GAR 2026 Future City

GAR 2026 - Version B

1. Scope of competition

(I) Competition groups: Kindergarten group, Primary group (grade 1-3).

(II) Number of participants: 2-3 contestants/team.

(III) Coach: 1 person (optional).

(IV) Each person is limited to participating in 1 event and 1 team.

(V) Group determination: based on the level of study of the contestants as determined by the local education administrative department (education committee, education department, education bureau).

2. Competition theme

When early morning packages wait between buildings, when the lives of the elderly require more convenient care, when the city's "capillaries" call for more efficient flow... these seemingly minute pulses of the city are crucial to people's daily well-being.

The rapid development of artificial intelligence and robotics is igniting hope for addressing these "soft spots" of urban life. This year's competition, themed "**GAR Future City**," envisions building a beautiful home where humans and machines coexist and are intelligently connected. Young students are invited to design and program intelligent robotic companions to independently complete a series of critical service tasks that improve quality of life, optimize urban operations, and deliver warmth and humanity. This competition not only comprehensively tests environmental perception, intelligent decision-making, precise execution, and collaborative collaboration, but also vividly demonstrates how technology can be deeply integrated into daily life, warm hearts, and empower communities.

3. Competition process

(I) Registration: Participants must register in the prescribed manner and time. Successfully registered participants are eligible to participate in the Trials.

(II) Trials: Participants will compete within the prescribed timeframe, in accordance with the methods and procedures specified by the organizing committee, to determine the finalists.

(III) Finals: Shortlisted participants will compete within the prescribed timeframe to determine the first, second, and third prizes.

4. Competition environment

(I) Programming System: use micro-brain programming.

(II) Prohibited Devices: USB flash drives, mobile phones, tablets, intercom, etc.

(III) Competition venue:

Map

1) The venue size is 2362mm Length × 1143mm Width (±5mm).
2) The venue material is scraped cloth, and the black guide line is 2.5cm wide (±2mm).
3) The size of base is 100cm Length × 30cm Width.
4) The specific size of the actual competition venue, marking points, and props material, size, and weight shall be subject to the on-site provision.

Base map

There are two starting bases. During the competition, teams can adjust the structure and program of the equipment or temporarily store prop modules for certain tasks in the base. If a team member touches the robot outside the base, it will be recorded as a restart. The robot can return to any base autonomously, which does not count as a restart.

Restart: this occurs when a robot is manually brought back to base during a match. There's no limit to the number of restarts per round. After each round, **20** restart bonus points are awarded. Each restart deducts **5** points from the restart bonus. After the deduction, the robot can restart again, but no further points will be deducted. Scores already completed before the restart remain valid. If no points were scored but the mission model has changed from its initial state, manual recovery is not permitted.

5. Competition equipment

1) Each team is limited to one robot. The maximum length, width and height of the overall vertical projection of the robot before starting is limited to 30*30*30cm. After the robot starts, the size is not limited.
2) Only one controller is allowed. The controller has no less than 20 buttons.
3) 3D printing or laser cutting shall not be used to make structural parts, transmission parts, and minimum unit housings. Auxiliary connection materials such as screws, screws, rivets, glue, and tape shall not be used.
4) The robot battery must be in the controller, and the battery rated voltage is 3.7V.

6. Competition tasks

6.1 Task details:

There are seven missions in total, including five basic tasks and two challenge tasks. Some tasks have random variations. There is no particular order in which to complete the tasks. During the match, players are prohibited from touching the task props on the map. Robots can repeat a single task during the match timer, provided the task is not broken.

Basic tasks:

Task 1: Protect green plants

In future cities, green vegetation is crucial for maintaining ecological balance. Robots will need to accurately identify and remove pests from green plants to protect the health of the city's green lungs.

	
Placement area of model	Initial status
	
Green plant area	Completion status

(1) This task is worth a maximum of 30 points.

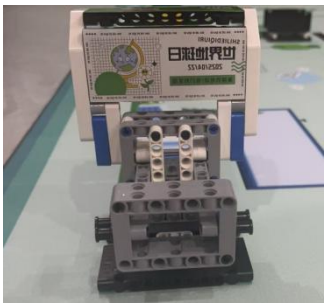
(2) The pest model is placed in position A1 or A2 of the circular green area, which is determined by drawing lots before debugging.

(3) The robot moves to the green area and removes the pest model from the green area. If the vertical projection of the pest model completely leaves the green area and remains there

until the end of the single round, it is considered a success and receives 30 points.

Task 2: Switch billboards

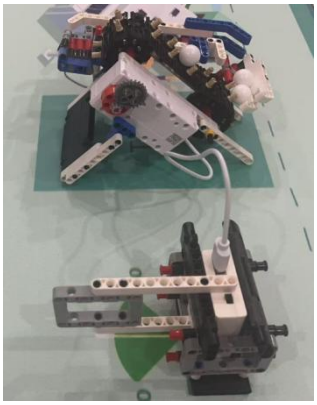
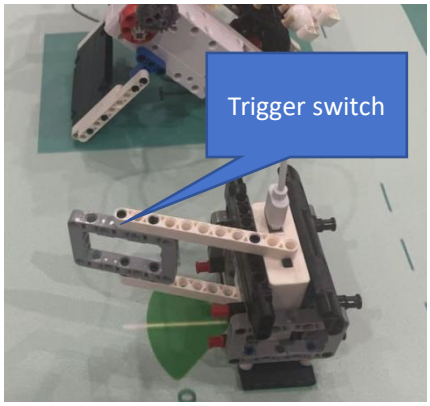
Billboards in cities are not only commercial display platforms, but also windows for information dissemination. Robots are needed to complete the switching of billboards, making future cities more dynamic and technologically advanced.

		
Fixed area of model	Initial status	Completion status

1) This task is worth a maximum of 30 points.
2) The billboard model is fixed in area C, with the trigger switch facing the left base.
3) The robot needs to move to the billboard model and push the trigger switch to switch the advertisement. This is considered a successful task and earns 30 points.

Task 3: Automatic factory

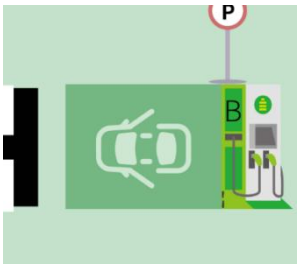
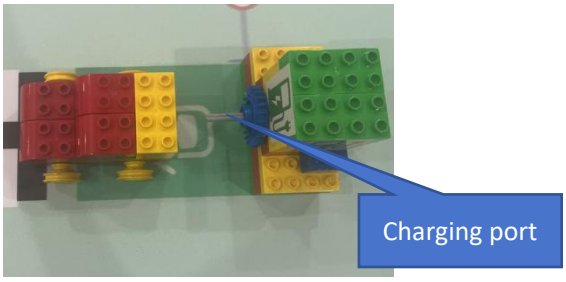
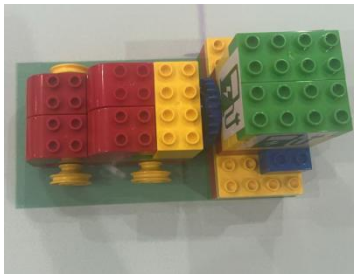
Automated factories are the core of future urban productivity. Robots are needed to activate factory systems, ensure the normal operation of production lines, and provide a steady supply of materials to the city.

			
Replacement area of factory model	Fixing area of trigger switch	Initial status	Completion status

1) This task is worth a maximum of 40 points.
2) The factory model is placed in area D1, and the trigger switch model is fixed in area D2.
3) The robot needs to move to area D, push the trigger switch, and make the factory model cycle and keep it running until the end of the single round. This is considered a success and is worth 40 points.
4) If the factory model falls over, this task will not be scored.

Task 4: Energy supply

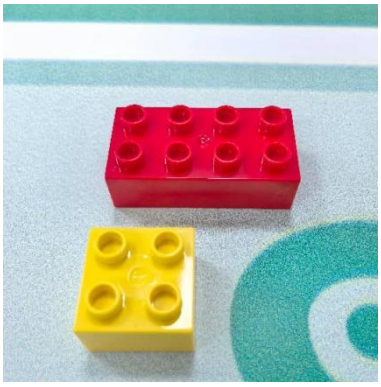
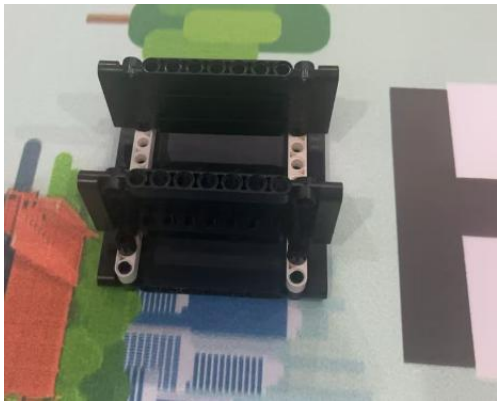
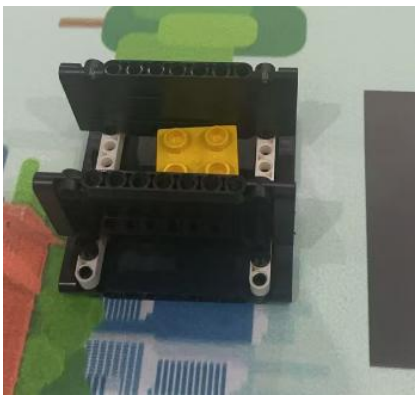
Electric vehicles are the mainstay of future transportation. Robots are needed to help charge these vehicles and ensure efficient operation of urban transportation systems.

		
Replacement area of model	Initial status	Completion status

1) This task is worth a maximum of 40 points.
2) The charging port model is placed in area B, with the charging head facing the parking space.
3) The car model is initially placed with the front of the car pressing against the black line on the left side of the parking space.
4) The robot needs to push the car model to the charging port, insert the charging head into the car model, and the vertical projection of the car is completely within the parking space and remains so until the end of the single round. This is considered a success and is worth 40 points.

Task 5: End garbage

Future cities advocate green development. Robots will assist in waste sorting and processing, turning waste into reusable resources and achieving zero waste.

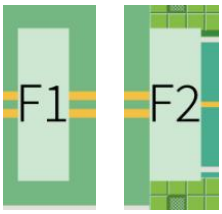
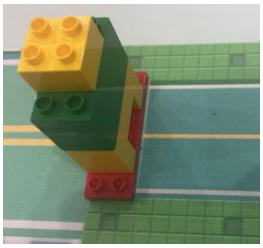
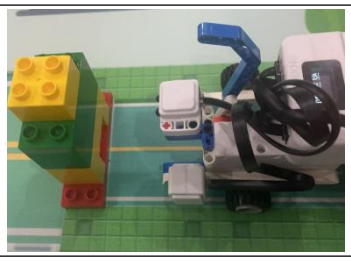
	
Fixed area of model	Garbage model
	
Initial status	Completion status

1) This task is worth up to 40 points.
2) The garbage briquetting machine model is fixed in Area E, with the model's pressure plate perpendicular to the right black line.
3) There are two types of garbage models, one of each. These are chosen by lot before commissioning and initially placed in the base. They can be manually placed on the robot during the task.
4) The robot must place the garbage model between the two pressure plates of the briquetting machine. A successful placement is considered 40 points if the vertical projection of the garbage model is completely between the two plates.

Challenge tasks:

Task 6: Road inspection

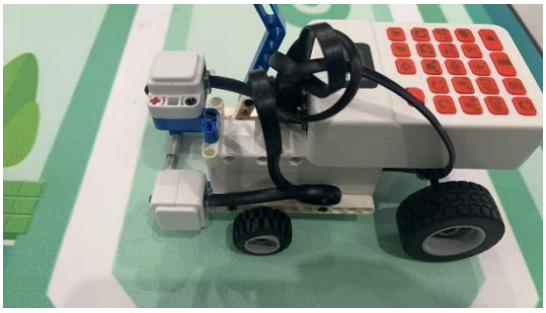
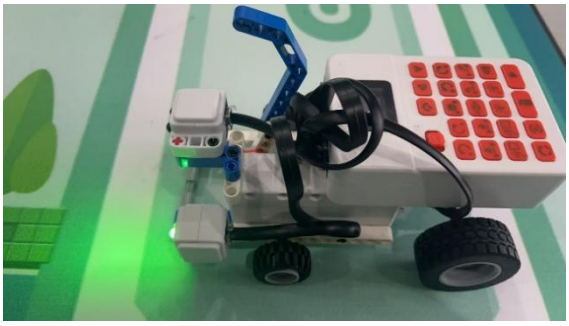
Safe roads are the foundation of smart cities. Robots are needed to inspect road surfaces and identify potential damage or hidden dangers.

		
Replacement area of model	Initial status	Completion status

1) This task is worth a maximum of 30 points.
2) The obstacle model is placed in the F1 or F2 area, which is determined by drawing lots before commissioning.
3) This task requires the use of an infrared obstacle avoidance sensor. The robot patrols along the road, stops when encountering an obstacle, and then returns to the base. The robot is considered successful if it does not touch the obstacle model and its vertical projection exceeds the white arrow in front of the obstacle, and scores 30 points.

Task 7: Glory flashes

In future cities, robots will be deeply integrated into core scenarios such as public services and emergency response, becoming crucial participants in urban operations. The glorious display of robots at their bases after completing missions is not only a visual confirmation of the achievements of individual robots, but also a key component of the intelligent and humane operation of future cities, a crucial manifestation of efficient urban collaboration and humanistic warmth.

	
Initial status	Completion status

1) This task is worth a maximum of 30 points.
2) Before debugging, a robot is randomly selected from the six tasks listed above. If the robot completes the task and returns to the base and lights up, it is considered a success and receives 30 points.
3) If robot doesn't return to the base and lights up, lights up before finishing the selected task, or lights up after finishing a non-selected task, no points will be awarded.

6.2 Task variables

1) All variables will be determined by a draw by the referee before debugging begins.
2) **Protect green plants**: Place the pest model in either position A1 or A2.
3) **End garbage**: Place the garbage model in either position (large or small).
4) **Road inspection**: Place the obstacle model in either position F1 or F2.
5) **Glory flashes**: Choose one of the first six tasks.

6.3 Time and frequency

Group	On-site programming and debugging time	Task duration	Task frequency
Kindergarten	Confirmed by the on-site judge team	180s/times	2 times
Primary		180s/times	2 times

1. On-site programming and debugging time: During this time, all participating teams in each group will perform programming and debugging uniformly.
2. Specified task time: The start and end time specified by the robot to complete the competition. If the competition is not completed within the specified time, the competition will be forced to end.

7. Operation and End

7.1 Robot operation

1) The competition utilizes micro-brain programming. After debugging, the controller program must be cleared, inspected, and sealed for the referee's inspection.
2) Robot startup and operation method: The robot must be stationary before being activated at the base. "Button-pressing" activation is permitted, and the robot must operate autonomously after activation.
3) No pauses are allowed within the time allotted for mission completion.
4) If a robot experiences structural detachment within the time allotted for mission completion, the competitor may retrieve the detached component without affecting the robot's normal operation.
5) Robot replacement is prohibited during the competition (substitution of functional structural components required for the mission is permitted). Borrowing another competitor's robot is not permitted.
6) The judge will determine the competition order on-site.

7.2 End of competition

1) All tasks must be completed within the specified time.
2) The specified time limit expires.
3) The robot may suddenly stop and remain motionless for 10 seconds while moving.
4) The robot may tip over or over while moving.
5) The participating team may request to abandon the task.

8. Evaluation criteria

8.1 Score calculation

1) If only a portion of the task is completed within the allotted time, the score will be calculated based on the actual number of tasks completed.
2) If restarts are required, the number of restarts will be recorded and the corresponding restart bonus points will be deducted. Each restart will deduct 5 points, with a maximum deduction of 20 points per round. If more than four restarts are recorded, no further deductions will be made.
3) The sum of the two scores will be taken.
4) The higher score will be ranked higher. If scores are tied, the shorter time will be ranked higher. If both scores and time are tied, the shorter number of restarts will be ranked higher. If all three are tied, the teams will be ranked tied.

8.2 No Awards

1) A competitor is more than 10 minutes late.
2) A competitor intentionally damages the competition venue.
3) A competitor fails to follow the referee's (judges') instructions.
4) Not all team members are present for the competition.
5) A competitor's score is zero.
6) A competitor is the subject of a complaint that is upheld.
7) A competitor participates in multiple events. 8. The robot cannot be remotely controlled after it is activated.

8.3 Related Notes

1) Each contestant is limited to one event. Duplicate or false registration is strictly prohibited. Upon discovery or reporting, the contestant will be disqualified.
2) Contestants may form teams from the same school or from other schools within a

prefecture-level city. Teams that register for the competition outside of one province or prefecture-level city are prohibited. Upon discovery or reporting, the contestant will be disqualified.

GAR 2026 Future City Competition Score Sheet

GAR 2026 - Version B

Kindergarten Group, primary school (G1-3) Group Competition Score Sheet

Name: Contestant 1: Contestant 2: Contestant 3:			Group: Kindergarten Group ☐ Primary school Group ☐	
	Tasks	Score	Round 1 Scoring	Round 2 Scoring
1	Protect green plants	30		
2	Switch billboards	30		
3	Automatic factory	40		
4	Energy supply	40		
5	End garbage	40		
6	Road inspection	30		
7	Glory flashes	30		
	Restart times in single round Minus 5 scores per time	20		
	Time	180 seconds		
	Total score (max. 260 scores)			
	Restart times			
Team signature			**Judge Signature**	