



National STEM Olympiad 2020

“Science and Technology for Sustainable Waste Management”

April 28-30, 2020

PROGRAMME AND GUIDELINES



ROYAL EDUCATION COUNCIL

PARO

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INTRODUCTION

National STEM Olympiad is devoted to improve the quality of STEM education. This programme is expected to spark students' interest in STEM related areas and provide recognition for outstanding achievement in STEM education. The STEM Olympiad is a competition that consists of team events, individual scholastic works which students and teachers prepare on the given theme. These challenging and motivational events are well balanced between the various science disciplines, mathematics, and technology.

Generating knowledge and understanding through STEM equips people to find solutions to today's emerging challenges and achieve the national goal of sustainable development and greener society. With exponential growth in urbanization and industrialization, waste management has become a global concern, and it is a concern for Bhutan too. Waste management practices vary across nations, regions, and sectors. The STEM education provide greater scope to mitigate the emerging national and global issues in terms of waste management and the wellbeing of people and the world at large. There are emerging trends in science and technology that can be used for sustainable and effective waste management. The theme for the National STEM Olympiad 2020 is ***"Science and Technology for Sustainable Waste Management"***.

OBJECTIVES

1. Ignite interest and curiosity in STEM.
2. Provide opportunities to develop transversal competencies.
3. Promote human values in science and technology.
4. Challenge students to come up with innovative and creative ideas to solve real world problems.
5. Encourage students and teachers to showcase their scholarly works.
6. Create a platform for participants and guests to experience hands-on activities.

PROGRAMMES AND ACTIVITIES

The National STEM Olympiad 2020 would comprise of the following programmes and activities:

- A. Exhibition
- B. Symposium
- C. Fun activities
- D. On-site Challenge

A. EXHIBITION

Exhibition is one of the main programme of the National STEM Olympiad where students are challenged to come up with innovative and creative ideas to solve real world problems. There are three phases. In the first phase, all schools submit their proposals of which, 20 best proposals shall be selected for the development of prototype. In the second phase, the 20 selected schools develop prototype and amongst them, 15 best prototypes shall be selected for the final phase at the National level. At the national level, the 15 best prototypes are displayed for public and, also ranked.

Phase 1: Submission of Proposal

1.1. Guidelines for the Submission of Proposal

- 1.1.1 A team from a school shall comprise of six students (3 girls and 3 boys), and a Mentor Teacher to work on one proposal.
- 1.1.2 The proposal must be planned and prepared by students themselves. However, the mentor teacher can assist the students as and when required.
- 1.1.3 The proposal must be relevant to the theme of the STEM Olympiad 2020.
- 1.1.4 The proposal should be submitted in PDF format along with the dully filled registration form ([Annexure 1](#)) to Phuntsho Norbu at phuntshonorbu@rec.gov.bt through the **official school email only**.
- 1.1.5 The proposal must be strictly developed using the template given in [Annexure 2](#) (Title Page) and [Annexure 3](#) (Write Up). If proposals are not submitted as per the template or if schools reveal their identify in **Annexure 3** or if the work is plagiarised, it will result in automatic disqualification.
- 1.1.6 The file name for the documents to be submitted should be in this format: 'SchoolName_Dzongkhag_Annexure#'.
For example, for submission of:
 - i. Annexure 1, file name to be 'JhomolhariCS_Paro_Annexure1'
 - ii. Annexure 2, file name to be 'JhomolhariCS_Paro_Annexure2'
 - iii. Annexure 3, file name to be 'JhomolhariCS_Paro_Annexure3'.
- 1.1.7 All schools submit one best proposal to the REC on or before February **25, 2020**.
- 1.1.8 From all the proposals submitted, 20 best proposals representing 20 schools will be selected after the evaluation by a committee as per the assessment tool given in [Annexure 8](#).
- 1.1.9 The decision of the selection committee is final and binding.
- 1.1.10 Twenty selected schools will be provided with financial support of Nu 10,000 for the development of prototype.
- 1.1.11 The REC reserves the right to publish the content of the selected proposals in any media.

1.2. Terms of Reference for Proposal Evaluators

- 1.2.1 Ensure that proposals are assessed in strict adherence to the criteria in [Annexure 8](#).
- 1.2.2 The evaluators must sign the declaration of conflict of interest ([Annexure 15](#))
- 1.2.3 Ensure that the proposals are not plagiarised.
- 1.2.4 Evaluators have right to disqualify any proposal if it does not adhere to the theme of the STEM Olympiad 2020.
- 1.2.5 Each proposal shall be evaluated at least by three evaluators.
- 1.2.6 Points awarded for each entry must be clear, signed if overwritten, and summed correctly using PEN only.
- 1.2.7 Evaluators shall complete the evaluation of all the papers on or before **March 13, 2020** and submit the duly signed score sheet to REC.
- 1.2.8 The selection result will be informed to all the participating schools by **March 16, 2020**.

Phase 2: School-Level Prototype Development

2.1. Guidelines to Select Prototype

- 2.1.1 All 20 selected schools should complete the development of the prototype on or before **April 13, 2020**.
- 2.1.2 The evaluators will visit the selected schools to evaluate the prototype within the time frame of **April 13-20, 2020**.
- 2.1.3 The school shall be provided maximum of 15 minutes for presentation of the prototype, followed by 25 minutes for demonstration, and question and answer.
- 2.1.4 The evaluation shall be carried out using criteria given in [Annexure 10](#).
- 2.1.5 A school shall depute an observer along with the mentor teacher to ensure fairness of the evaluation.
- 2.1.6 The mentor teacher and the school observer should sign the observation form in *Annexure 14*.
- 2.1.7 Prototype evaluation will carry 90% of the total weighting. The remaining 10% shall be included from cognitive test.
- 2.1.8 The selection result will be declared by **April 23, 2020**.
- 2.1.9 All 15 selected schools are required to submit the detailed report about the prototype by using [Annexure 7](#) to REC when they report for the National STEM Olympiad 2020 venue.
- 2.1.10 The detailed report of the prototype development will be published by REC for wider dissemination and circulation.
- 2.1.11 The contributing authors will have the authorship of the report whereas REC reserves the copyright.

2.2. Guidelines for Cognitive Test

- 2.2.1 There will be a written test for all the participants related to the theme of the Olympiad.
- 2.2.2 An evaluation team will administer cognitive test to the participants and this part will carry 10% of the weighting.
- 2.2.3 A total of 10 Multiple Choice Questions (MCQ) will be tested for a duration of 20 minutes. Each MCQ shall carry 1 point.
- 2.2.4 Cognitive test will be administered and evaluated by the evaluation team.
- 2.2.5 Evaluation team to administer the test with highest standards of integrity and fairness.
- 2.2.6 A school shall depute an observer other than the mentor teacher to ensure fairness of the test.
- 2.2.7 The observer from the school will be briefed on the modality of the test, sign the conflict of interest and complete an observation form on [Annexure 14](#).
- 2.2.8 The average points scored by the team will be counted as the final score for cognitive test.

2.3. Terms of Reference for Evaluators

- 2.3.1 Evaluators for school level prototypes will comprise of officials from REC and other professionals from relevant agencies.
- 2.3.2 The evaluators must sign the declaration of conflict of interest on [Annexure 15](#).
- 2.3.3 Evaluators shall convene meeting to have a common understanding of the administration and evaluation of cognitive test and prototype before the field visits.
- 2.3.4 Evaluators have rights to disqualify and not evaluate the prototype if does not adhere to the proposal submitted.

- 2.3.5 Points awarded for each prototype and cognitive test must be written clearly, signed if over-written and summed correctly using PEN only.
- 2.3.6 All the evaluators must assess the prototype. The average score shall be converted to 90% for the final score.
- 2.3.7 The evaluators must administer and evaluate the cognitive test to all the participants and the average points shall be converted to 10% for the final score.
- 2.3.8 The final score is the sum of the 90% of prototype evaluation and 10% of the cognitive test.
- 2.3.9 The points awarded by the evaluators will be final and binding.
- 2.3.10 Announcement of result, date and venue for the National level competition will be informed to the 15 selected schools latest by **April 23, 2020**.

Phase 3: National STEM Olympiad 2020

3.1. Guidelines for National STEM Olympiad 2020

- 3.1.1 The teams from the 20 selected schools shall report to the venue on the evening of **April 26, 2020**.
- 3.1.2 Upon arrival at the venue, the escort teacher should contact Mr. Karma Dorji (Mobile No. 17846315) for registration and logistics.
- 3.1.3 During the registration, selected schools are required to submit a copy of the following:
 - ✓ Approval letter from the Dzongkhag/Thromde to participate in the event
 - ✓ List of participants ([Annexure 4](#))
 - ✓ Written consent for the participating students from their parent/guardian. ([Annexure 6](#))
 - ✓ Written permission form for participants from CDEO/CTEO. ([Annexure 5](#))
 - ✓ Prototype Report Booklet ([Annexure 7](#))
- 3.1.4 The selected schools shall be responsible for the safe transportation of the team.
- 3.1.5 The expenditure incurred for transportation including DSA of the driver shall be borne by the participating school.
- 3.1.6 Food and lodge from the evening of **April 26, 2020** to morning of **April 30, 2020** will be provided by the organizer.
- 3.1.7 The entitlements for students will be paid as per the existing financial rule only for the journey from the school to the venue and back.
- 3.1.8 The entitlement for the escort teachers will be paid as per the existing financial rules. However, no TA will be paid as the transportation is arranged by the school.
- 3.1.9 The selected schools shall bring an exhibit banner and their school flag.
- 3.1.10 The selected schools will be allocated a space based on lucky draw to display their prototype. (**April 27, 2020**)
- 3.1.11 The exhibits will be evaluated on **April 28, 2020** by a panel of judges as per the criteria given in [Annexure 10](#). The results will be declared on **April 30, 2020**.
- 3.1.12 The exhibits will be opened to the general public on **April 28 - 30, 2020**.

3.2. Terms of Reference for Judges

- 3.2.1 A panel of judges comprising of officials from relevant organizations and agencies without any affiliation to the participating school shall judge the prototype.
- 3.2.2 The evaluators must sign the declaration of conflict of interest on [Annexure 15](#).
- 3.2.3 Judges shall report to the National STEM Olympiad venue by **9.00 AM on April 28, 2020** and meet overall coordinator (Mr. Bhoj Raj Rai, STEM unit, REC) to discuss, finalise, and

- familiarize the assessment tool to evaluate the prototype.
- 3.2.4 Judges to ensure that the prototypes are assessed with utmost integrity, efficiency and quality using the assessment tools and techniques.
 - 3.2.5 All the prototypes must be evaluated by every judge.
 - 3.2.6 The points awarded for each prototype must be clear, signed if over-written, and summed correctly using PEN only.
 - 3.2.7 The consolidated score sheet for all the prototypes must be duly signed by all the judges clearly stating the position secured by each team.
 - 3.2.8 The award of points by the judges is final and binding.

B. SYMPOSIUM

Symposium is a forum for presentation and discussion of scholarly works of the teachers and students on the theme of the National STEM Olympiad 2020. The theme for the symposium 2020 is **“Science and Technology for Sustainable Waste Management”**. Teachers and students are required to submit their paper on the theme to REC. A panel of evaluators will select four teachers and six students for presentation during the symposium.

1. Objectives:

The objectives of the symposium are to:

- i. ignite interest and curiosity in scholarly work related to STEM education.
- ii. encourage teachers and students to showcase their scholarly works at the national level.
- iii. promote a broader understanding of contributions made by STEM Education in managing waste to improve livelihood.
- iv. provide opportunity to the participants to discuss and understand the challenges related to waste management.
- v. provide opportunities to develop transversal competencies.
- vi. promote human values in science and technology.

2. Procedure:

- 2.1 Teachers and students are invited to carry out research on the theme, “**Science and Technology for Sustainable Waste Management**” and submit the full paper in PDF format along with the dully filled registration form ([Annexure 1](#)) to Mr Karma Dorji at karmadorji@rec.gov.bt. on or before **March 15, 2020**.
- 2.2 The research paper must be strictly developed using the template given in [Annexure 2](#) (Title Page) and [Annexure 3](#) (Write Up). If proposals are not submitted as per the template or if candidates reveal their identity in Annexure 3 or if the work is plagiarised, it will result in automatic disqualification.
- 2.3 The file name for the documents to be submitted should be in this format: ‘Name_School_Annexure#’. For example, for submission of:
 1. Annexure 1 file name to be ‘Sonam_JhomolhariCS_Annexure1’
 2. Annexure 2 file name to be ‘Sonam_JhomolhariCS_Annexure2’
 3. Annexure 3 file name to be ‘Sonam_JhomolhariCS_Annexure3’.
- 2.4 The papers submitted will be evaluated and selected by a group of evaluators.
- 2.5 The evaluators will shortlist the best **SEVEN** and **TEN** papers from teacher and student category respectively.
- 2.6 The shortlisted teachers and students for symposium must sit for video presentation for 10 minutes.
- 2.7 The date and time for video presentation will be confirmed by REC to the respective shortlisted teacher and student candidates.
- 2.8 Of all the shortlisted candidates, only **FOUR** teachers’ and **SIX** students’ paper will be selected for presentation during the symposium at the National STEM Olympiad 2020.
- 2.9 Two guest speakers from the STEM related background will also be invited to present on the given theme.
- 2.10 The result of the selected symposium papers will be declared on **April 2, 2020**.
- 2.11 Schools are required to obtain the following:
 - ✓ Approval from the Dzongkhag/Thromde to participate in the event.
 - ✓ Written consent from ([Annexure 6](#)) the parents/guardian to enable students to travel for the symposium.
 - ✓ Written permission form for participants from CDEO/CTEO. ([Annexure 5](#))
- 2.12 The schools should arrange an escort teacher for the selected student presenter.
- 2.13 The decision of the evaluation committee is final and binding.
- 2.14 The REC reserves the right to publish the content of the selected entries of students and teachers in any media.
- 2.15 The STEM Unit, REC, shall publish the proceedings of the symposium for dissemination of information for wider circulation.

3. Guidelines for Symposium

- 3.6 Duly filled Registration Form ([Annexure 1](#)) must be completed and submitted electronically along with proposal paper to Karma Dorji at karmadorji@rec.gov.bt **no later than March 15, 2020**
- 3.7 Upon selection of the symposium paper, the participants will receive a confirmation email and a telephone call from Royal Education Council, no later than **April 2, 2020**
- 3.8 Only one presenter will be invited to present their paper. No logistics and other entitlements will be arranged for additional member.
- 3.9 Duration of each presentation is strictly limited to 10 minutes and 15 minutes for questions and answers.

- 3.10 The exact schedule will be determined after all registrations have been received.
- 3.11 The presenters should report on **April 28, 2020** for necessary instruction.
- 3.12 Please note that if there is a plan to use PowerPoint, then it must be compatible software version.
- 3.13 The symposium is NOT a competition amongst the participants.
- 3.14 In the proposal, full definition of acronyms must be written, when used for the first time.
- 3.15 All the presenters are expected to be in formal dress with *Kabney/Rachu* during the presentation.

4. Award

- 1.1 A sum of Nu 7,000/- (Seven thousand only) along with the certificate of commendation shall be awarded to the speakers of all the selected papers.
- 1.2 A memento and a certificate of commendation shall also be presented to the guest speakers and moderators.

5. Terms of Reference for the Evaluators of Symposium Paper

- 5.1 The evaluators for symposium papers will comprise of professionals from relevant agencies.
- 5.2 The evaluators must sign the declaration of conflict of interest on [Annexure 15](#).
- 5.3 The evaluators shall convene meeting to have a common understanding of the evaluation criteria. ([Annexure 12](#))
- 5.4 The evaluators have rights to disqualify and not evaluate the symposium paper if it does not adhere to the theme and the template provided.
- 5.5 The points awarded for each symposium paper must be written clearly, signed if over-written and summed correctly using PEN only.
- 5.6 The evaluators to ensure that the papers are evaluated with utmost integrity, using the set criteria ([Annexure 12](#))
- 5.7 All the papers must be evaluated by every evaluator.
- 5.8 The evaluators shall receive all the papers by **March 17, 2020** and must complete the evaluation of all the papers on or before **March 23, 2020**.
- 5.9 The evaluators will shortlist the best **SEVEN** and **TEN** papers from teacher and student category respectively.
- 5.10 Of the shortlisted candidates, only **FOUR** teachers' and **SIX** students' papers will be selected through video conference for presentation during the symposium at the National STEM Olympiad 2020.
- 5.11 The evaluators shall submit the results of the selected papers to the Symposium Coordinator on **March 24, 2020**.

C. FUN ACTIVITIES

The fun activities are for visitors to engage in a variety of STEM related activities such as 3D show (scientific documentary), hands-on experiments, mathematical puzzles, and optical illusions. Visitors try out fun activities to evaluate and reflect on how science works.

1. Objectives

The objectives of the fun activities are to:

- i. ignite interest and curiosity in STEM.
- ii. create awareness on the importance of STEM.
- iii. encourage visitors to reflect on how science and technology works.
- iv. provide opportunity to appreciate the wonders of science and technology.

2. Procedures

- 2.1 A dedicated official (Mr Wangchuk, STEM Unit) REC will plan and organize the fun activities.
- 2.2 The fun activities are not competitive events.
- 2.3 Consideration to health and safety will be made while planning the fun activities.
- 2.4 There will be a dedicated space with several stations allocated to display fun activities.
- 2.5 Each station will have specific instructions and materials for the activity along with a dedicated student facilitator.
- 2.6 Visitors may try out the fun activities and seek clarification on the scientific phenomena.

D. ON-SITE CHALLENGE

The on-site challenge is an event to challenge students to come up with innovative and creative ideas to solve real world problem. Only the selected students for National Level competition can participate in the challenge. The topic and materials for challenge will be provided on the spot. The event is evaluated by a panel of judges.

1. Objectives

The objectives of the on-site challenge are to:

- i. to challenge students and provide them a platform to showcase their innovative and creative competences.
- ii. create awareness on the importance of STEM.
- iii. encourage collaboration and team work in a group.

2. Procedures

- 2.1 This event is carried out at the national level only.
- 2.2 Each team is given a challenge (impromptu) on the spot to complete within a given time.
- 2.3 It will be evaluated by a panel of judges.
- 2.4 The evaluators shall administer and evaluate on-site challenge and the average points shall be converted to 20% for the final score.
- 2.5 The final score is the sum of the 80% of prototype evaluation and 20% of the on-site challenge.

FINANCIAL REMUNERATION

All financial payments shall be made in accordance to the existing RGOB Financial Rules and Regulations.

A. DSA and TA

1. Evaluators shall be entitled for TA and DSA.
2. Escort teachers shall be paid DSA during the National STEM Olympiad but no TA will be entertained.
3. Student participants shall be paid DSA during travel time only.
4. Guest speakers and teacher symposium presenters shall be entitled for TA and DSA.

B. Meals and refreshments

1. Student participant, escort teachers, symposium presenters, and drivers shall be provided meals and refreshments.
 - i. Dinner on arrival
 - ii. All meals during the Olympiad
 - iii. Breakfast on departure date (Next day of closing)
2. Officials involved shall be provided working lunch and refreshments during the preparation.
3. Invited guests and officials involved shall be provided lunch and refreshments during the three day Olympiad.

C. Prizes and certificates

1. Prize money and certificates are as follows:

First:	Nu 75,000, Rolling Trophy, and Certificates.
Second:	Nu 60,000 and Certificates
Third:	Nu 45,000 and Certificates
Consolation Prizes:	Nu 10,000 and Certificate
2. Certificates shall be awarded to:
 - i. Student participants
 - ii. Teacher presenters
 - iii. Guest presenters
 - iv. Moderators
 - v. Volunteers
 - vi. Working committee members
 - vii. Participants of 20 selected schools
3. Memento shall be awarded to:
 - i. Chief Guests
 - ii. Advisory Committee Members
 - iii. Guest speakers
 - iv. Moderators
 - v. Working committee members
 - vi. Host School and Dzongkhag

D. Event Management

1. Planning and designing of the National STEM Olympiad
2. Construction and setting up of infrastructure
3. Entertainment services.

CONTINGENCY PLANS

Contingency plans are required to response to an emergency and to make an informed decision about the management of human and financial resources, coordination and communication procedures, and to be aware of a range of technical and logical responses.

1. School Level

- i. School principal, escort teacher and driver shall be responsible for safe transportation.
- ii. Escort teacher shall be responsible for the safety of the student participants.
- iii. In case of emergency, the students should immediately report to the escort teacher/REC officials. The escort teacher to report to the host principal, overall coordinator of REC and the CDEO/CTEO.
- iv. If the venue is at a school, then host principal shall:
 - a. orient the participants on the contingency plans on arrival to school.
 - b. ensure care and protection of students.
 - c. ensure availability of first-aid services, fire service, traffic control and crowd management including evacuation areas.
 - d. facilitate transportation in event of emergencies.
 - e. report to the overall coordinator and Disaster Management Unit, DSE, MoE.

2. Dzongkhag Level

Host CDEO/CTEO to:

- ✓ ensure safety of the visiting students.
- ✓ ensure first-aid services, fire service, traffic control and crowd management.
- ✓ facilitate support to from emergency response agencies (fire brigade, ambulance, and search and rescue team).
- ✓ report to the overall coordinator and Disaster Management Unit, DSE, MoE, in event of emergency.

If the venue is not at a school, then host CDEO/CTEO shall also:

- ✓ orient the participants on the contingency plans on arrival to school.
- ✓ ensure care and protection of students.
- ✓ ensure availability of first-aid services, fire service, traffic control and crowd management including evacuation areas.
- ✓ facilitate transportation in event of emergencies.
- ✓ report to the overall coordinator and Disaster Management Unit, DSE, MoE.

3. National Level

REC in collaboration with MoE, host Dzongkhag and host school shall plan the conduct of National STEM Olympiad 2020.

4. Media Protocol

The overall coordinator of the National STEM Olympiad shall:

- ✓ be the media spokesperson.
- ✓ invite media personal to the Olympiad.
- ✓ issue the press release.
- ✓ ensure media coverage.

MISCELLANEOUS

1. All the participants, escort teachers and drivers should bring their own beddings, plates and mugs.
2. The escort teachers, drivers and participants will be provided with name tag on arrival at venue.
3. The name tag must be worn all the times till the end of the function.
4. The team or individual must inform in advance to meals and refreshment coordinator in case of skipping the meals.
5. The participants, escort teachers and drivers are advised to bring their own enabling gadgets such as torch, toiletries and other necessary things.
6. All are expected to follow the timing strictly to avoid delay in implementation of subsequent activities.

ADVISORY COMMITTEE MEMBERS

1. Director General, DSE, MoE (Chairperson)
2. Director General, DYS, MoE (Vice Chair)
3. Director, REC
4. Dean, CDC, REC
5. Chief DEO/TEO, Host Dzongkhag/Thromde
6. Unit Head, STEM Division, REC (Member Secretary)

TOR FOR ADVISORY COMMITTEE MEMBERS

1. The advisory committee members will meet as and when required or necessary.
2. Vice chairperson shall coordinate the meeting in absence of chairperson.
3. The presence of two-third members will constitute the quorum.
4. Advisory committee shall provide guidance, support and direction for the conduct of STEM Olympiad.
5. The advisory committee shall validate the proposal and grant approval submitted by the STEM division, REC including the financial expenditures.
6. The member Secretary shall inform the date and venue of the meeting and circulate the agenda with relevant documents in advance.
7. All the members are mandated to sign the resolutions taken in all the meetings.

TOR FOR WORKING COMMITTEE MEMBERS

1. Working committee members shall meet and convene the meeting as and when required.
2. Head of the STEM Unit shall lead as the overall coordinator of the working committee members.
3. Dean of CDC shall coordinate and lead the function in absence of the overall coordinator.
4. Respective coordinators shall take lead of the team and carry out the task assigned accordingly.
5. Overall coordinator shall inform the date and venue of the meeting and circulate the agenda with relevant documents in advance.
6. All the members are mandated to sign the resolutions taken in all the meetings.

ANNEXURE 1: REGISTRATION FORM

National STEM Olympiad 2020

Please write in **BLOCK LETTERS**:

Name of the School:

Dzongkhag/Thromde:

Name and contact number of Mentor Teacher:	
Boys	Girls
Name: Class: Student Code No: CID No:	Name: Class: Student Code No: CID No:
Name: Class: Student Code No: CID No:	Name: Class: Student Code No: CID No:
Name: Class: Student Code No: CID No:	Name: Class: Student Code No: CID No:

Name and contact number of the Principal

Signature of Principal

Title Page

The title page includes Title of the Proposal, the Author's Name and the Institutional Affiliation.

Title

The title should summarise the main idea of the proposal. While writing the title, the following requirements must be fulfilled:

- i. Title of the proposal to be kept at the centre of the page.
- i. First letter of each word in the title should be capitalized, except for articles and prepositions.
- ii. No abbreviations/contractions should be used in the title.
- iii. The title should not be more 12 words in length.
- iv. Font size of 12 pt Times New Roman
- v. Double line spacing
- vi. 1 inch (2.54 cm) margins

Author name(s)

The name of the students (3 boys and 3 girls) to be written in full as per the school record in the order of their contribution to the proposal.

Institutional affiliation

Write the name of your school.

ANNEXURE 3: WRITE UP

To be written in Times New Roman font size 12 with double spacing and a margin of 1 inch. The write up should not exceed 2000 words.

1. Purpose (300 words)

State the purpose of the proposal.

2. Limitations (100 words)

State limitations of the proposal.

3. Significance (100 words)

State significance of the proposal.

4. Relevance to Professional or Academic Field (Literature Review) (800 words)

Describe using referenced material

- How your proposal will fit into the existing body of knowledge and practices?
- How your proposal will enhance knowledge and contribute to new understanding?

5. Approach (Methodology) (400 words)

- Describe the methods you intend to use to achieve the purpose of the proposal.
- Provide details of data source and resources you intend to use in the development of the prototype.

6. Expected Outcomes (300 words)

Summarise the expected outcomes of the proposal.

7. References

List the references using APA format.

ANNEXURE 4: LIST OF PARTICIPANTS FOR STEM OLYMPIAD 2020

Date :.....

..... CS/ Higher/Middle Secondary School

Name and contact number of Escort Teacher:.....

Name and contact number of School Driver:

The following students will be participating in the upcoming STEM Olympiad

2020 at

The bus (transport) will leave the school at AM/PM on

..... (date) and return to school at

..... AM/PM on (date).

List of Participants:

SI No	Name of student	Class & Section
1		
2		
3		
4		
5		
6		

(Seal and Signature of Principal) Phone No.:.....

If you have any concerns, please contact:

- Mr Phuntsho Norbu, REC @ 17370573 (phuntshonorbu@rec.gov.bt)
- Mr Karma Dorji, REC @ 17846315 (karmadorji@rec.gov.bt)

ANNEXURE 5: PERMISSION FORM FOR PARTICIPANTS IN STEM OLYMPIAD-2020

..... CS/Higher/Middle Secondary School

Name and contact number of Escort Teacher:.....

Name and contact number of School Driver:

Name of Participant	Contact Number (in case of Emergency)

has my permission to attend in the upcoming STEM Olympiad 2020 at

.....(venue)

The bus (transport) will leave the school at..... AM/PM on..... (date)

and return to school at.....AM/PM on (date).

Name and Signature of CDEO/CTEO:

Mobile Number of CDEO/CTEO:

ANNEXURE 6: CONSENT FORM FOR PARTICIPANTS IN STEM OLYMPIAD-2020

Date:

Name:..... of class fromschool has my
permission to attend in the upcoming STEM Olympiad 2020 at
.....(venue).

I have been informed that the bus (transport) will leave the school at..... AM/PM
on.....(date) and return to school at.....AM/PM on (date).

Name and contact number of Parent/Guardian:

Signature of Parent/Guardian:

ANNEXURE 7: TEMPLATE FOR SYMPOSIUM PAPER AND EXHIBITION REPORT

To be written in Times New Roman font size 12 with double spacing and a margin of 1 inch. The total write up should be within 5,000 to 10,000 words excluding the title page, abstract, references and annexures.

Title Page (not to exceed 12 words)

The title page includes title of the paper/report, the author's name and the institutional affiliation.

Abstract (not to exceed 300 words)

Summary of the entire paper/report.

Introduction

Introduction to include the background, rationale, objectives, limitations and significance of the study.

Literature Review

Literature review to highlight how the study fits into the existing body of academic knowledge and practice using referenced materials.

Methodology

Describe the methods used while also providing details of data source, data collection and data analysis.

Findings and Discussion

State and discuss the findings of the study.

Conclusion

Summary the study and if relevant provide recommendations.

References

Provide the list of resources in APA format.

Annexures

Include illustrations and any other supporting materials.

ANNEXURE 8: EVALUATION TOOL FOR THE PROPOSAL

Name of the Proposal:

School Code:

Name of Evaluator:

The group of evaluators will discuss prior to the evaluation, the following criteria and come up with the specific descriptors. The evaluators will use pen only for marking and scoring

Sl No	Criteria	Score				
		1	2	3	4	5
1	The purpose of the proposal is clearly articulated.					
2	The limitations of the proposal are identified.					
3	The significance of the proposal are highlighted.					
4	The proposal is built on existing body of knowledge.					
5	The proposal describes the methods intended to be used.					
6	The details of data source are specified.					
7	The expected outcomes are achievable.					
8	There are evidence(s) that prove the originality of the proposed prototype.					
9	The proposed prototype is based on scientific principle.					
10	The proposed prototype has commercial values.					
11	The proposed prototype solves local community problems.					
12	The proposal outlines the stages of prototype development.					

13	There are illustrations to support the write up.					
14	The proposed prototype has low development costs.					

Signature of evaluator

ANNEXURE 9: CONSOLIDATED SCORE SHEET OF PROPOSAL EVALUATION

The top 20 proposals shall be selected for second phase.

Sl. No.	School Name	Name of prototype	Points				Remark
			Evaluator 1	Evaluator 2	Evaluator 3	Grand Total	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Signature of evaluators:

Verified by REC official:

ANNEXURE 10: EVALUATION TOOL FOR THE PROTOTYPE

Name of the Prototype:

Name of School:

Name of Evaluator:

The group of evaluators will discuss prior to the evaluation, the following criteria and come up with the specific descriptors.

A. Design: Design refers to the physical attributes of the prototype

Sl no	Criteria	1	2	3	4	5
1	The design of the prototype uses scientific principles.					
2.	Ergonomics considerations are evident in design of prototype.					
3.	The prototype has appealing aesthetic appearance.					
	Appropriate materials have been used.					

A. Function: Function refers to the utility and the efficiency of the prototype

Sl no	Criteria	1	2	3	4	5
	The prototype functions efficiently.					
	The prototype can be easily operated.					
	The prototype solves local community problems.					
	Environmental considerations are evident.					
	The demonstration of the prototype is a success.					

B. Presentation: *Presentation refers to the ability of the team to communicate information clearly*

Sl no	Criteria C. Presentation	5	4	3	2	1
	The presentation demonstrated time management skills.					
	The information is well communicated in line with the Theme.					
	The presentation exhibited understanding of the prototype.					
	Good language skills were used.					
	Proper body language techniques were employed.					
11	Clear responses were provided to questions.					
12	The prototype is supported by illustrations					
13	Balanced division of responsibilities among all members of team evident					

ANNEXURE 11: CONSOLIDATED SCORE SHEET FOR PROTOTYPE AT SCHOOL LEVEL

Sl. No.	Name of the School	Name of Prototype	Points			
			Evaluator 1	Evaluator 2	Evaluator 3	Grand Total
1						
2						
3						

Name and Signature of Evaluators

ANNEXURE 12: EVALUATION TOOL FOR SYMPOSIUM PAPER

Title of Paper:

Author Code:

Name of Evaluator:

The group of evaluators will discuss prior to the evaluation, the following criteria and come up with the specific descriptors. The evaluators will use pen only for marking and scoring

Sl No	Criteria	Score				
		1	2	3	4	5
1	The purpose of the paper is clearly articulated.					
2	The problem statement is objectively stated.					
3	The introduction provides a clear outline of the overall study.					
4	The significance of the paper are highlighted.					
5	The limitations of the paper are identified.					
6	The paper solves local community problems.					
7	Theoretical framework has been defined.					
8	Relevant literature are used in the study.					
9	Ideas are synthesized from different sources coherently to build an argument.					
10	The write up indicate the researcher's thorough understanding of the topic.					
11	Appropriate choice of research method.					
12	Clearly justifies the choice of research instruments.					
13	Data collection procedures are clearly stated.					

14	Procedures for analyzing the data are explained clearly step-by-step.					
15	Ethical considerations are made.					
16	Validity is addressed appropriately.					
17	Reliability is addressed appropriately.					
18	The results are analysed coherently.					
19	Triangulation of data is done to derive the findings.					
20	The discussion is done professionally.					
21	The conclusion are logical.					
22	Relevant recommendations are made.					
23	The overall presentation of the paper is well organized.					
24	Exhibition of good writing skills in terms of the flow of ideas, sentences, paragraphs, grammar, spelling, syntax, punctuation, choice of words, smooth transition from one section to another, etc.					
25	All in-text citations and end referencing are used correctly according to the APA style.					

ANNEXURE 13: SCORE SHEET FOR SYMPOSIUM

Sl. No.	Name of Student/Teacher	Title of	Points				Remark
			Evaluator 1	Evaluator 2	Evaluator 3	Grand Total	
1							
2							
3							
4							
5							
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Signature of Evaluators:

ANNEXURE 14: OBSERVER'S FORM FOR EVALUATION

I CID
No.....working asin
.....School observed the conduct of Cognitive
Test and Evaluation of Prototypes. The evaluation was conducted as per the guidelines with
utmost integrity.

Signature of the Observer:

Name and Signature of Mentor Teacher

Contact Number:

Contact Teacher

ANNEXURE 15: DECLARATION OF CONFLICT OF INTEREST

I,(name), bearing CID/EID No... ..,
(Position Title)(Agency)..... as
per the provisions of guidelines for the STEM Olympiad 2020, I declare that in serving
as a member of.....(Committee)
in.....(Agency):

☐ I do not have or anticipate any Conflict of Interest. I shall notify the Agency
concerned immediately in the event such interests arise in the course of or before
discharging my duty; OR

☐ I do have Conflict of Interest in view of the following reason(s):

- ☐ Family Member:.....
- ☐ Close Relative:
- ☐ Close Friend:.....
- ☐ In Laws:.....
- ☐ Enemy:.....
- ☐ Others:.....

I, hereby confirm that the above information is true to the best of my knowledge. In the
event the above declaration is found to be incorrect, I shall be liable for
administrative/legal action.

Signature

Place:

Date:

For further information, please contact the following:

Advisor	
Mr Kinga Dakpa, Director, REC	Mr. Wangpo Tenzin DEAN, CDC, REC
Programme Coordinator	
Mr. Bhoj Raj Rai STEM Unit Head, CDC, REC Email: bhojrajrai@rec.org.bt Mobile: 17642838	
Working Committee	Food and Refreshment Coordinator
Mr Geewanath Sharma, CDC, REC Email: geewanath@rec.gov.bt Mobile: 17635797	Mr Phuntsho Norbu, CDC, REC Email: phuntshonorbu@rec.gov.bt Mobile: 17370573
Logistics	
Mr. Wangchuk, CDC, REC Email: wangchuck@rec.gov.bt Mobile: 17534760	Mr Karma Dorji, CDC, REC Email: karmadorji@rec.gov.bt Mobile: 17846315

REC, Dopshari, Paro

Phone No: 975-08-271226/271214

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