Annex
to the Regulations on the X International Festival of Robotics,
Programming and Innovative Technologies "RoboLand 2025"

REGULATIONS OF THE ROBOT COMPETITION «ASSEMBLE A ROBOT. LEVEL 1»

Age of participants: Level 1: 7-8 years.

Team: 1-2 people.

Robots: autonomous robots.

Equipment used: LEGO WeDo 2.0.

Programming language: no restrictions.

Description of the task: The competition consists of three rounds. In the first round, it is necessary to assemble a model from an image, in the second round - write a program based on the description of the algorithm. The third round is the assembly and programming of a robot to solve a practical problem.

1. Requirements for the robot

1.1 To participate in the competition, you must use your own parts and controller from 1 (ONE) LEGO WeDo 2.0 set. The use of additional parts is prohibited.

1.2. The robot is assembled on the day of the competition.

1.3. Before the start of the competition, the robot assembly kit must be completely disassembled.

1.4. The use of any instructions is prohibited.

2. Requirements for participants

2.1. To successfully pass the tests, participants must have competencies in the fields of mechanics and programming.

2.2. Necessary competencies in the field of mechanics:

– Securing the beam vertically and horizontally;

– Transfer of rotation from one motor to the axis;

– Movable and fixed fastening of parts;

– Ability to use mechanical transmissions;

– Construction of simple mechanisms;

– Construction of a crank mechanism.

2.3. Necessary competencies in the field of programming:

– Drawing up a program based on a block diagram or program description;

– Programming the motor movement for a certain time;

– Programming motor movement in different directions;

– Stopping and starting the motor using a sensor;

– Use of indication on the robot (sound, color);

– Change of engine power;

– Waiting for events;

– Displaying images and numbers on the screen;

– Counting events by sensor;

– Working with letters.

3. Procedure for holding the competition

3.1. All participants are invited to the competition area at the same time and, upon the judge's signal, begin performing the task. Participants of one team work with one set.

3.2. The duration of the first round is 1 hour, the second round is 30 minutes, the third round is 1 hour 40 minutes. There are breaks between rounds (at least 10 minutes).

3.3. The participant must inform the judge of the completion of the task by raising his hand and stating his readiness to submit the task. At this point, the time spent on completing the round is recorded and no changes are allowed.

3.4. The points and time scored for each round are summed up.

3.5. Round 1 – Building a model from an image.

3.5.1. In the first round, competitors must demonstrate spatial thinking, the ability to assemble a structure based on a given image, and reproduce the robot as accurately as possible. The color of the parts may differ from the image.

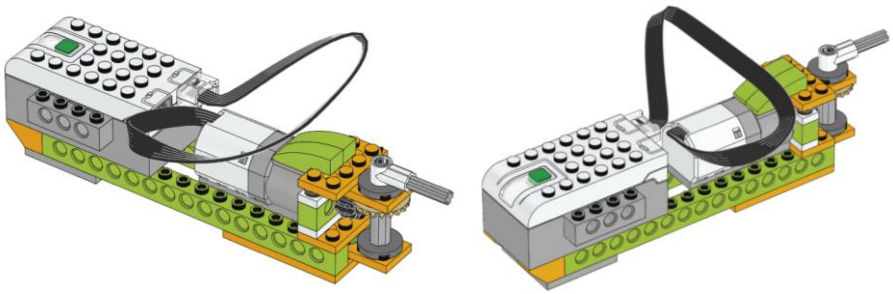

Fig. 1. **Rotary mechanism for the "Gateway" model**
(assignment example)

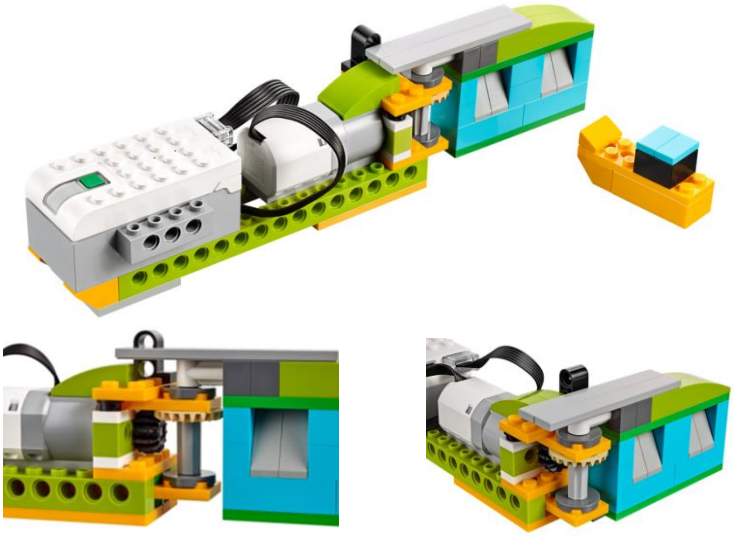

Fig. 2. **Gateway model**
(task example)

3.5.2. Scoring in the first round:

Criterion	Points	Penalty points	
The correct gear is used in the model	10		
The transmission is secured and operational.	10		
Accuracy of model assembly (if the penalties are more than 40 points, 0 points are assigned for the criterion)	20	-5 points Lack of detail	-1 point The part is not secured correctly, An extra part was used
Additional fixed model boat	10	-5 points Lack of detail	-1 point The part is not secured correctly, An extra part was used

3.5.3. Points are awarded for a correctly assembled robot. Assembly time is taken into account; if the number of points is the same, the advantage is given to the participant whose time was the least.

3.6. Round 2 – Programming.

3.6.1. In the second round, competitors must demonstrate the ability to think algorithmically and competently compose a program.

Example of a task.
To assemble the " Gateway ", independently attach the distance sensor and create a program to perform the next task. Initially the gateway is closed. When the sensor detects a boat, the gateway opens for 3 seconds, makes a water sound and lets the boat through. After that the gateway closes. The program is repeated 5 times. When the gateway is closed the indicator lights up red, when it is open – green.

3.6.2. Scoring in the second round:

Criterion	Points
As the boat approaches, the lock opens	10
The gateway has been open for 3 seconds.	5
Play the sound of water	5
The floodgates are closing	10
The program is repeated 5 times.	10
When closed, the indicator is red	5
When open, the indicator is green	5

3.6.3. Points for criteria are summed up. The maximum number of points for a round is 50. Time spent on programming is included in the tournament table time.

3.7. Round 3 – Practical task.

3.7.1. The team must demonstrate the assembly and programming of the robot within the allotted time according to the task. Upon completion of the assembly, experts evaluate the task completion according to the criteria.

Example of a task.

It is necessary to build a combine harvester with a reduction gear. The combine harvester must be equipped with a distance sensor directed in the direction of the combine's movement to detect thickets of wheat. When wheat is detected, the robot must stop and play any sound and wait 5 seconds. The judge removes the wheat, and the robot continues moving. It is necessary to collect wheat three times.

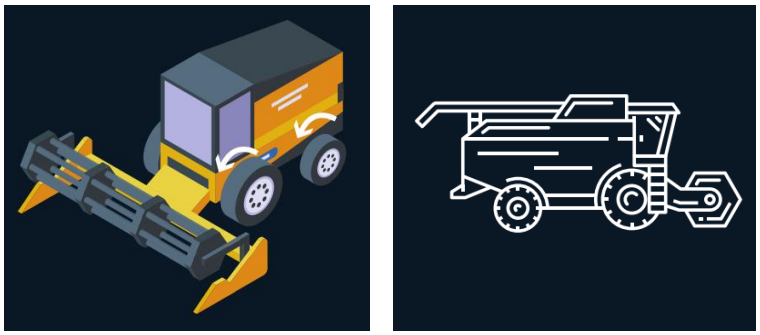

Fig. 3. **Task "Combine"**
(task example)

3.7.2. Scoring in the third round:

Criterion	Points
The combine harvester model is mobile (the model can move manually or from a motor)	5
The combine model is driven by a motor	5
The model is equipped with a transmission	10
The gear is selected correctly	10
The distance sensor is fixed forward	10
The model is assembled firmly, the parts do not fall	10

off	
The robot moves forward	10
The robot stops in front of a wheat field	10
After stopping, the sound is played	5
After stopping, the combine waits 5 seconds and continues moving forward.	5
The program is repeated 3 times.	10
The program uses a cycle	10

3.7.3. Points for criteria are summed up. The maximum number of points for a round is 100.

Time spent on programming is included in the tournament table time.

4. Determining the winner

After the competition, the points for the three rounds are summed up. Based on the sum of the points, the teams are ranked. If the points are equal, the total time to complete the task is taken into account. The team that scores the maximum number of points in its age group and spends the least amount of time is declared the winner.

5. Organizational recommendations

Assign a separate person who will record the time of the end of the attempt, but not evaluate their performance. He should also ensure that work on the task is not carried out after the time is recorded.