Capelli Sports Inspire – Smart Logistics (Season 1).

🔳 *Simplified, clear, complete version of the official rules*

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1. Overview of the Challenge

In this category, students program a robot that works **fully autonomously** after the match begins.
The robot's mission is to:

1. Collect **3 cubes** (RED or GREEN) placed in the Lockers.

2. Deliver each cube to its **correct colored bay** in the center.

3. **Avoid moving the BLUE cube**, which must remain in its Locker.

4. **Return to the START area** before time ends for a bonus.

This challenge teaches planning, organization, and accurate navigation — all inspired by real sports logistics.

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2. Mission Story (Theme)

Just before a big match, some team equipment is still stored in the Lockers.
Your robot is the "logistics assistant":

- Find the equipment (RED and GREEN cubes).

- Deliver each to the correct preparation zone:

    o **RED cube → Home (RED)**

    o **GREEN cube → Training zone (GREEN)**
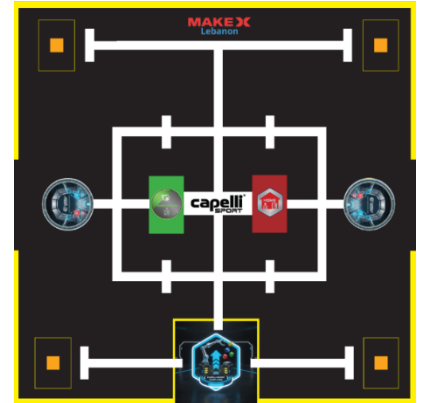
- Do not touch the **BLUE reserved kit**.

The BLUE cube represents items that **must stay in storage**, so touching or moving it is penalized.

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3. The Map

The competition field includes several areas that the robot must navigate correctly.

3.1 START Area

- Marked with a **blue arrow panel**.

- The robot starts **completely inside** this zone.

- At the end of the match, this is where the robot returns for a bonus.

3.2 Lockers (Pickup Points)

- Four Lockers are located in the **four corners**.

- Each Locker is marked with a yellow square and an orange center.

- Before each match:

    - **Three Lockers** contain mission cubes (RED or GREEN).

    - **One Locker** contains the BLUE reserved cube.

3.3 Delivery Bays (Drop Zones)

In the center of the field:

- **RED Bay (HOME)** → deliver RED cubes

- **GREEN Bay (TRAINING)** → deliver GREEN cubes

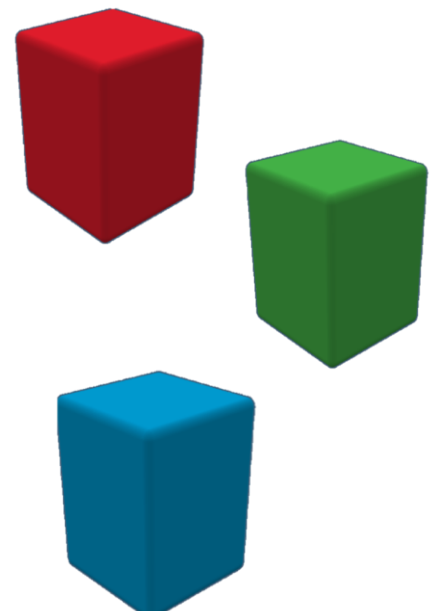A cube must be **fully inside** the correct bay to score.

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4. Game Elements

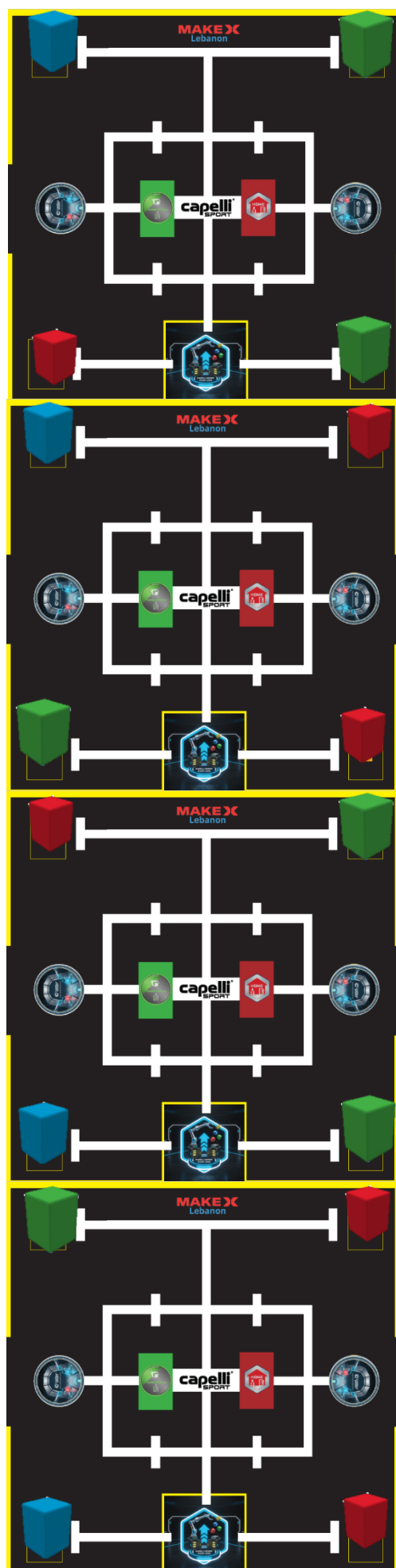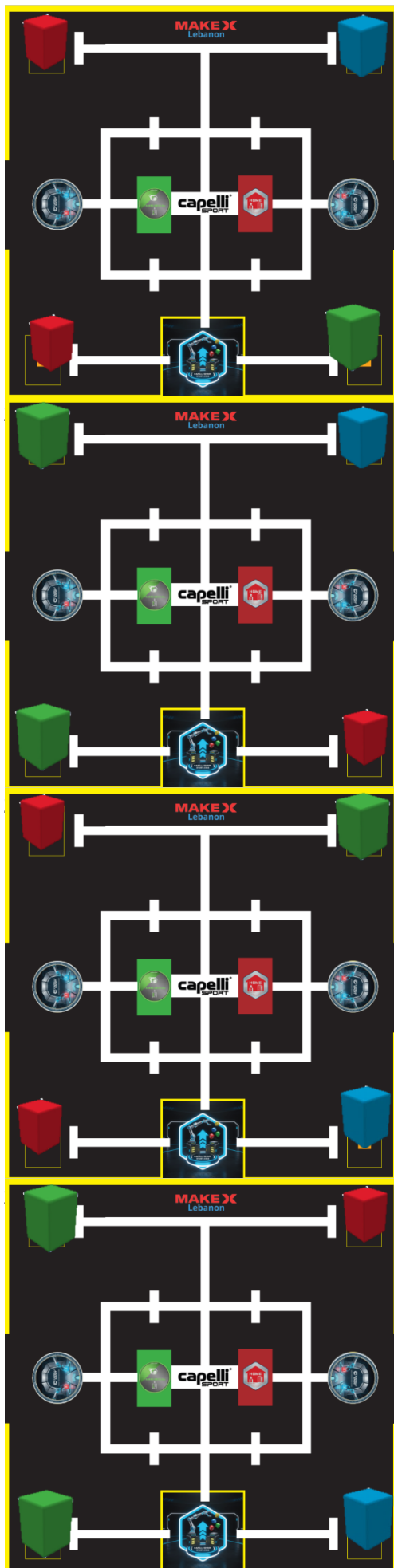### 4.1 Mission Cubes (RED and GREEN)

- Size: **5 × 5 × 7 cm**

- These cubes are the ones the robot must deliver.

- Color determines the delivery zone.

4.2 Reserved BLUE Cube

- Same size as mission cubes.

- Must stay inside its Locker.

- If the robot moves it, penalties apply.

4.3 Combinations

4.4 Pre-Match Setup

Before every match:

1. The student randomly selects a combination **from 8 possible combinations.**

2. The referee places the 4 cubes on the map based on the selected randomization.

3. The student confirm the correct placement.

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5. Match Procedure

Step 1 – Setup

- Referee places all cubes according to the rules.

- Referee verifies that the field and START area are ready.

Step 2 – Robot Placement

- Robot is placed fully inside the START area.

- Robot must **not** begin with a cube already held.

Step 3 – Countdown

Referee:
"3… 2… 1… GO!"

- Match time: **150 seconds**.

Step 4 – Autonomous Run

Once GO is announced:

- Robot moves **autonomously** — no touching, no remote control.

- Robot must:

    1. Exit START

    2. Navigate to any Locker

    3. Retrieve the cube

    4. Deliver it to the correct bay

    5. Repeat for all **3 active cubes**

    6. Avoid touching the BLUE cube

Step 5 – Return

Before time expires, the robot should return to the START area for the parking bonus.

Step 6 – STOP

- When the referee says "STOP", the robot must immediately freeze.

- The referee evaluates cube positions and robot parking.

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6. Scoring

6.1 Correct Cube Delivery

- **+20 points** for each correctly delivered cube

- Maximum: **3 × 20 = 60 points**

A cube counts only if it is **fully inside** the correct bay.

6.2 Park in finish Bonus

- **+10 points** if the robot is partially or completely inside the Finish zone.

6.3 BLUE Cube Protected Bonus

- **+10 points** if the BLUE cube stayed exactly in place.

6.4 Wrong Delivery Penalty

- **–10 points** per cube placed in the wrong colored bay.

6.5 BLUE Disturbance Penalty

If the BLUE cube is moved:

- Lose the +10 BLUE bonus

- **–20 points** penalty if completely outside the locker room (the yellow rectangle)

6.6 Final Score Calculation

Final Score =
(+20 per correct delivery)

- Return Bonus

- BLUE Protection Bonus
  – Wrong Bay Penalties
  – BLUE Disturbance Penalty

7. Robot Technical Requirements

7.1 Allowed Platforms

- Robots from Makeblock (mBot2, CyberPi, etc.).

- Must use battery power only.

- Forbidden: projectiles, blades, liquids, flames, etc.

7.2 Size at Start

- Robot base must fit fully inside the START.

7.3 Cube Handling

The robot may:

- Push

- Pull

- Scoop

- Drag

- Partially lift

But it must not damage the field or structures.

7.4 Autonomy Requirement

After GO:

- No touching the robot

- No steering

- No cube adjustment by hand

- No controller or joystick

7.5 Field Protection

Any robot that damages the map, lockers, or bays may have its run voided.

8. Referee Evaluation

At STOP, the referee checks:

1. **Correct deliveries**

2. **Wrong deliveries**

3. **BLUE cube position**

4. **Return to START**

5. **Any illegal assistance**

Both the coach and referee confirm the final score.

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9. Ranking & Finals

Qualification

- Each team receives **2 runs**.

- Ranking uses the **best of the two scores**.

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