

The 3rd International STEM Study Contest (3rdISSC)

Competition Program Guidebook

(updated on 30-5-2018)

1. Aim

To promote science and technology inquiry activities to enhance scientific and technological literacy for all.

2. Objectives

- 2.1 To develop interesting scientific and technological contents suitable for field competition, so as to popularise the study of science and technology.
- 2.2 To implement large-scale scientific and technological literacy performance assessment by providing a fair platform for competitions with the support of the specialists in the field.
- 2.3 To showcase students' practical skills, innovative and creative thinking, and their inclination in scientific and technological inquiry activities.

3. Target Participants

Open to tertiary, secondary and primary students. The participating schools from mainland China are required to register as school teams, whereas other schools under the invitation of the Organising Committee may register as school or family teams.

4. The Organisation

The organiser has invited the local and foreign outstanding experts in science and technology education, teachers and educators to participate in the planning, advisory and various technical committees to implement the various events. Each technical committee will specifically be responsible for designing the competition system and the development of technical specifications, evaluation of the outcomes of the competition and appointment of referees and other officials.

5. Competition Rules

- 5.1 The competition is divided into two stages: Preliminaries and Finals. Unless otherwise specially invited by the Organising Committee, only players qualified from the preliminary rounds can take part in the finals in the specific events concerned.
- 5.2 The preliminaries may be organized by the various authorized units of the Organizing Committee at different places and times, but the Finals will be held at the same time at a specified venue to be decided by the main Organising Committee.
- 5.3 Participants are free to choose where and when to take part in the Preliminaries based on their own conveniences and locations.
- 5.4 The organisers of the preliminary competitions (or competition under special invitations) are authorised by the Organizing Committee to carry out any relevant items in competition at their own discretion.
- 5.5 Not more than 45% of the total number of participants who qualified from the Preliminaries would be invited by the main Organising Committee to enter the Final competition.
- 5.6 The preliminary results will be announced based on the on-site competition, and judging will follow the same set of criteria and rules used by the various Event Organizing Committees.

- 5.7 The same set of criteria and rules are to be used in the Finals, except that additional experts' views will be taken into consideration to decide on the final winners, if and when necessary.

6. The Entry, Registration and Grouping of the Competitors

- 6.1 Primary, secondary and tertiary (university) students from Mainland China may enter the preliminary competitions (or by special invitations) through their schools/universities as participation units. However, no individual registration will be accepted.
- 6.2 The oversea regions, like Hong Kong, Macao, and Taiwan, and the foreign countries whose participants having difficulties to participate in the preliminary rounds (or through special invitations) of competition, may apply to the Organizing Committee for direct registration in final competition.
- 6.3 The competition is divided into primary, lower-secondary, upper-secondary and tertiary/university student categories. In the event of special situations, for example, lack of sufficient number of participants, the groups may combine to form a team to participate in an event (subject to the approval by the Organising Committee). The details of each category of competition shall refer to the rules and regulations of each event.
- 6.4 A competitor shall only participate in one event in the Finals or in a special invitation programme. However, in the preliminary rounds a player may participate in more than one event at the discretion of the organisers of the preliminary events.
- 6.5 Whether in preliminary, special invitational or final competitions, the Organizing Committee must take control to ensure that the number of competitors shall not exceed the capacity of hosting the final event. Players who have not obtained prior approval from the Organizing Committee shall not be permitted to participate in the final competition.

7. Prizes and Awards

- 7.1 The number of prizes and awards will be determined based on the actual number of participants and events. However, whether in preliminary, special invitation or final competitions, about 45% of the total number of entries may be awarded with the winning prizes. Actual proportions will be announced during the competition.
- 7.2 For the first three positions of the winners in each event, the names of the instructors (not more than two) will also be printed on the certificates.
- 7.3 For organizations that actively prepare students to participate and make outstanding achievements, "Special Contribution Award" is to be awarded to the institutions and those individuals who are actively contributing to the development of innovative projects. The relevant details of such awards will be announced during the formal competition.

8. Competition Dates and Venues

- 8.1 Final competition: 17-18 November 2018; Guangxi Normal University, Yucai Campus, Guilin.
- 8.2 Special Preliminary Competitions: 28-29 July 2018 at Macau University, Macau, China; and 22-23 September 2018 at Ningxia University, Yinchuan, China.
- 8.3 Authorised Preliminary Competition: 13-14 October 2018 at Guigang Jiangnan Secondary School, Guangxi, China (other venues will be notified if available).

9. Competition Events and Program Implementation

The following competition events are announced by the Organizing Committee. Preliminary competitions may have their own programmes and events which are announced separately.

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Guidelines for Water Rocket Competition

1. Event Overview:

The participating teams must prepare their own tools and necessary materials, and construct their water rocket on the spot within 120 minutes. After the construction, the participating teams will be brought to a specified area to launch their water rockets. The winning results will be based on the ranking of the highest altitudes attained by the water rockets.
2. Instructions for team formation

The participants are required to form small competition teams (2-3 students per team), according to different levels of category, namely the primary, lower secondary, upper secondary and tertiary/university student groups.
3. Production Requirements
 - 3.1 Use the carbonated beverage plastic bottle that can withstand the pressure of ≥ 1.2 Mpa to make the water rocket.
 - 3.2 Each competition team must bring their own tools and materials to build the water rocket on the spot.
 - 3.3 The construction materials must not be modified prior to the competition, except that the separation device from the launcher may be constructed in advance.
 - 3.4 The external body of the water rocket must not be fixed with any hard objects or gadgets that may jeopardise safety.
 - 3.5 The construction of the water rocket must be completed within the stipulated time of 120 minutes.
4. Competition Rules
 - 4.1 Production Area
 - 4.1.1 Competitors will have to register before being allowed to enter into the competition area.
 - 4.1.2 Once the competition starts, members of the team are not allowed to communicate with other teams. The team will be disqualified if being reprimand twice.
 - 4.1.3 The competitors need to complete the production in 120 minutes, failing which the team will be disqualified.

- 4.1.4 After one hour, the participants are allowed to submit their product. Then the team's information will be recorded before being guided to the launching area.
- 4.1.5 Each team will only be provided with one parachute. No modification is allowed to be done on the parachute before or after installation on the water rocket.
- 4.1.6 Upon completion of the production, the team concerned has to tidy up the working area.

4.2 Preparation Area

- 4.2.1 Based on the sequence of reporting at the preparation area, each team is given the queue number, and all the teams have to line-up accordingly to the queue number before entering into the competition area.
- 4.2.2 In the preparation area, competitors are not allowed to modify the water rocket, otherwise offenders would be disqualified from participating in the competition.
- 4.2.3 Competitors may use their own launchers. If, however, any of these launchers are faulty, the competitors may seek the help of the staff of the Sub-organising Committee to solve the problems.
- 4.2.4 The competitors shall install the parachute and altimeter sensor under the supervision of the staff, and they are responsible to return these items after the launch.
- 4.2.5 Every team must be led by a staff member to enter the launching area according to the order of queuing.

4.3 The Launching Area

- 4.3.1 Each of the teams must follow a staff when entering or exiting from the preparation area to launching area. It is compulsory for everyone to wear safety helmet in the launching area.
- 4.3.2 The competition is held in two rounds. Each team shall make two launches and the maximum height of the two shall be taken as the final achievement.
- 4.3.3 Air pressure of the water rocket must be maintained in the range of 0.4Mpa to 0.7Mpa. The competitors may decide and specify on the air pressure to be used. The air pressure shall be installed by the referee on duty.
- 4.3.4 If a rocket cannot be launched and the fault cannot be rectified or repaired quickly, then the team concerned should return to the preparation area and shall be placed in new queuing.
- 4.3.5 If, for some reasons that the launching cannot continue, then all the teams that have not completed the competition must hand in the rockets to the Sub-organising Committee for safe keeping until the launching restarts.
- 4.3.6 Before launching, the rocket must be installed with a altimeter sensor (about 20g) and a parachute (about 70g) provided by the Sub-Organizing Committee. Installation and detachment of these equipment shall be carried out by the staff members.

Installing altimeter and parachute

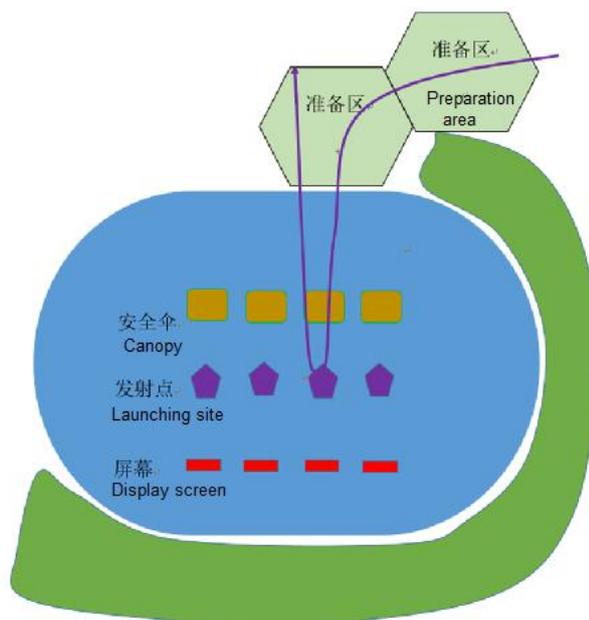


5. Penalty Clause

- 5.1 No semi or ready made parts of the rocket shall be brought into the competition area. The teams that are found to use any ready-made parts of the water rocket shall automatically be disqualified from the competition.
- 5.2 Water rocket can only use air and pure water (including tap water, but not with added solute or sand and other substances) as the source of power for launching. Offenders are automatically be disqualified from the competition.
- 5.3 If the inflation pressure cannot reach 0.4 Mpa in the water rocket, the team shall then be disqualified from the launch.
- 5.4 Any production or inflation problems occur during launching will automatically disqualify the team from participation.
- 5.5 If the water rocket burst during the process of inflation, the team shall lose its eligibility for competition.
- 5.6 Competitors may request for re-launching, if the parachute opens in advance before the end of the upwards flight.
- 5.7 Even if the parachute has not been able to open, as long as the results are shown to be accurate, than the launching is considered successful and the result taken as valid.
- 5.8 If there are any doubts about the contest, the relevant evidence must be submitted within 30 minutes after the launch to the referee to appeal. The referee shall make an appropriate ruling based on the actual situation

6. The Competition and trial test venues

Competition area and preparation area are located in the open field. The competition area will be divided into the Launching Area and Height Display Board Area.



Water rocket launching area

7. Safety Precautions

- 7.1 All persons entering the Launching Area must wear helmets.
- 7.2 Only the competitors and referee are allowed into the Launching Area, and any other people are not allowed to enter.
- 7.3 The competitors must take instructions from the referee, otherwise they may be disqualified from the competition.
- 7.4 It is forbidden to carry equipment that has nothing to do with the game into the Launching Area.

II. Guidelines for Pressurised Bow and Arrow Competition

1. Event Overview

The Pressurised Bow is innovated from the original blow-bow by pressurizing the cylinder (bottle) to store energy. This energy would enable the rocket body (arrow) to accelerate during the launch. The principle is similar to the potential energy stored in the traditional elastic bowstring which propels the arrow to accelerate. Participants shall use the materials provided by the organizer to make the Pressurised Bow and Arrow. Competition shall be judged by the distance travelled by the arrow and the accuracy on hitting the target.

2. The Competition Format

- 2.1 Competition between teams. Each team shall consist of 1-2 persons.
- 2.2 Competition groups are categorised into primary school teams, junior high school teams, senior high school teams, and university student teams.

3. Production Requirement

- 3.1 Material: special paper- 7 (157 grams of unified coated paper); transparent cellophane tape and double-sided adhesive 1 roll (competitors to bring on their own); No other materials are allowed to be used to make the arrows.
- 3.2 Tools: each team will be provided with 3 pieces of 350 mm PVC pipe (water supply PVC pipe, outer diameter are 20 mm, 25 mm, 32 mm, without threaded joints).
- 3.3 Competitors to bring their own: scissors- 1, utility knife- 1, other tools may include ruler, pen, table cover pad (to protect the table top), etc.
- 3.4 Competitors may bring other relevant tools or materials that are permitted in this completion.
- 3.5 No limit to the number of arrows to be made from materials allocated. However the team's name must be clearly displayed on the arrow.
- 3.6 During the try-run and competition, competitors can use their own tools and materials for improving and altering the arrows.
4. Details of the Competition Format
 - 4.1 The game is divided into two modes: indoor production and outdoor launch;
 - 4.2 Interior production time is 60 minutes. If the competitors may complete the production ahead of time allocated, they may enter the outdoor trial launch.
 - 4.3 The competition use a standard launching device (Figure 1). This device has a blue transmitter and three launch tubes with threaded joint launch. Air should be compressed manually into the transmitter, using both hands and body strength and weight (Figure 2).
 - 4.4 No other tools shall be used to pressurize. Inflation process should follow the instructions of the referee.
 - 4.5 Each competitor may take turns to have two trial tests before the competition. However, competitors may opt to enter competition directly without trial test.
 - 4.6 The target ring is shown in Figure 3.
 - 4.7 The score is set at 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0 from the inside to the outside.
 - 4.8 The target frame is made of PVC pipe. The target surface and ground is set at an angle of 80 degrees. The target surface contains 20 cm thickness of the pearl cotton with paper.
 - 4.9 The arrows must hit the target ring to score. If the arrows fall behind the target surface, then the score is 0; if the arrows hit the target surface but the referee did not see, the scoring would than based on the camera record as evidence.



Figure 1



Figure 2

- 4.10 If the an arrow is accidentally miss-fired, meters line limit (Figure 4), then the arrow is considered not fired, and the player can re-shoot the arrow. (Note: only one repetition is allowed for the whole game)
- 4.11 Each player is to launch the arrow three time, taking turns among themselves. The total score of the three results will be the final score.
- 4.12 The game is divided into knockout and qualifying rounds, about 45% of the players will qualify for the final competition.
- 4.13 In the final match, the knockout target is extended by 2 meters, and the player needs to re-create the arrows, and test launch before the final competition.

but part of the arrow falls within 2

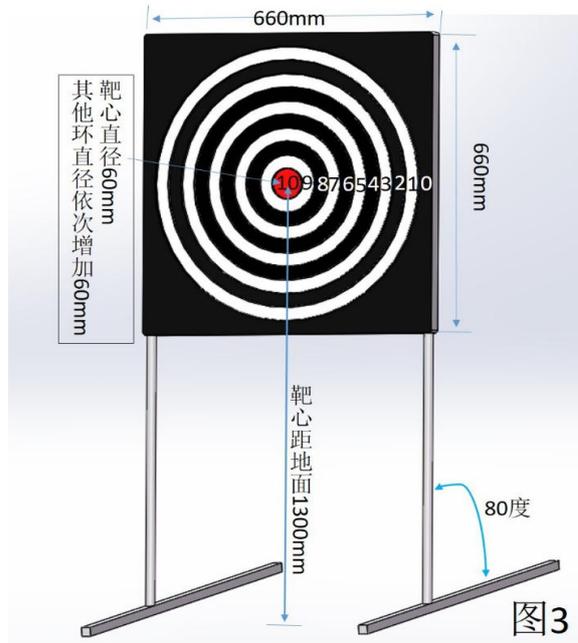


图3

Figure 3

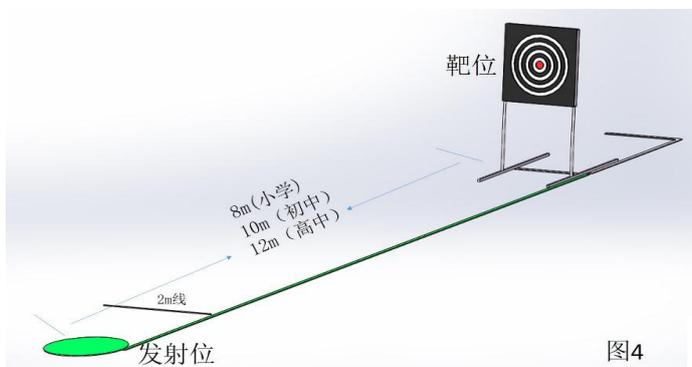


图4

Figure 4

- 4.14 The other terms and conditions are the same as in the knockout round.

4.15 Each player has 2 test opportunities and 3 launches. The final score is obtained from the total score of the three launches.

5. Penalty clause

5.1 The main penalties include verbal warning, the yellow card warning, the red card warning, disqualification and so on.

5.2 Verbal warning for minor foul; yellow card warning is also a minor foul; red card warning for serious foul. When the player ignores the yellow card warning, continue to launch, the referee would show the red card, and the points would be taken from the team.

5.3 At the end of the production, the referee will inspect production area and check the table top, if found untidy or damage, the referee may record his findings and give warning or even penalise the team by deducting points.

5.4 Unauthorised materials found on the arrows will disqualify the team.

5.5 Teachers and parents are prohibited to enter production, testing, competition venues, nor allowed to provide remote guidance. Offenders will be given warning, and ignoring the warnings will lead to disqualification from the competition.

6. Site layout

6.1 The target ring is set as shown in Figure 3. The target frame is designed in accordance with the Olympic standard height, and tilt at 10 degrees. The target center is at a distance of 130 cm from the ground.

6.2 The distance between the target and the launch site is 8 meters (primary group), 10 meters (junior high school group), 12 meters (high school group) respectively (Figure 4).

6.3 The venue for the final competition has its target distance increased by 2 m (Figure 5).

7. Safety Precautions

7.1 As the archery event has a certain risk, all players have to follow the instructions of the referee and the volunteers in-charge. The arrows must not point at any directions other than at the target frame.

7.2 Other than the competitors, all others are not allowed to enter the launch area.

7.3 In order to ensure safety, after inflation is completed, then only the launch device pointing to the target can be installed in the device (i.e., inflated before loading).

7.4 Launch site layout is shown in Figure 5. The players enter through the entrance into the waiting area to take turns to launch. The red area is the launch site. During the launching process no one is allowed to enter the competition area (except the referee).

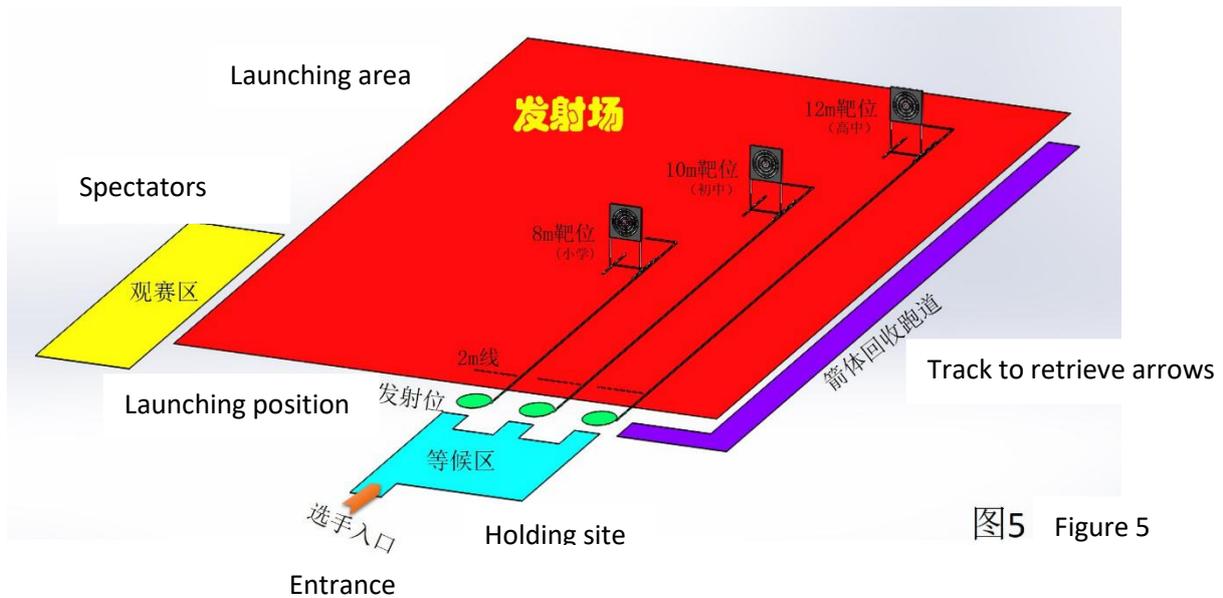


图5 Figure 5

III. Guidelines for Wire Tops Competition

1. Event Overview

Participants use the materials (a specific length of wire or a type of paper clip) provided by the organizer to make a top within the specified time. The longest time that the top spins continuously would determine the winner. Hence, in this competition, the longer (time) the top spins, the better the results would be.

2. Competition Format

The Wire Top competition is an individual event (1 person per team). Competitors are divided into four groups, namely Primary school group, junior high school group, senior high school group and tertiary education group.

3. The production Requirement

3.1 Material description: all materials used for the competition are to be provided by the Organizing Committee. Specifications and related requirements are as follows: (Diameter error ± 0.02 mm; Length error $\pm 1\%$)

3.1.1 Primary school group: 1.2 mm 20 cm

3.1.2 Junior high school group : 1.8 mm 20 cm

3.1.3 High school group: 2.0 mm 20 cm

3.1.4 Tertiary group: 2.2 mm 20 cm

3.2 Competition Tools Description

- 3.2.1 Players may bring their own tools. The number and the types of tools are not limited, but during the competition the tools are not allowed to be used by players from other team.
- 3.2.2 Limit of production time: 40 mins.
- 3.2.3 At the end of the production, the finished product must be handed over to the referee for safe keeping. Each player shall prepare only one top.

4 Competition format

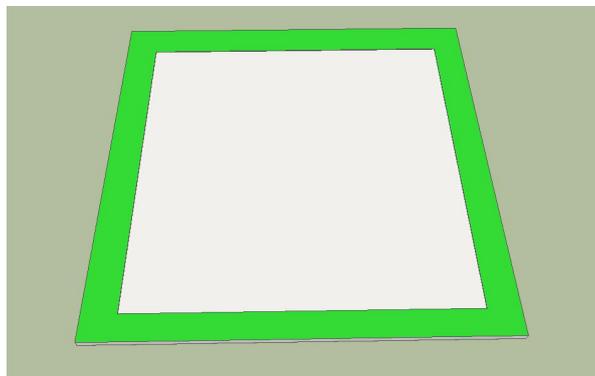
- 4.1 Each player may have a total of 3 trials. The highest score of the 3 would be taken as the final result.
- 4.2 The period of time when the top is being launched at the beginning to the end of its rotation is considered as the result of the score.
- 4.3 The longer the top spins, the higher would be the result of the score.
- 4.4 A player is given 30 seconds to prepare for the launch. The last 10 seconds would be the count down to start the launch. When timing begins, the top must be already in rotation. Advanced timing would render the timing invalid.
- 4.5 Do not touch the top during the counting process. No additional external power or material is allowed to be applied to the top to help it to spin for a longer time.

5 Penalty clause

- 5.1 Players are prohibited to bring finished or semi-finished top into the production site.
- 5.2 Players are not allowed to exchange materials, semi-finished products, finished products and production tools. Offenders would be disqualified from the competition.
- 5.3 Player must use bare hand to spin-start the top. Offender will be disqualified.
- 5.4 Players must not deliberately change the surrounding environment, such as increasing airflow and smoothness of the contact surface.
- 5.5 Immediately after the competition, the top must be handed over to the referee for inspection. Failure to do so may disqualify the eligibility of the contest.

6 Competition and Trial Sites

- 6.1 Trial Site: 460 mm diameter on tempered glass surface. Glass edge has extension 30 mm of advertising paper.
- 6.2 All players would be allocated specific trial site.
- 6.3 Timing will end when the top spin out of the specified area.
The competition site is shown in the Figure below.



IV. Guidelines for Trebuchet Competition

1 Event Overview

Trebuchet was a heavy weapon widely used in the ancient time. It reflected a wealth of wisdom from the working people in application of the perfect fusion of science and technology. This project requires the use of disposable chopsticks to build Trebuchet. The competition enables students to explore the use of science and technology in designing and producing efficient and powerful Trebuchet, thereby enhancing the scientific and technological literacy among them. A good Trebuchet is indicated by the distance a stone is thrown out as well the accuracy of hitting a target. In this competition, the main challenge is measured by the accuracy of the projectile hitting the target.

2 The Competition Format

2.1 The competition is divided into four categories, namely, primary school group, junior high school group, high school group and tertiary (university) group. Each team may make up of 2-3 students.

2.2 The game adopts the round robin system with single-phased elimination initially, but the final shall be determined by “three rounds two wins system”. The actual details will be announced by the organiser before the competition.

3 The Production Requirements

3.1 Materials: The Organizing Committee will provide each group one-time 30 chopsticks (about 20 cm long, diameter of about 5 mm). All other materials are to be prepared by the players themselves.

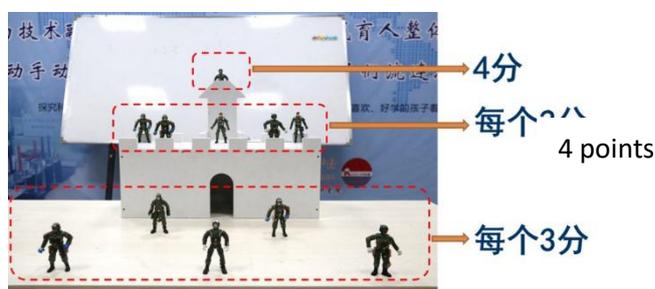
3.2 Tools: Players have to prepare their own tools, such as hot-melt glue gun, needle nose pliers, diagonal pliers, utility knives, angle feet, etc. (there will be on-site 220v power supply)

3.3 Products requirement: (1) The organiser will provide standard machine for Trebuchet to propel the stone; (2) The main structure of the machine must be constructed using chopsticks provided by the organiser, but players can use their own plate to make the base; (3) the shaft height must not be more than 40 cm, and the total height must not be more than 80 cm.

3.4 Production Time: On-site production time is limited to 200 minutes (including debugging time). The end products must be submitted to the organiser for safe keeping in the storage area.

4 The Competition format

4.1 The competition adopts the system “the target to hit to obtain the points” whereby hitting different targets may obtain different point scores. Once a target is knocked down, it would not be restored again. The highest score of aggregate points shall be the winner.



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Contestants are to participate in small groups, using materials (A4 printing paper) provided by the Organizing Committee to make a paper bridge within 120 minutes. Bridge deck span should 29-30 cm long, deck width of 10-21cm, and the overall height of not more than 10 cm. The competition is based on capability of the bridge to support the weight placed at the central load-bearing plane. The bridge that can support the greatest weight would be the winner.

2 The Team format

This is a team competition (each team of 2-3 students). Players are categorised as primary school group, junior high school group, high school group and tertiary (university) group.

3 The Production Requirement

3.1 Materials: A4 printing paper- 35, double-sided adhesive roll- 2 (double-sided plastic size 0.6cm * 5m). All will be provided by the Organizing Committee. Players are not allowed to bring their materials.

3.2 Tools: 30cm steel ruler, utility knife, scissors, pencil, pad, etc., to be prepared by players themselves.

3.3 Production time: 120 mins.

3.4 Product requirement: Bridge deck span should 29-30cm long, deck width of 10-21cm, and the overall height must not be more than 10 cm.

4 The Detailed Rules of Competition

4.1 After the production is completed, the contestants will submit the paper bridge to the referee in the test area. The referee will inspect the paper bridge, and then weighing and labelling it.

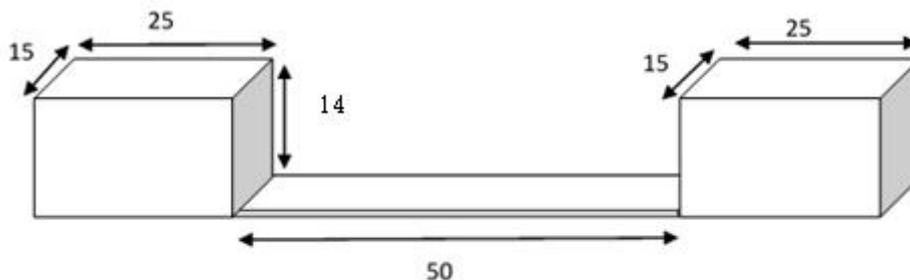
4.2 The sequence of testing depends on the order the paper bridge is submitted to the referee.

4.3 The players themselves place the paper bridge on the weighting device, and select the weight or load to be placed on the test car. The heaviest load that can be carried through the bridge is considered the strongest bridge. Each team can test 3 times and the maximum weight is deemed to be the final score.

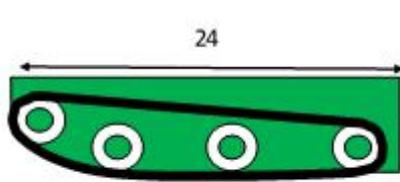
4.4 If two or more bridges can support the same weight, then the team who made the lightest bridge is the winner.

5 Installing load: length unit (cm)

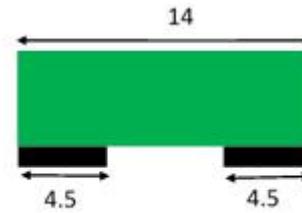
5.1 Diagram below shows the load-bearing table (bridge) and load bearing car.



Installation 1: Top view of "load-bearing table": the middle area is hollowed out. r



Side view



Front view

Installation 2: Load measuring car.

5.2 Installation 3: Load (measuring weight)

The loads are made of steel. Each of their dimensions are not bigger than the car. The weight of the loads are 0.25 kg, 0.5 kg, 1 kg, 2 kg, 4 kg, 7.5 kg, 10 kg, 1 5kg and so on.

VI Guideline for Propeller Recoil Toy Car

1 Event Overview

Participants are to enter the contest in pairs (2 in each team). Each team is required to produce on-site a Propeller Recoil Toy Car within 120 minutes. The dimensions of the car must not exceed 200 * 200 * 200 mm in size and capable of running straight in the race.

2 The Competition Format

Players are to participate as teams (2 students each team). The teams are categorised as primary school group, junior high school group, senior high school group and tertiary (university) group.

3 The Production Requirement

3.1 Materials (own preparation)

Motor: up to 2, models and specifications are not limited

Battery: up to 2 batteries on No. 5 grade, voltage $\leq 1.7V$

Wheel (without axle): can be produced in advance, or purchased directly

Propeller: up to 2, models and specifications are not limited

Other materials: to be prepared by the teams themselves, such as axles (raw materials), battery boxes, wires, glue and so on.

Special Note: If the materials do not meet the production requirements, then the team shall not be allowed to participate I the contest.

3.2 Tools: To be prepared by the participants, such as hot melt glue gun, electric iron, utility knife, steel ruler, needle nose pliers, sandpaper, hand drill, etc.

3.3 The production requirement:

3.3.1 The motor, battery, wheel, propeller and other material used by the players must be tested by the referee. If found not meeting the requirements, then they will be temporary kept by the referee. If the battery box cannot be opened for inspection, then it has to be tested to determine its legibility for use.

3.3.2 The car body and axle must be assembled on-site. Ready-made or purchased parts are not allowed.

3.3.3 During the production process, participants shall not obtain the help or instruction in any way.

3.3.4 At the end of the production time, all activities of the production should stop immediately, and the car should be placed in the specified position as required. No contact with the finished product is allowed before the competition.

4 The Details of Racing Competition

4.1 Each team has 120 minutes of production time. During which time the participants are free to have trial run on the track. At the end of production time, all groups must immediately stop work, paste a label on their respective product, and then submit to referee for safe-keeping.

4.2 Any product (car), if found not meeting the production requirements, then it will not be granted racing eligibility.

4.3 The teams will take turn to enter the competition according to the order of queuing.

4.3.1 Each team had 3 minutes of test run, with as many trials as possible.

4.3.2 The time that the car begins from the starting point to the end of the finishing line provide time as the effective result.

4.3.3 The best results (within the stipulated time of 3 mins.) of the test shall be taken as the final result.

4.3.4 At the onset of the competition, the referee will announce "start" to begin the 3 minutes countdown.

4.3.5 The time taken by the car to travel through the distance from starting to finishing lines will be provide by automatic timing by the photoelectric door, with an accuracy to 0.01 second.

4.3.6 At the end of 3-minute duration, the referee will announce "stop", and the race is immediately terminated.

4.4 At the start of the race from the starting line, the player must not push the car in any way. During the race, the player is also not allowed to touch the car. However, if the car struck half way, rollover, and so on, the player can retrieve the car, and restart the race.

4.5 During the competition, the player shall not take the car from competition area. After the competition, the player must sign to confirm the result before leaving with the car.

4.6 During the race, if the car is damaged due to the collision or any other incidences, the players are responsible on the damages themselves.

4.7 All players must obey the referee's instructions, and abide by his/her arbitration on any complain. Failure to do so may disqualify the eligibility of the team in participating in the competition.

5 The Competition Site

As shown in the figure below. The racing track is divided into five parts: the start-up area, the runway, the starting time zone, the end time zone, and the runway baffle zone (there may be an error of ± 2.0 mm).



VII. Guidelines for Making Slowest Falling Object

1 Event Overview

This project is to make a falling body to descend as slow as possible on a structure. In the competition, a (steel) ball is dropping from a specified height. The structure is constructed in such a way, or it is fixed with obstacles to slow down the falling process. How slow the ball (object) will fall depends on the design and control of the structure created. The slowest falling object wins the race.

2 The Team Format

This is a team competition. Each team is limited to 2-3 students. The teams are categorised as the primary school group, junior high school group, senior high school group, and tertiary (university) group.

3 The Production Requirements

3.1 Materials and Tools

- 3.1.1 The organiser will provide one steel ball of diameter of 12 mm (weight approximately 7 g) to each participating team.

Steel l



- 3.1.2 In this competition, the organiser will not provide any other materials, hence the participants may prepare their own materials as follows:

- (a) Primary school group: use paper only
- (b) Junior High, Senior High & Tertiary Groups: may use paper, PVC board (ABS, foam board, etc.); plastic board; wood board. The original size of each of the above materials is not less than 200 mm x 200 mm, and the thickness is less than 10 mm. The number is not limited.
- (c) Bring your own tools for cutting, measuring, and drilling, such as: scissors, cutting knife, ruler, etc.,
- (d) Use your own adhesive materials, that may include transparent plastic and double-sided adhesive tapes.

3.2 The Competition Time

All the teams will start producing the structures at the same time, within the time period of 120 minutes. After the production time is over, the teams will place the finished product (structure) in the designated locations respectively. The players are not allowed to touch the finish product before the start of the competition.

4 Product Requirements

- 4.1 The structure (finished product) should be able to independently support the weight (steel ball). No other supporting materials could be used. Do not glue the structure on to the table. The maximum dimension of the product, i.e. length, width and height are limited to within 80 cm.
- 4.2 Before the start of competition, the players are given 3 minutes to test-run on their structures and rectify if necessary. There after competition will commence immediately. In between the rounds, players are given 1 minute of debugging and adjustment to the structure.
- 4.3 Timing is taken at the moment the ball leaves the hand to the end the ball roll out of the structure. This will be counted as a single test result. If the ball stops along the way for 5 seconds, it is taken that the test failed. Each team is given 3 trials in the competition. The highest score of the 3 results is taken as the final result.
- 4.4 During the competition the players must not touch the structure or the ball, shake the structure or blow at the ball, otherwise the round concerned or the competition would be disqualified.

VIII. Other Issues

1 Queries and Complaints

- 1.1 In case of controversy, a team leader may raise the issue with the jury. For pressing problem on the spot, the team leader may raise the question with the referee, provided such action will not disturb the proceeding of the competition.
- 1.2 Contestants may submit oral questions to query referee's decision, but once the referee has given a clear and reasonable reply, the decision should be accepted without further ado.
- 1.3 Any disagreement with the referee's decision, the team leader may make a written complaint to the jury and the Arbitration Committee will then make the final judgment. Any dispute and disagreement with the decision on the competition results and awards must be submitted to the jury within 30 minutes after the results are announced. After which such complaint will not be entertained.

2 Safety and Emergency Measures

- 2.1 Teacher advisers are responsible for the safety of their students, particularly in relation to traffic and on-site/venue safety, so as to ensure the smooth progress of the competition.
- 2.2 The Organizing Committee engage 'specialists' and security officers to safe guard the security of the entire stadium, to handle emergencies in the shortest notice such as to ensure student health, safety, and the smooth conduct of the game.

3 Civilized and Smart Participation

- 3.1 Participating contestants and teams must observe and maintain decorum at all times, viz., before, during and after the competition for any event. Staff members, team leaders and players must not be subjected to insult, abuse, quarrel, and assault, whether within and outside of the competition areas. Offenders will be provided with advice, counselling and finally warning, but if the unfortunate incidence persists, then the team will be disqualified from participation.

- 3.2 All participants are urged to take good care of public facilities, and vandalism is punishable by laws.
- 3.3 After completion of an event, participants concerned must returned all 'borrowed' equipment and tools to the organizer, and undertake to clear and clean the areas promptly.

Note:

Notice is hereby given that if there is any discrepancy and dispute to the English version of this guidebook, then the final interpretation should be referred to and based on the original Chinese version.

(End)