

Swift Stacker Challenge Rules

1 Challenge Overview

The Swift Stacker challenge is a robotics competition designed to cultivate students' computational thinking and problem-solving competencies. Participants must demonstrate creativity, spatial reasoning, and team collaboration to complete onsite-released tasks within stipulated time limits.



2 Division and Age Requirements

- Team size: 2-4 players
- Age limit: ≤ 7 years

3 Construction Specifications

Category	Requirements
Platform	Electronics restricted to: LEGO® 9686, WeDo 45300, SPIKE Essential 45345. Non-electronic components unrestricted.
Control Type	Remote-control
Max Volume	≤65,030 cm ³ (post-activation expansion permitted)
Controllers	1 controller per gripping mechanism
Sensors	Type/quantity unrestricted
Drivetrain	Type unrestricted
Motors/Servos	≤3 per gripping mechanism

1. Gripping mechanisms must be constructed onsite.
2. Maximum 2 gripping mechanisms per team.
3. **Mandatory motor-controlled actuation** for gripping operations.
4. Adhesive-assisted gripping prohibited.
5. **Rubber band integration permitted** in mechanisms.

4 Field & Props

1. **Arena Specifications**
 - Material: PVC foam board
 - Dimensions: 152cm(L) × 76cm(W) × 0.3cm(H)

- Layout as shown below:



2. Zoning

- Staging Area** (black-bordered zone): Pre-challenge placement of paper cups/corrugated sheets
- Mission Zone**: Designated stacking area per task requirements

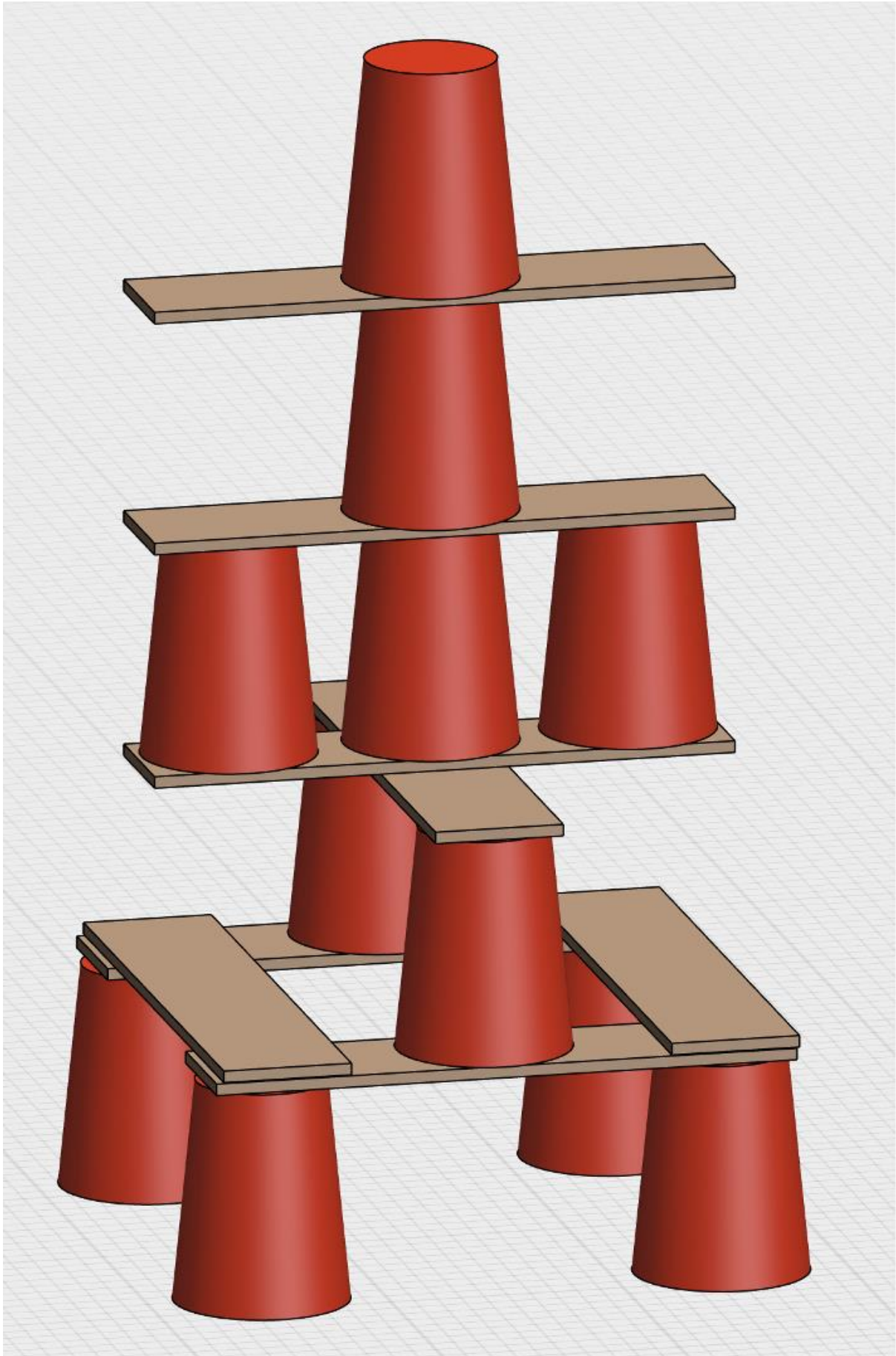
3. Props

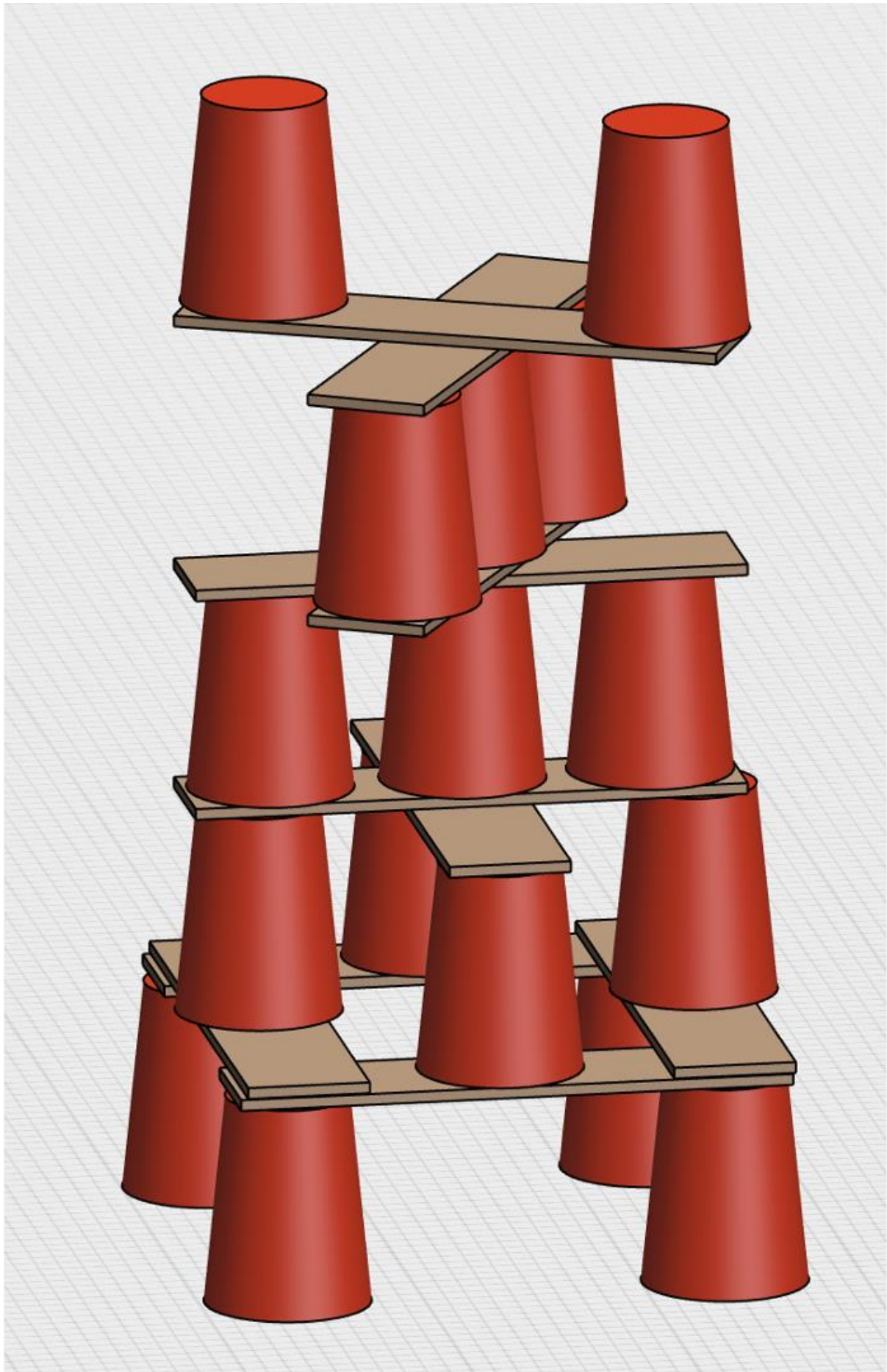
Item	Specifications	Quantity
Paper Cups	Disposable, H=9.5cm, Base Ø7.5cm, Rim Ø5.5cm	12-20
Corrugated Sheets	25cm x 5.5cm	10

5 Rules & Scoring

- Time Limit**: 3 minutes per attempt
- Objective**: Transport cups from staging to mission zone using gripping mechanisms
- Scoring**: 10 points per cup standing independently in mission zone
- Error Protocol**: Dropped cups can be manually returned to staging area by hand
- Completion Criteria**:
 - Time bonus: 1 point/sec for remaining full seconds after task completion
 - Formula: $\text{Total Score} = \text{Component Score} + \text{Time Bonus}$

6. **Corrugated Sheets Handling:** Manual placement of corrugated sheets permitted





6 Check-In

1. All components must be in disassembled state before construction phase.

7 Competition Procedure

7.1 Qualification Stage

1. **Phases:** Qualification Rounds + Tournament
2. **Tasks:**
 - 4 onsite-released tasks across 4 rounds
 - Sum of Best 3 scores for ranking
3. **Scheduling:**
 - Roll call system for sequential attempts
4. **Attempt Protocol:**
 - 1-minute calibration period
 - Missed calls:
 - a) 1st deferral: Requeue at round end
 - b) 2nd deferral: Score = 0
5. **Tournament Qualification:**
 - Top 8 teams advance (ties expand bracket size)
 - Task selected from qualification pool

7.2 Championship Bracket

1. **Format:** Single-elimination tournament

