In-House Challenge 1: Research Ready

Game Rules

WORLD ROBOT OLYMPIAD ™

WRO®

SOUTH AFRICA

Date: 18 February 2026

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PART ONE – GAME DESCRIPTION

1. Introduction

Robotics is a wonderful platform for learning 21st century skills. Solving robotic challenges encourages innovation and develops creativity and problem-solving skills in students. Because robotics crosses multiple curricular subjects, students must learn and apply their knowledge of science, technology, engineering, math, and computer programming.

The most rewarding part of designing robots is that students have fun. They work together as a team, discovering their own solutions. Coaches guide them along the way, then step back to allow them their own victories and losses. Students thrive in this supportive and immersive environment, and learning occurs as naturally as breathing air.
At the end of the day, at the end of a fair competition, students can say they did their best, they learned, and they had fun.

There is no international component for the In-House challenge.
The In-House challenge is run by coaches in their own capacity.
Score submission takes place between the 1st and 31st of October

Game Story:
Palaeontologists and scientists at a newly discovered research site have requested your team to build and program a robot to assist their research. Your robot must deliver important research tools and materials, move debris from recent digging activities and ensure the storage shed is stocked and ready for the second phase of the dig site. To make things tricky ancient pillars have also been found on the site which your robot must avoid and not damage. Palaeontologists have unearthed a new fossil from the dig site, the fossil is currently in a delicate state and must not be moved or damaged in any way until the palaeontological team deems the fossil safe to move. Can you assist this research and help unearth something new to science?

2. Game Field

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

If the table is larger than the game mat, place the mat on the wall with the start area side touching the table wall.

Level 1 - Research Ready:

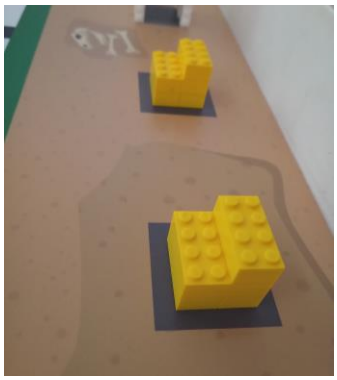
1. Collect the debris from the dig site and move it to the robot start area.
2. Deliver the excavation toolbox to the dig site.
3. Collect and deliver the pallets to the storage shed.
4. Deliver the research tent crates to the research tent area.
5. Dig site fossil must not be moved or damaged.
6. Touch the robot and say STOP to show you have ended your scoring run.

Bonus: Ancient pillars must not be moved or damaged.

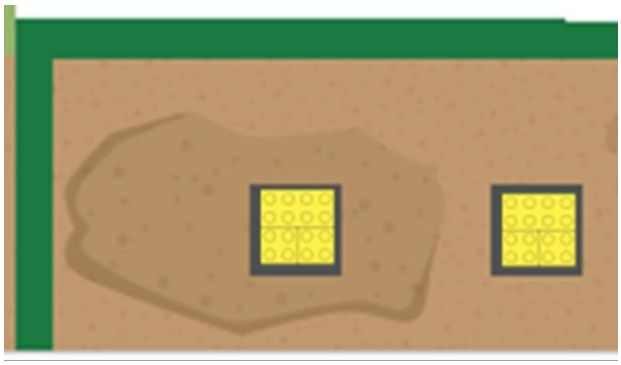
3. Game Objects & Positioning

Dig Site Debris (x2)

Two debris elements are placed on the first and second black square in the dig site area.



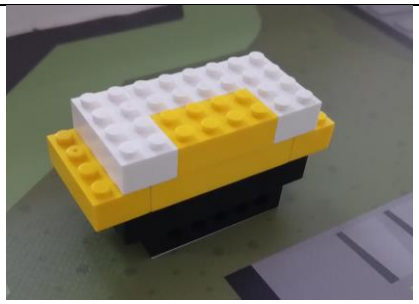
Starting orientation of the debris elements



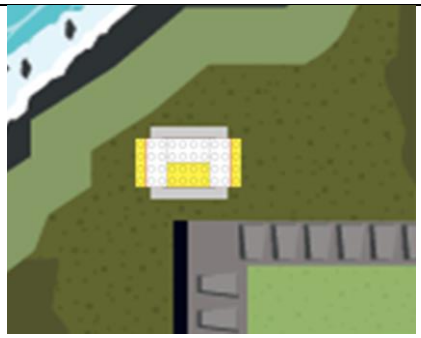
Starting location of the debris elements.

Excavation Toolbox (x1)

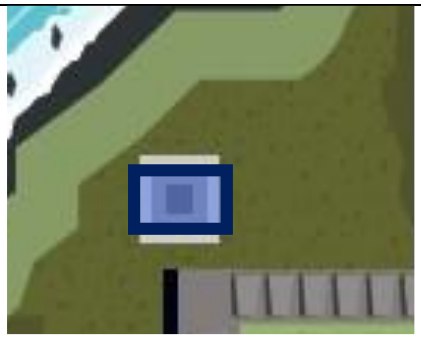
One toolbox is placed on the game in the grey square to the left of the start area near the water image.



Starting position of the Toolbox.



Starting orientation of the toolbox.

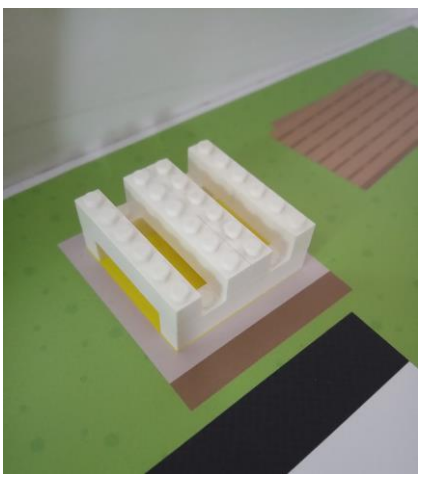


Starting position of the toolbox.

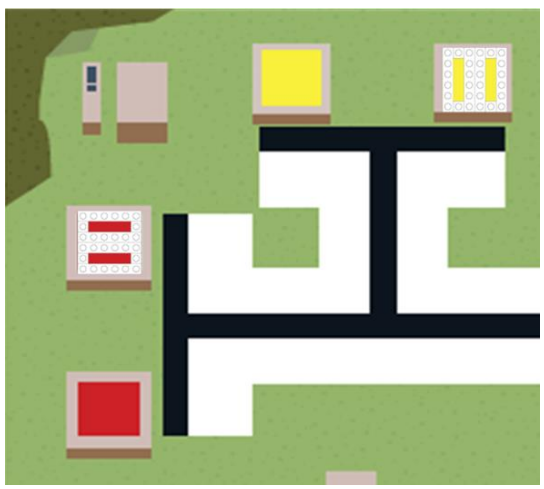
Pallets (x2)

Two white pallets are placed on the game mat. One pallet in the red square to the top left of the game mat. One pallet on the yellow square closest to the storage shed.

Starting position of the pallet on the red square.



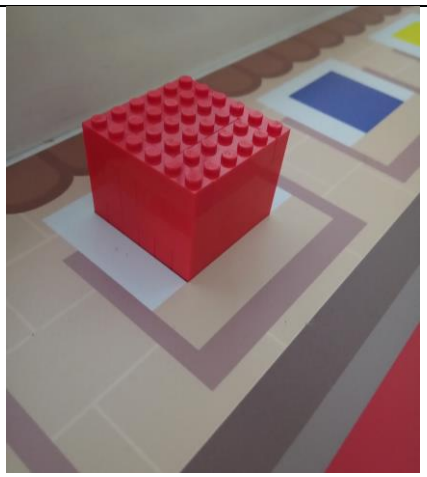
Starting position of the pallet on the yellow square.



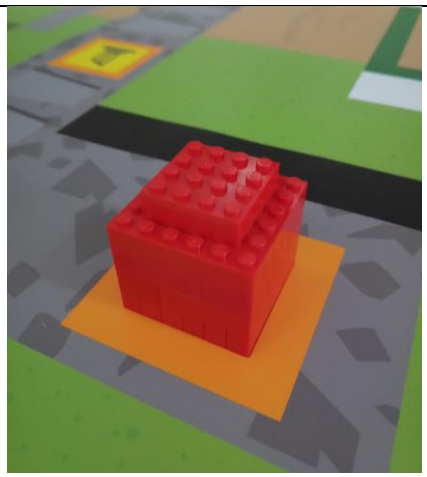
Starting position of the pallets.

Research tent crates (x2)

Two tent crates are placed on the game mat. One tent crate starts on the black square inside of the storage area. The other tent crate starts on the red square with orange border closest to the dig site. Teams can decide which tent crate build starts in which crate location.



Starting position of the tent crate on the black square in the storage area.

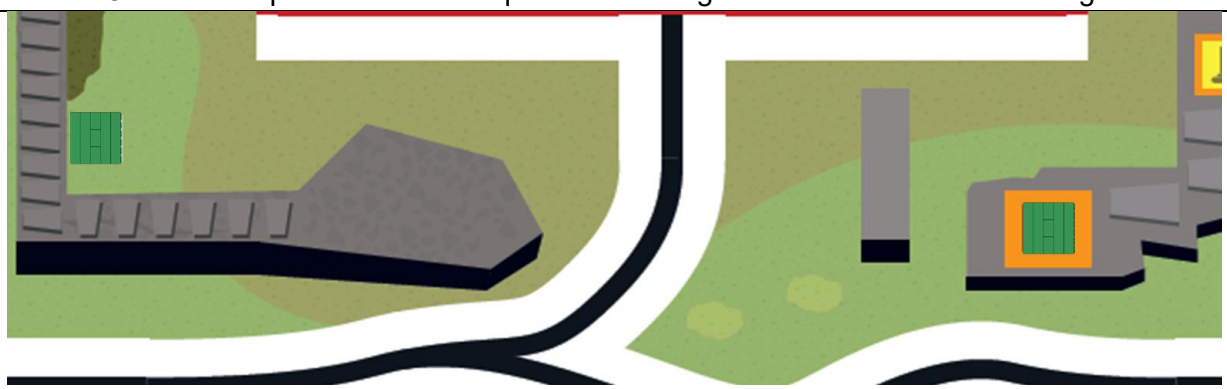


Starting position of the tent crate on the red square closest to the dig site.

Starting position of the tent crates.

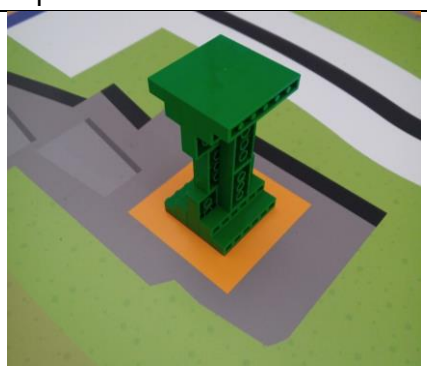
Ancient Pillars (x2)

Two ancient pillars are placed on the game mat. One pillar in the grey square between the start area and the storage shed. One ancient pillar on the red square with orange outline closest to the storage shed.



Starting locations of the ancient pillars

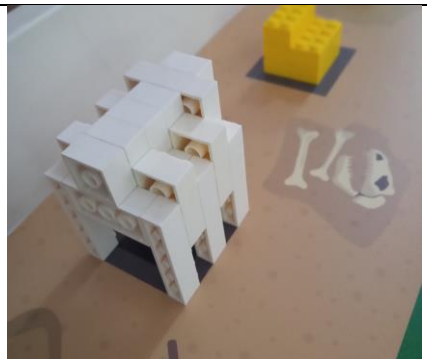
Starting position of the pillar closest to the start area.



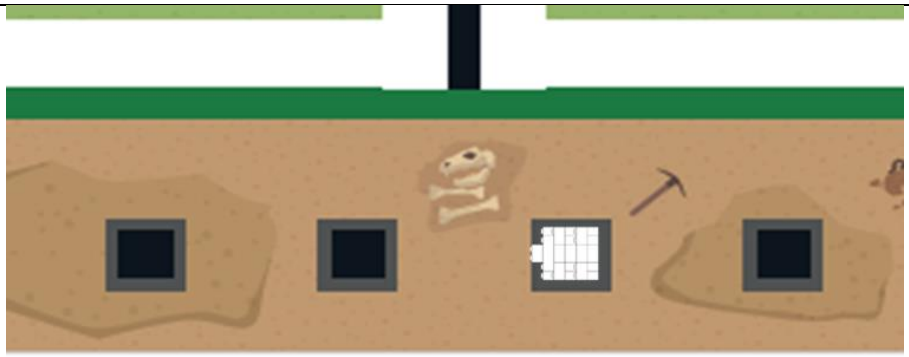
Starting position of the pillar furthest from the start area.

Fossil (x1)

One white fossil element is placed on the third black square furthest from the start area inside the dig site area near the dinosaur fossil image.



Starting position of the fossil.



Starting position of the fossil.

4. Robot Missions

4.1 Move the debris

Palaeontologists have started working in the dig site. Your robot must collect the debris left over from the excavation and deliver it to the start area to be collected later. The debris only needs to touch the start area and can be in any orientation.

4.2 Deliver the toolbox

Now that the fossil is exposed the palaeontological team needs more specialised tools. Deliver the excavation toolbox to the dig site. The toolbox should be upright and completely inside of the dig site area.

4.3 Collect and return the pallets

Pallets from previous operations have been left out in the field. Your robot must collect these pallets and deliver them to the storage shed to be packed away. The pallets must be completely inside of the storage shed area.

4.4 Research Tent Crates

Two research tent crates have been dropped off. Your robot must collect these crates and deliver them to the research tent site. The crates must touch the research tent site.

4.5 Ancient Pillars

Two ancient pillars are found in the operational area. Do not damage these pillars or move them from their original starting positions.

4.6 Fossil

The fossil the palaeontologists are working on is now exposed. Do not move or damage the fossil.

4.7 Stop the robot.

One team member must **touch** the robot while saying “STOP” and **end the program** to indicate their run has finished. The robot should remain in the position the team stopped it in and not have been moved anywhere else on the game table.

In-House rule adaptions:

The In-House challenge is designed for teams to have fun, test their abilities and to encourage robotics in schools and clubs.

NB: Coaches may alter the rules to assist their teams if the coach deems it necessary. For example, where elements must be completely inside to score a coach may determine that elements only need to touch the scoring areas to score full points. All teams should be judged fairly and in the same way with the same rules.

Changes or adaptions of these rules **do not** need to be checked by WRO SA or agreed upon by WRO SA for teams to have scores submitted during the challenge week.

5. Scoresheet

Tasks:	Points	Scoring	
Toolbox scoring:			
Toolbox **touching** the dig site area.	10	0 1	
OR			
Toolbox **completely inside** the dig site area.	30	0 1	
Pallets Scoring:			
Pallets **touching** the storage shed area.	10 each	0 1 2	
OR			
Pallets **completely inside** the storage shed area.	30 each **(Max 60)**	0 1 2	
Other Scoring:			
Debris **touching** the start area.	30 each **(Max 60)**	0 1 2	
Research tent crates **touching** the research tent area.	30 each **(Max 60)**	0 1 2	
Touched the robot and ended the program	30	0 1	
Bonus Points: (bonus points are always awarded unless the conditions have not been met.)			
Ancient Pillars not moved or damaged.	15 each **(Max 30)**	0 1	
Fossil not moved or damaged.	30	0 1	
Unknown Extra Task:(check the game rules for ideas. If not attempting, score the team these points anyway.)			
Unknown extra task completed	30	0 1	
	330 Max	**TOTAL SCORE:**	

resolute.

ROBOTS MEET CULTURE

WORLD ROBOT OLYMPIAD™ WRO SOUTH AFRICA

In-House Level 1: Scoresheet

NOTES:
In-House is about having fun and learning. Coaches are allowed to change the rules as long as the rules are fair for all teams.
Coaches can develop their own extra tasks. If no extra task is used award the 30 points for the task to the team anyway.

Certificate levels:	Bronze 0-79 points	Silver 80 - 179 points	Gold 180 - 279 points	Diamond 280+ points

School/Club Name:

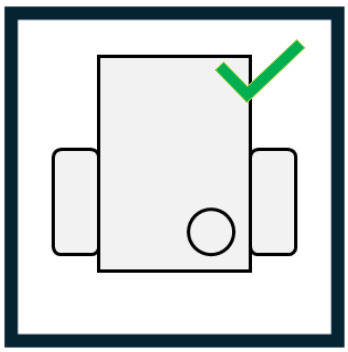
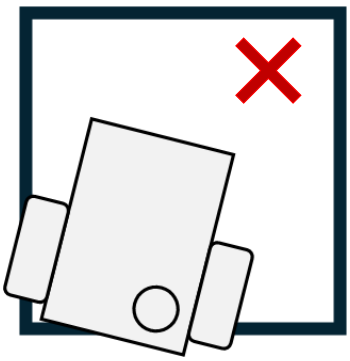
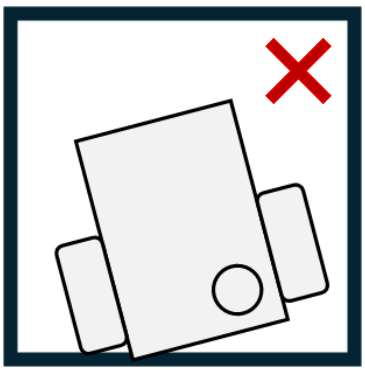
Team Name:

6. Scoring Interpretation

The images in this section will help to explain the scoring options available to teams. In cases where scoring is unsure the judge must bias their decision to the best possible outcome of the team.

Robot start area

The robot must start completely inside the start/finish area. All parts of the robot must fit into this area **including robot cables**. No part of the robot is allowed to project outside of the start/finish area or into the surrounding line. The start/finish area is defined as the white area only and not the surrounding different colour line/square.

		
Robot completely inside the start/finish area. No part overhanging or touching the surrounding line.	Robot outside of the start/finish area. Robot will not be allowed to start.	Robot projecting out of the start/finish area. Robot will not be allowed to start

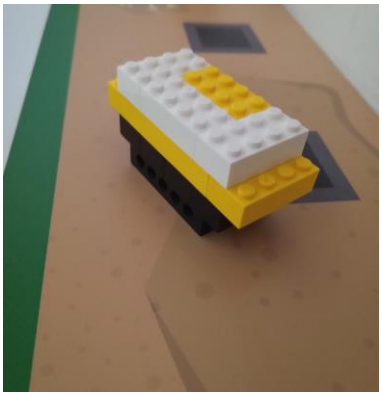
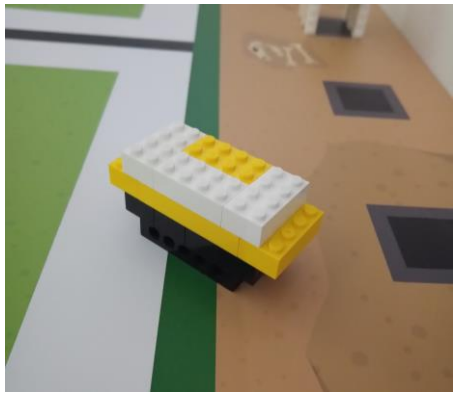
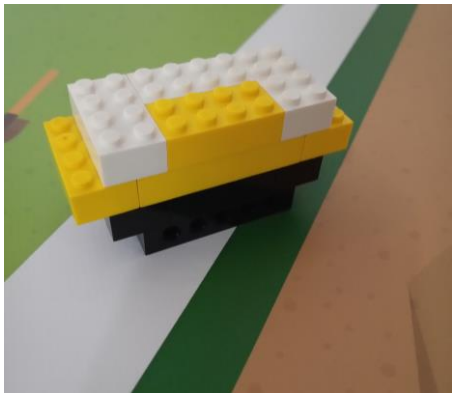
Debris:

The below images apply to the debris elements and the start area.

		
Debris completely inside the start area. 60 points	One debris completely inside the start area, one debris touching the start area 60 points	One debris completely inside the start area. One debris outside of the start area. 30 points

Excavation Toolbox:

The below images apply to the excavation toolbox in the dig site area.

		
Excavation toolbox completely inside the dig site area. 30 points	Excavation toolbox touching inside the dig site area. 10 points	Excavation toolbox not touching inside the dig site area. 0 points

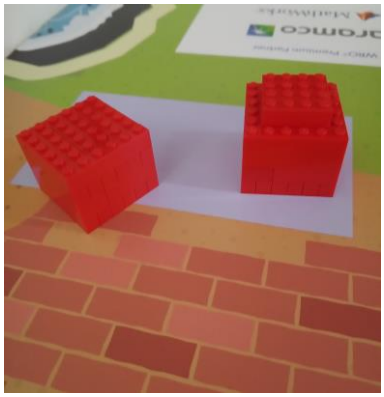
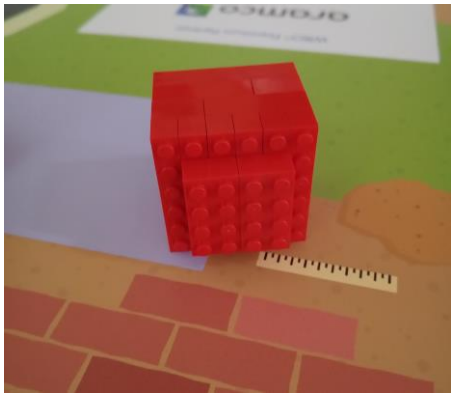
Pallets:

The below images apply to the pallets and the storage shed area.

		
Two pallets completely inside the storage shed 60 points	One pallet completely inside the storage shed. One pallet touching the inside of the storage shed. 40 points	One pallet completely inside the storage shed. One pallet not touching the inside of the storage shed. 30 points

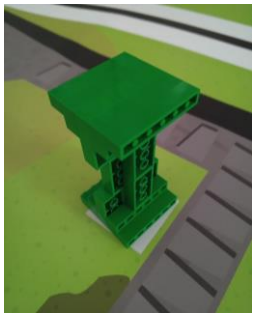
Research Tent Crates

The below images apply to the research tent crates and the research tent area.

 One research tent crate completely inside the research tent area. One research tent crate touching the research tent area. 60 points	 One research tent crate touching the research tent area. 30 points

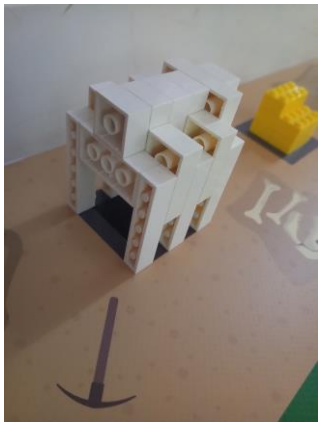
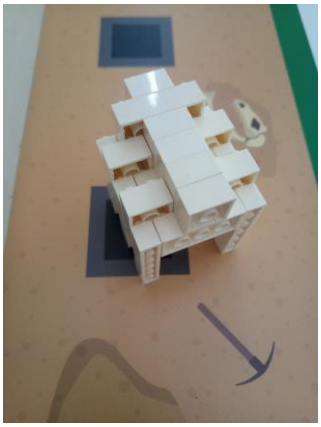
Ancient Pillars

The below images apply to the two ancient pillars.

 Ancient pillar not moved or damaged. Still in its original starting position. 15 points	 Ancient pillar not moved or damaged. Still in its original starting position. 15 points	 Ancient pillar moved. No longer in its original starting position. 0 points	 Ancient pillar moved. No longer in its original starting position. 0 points

Fossil

The below images apply to the fossil in the dig site area

		
Fossil unmoved and damaged. Still in its original starting position 30 points	Fossil moved. No longer in its original starting position 0 points	Fossil damaged no longer in its original starting position 0 points

Robot finishing points

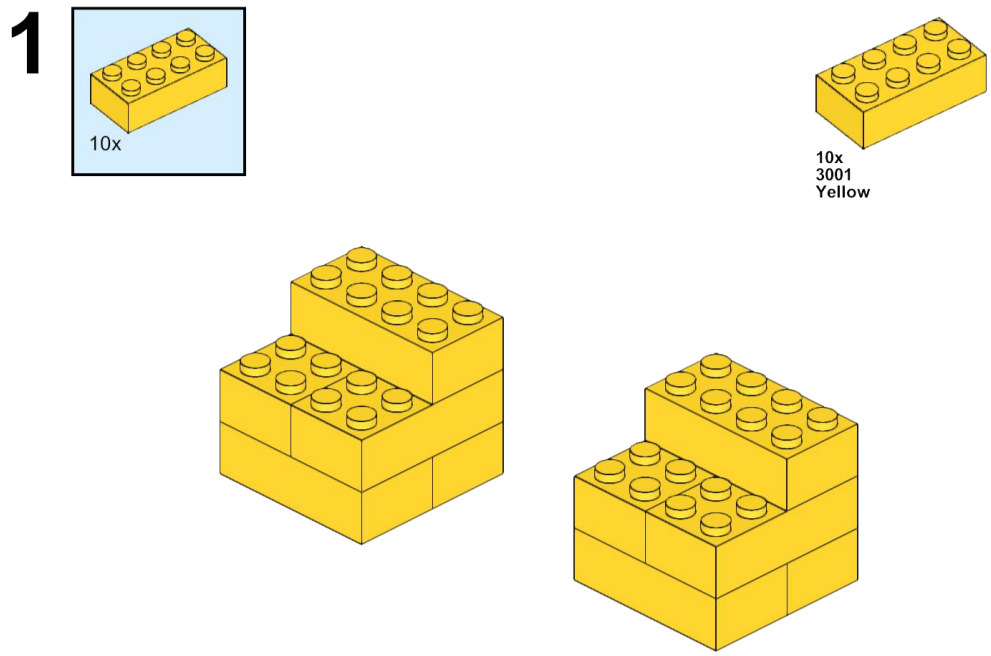
The team must touch the robot and say stop to indicate the robot has finished its run.

The robot program must be ended, and the robot must no longer move. The robot must remain on the game table until the judge requests the robot to be removed.

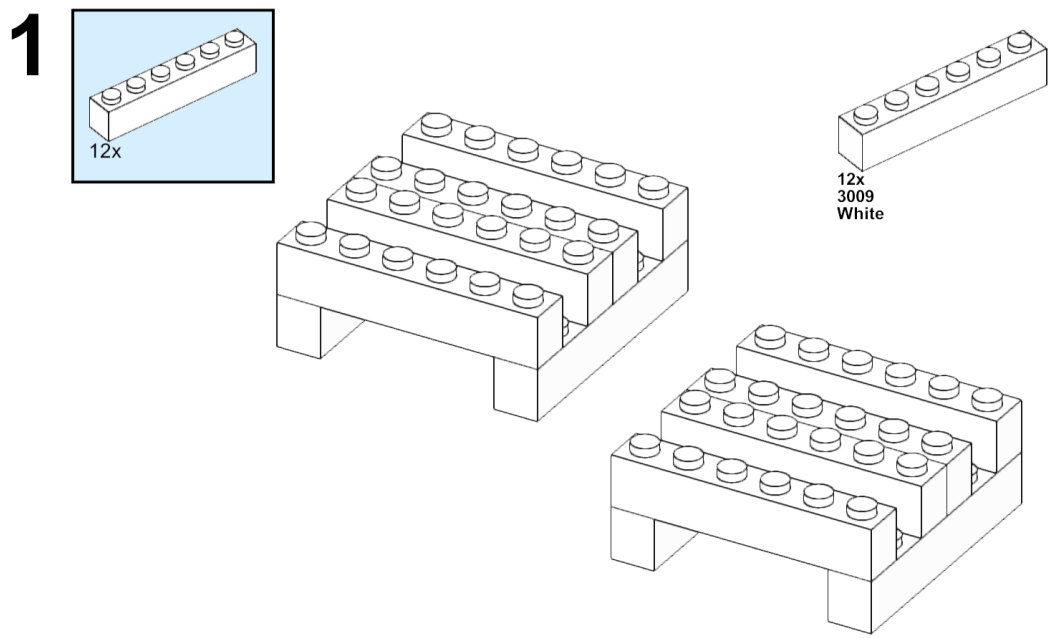
In-House game rules and In-House challenge developed and written by Duncan Beaton for WRO SA.

PART TWO – ASSEMBLY OF GAME OBJECTS

Debris (x2)

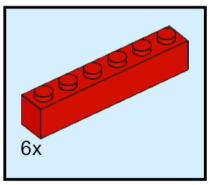


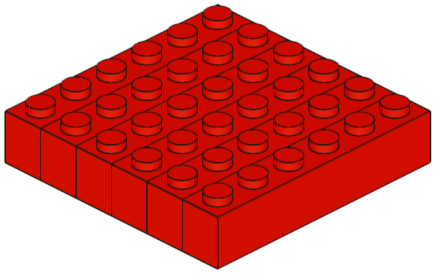
Pallets (x2)



Research Tent Crate build A (x1)

1





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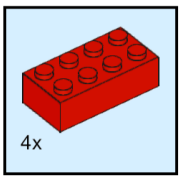

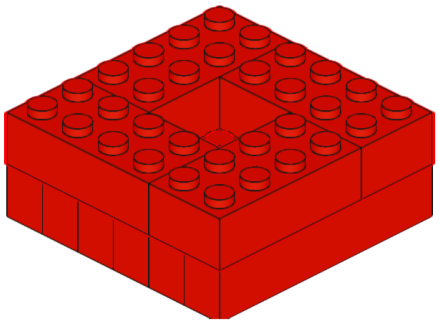

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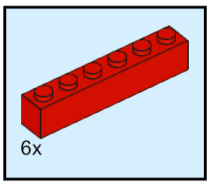

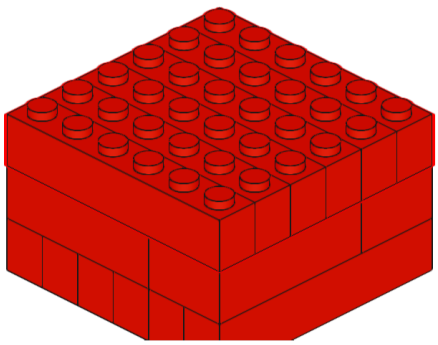

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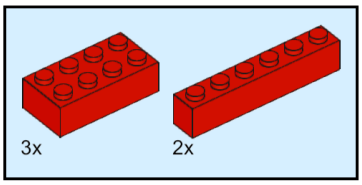
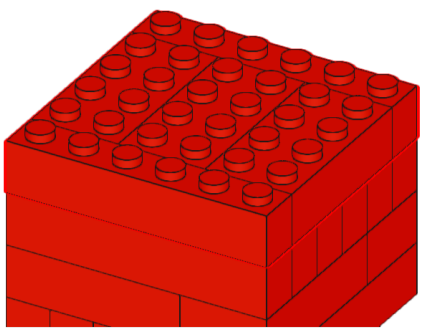
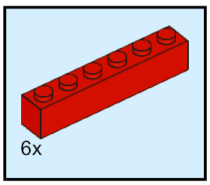
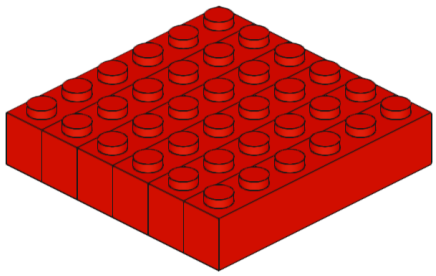




Research Tent Crate build B (x1)

1





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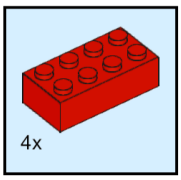

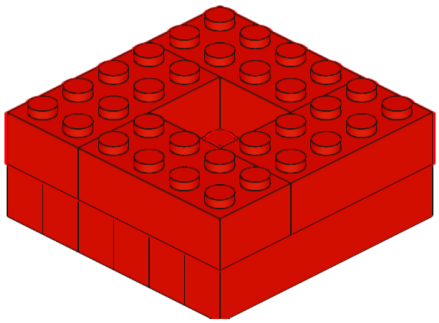

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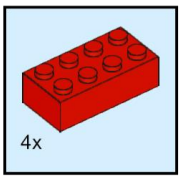

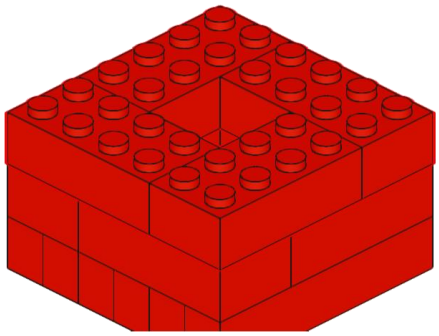

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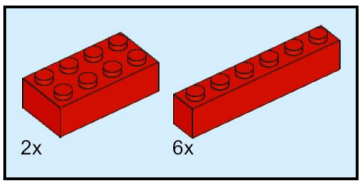
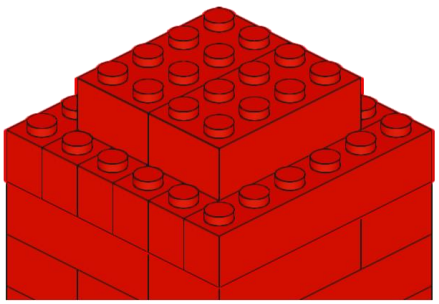
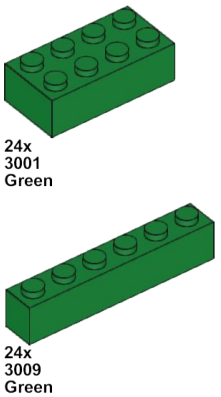
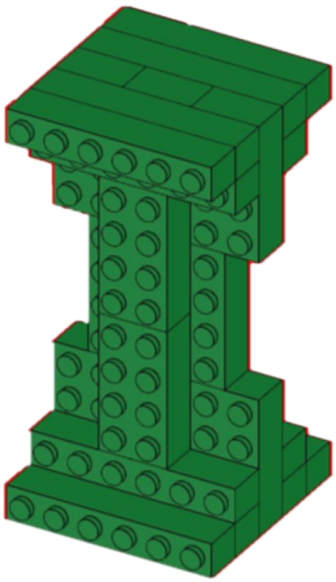
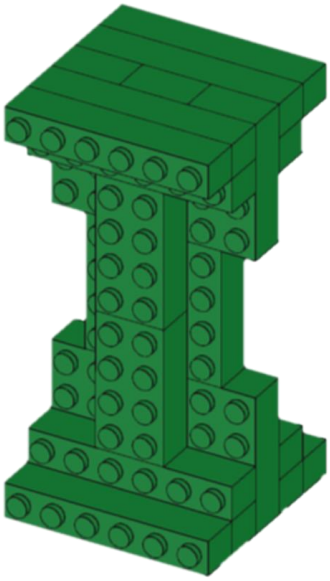


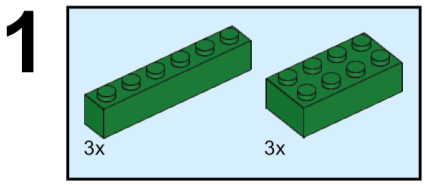


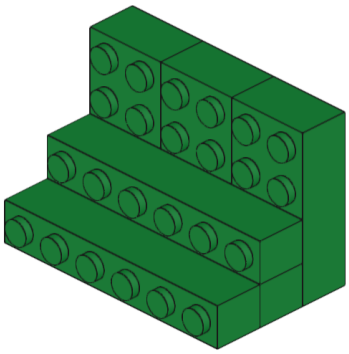
Ancient Pillars (x2)

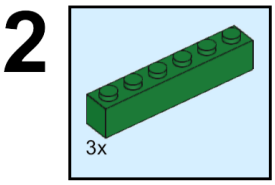


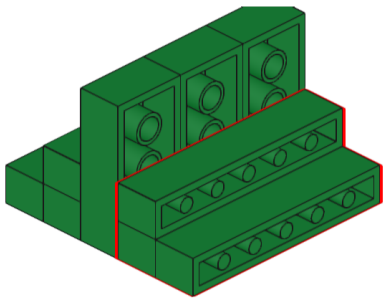












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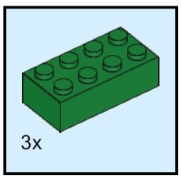

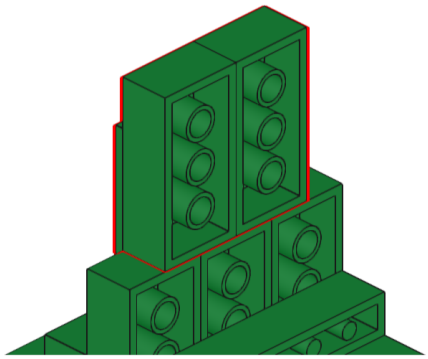

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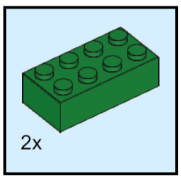

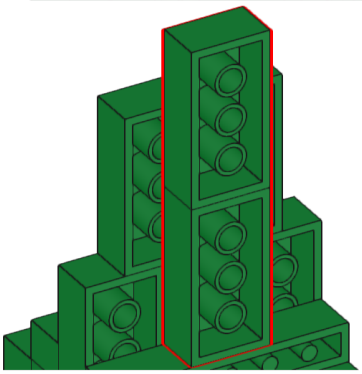

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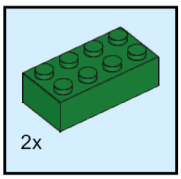

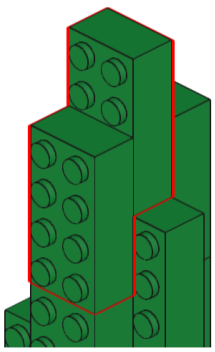

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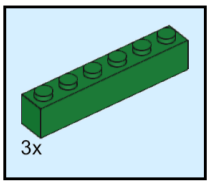
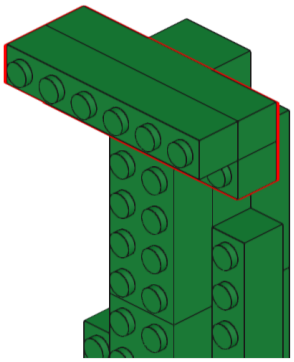
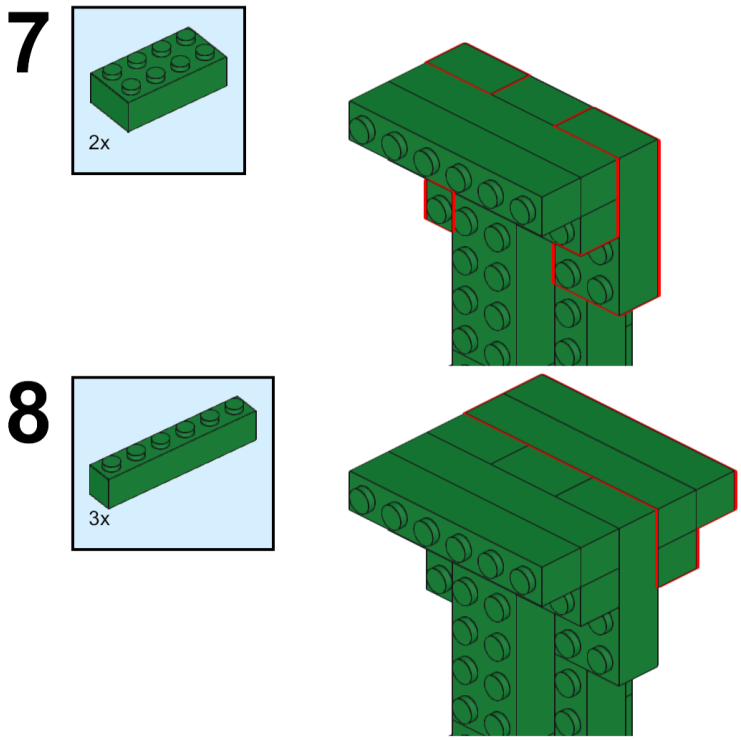
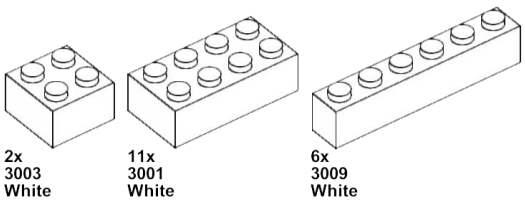
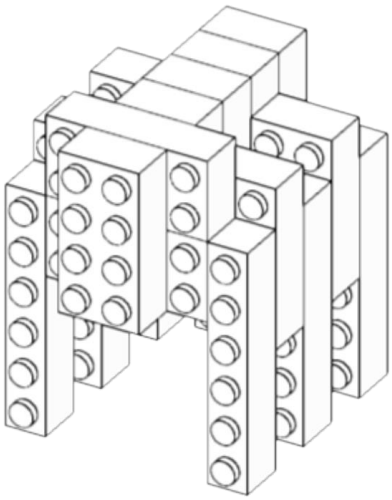






Fossil (x1)





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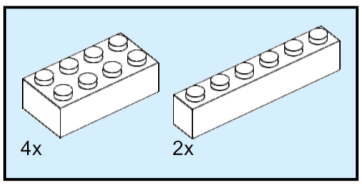

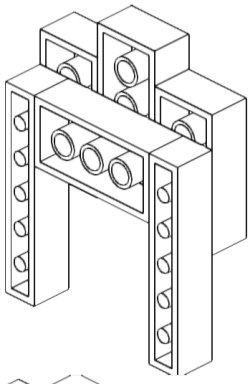

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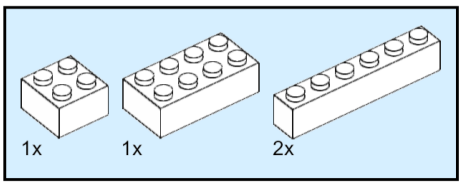

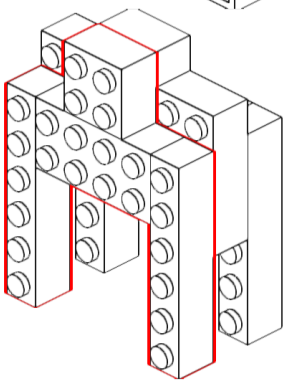

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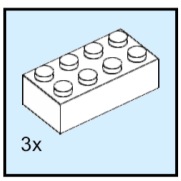

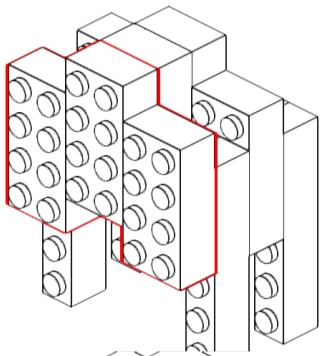

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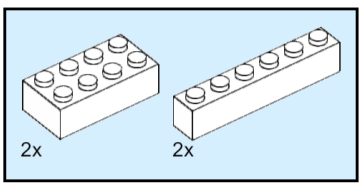
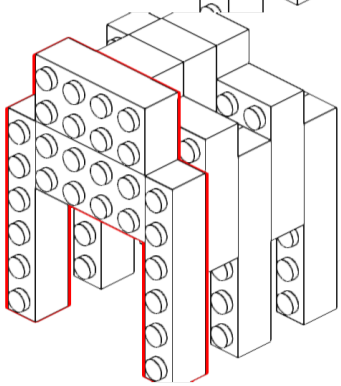
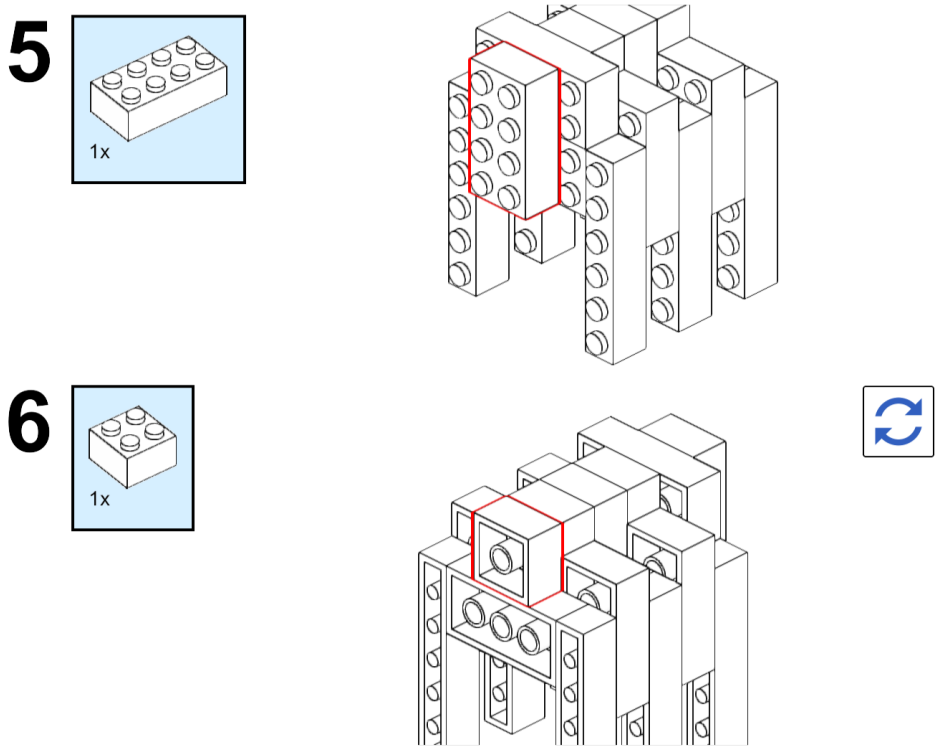
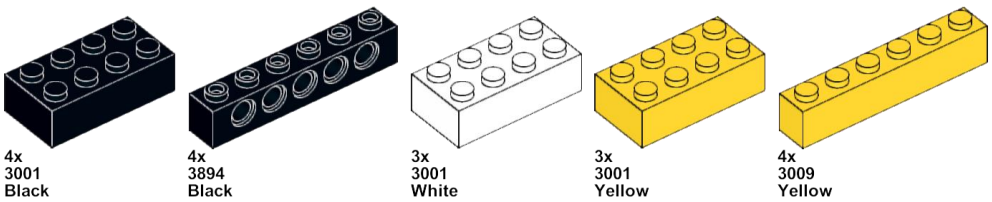
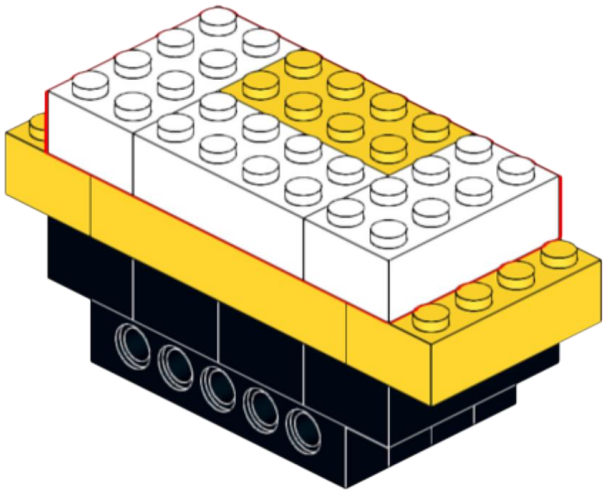






Excavation Toolbox (x1)





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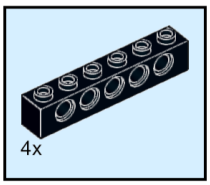

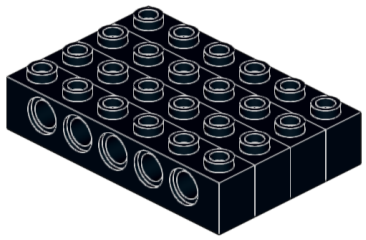

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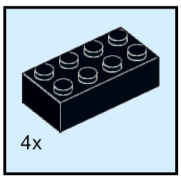

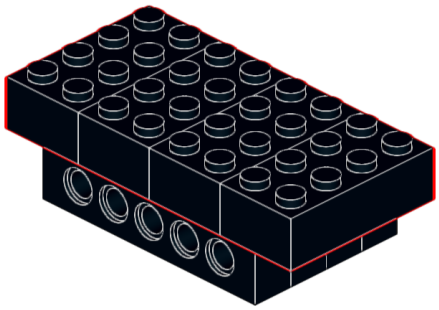

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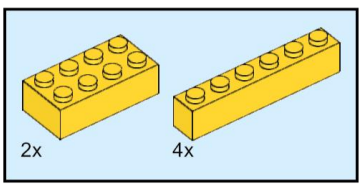

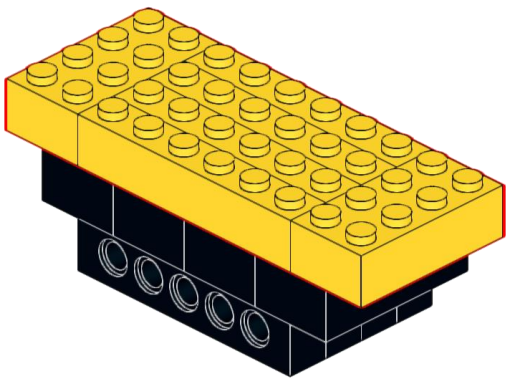

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