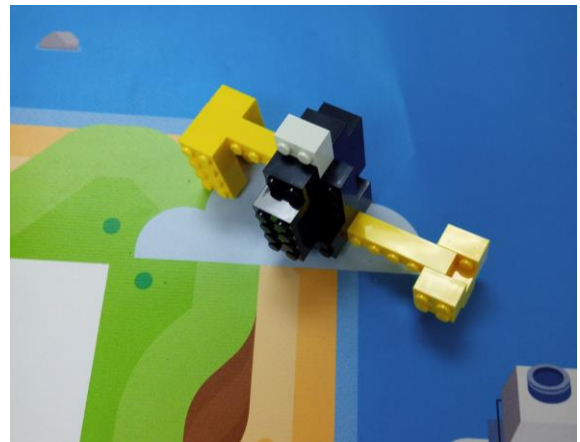
0 points

Animal (ostrich) moved completely outside its original starting area.

0 points

Robot finishing area.

The robot must be completely inside of the Rover In-House circle for points for finishing to be scored. A team does not need to complete all challenges for these points to be scored.

Robot completely inside the Rover In-House circle. standing.

20 points

Robot not completely inside of the finish area. Parts of the robot are outside of the circle.

0 points

PART TWO – ASSEMBLY OF GAME OBJECTS

Ostrich (x1)

1 1x

2 2x

3 1x 2x 1x

4 1x

5

2x

6

1x

7

2x

8

3x

9

Crocodile (x1)

1

2x   2x

2

2x   2x

3

4x

4

3x

5

2x 2x

6

3x

7

Penguin (x1)

1 1x 2x

2 1x 1x 1x

3 3x

4 2x

5 2x 1x

6

Sheep (x1)

1

1x 1x

2

3x

3

1x 1x

4

3x

5

2x

6

1x

7

2x 1x

8

1x
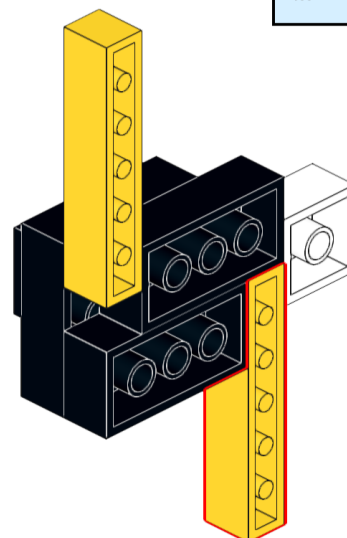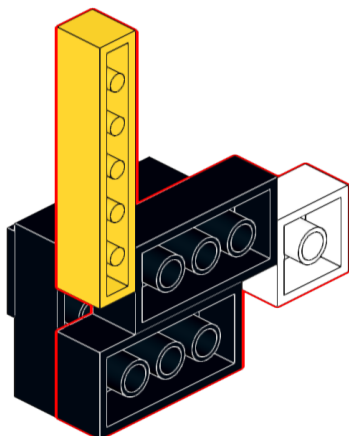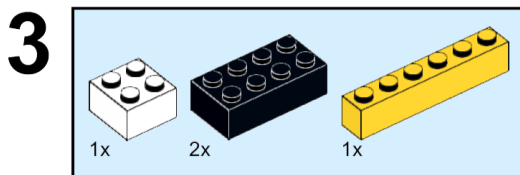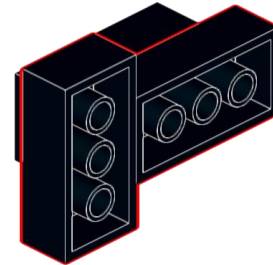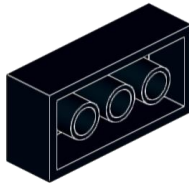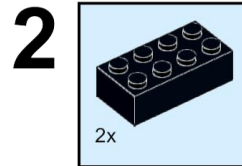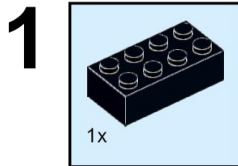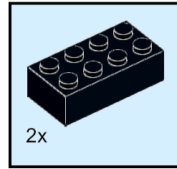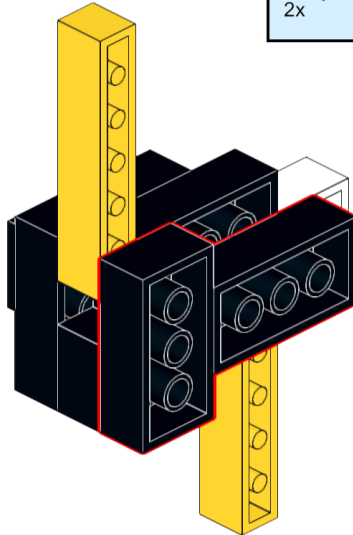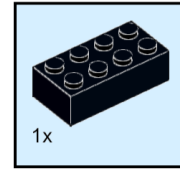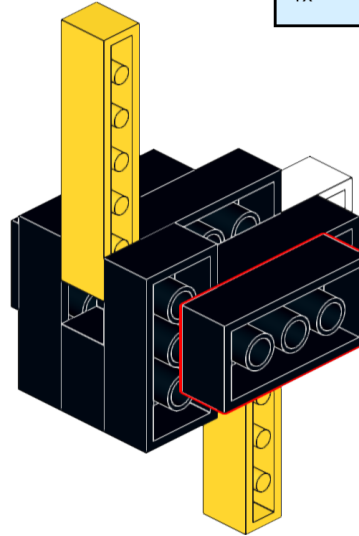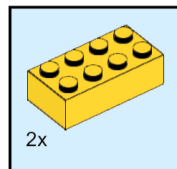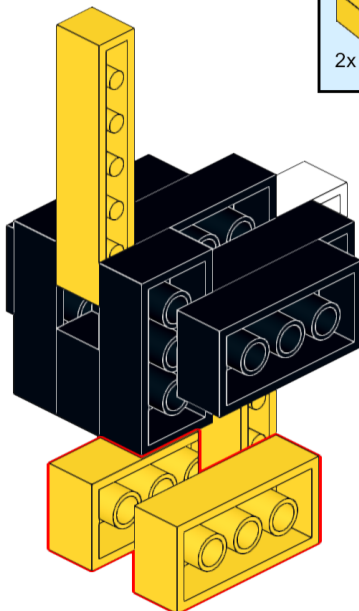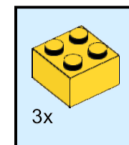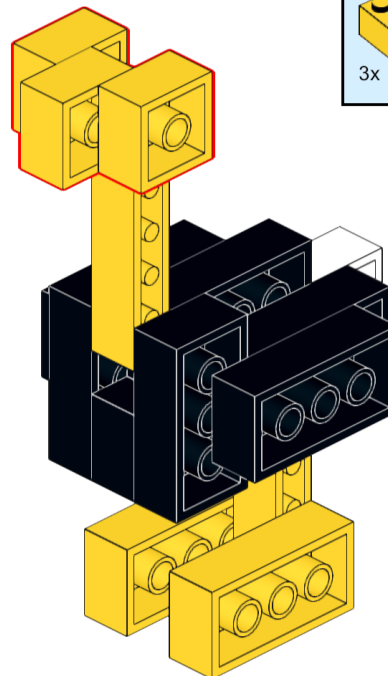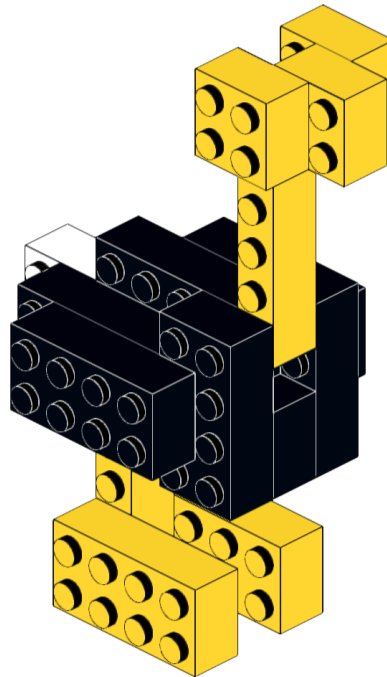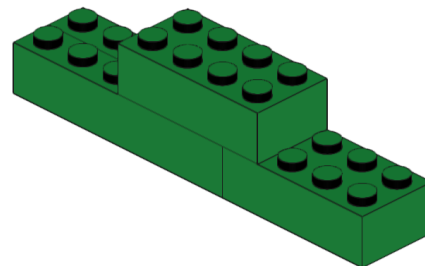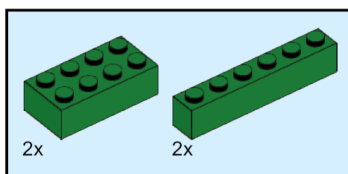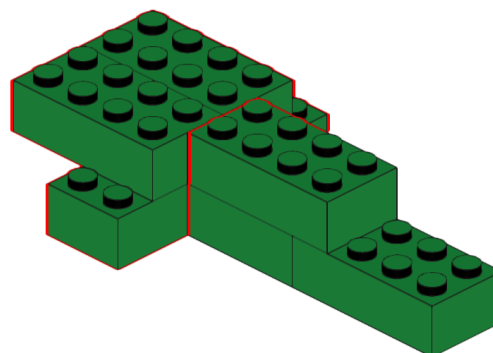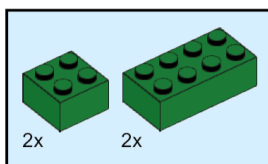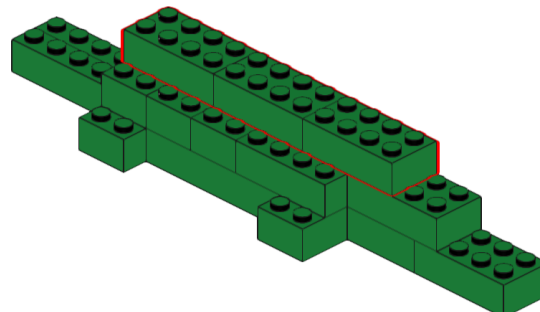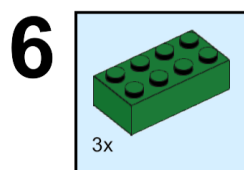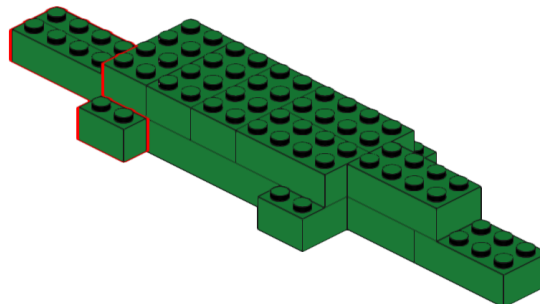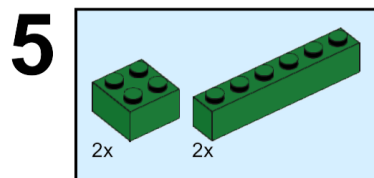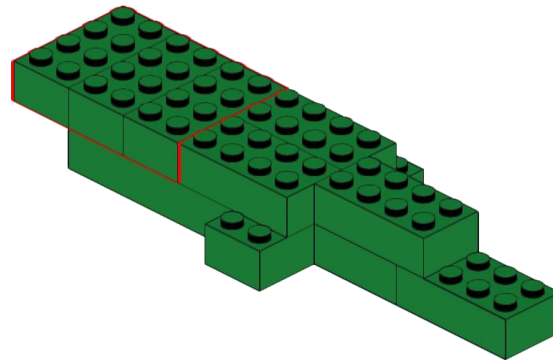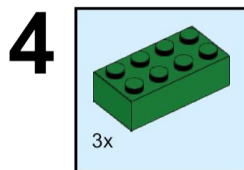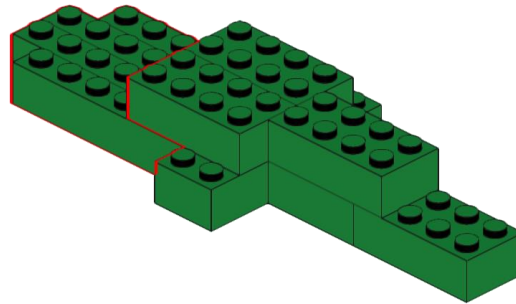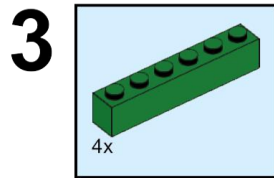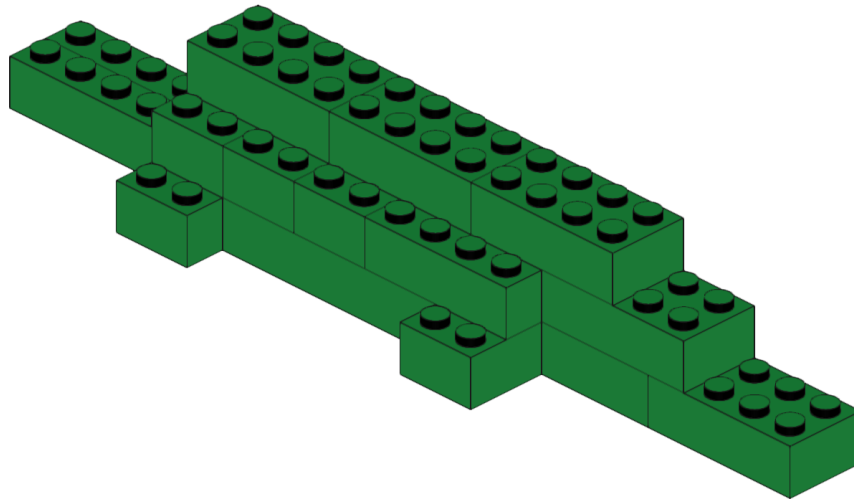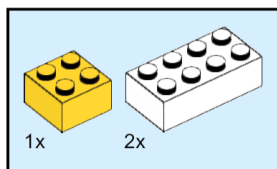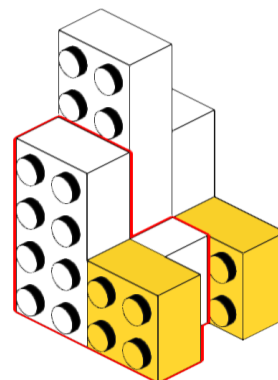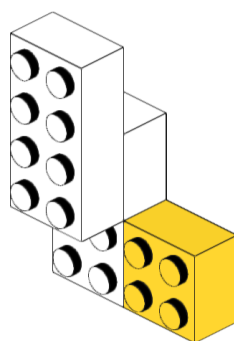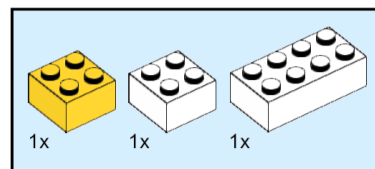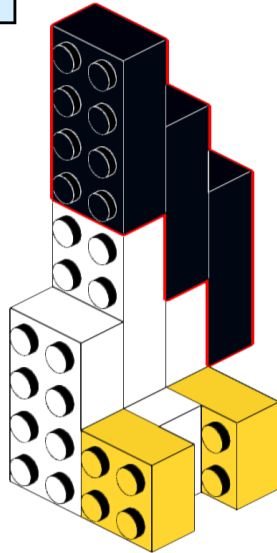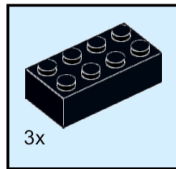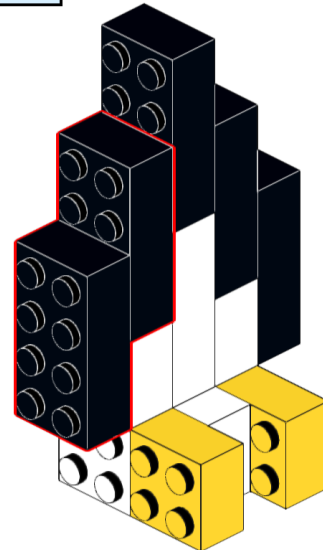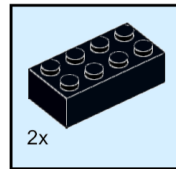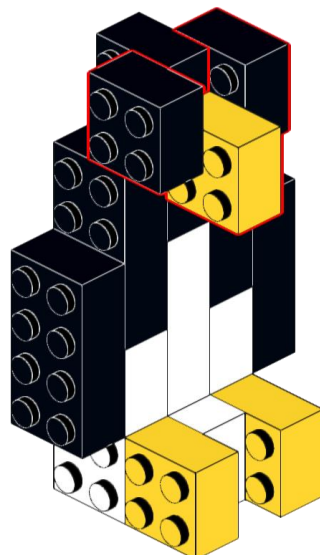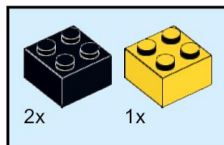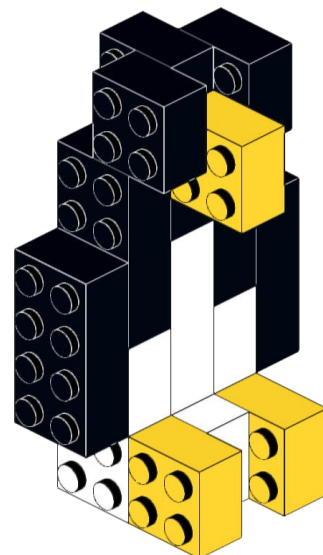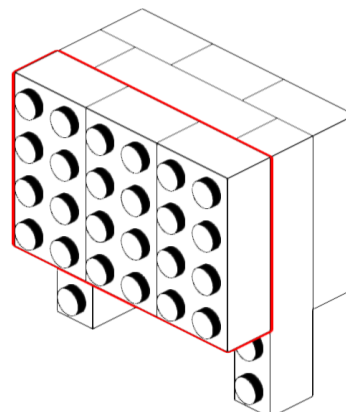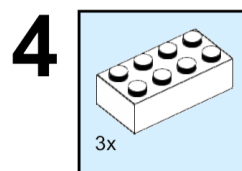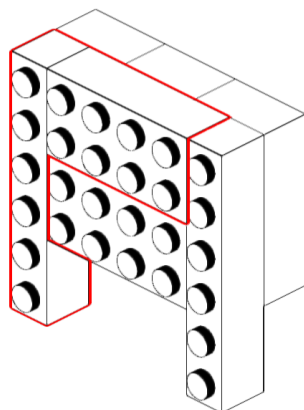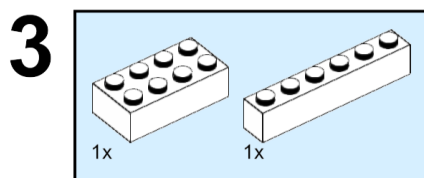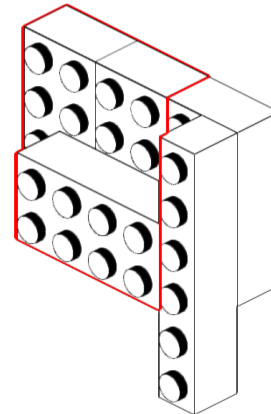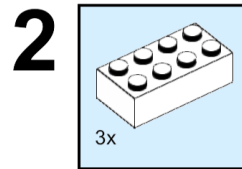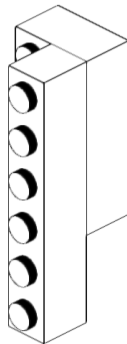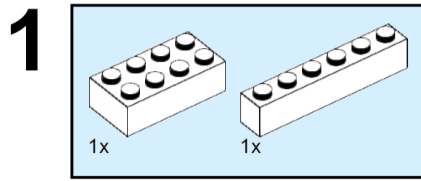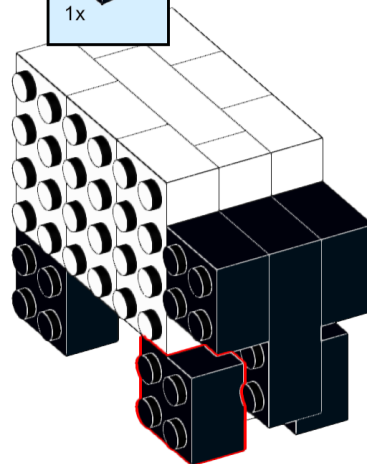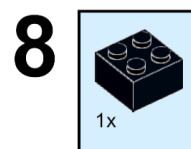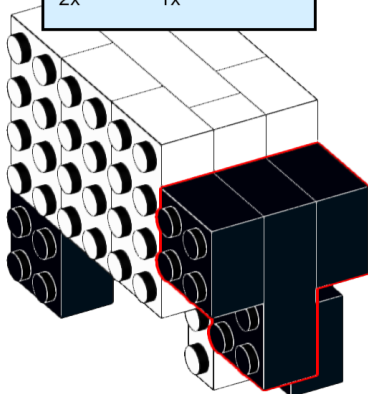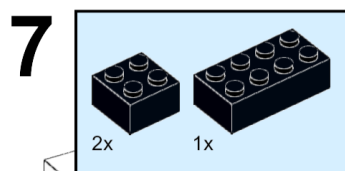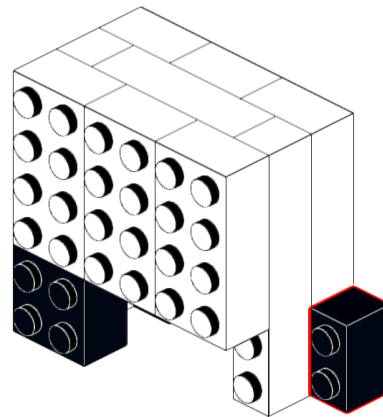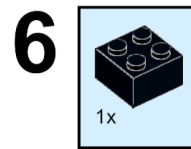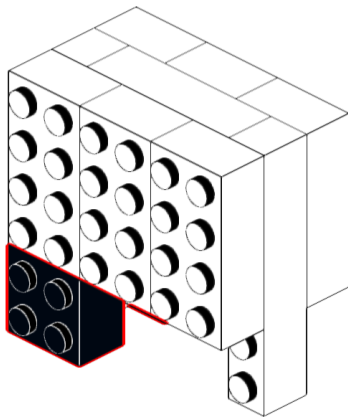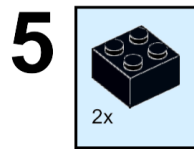
9
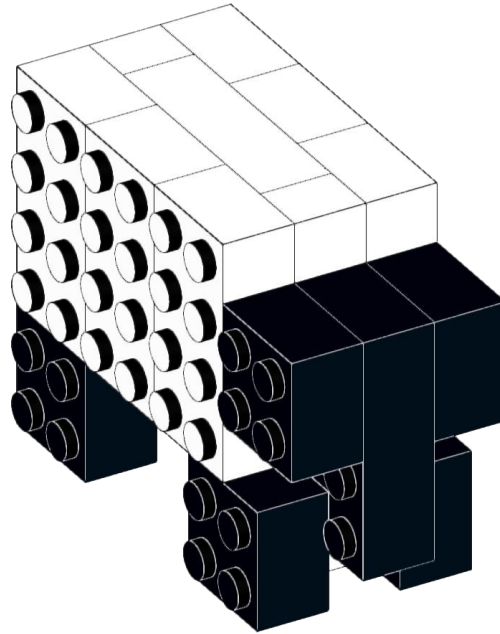
Turtles (x1 Green, x1 Blue, x1 Red, x1 Yellow)

1

6x
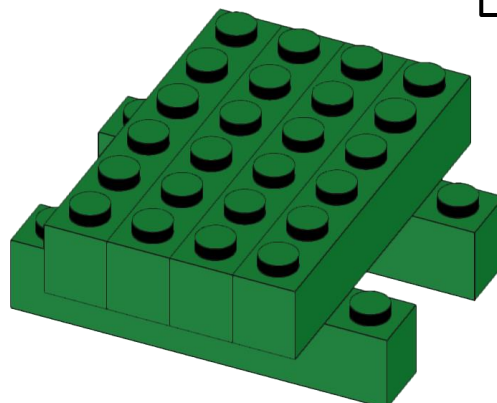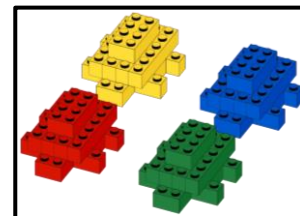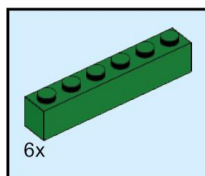
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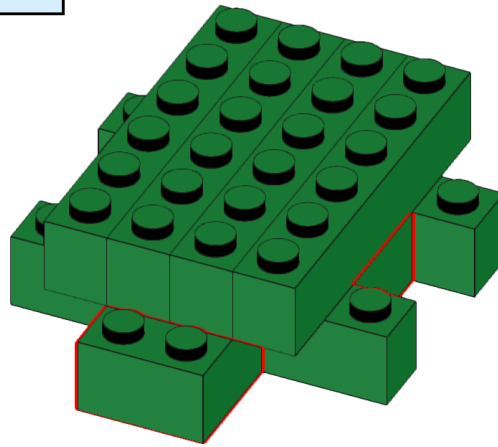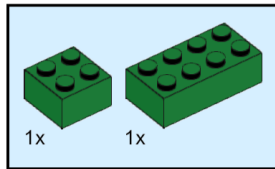
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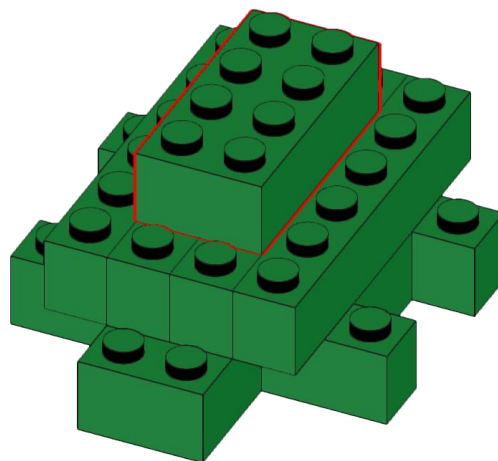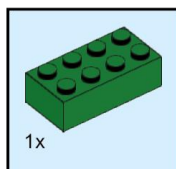
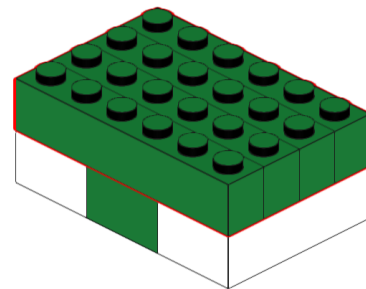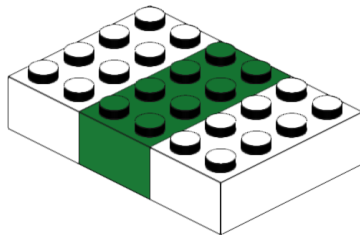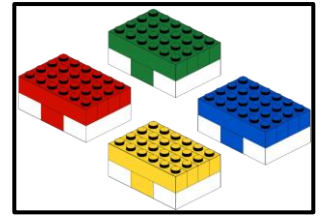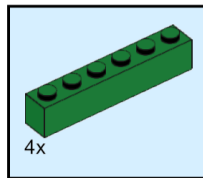## Resource Blocks (x1 Green, x1 Blue, x1 Red, x1 Yellow)
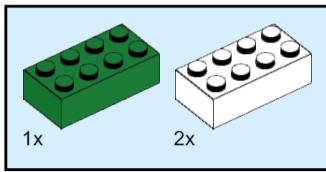
Marker Blocks (x1 Green, x1 Blue, x1 Red, x1 Yellow)