STEAM AZERBAIJAN

SAF 2024

Engineers of Future

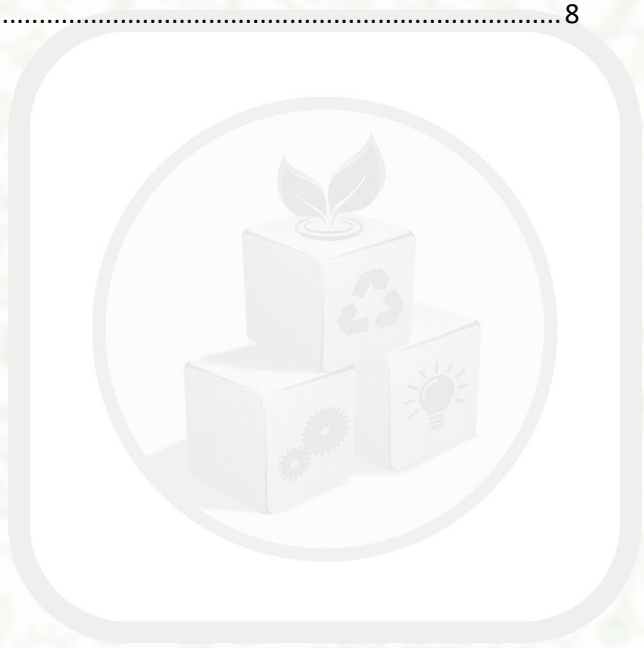
Category

FINAL STAGE RULES

BAKU 2024

Table of Contents

1. Introduction 3
2. Participation Conditions 3
3. Attention 3
4. Method of application 4
5. Final Stage 4
6. Requirements for the "Best Eco-Designer" award 6
7. Safety rules 8



1. Introduction

By participating in the "Engineers of the Future" category of the SAF-2024 festival, students will have the opportunity to demonstrate and develop the basics of engineering skills. In this category students (participants) will present solutions to the problems posed first in imagination and then in visual form, using critical thinking, creativity, and problem-solving skills with using CUBORO cubes. Participation in this competition is a perfect way for developing students' creativity and logical thinking. The goal of the game is to connect or build the pieces in a certain order. This category helps students develop many important skills. It promotes important mental skills such as logical thinking, problem-solving, patience, three-dimensional thinking, and the 4Cs (creativity, critical thinking, communication, collaboration). It also supports the spirit of research and creativity, helping participants to recognize 3D models, strengthen their knowledge, and develop engineering thinking.

2. Participation Conditions

2.1. Each teams must consist of a team leader over 18 years of age and 3 participants between the ages of 6-8 only. Each participant can join only 1 team.

2.2. Only one category can be applied for with the same team. Applications from the same team or individuals applying for different categories of SAF-2024 will be considered invalid.

2.3. Participating teams are considered to have accepted the changes made by the SAF-2024 Scientific Committee and all the conditions mentioned in the rules.

3. Attention

3.1. Participating teams must be safety-aware and not engage in behavior that threatens the safety of their team or other participant. They must inform the persons responsible for the category when using the power source. The use of open flames and the bringing of dangerous objects to the competition venue are also prohibited.

3.2. During the competition, team leaders and team accompany are not allowed to enter the competition field, interfere with the game in any way from outside the competition area. If the leader of the team or the person accompanying them supports the team in any way and interferes with the games of other teams, the referee has the right to warn, disqualify the team, and impose other penalties.

3.3. Each contestant is limited to competing in one category. Duplication of registration, false registration, falsification of the age of contestants, unauthorized change of contestants, etc. is strictly prohibited. If such circumstances are discovered and the incident is confirmed, the participant will be disqualified.

3.4. In case of force majeure (circumstances) not provided for in the rules, decisions will be made by the coordinators.

4. Method of application

4.1. Applications will be accepted through the official website of SAF: https://saf.steam.edu.az/en

5. Final Stage

5.1. General Information. The final round will consist of 1 stage, which are as follows:

- **Puzzle Mazzle**

5.2. Terms of the Final Stage:

5.2.1. **Stage - Puzzle Mazzle**

The goal is always to find new and as long as possible paths to different destinations; the longer the path, the more points you can score. This stage is a simplified version of the game where balls move along the paths on the surface of the cube, and children use their logical thinking skills.

5.2.2. **Game Rules:**

Each game table has 4 game pegs of different colors and 12 colored glass balls (8 blue, 4 red). Each team is given 1 game pegs and 3 colored glass balls (2 blue, 1 red). The student who starts the game first is chosen by lot. A blue glass ball on the cubes on the field means 3 changes, and a red glass ball means 4 changes. Each team can make 3 moves during the game, and during each move, the player can make changes using 3 types of combinations of moves on the cubes.

The manipulations that can be performed on the cubes are:

- ***Shifting*** - moving the cube from one cell to another cell.
- ***Rotation*** - rotation of the cube around the center of gravity along the face surface.
- ***Jumping*** - jumping of the cube from one cell to another empty cell.

Participants are free to choose combinations of these moves on the cubes. For example, for a blue ball: 2 shifting + 1 rotation, 1 rotation + 1 shifting + 1 jumping; 3 rotations; 3 shifting, etc.

For the red ball: 3 shifting + 1 rotation, 2 rotations + 1 shifting + 1 jumping; 2 rotations + 2 shifting; 4 shifting, etc. There are 8 cubes and 1 tower on the game table.

The cube, which plays the role of a tower, is placed outside the field by the referee after each move and on the field at the start of the game.

5.2.3. **The game progresses as follows**

The first player constructs their path by executing the number of changes specified in the game rules. The ball is released from the tower, and the number of cubes the ball passes over (including the tower) is counted as a score. The player's token is moved along the map according to the accumulated points. Only 1 ball can be placed in each ball hole (the ball's final destination). If the player's ball lands in a hole that already has a ball inside, the player's attempt is counted as zero. Only when the ball passes through each of the 9 cubes it mean 10 points.

The game continues as long as the player has glass balls. The game duration is 50 minutes. We move the glass balls on the surface, not inside the cube.

Components	Explanation
Red ball	4 changes on the cubes on the field
Blue ball	3 changes on the cubes on the field
Tower	The initial starting point of the glass ball
Game peg	Shows the progress of the player on the field according to the accumulated point

Notes:

1. If the moving ball stops because of not enough speed, the ball could be pushed by the referee and directed to the end point.
2. Within the game, the participant can touch the cubes only during their turn. During the course of the game, the participant can touch the cubes up to the number of changes given in the conditions (3 touches for a blue glass ball, 4 touches for a red glass ball). It is forbidden to change the cubes for testing purposes, to change more than the allowed number, and to return them to their place.
3. The participant cannot perform the 3 combinations of changes given in the terms of the game on the same cube.

5.2.4. **Evaluation Conditions**

The ball is released from the tower, and the number of cubes the ball passes over (including the tower) is counted as a score. And the token belonging to the player is moved along the map by the number of points.	For each cube the ball passes through to complete its trajectory, **1 point is awarded.**
Each designated field (the final destination point for the ball) is intended for only 1 ball. If a player's ball falls into a goal that already has a ball inside, the player's attempt is counted as zero.	A ball falling into a non-empty field **scores 0 points**.
When the ball passes through each of the 9 cubes, that means 10 points."	For the longest possible trajectory, **10 points.**

6. Requirements for the "Best Eco-Designer" award

The requirements for the "Best Eco-Designer" award do not affect the evaluation of the final stage, this award aims to increase the environmental responsibility of the participants, and at the same time have a fun and creative time.

6.1. All teams that have registered and qualified for the final stage will compete for the "Best Designer" award on the first day of the competition.

Rules of "Eco-Design" activity

6.1.1. **Materials:**

Each student must bring waste materials (paper, plastic, fabric, colored tapes, etc.). The materials brought must be clean and usable, and most importantly, real waste materials.

6.1.2. **Topics for design:**

- **Guardians of green nature**
- **Enchanted sky: Planets**

Note: Each team must choose one of the given topics and the design prepared by the team members must harmonize with each other.

6.1.3. **Eco-bags:**

Each student will be given a simple eco-bag made of fabric. The bags will be given to each student at the beginning of the event.

6.1.4. **Design Works:**

Students should decorate their eco-bags using the materials they brought. Essential point is the process should be performed on the competition field. For the design, they can freely use their creativity. Students can add pictures, writings or decorative elements on the bags.

6.1.5. **Design tools:**

Students will be provided with glue, scissors, markers, paints and other supplies necessary for the design process. Each student must approach his work carefully, observe safety rules and use tools correctly.

6.1.6. **Presentation:**

At the end of the activity, each team will present their own designed bag.

Students have to explain how they made their designs and what materials they used, and at the same time present their creations in an interesting way on a specially designed stage.

6.1.7. **Evaluation:**

Originality of design (individual)	10
Compatibility with the topic (individual)	10
Originality of the presentation (team)	20
Cooperation (team)	10

Note: The criteria of **"Design originality"**and **"Compatibility with the topic"** are calculated separately for each member of the team, and in the end, the average score for the overall team will be determined. For example, in team **X**, Student **A** receives 8 points for their design, while Student **B** receives 6 points. The judges will calculate the team's score for this criteria as follows:
(8 + 6) / 2 = 7, meaning the final score for the team's "**Originality of design"** criterion will be 7 points.

7. Safety rules

The safety and well-being of our participants are our top priority. This part outlines the essential safety rules and guidelines for using scissors, glue guns, and electric drills during the competition. All participants, along with their guardians, must review and adhere to these rules to ensure a safe and enjoyable experience.

7.1. General Safety Rules:

7.1.1. Supervision:

- Adult supervision is mandatory at all times when using any of the tools provided.
- Participants must follow the instructions of the supervisors and competition staff.

7.1.2. Personal protective equipment (PPE):

- Safety goggles must be worn when using the glue gun.
- Gloves should be worn when handling the glue gun and in painting process.

7.1.3. Behavioral guidelines:

- No running or rough play is allowed in the workspace.
- Tools should be used only for their intended purpose.
- Keep the work area clean and free of obstacles.

7.1.4. Tool-specific safety rules:

1. **Scissors:**
   - Use scissors only for cutting paper, fabric, or similar materials.
   - Always cut away from your body.
   - Store scissors with the blades closed when not in use.
   - Do not walk around with scissors; if you need to move, carry them with the blades pointed down and closed.
2. **Glue gun:**
   - Only use the glue gun under adult supervision.
   - Do not touch the hot nozzle or melted glue. Wait until the glue has cooled before touching it.
   - If glue contacts the skin, rinse immediately with cool water and seek adult assistance.
3. **Electric sockets:**
   - Children should use electrical outlets only under adult supervision.
   - If any problem arises, they should immediately seek help from responsible personnel.
   - Touching electrical outlets with wet hands is strictly prohibited.
   - It is not permissible to keep containers with liquids near electrical outlets for safety reasons.
4. **Blocks:**
   - Wooden blocks should only be used for their intended purpose.

NOTE: The organizing committee reserves the right to change the rules at any point in time. The change will however be highlighted on the website https://saf.steam.edu.az .