***Request for Proposal***

The Society of Cedarcrest Engineers (hereafter referred to as SCE) is seeking proposals for a Rolling Toy (RT), a rolling child’s toy. All proposals must include drawings of the RT, testing plans and results, scale models, and a physical assembly. All rolling toys will be tested on December TBD, 2023. All written proposals (including drawings) will be due to the association on or before December TBD, 2022. The design teams submitting proposals for consideration will present their designs between December TBD, 2023.

**Design Teams**

There may be no less than two and no more than three persons per team. Each design team must have a team name, logo (drawn electronically), mission statement, motto, and song (no greater than 30 seconds). The team logo must appear on all drawings and on the first page of the requirements document. The team name, mission statement, motto, and song must be presented during the oral presentation.

**Requirements**

The Rolling Toy must meet certain operational and design requirements. Failure to meet the design requirements will make the RT eligible for only 10 of the 20 points possible. Systems that meet the design requirements will be eligible for a maximum of 30 points (up to 10 extra points) depending on how the systems perform during testing.

***Design Requirements***: The Rolling Toy must:

1. be digitally designed and assembled on SolidWorks,
2. have a minimum of 6 parts,
3. have all parts 3D printed,
4. have all the pieces fit together without scaling,
5. be the collaboration between two teams – the body team and the transport/noise team,
6. have total parts cost under $25 as shown by the 3D printer software,
7. be appropriate for children ages 5-8 (think about part sizes),
8. designed, constructed, tested, drawn, and documented by the design team.

***Performance Requirements***: NPT must:

1. Roll when pushed or sent down a ramp (skidding is not rolling),
2. Use the given piece as an integral part of the design (does not count toward the part count),
3. Must be completely mechanical toys (no hydro-, electro-, thermo-, etc.- systems),
4. May have a launcher/pusher,
5. 10 extra points may be earned if the rolling toy fits and rolls on commercially available tracks (i.e. Hot Wheel, train tracks, etc.). You must provide the tracks for testing to earn these points.

**Points:**

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| --- | --- |
| Rolls when pushed or sent down a ramp. (Skidding toys will not earn these points.) | 3 points |
| Meets age appropriateness (size of parts) | 2 points |
| Meets cost requirement (a penalty of half a point for every dollar over the cost requirement will be assessed) | 7 points |
| The given piece is an integral part of the design | 3 points |
| Has the required six parts. (The required part does not count toward this requirement.) | 3 points |
| Meets all other design and performance requirements | 2 points |

**Bonus (Extra) Points:**

|  |  |
| --- | --- |
| The rolling toy fits and rolls on commercially available tracks (i.e. Hot Wheels, train tracks). | 10 points |

A maximum of 30 performance points can be received. All teams submitting a prototype system for testing will receive a minimum of 5 points. Teams submitting projects made from kits will receive no points. Teams submitting projects not designed, built, and tested by the team will receive no points.

**Written Requirements**

Each design must be detailed by a requirements document which must follow the requirements document boilerplate (pr\_rqtsdoc.doc). The boilerplate document should be completed according to the directions given in the paragraphs. The formatting of the document should not be changed. All the sections of the document must be complete and drawings must be included. The document should be completed as a third-person narrative. References to the author(s) should also be made in the third-person.

**Drawing Standards**

Drawings must follow the drawing standards as defined in Drawing Requirements Manual, Ninth Edition. Particularly, the drawing formats found in section 6 and the drawing and part numbering systems found in section 7 must be followed. All drawings will have a standard title block (with the design group identifiers) as found in section 6.

**Test Plans and Results**

As stated above, testing must be documented and included in the written requirements. The test plans must have a clearly stated objective and detailed procedures that will meet that objective. As part of the test results, make observations and write them in a test notebook. All of the notes, including observations from the tests must be included in the test results. A bound, page-numbered notebook is acceptable for testing (it is required by the U.S. Patent office) and this may be included in its entirety as part of Appendix A.

**Oral Presentations**

Design teams will present their products after the tests on the dates given above. All presentations must include models, drawings, and other visual aids. Each member of the design teams must be part of the presentation. The presentations must be from 12 to 25 minutes (for the paired teams – essentially 6 minutes per team minimum). The presentation requirements and point distribution is detailed in the file p:\\_public\\_engineering\ pr\_Oral Presentation.doc.

**Scoring**

There will be a total of 120 points possible for each person on the design team. The points will be awarded as follows:

20 pts. Meets Timeline Objectives

20 pts. Meets Requirements

20 pts. Requirements Document

20 pts. Drawings and Models

20 pts. Appendices A and B (Test Plans and Results, Cost)

20 pts. Oral Presentation

Projects must meet the specifications in each category. Oral presentation requirements are found in the document pr\_oralpresentation.doc. There are five timeline objectives that must be met. Each objective met (on time) will receive up to 4 points. The five objectives are as follows: 1. form groups, 2. create team name, logo, and mission statement, 3. design tests, 4. create initial drawings or create test parts, 5. create draft of requirements document and create visual aids for oral presentation.

The total out of one-hundred and twenty points will be awarded for the project and then multiplied by the number of team members. The team members will then be allowed to give points to the members as they have earned them. The group must all be in agreement as to the distribution of points before individual grades are given. (Timeline requirements and presentation points are excluded in the redistribution of points.) An individual's signature must be given to show agreement on the point distribution. Any team that can not come to agreement on the point distribution will go to arbitration by the head of the Society of Cedarcrest Engineers (Mr. Miyoshi). Note that any individual in the group may receive a minimum of 20 points and a maximum of 120 points regardless of the total number of points (including bonus points) earned by the group.