2009 15th Annual SECME Regional Olympiad

Saturday March 21st, 2009
University of Florida
College of Engineering
Gainesville, Florida

TABLE OF CONTENTS

1. Competition Site/Date_____

2. School _____

3. Team Name _____

4. Adult Leader/Supervisor _____

5. Address _____

_____

6. Telephone/Fax _____

7. Competition Rule_____
or Procedure in Question

8. Specific Concern_____

(Use 2nd sheet if needed to document fully)

_____

_____

_____

_____

_____

9. Submitted by _____
Name

_____
Signature

10. Date _____

INTRODUCTION

The University of Florida College of Engineering and the Florida Alpha Chapter of Tau Beta Pi, The National Engineering Honor Society, are pleased to invite you to participate in the 2009 Fifteenth Annual SECME Regional Olympiad to be held at the University of Florida in Gainesville, on Saturday, March 21st, 2009. We are very excited about this year's competition. We will be holding the same events that your teams will see at the national competition, as well as other competitions your students will enjoy.

Our regional competition is intended to serve as a learning experience for each of your teams before they attend the national competition. Each event will be judged by engineering students at the University of Florida. The judges will be available after each event to offer advice to the contestants to help improve their designs before the national competition arrives.

IMPORTANT CHANGE NOTICES

Included in this package are the comprehensive rules and guidelines for the 2009 SECME Regional Competition. Please read the enclose guidelines carefully, as certain rules have been changed. In particular, please note the following changes:

1. **ISTF:** The national competition will be holding a technology research competition, so we have updated the guidelines for our competition to coincide with national rules. Please take note this competition is for Middle and High Schools ONLY.

2. **COMPETITIONS:** Some competitions have changed the grade levels that are eligible for competing. Please take note of these changes!

    a. Elementary school students are now competing in Mousetrap Cars.
    b. The spelling competition (previously elementary only) is no longer being held.
    c. The essay competition is now for Elementary students ONLY.
    d. Middle and high schools students will now participate in the ISTF competition.
    e. Water Rocketry scores will now be sent to Nationals.

3. **NATIONALS:** This year, in order to better fund the regional SECME Olympiad at UF, we will not be providing the money to send regional winners for the National SECME Olympiad. We will be allocating our funds to improving the experience at Regionals for everyone. Students will still be able to go to Nationals if their parents or schools are able to pay for it.

If you have any recommendations to better improve the Regional Olympiad, please contact us at your convenience. To access the survival guide and other SECME resources, visit our website at http://grove.ufl.edu/~secme. We look forward to your school's participation in the 2009 Fifteenth Annual SECME Regional Olympiad!

Nishant Garg and Rob Hendryx
SECME Coordinators 2009
ufsecme@gmail.com

IMPORTANT DATES AND DEADLINES

Fri. January 9, 2009	Last date for **School Registration** forms to be postmarked and returned (page 4).
Fri. February 13, 2009	All essay entries must be received at the University of Florida to ensure that they can be judged, returned, and corrected before they must be turned in to the National Olympiad.
Fri. February 13, 2009	Last date for **Student Registration** forms to be postmarked and returned. *No teams will be accepted after this date.*
Fri. February 27, 2009	Last date to register team correction/substitutions. Any student not registered by this date *will not be allowed to participate*. New students may submit essays at this time.
Sat. March 21, 2009	Fifteenth Annual SECME Regional Olympiad

SUBMIT DOCUMENTS TO:

Margie Williams
Executive Secretary
312 Weil Hall
P.O. Box 116550
Gainesville, FL 32611-6550
Tel: (352) 392-2177
Fax: (352) 392-9673
Email: mwill@eng.ufl.edu

DESIGN PROJECTS (Mousetrap Car, Egg Drop and Water Rocketry Competitions)

Each design project must be packaged separately and turned in at the time of check-in the morning of the competition. The packaging must protect each design from any damage that could occur during normal handling and transportation.

Each entry must be clearly labeled with the following information:

- Team Name
- Names of Students on Team
- Coordinator Name
- School Name and Address

GENERAL INSTRUCTIONS

To be eligible to compete at the 2009 Fifteenth Annual SECME Regional Olympiad, each school must be registered and in good standing with SECME.

Each event will be divided into three categories: elementary school, middle school, and high school. Winners will be determined for each competition based on the rules and guidelines established in this booklet.

Elementary School students will only compete against other Elementary School Students.
Middle School students will only compete against other Middle School Students.
High School students will only compete against other High School Students.

For the 2009 Fifteenth Annual SECME Regional Olympiad, each team must comply with the following provisions:

- Each team must consist of three (3) registered members.
- A maximum of one team of two (2) members will be allowed only if there are not enough people to form complete teams. Note: this team cannot qualify for national competition, since Nationals rules require teams of three (3) members.
- Each student may be in only one team.
- If circumstances prevent one or more members from attending SECME, notice must be given at least 24 hours in advance of the start of registration for a team to be eligible for team awards (see **Team Awards Rules**).
- **No substitutions between teams are permitted on the day of SECME. *THIS RULE WILL BE STRICTLY ENFORCED STARTING IN 2009.***
- **Though these rules have not been strictly enforced in the past, we feel that the modifications made promote participation and fair competition.**

National Eligibility Rules

The winning team from each of group (elementary, middle, high school) in the Mousetrap Car competition will qualify to participate at SECME Nationals. However, in order to be eligible, a team must do the following:

- All three (3) team members must be part of a team that submitted an ISTF project.
- All three (3) team members must submit a poster.
- At least two (2) team members must attend SECME and participate in all of the events for their division (middle or high school).
- Notification must be given for the missing team member at least 24 hours in advance.

Should the first place Mousetrap Car team fail to meet any of the above qualifications, the Nationals spot will be given to the next highest placing team that does meet the qualifications.

Only winning middle and high school teams can physically travel to Nationals. Winning Poster and Essay entries only for elementary will be sent to Nationals, where the first place winner receives a $100 cash prize.

AWARDS

Individual Awards

To be eligible to win an individual award, a participant must be part of a registered team.

Individual awards will be given in the following events:

- Math
- Essay (elementary only)
- Poster

Team Awards

To be eligible to win a team award, all team members must be present, unless proper notification was given as previously specified

Team awards will be given in the following events:

- Egg drop (elementary only)
- Water Rocketry (middle and high only)
- Mousetrap Car
- Surprise Design
- Cerebral
- Most Awesomely SECME (best overall team)

Points will be given to the top seven teams in most events toward the Most Awesomely SECME award, according to the following scale:

Event Rank	Points
1	100
2	80
3	60
4	40
5	20
6	10
7	5

School Awards

School awards will be given in the following events:

- Banner
- Sweepstakes

Sweepstakes points will be awarded for team events according to the scale above and individual events based on the raw scores of the top seven individuals from each school.

RELATION TO NATIONAL RULES PACKET

The rules relating to the Essay, Poster, Banner, Mousetrap Car, Water Rocketry, and ISTF competitions are based off of the National Rules Packet. You can access this document from either www.secme.org (click on the Competition Guidelines button) or http://grove.ufl.edu/~secme (click on National Rule Packet). However, this Regional Rules Packet was written so that if the Regionals rules are met, the Nationals rules are also met. Therefore, **it should not be necessary to read the National Rules Packet.**

If you do look into the National Rules Packet, please be aware there are differences. These include:

- We will not be able to participate in the VEX Robotics competition this year.
- All grade levels are participating in Posters at Regionals (a frame is not required).

Below are the rules and information related to the Regional Competition.

NATIONAL EVENTS

BANNER COMPETITION

Elementary / Middle / High Schools – MANDATORY @ Nationals

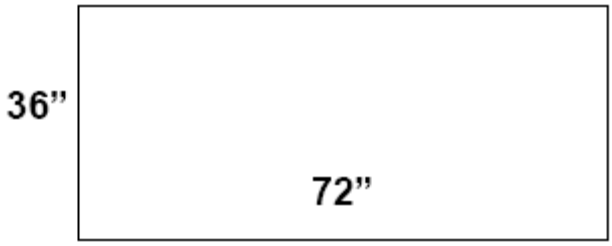
Each school is allowed one (1) banner entry. Each school banner will be displayed during the opening and closing ceremonies. Because of difficulty in hanging, we request that you do not put a pole on your banner.

Teams eligible to go to Nationals will design a school banner for competing in the Banner Competition at the National Competition Finals at the Summer Institute.

REQUIREMENTS: Any entries not meeting these requirements will be automatically disqualified.

I. DESIGN AND CONTEST RULES:

- Banners cannot exceed a maximum of 72 inches wide and 36 inches high.



- The school name and colors, city and state, current year and the word “SECME” must appear on the banner and it must be reflective of this year’s competition theme

- All schools participating in the SECME Nationals must be prepared to parade with their banner at the start of the competition.

- Banners must be hand-made original work for the year it is submitted

II. SCORING:

- The banners will be scored in the following categories:
  - Content (4 pts) – Quality and organization of the information of the banner
  - Originality (4 pts) – Innovativeness of the design and how well it presents the ideas on the entry.
  - Creativity (4 pts) – The uniqueness of the information depicted.
  - Appearance (4 pts) – The attractiveness and neatness, scale and balance of the presentation.

A sample banner evaluation sheet is attached below.

2009 SECME BANNER COMPETITION
(Evaluation Sheet)

Please Check: ☐ Elementary ☐ Middle School/Junior High ☐ High School

Design Team Name _____

School Name _____

District _____ City/State _____

Judge's Name_____ Date _____

The banner is disqualified if any of the following requirements are not met:

Requirements Check: ☐ 72"wide by 36" high ☐ School name and colors
☐ City and state ☐ Current Year
☐ The word "SECME" on the banner

Score each item in a given category as indicated.

		POINTS
1.	CONTENT Measure the quality and organization of the information on the banner (0-4 points)	_____
2.	ORIGINALITY Evaluate the innovativeness of the design, how well it presents the ideas on the entry (0-4 points)	_____
3.	CREATIVITY Judge the uniqueness of the information depicted (0-4 points)	_____
4.	APPEARANCE Examine the entry for attractiveness and neatness, scale and balance of the presentation (0-4 points)	_____
	Total (out of maximum 16)	_____

ESSAY COMPETITION

Elementary Schools – MANDATORY @ Nationals

Each school is allowed to submit one (1) essay per **student**. The essay is to be based upon the theme and guidelines as in the National Rules replicated below**.** The essays must be received by **February 13th, 2009**.

The 2009 Essay Competition Theme Is:
"SECME: Thinking Out of the Box"

Any entries not meeting these requirements will be automatically disqualified.

1. TITLE PAGE
    a. Essay's Title (MUST be this year's theme)
    b. Student's name, grade, age
    c. Home address, zip code, and telephone number
    d. Name of school and address, city state
    e. School System name
    f. SECME School Coordinator's name
    g. Date

2. ESSAY
    a. Computer typed/printed
    b. 2-3 pages (not including title or bibliography pages)

3. BIBLIOGRAPHY – Reference sources and direct quotations are required to be identified as cited.

IMPORTANT: *All pages (title, essay, and bibliography) must be* ***computer printed/typed*** *pages 8½" x 11" white paper, double spaced with one inch borders on each side, 12 pt. Times New Roman OR CG Times font.*

At all levels of competitions, essays will be judged on:

Organization
Grammar and Sentence Structure
Mechanics/Punctuation/Spelling
Creativity and Style
Relationship to Competition Theme

A sample essay evaluation sheet is attached below.

Submit one (1) copy of each student's entry to:

Margie Williams
Executive Secretary
312 Weil Hall
P.O. Box 116550
Gainesville, FL 32611-6550

2009 SECME STUDENT ESSAY COMPETITION
(Evaluation Sheet)

Team Name				
School Name				
District			State	
Student Name			Grade	
Judge's Name		Date		
Regional Sponsor				

The essay is disqualified if any of the following requirements are not met:

Requirements Check: ☐ Cover page with required information ☐ 1" borders on each side
☐ White paper ☐ 12 pt / Times New Roman Font ☐ 2-3 pages

Score each item in a given category as indicated.

ESSAY ORGANIZATION (7-45 points)	POINTS
1. Clear and precise thesis statement or central idea (1-5 points)	_____
2. Effective introduction arousing reader interest and indicating the subject (1-5 points)	_____
3. Body of essay contains supporting details related to thesis statement or central idea (1-10 points)	_____
4. Clear transitions between paragraphs (1-5 points)	_____
5. Logical and coherent essay as a whole (1-10 points)	_____
6. Each paragraph adequately developed (1-5 points)	_____
7. Satisfying closing (1-5 points)	_____
GRAMMAR AND SENTENCE STRUCTURE (3 - 20 points)	
1. Effective use of subordination and coordination to relate ideas (1-5 points)	_____
2. Complete sentences without misplaced sentence parts, sentence fragments, comma splices or run-ons (1-10 points)	_____
3. Proper subject/verb agreement and pronoun/antecedent usage (1-5 points)	_____
MECHANICS/PUNCTUATION/SPELLING (3 - 20 points)	
1. Correct use of punctuation (1-10 points)	_____
2. Correct spelling (1-5 points)	_____
3. Capitals, underlining, and abbreviations correctly used (1-5 points)	_____
CREATIVITY AND STYLE (1 - 10 points)	_____
DEMONSTRATES RELATIONSHIP TO THEME (1-5 points)	_____
Total (out of maximum 100)	_____

POSTER COMPETITION

Elementary / Middle / High Schools – MANDATORY @ Nationals for Elementary

Each school may submit one (1) poster per **student**. ***Students,* with minor guidance from the teachers,** must construct a design/poster that encompasses the theme. **Do not submit posters in a frame.** UF SECME will frame the posters that win Regionals and send them to Nationals. Posters must be regulation size at the time of the competition, and matted with construction paper or other suitable "framing" material.

The 2009 Poster Competition Theme Is:
"SECME: Thinking Out of the Box"

Any entries not meeting these requirements will be automatically disqualified.

1. TITLE CARD
    a. 4" x 6" card (taped to back of poster)
    b. Poster's Title (MUST be this year's Theme)
    c. Student's name, grade, age
    d. Home address, zip code and telephone number
    e. Name of school and address, city, state
    f. School System name
    g. SECME School Coordinator's name
    h. Date

2. POSTER
    a. Size of the poster is required to be able to fit into a 22" X 28" frame (frame not required)
    b. Theme must appear on the poster.
    c. Poster must be an original work and may use any medium:
        - cut and paste
        - hand drawn (paints, charcoal, markers, crayon)
        - computer (complete work cannot be generated by computer)
        - any combination of the above

IMPORTANT: Lamination may be used to protect posters during transport. Three dimensional posters are NOT ALLOWED.

At all levels of competition, posters will be judged on:

Description (Physical Facts)
Analysis (Visual Principles and Unity of Design)
Interpretation (Meanings and Intention)
Judgment (Comparison and Response)

A sample poster evaluation sheet is attached below.

2009 SECME STUDENT POSTER COMPETITION
(Evaluation Sheet)

Please Check: ☐ Elementary ☐ Middle School/Junior High ☐ High School

Student's Name _____

School Name _____

District _____ City/State _____

Judge's Name_____ Date _____

The essay is disqualified if any of the following requirements are not met:

Requirements Check: ☐ 4" x 6" Title card with required information
☐ Poster size 22" x 28"

Score each item in a given category as indicated.

		POINTS
1.	DESCRIPTION (Physical Facts) (2-20 points)	
	a. Theme visible and integral to poster design (1-10 points)	_____
	b. Appearance and craftsmanship, including spelling (1-10 points)	_____
2.	ANALYSIS (Visual Principles and Unity of Design (3-30 points)	
	a. Words and images support each other visually (1-10 points)	_____
	b. Elements (lines, shape, color, value, texture) are used intentionally and effectively (1-10 points)	_____
	c. Visual principles (form, layout, pattern, emphasis, rhythm, contrast, balance, proportion, variety) combine elements in a pleasing, appropriate, and effective way (1-10 points)	_____
3.	INTERPRETATION (Meaning and Intention) (3-30 points)	
	a. Verbal theme is translated by effective metaphor into visual terms (1-10 points)	_____
	b. All points of the theme's concept are illustrated effectively (1-10 points)	_____
	c. Stylistic use of medium supports the overall work of art (1-10 points)	_____
4.	JUDGMENT (Comparison and Response) (2-20 points)	
	a. This work is more effective than those in its category in visually carrying out the theme (1-10 points)	_____
	b. This work appeals to me personally as an isolated work of art (1-10 points)	_____
	Total (out of maximum 100)	_____

MOUSETRAP CAR COMPETITION

Elementary / Middle / High Schools – MANDATORY @ Nationals for Middle and High Schools

MOUSETRAP CAR CONSTRUCTION AND OPERATION

MOUSETRAP CAR COMPETITION REQUIREMENTS:

1. The Engineering Design Competition requires participation in each of these four areas:
   a. Mousetrap Car Construction and Run
   b. Design Drawing of Mousetrap Car
   c. Technical Report on Mousetrap Car ***(not required for Elementary)***
   d. Team Interview with Judges

2. This is a team competition and should reflect the coordinated efforts of all members.

3. Three (3) students must be on each team. Members must remain the same at all levels of competition (school, state/regional, and National finals).

4. Each team member is expected to be able to serve as a spokesperson and be fully involved with all aspects of the entry.

5. A standard mousetrap--usually about 4.5 X 10 centimeters and weighing about 25 grams—must be used to build the car.

6. Components of the mousetrap are: base (on which other components are mounted), spring, bail, locking lever, and bait hook (see component sketch below).

7. The mousetrap spring must be the sole source of power. (You may NOT use rubber bands, CO2 boosters, or any other agent or element for extra power).

8. In design and construction of the car, the original mousetrap spring and wood base MUST remain intact. These two components may NOT be cut or altered in any way— physically, chemically, or thermally. Only the locking lever and bait holder may be removed from the base, if desired. The bail may be straightened but NOT cut (shortened), added on to, or reinforced. It must remain as a component of the completed car.

9. The spring must be visible and/or accessible to the judges for inspection.

10. The car must have a minimum of three wheels and can be made as long or short as desired as long as requirement #8 above is met.

11. Cars will be tested on a smooth flat surface. Distance is measured from the starting line to the farthest point of travel, utilizing a straight line to connect the two points.

12. There will be two runs for each car; the better run will be used for final scoring of the mousetrap car’s performance.

13. Two formulas are used to calculate the Performance score for the car run:

$$N = \left(\frac{w}{W}\right) X \left(\frac{D}{L}\right)^2 \quad \text{and} \quad F = \frac{N}{N_L} X\ 100$$

where:

N is the score.

To ensure that cars actually perform and are not just small and light:

N=0 if D is less than 300 centimeters (for elementary and middle school teams)
N=0 if D is less than 600 centimeters (for high school teams)

w is the mass of the original mousetrap (always taken as 25 grams). Note: At all competitions, this standard value will be used in calculating the Performance score.

W is the total mass of the complete car in grams.

D is the distance measured in a straight line from the starting point to the stopping point in centimeters. D=2,500 if the car travels 2,500 centimeters or more.

L is the car's longest measurement along one of the three basic dimensions – length, width, or height – in centimeters, measured with the bail extended or retracted, whichever is greater.

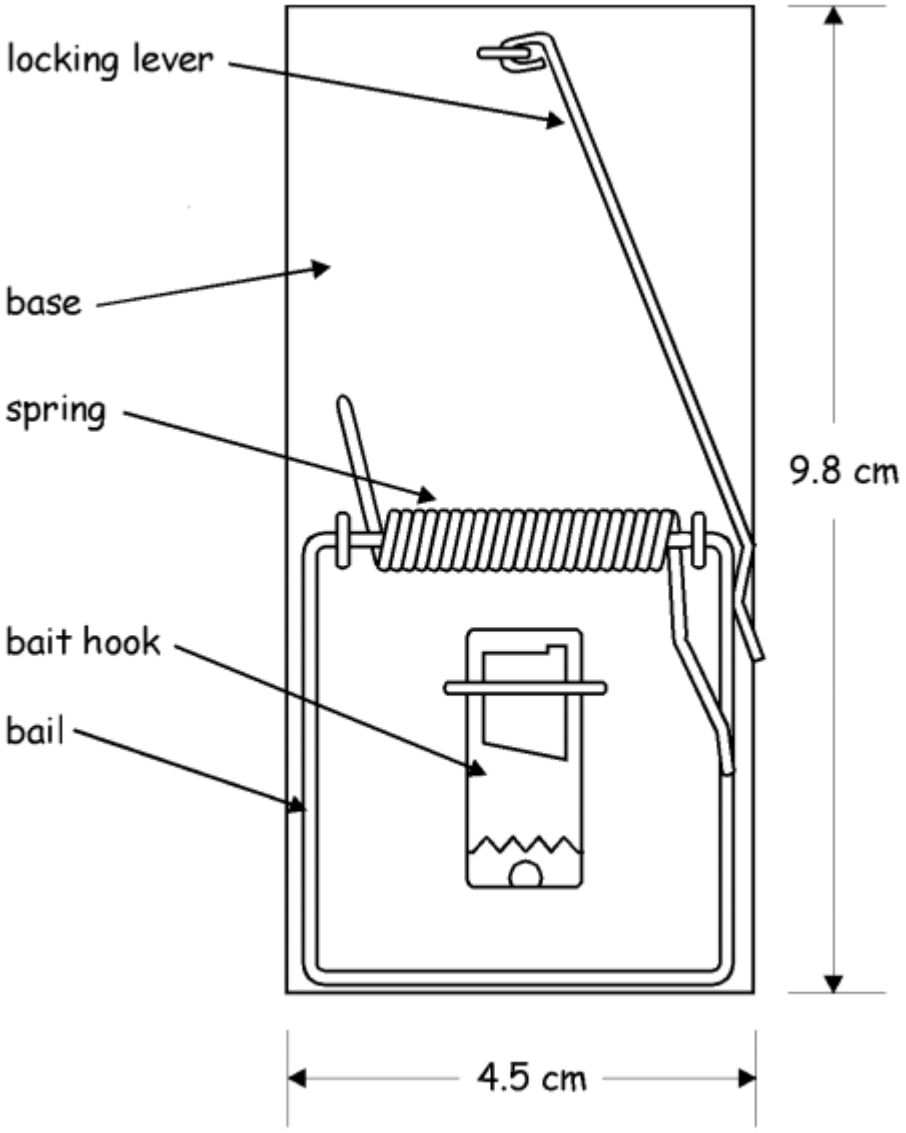
N_L is the highest Performance score at the competition site.

F is the final Performance score (to be combined with scores from the Design Drawing, Technical Report, and Team Interview.

Note: Judges will measure L (see illustration on following page) and W prior to the mousetrap car Performance runs. These measurements, together with D, are used to calculate N in the formula above.

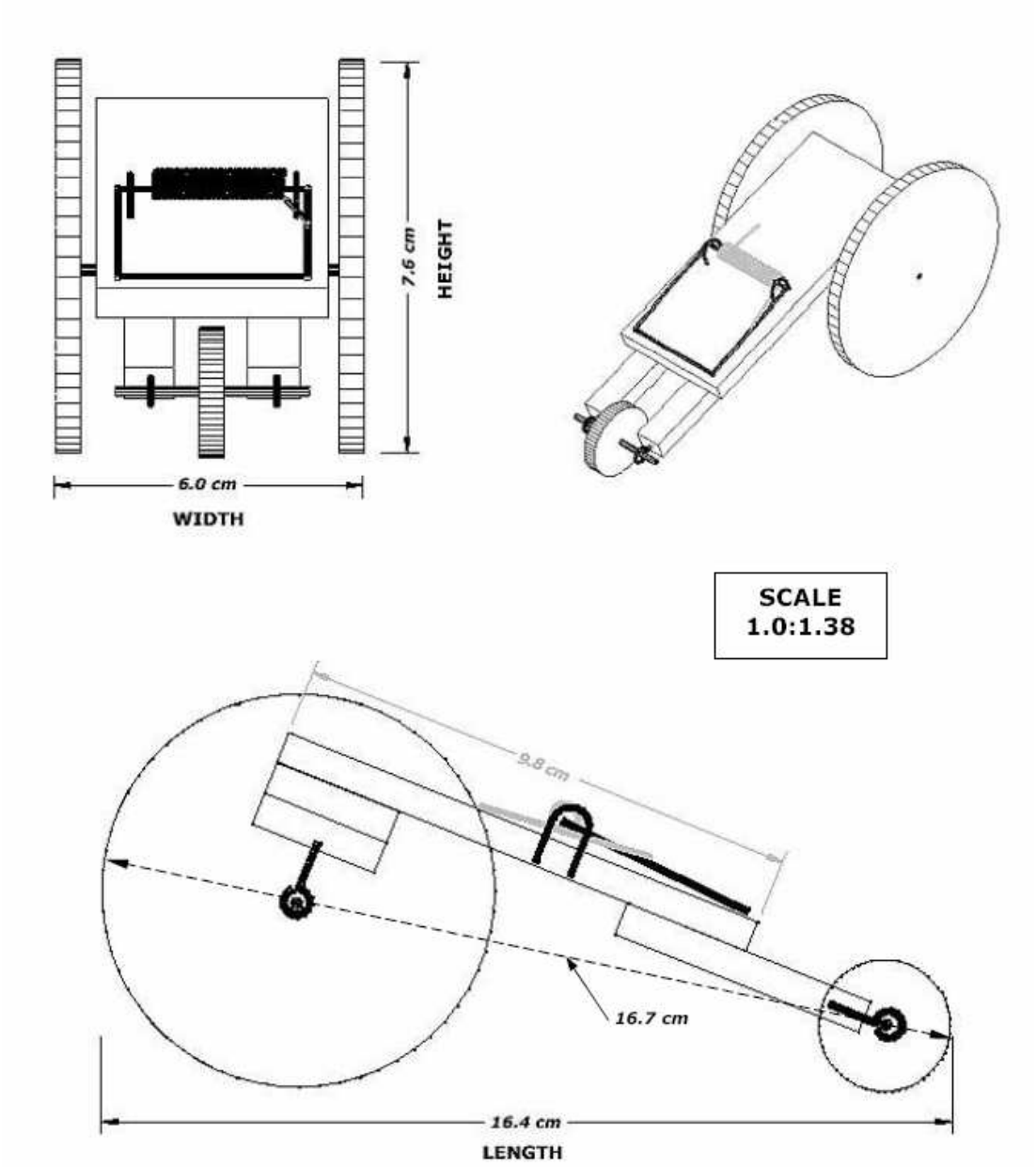
14. Overall Team Score in competition is the sum of: 1. Performance as calculated above (max. 100 points); 2. Design Drawing (max. 50 points); 3. Technical Report (max. 50 points); and 4. Team Interview (max. 50 points). The maximum total is 250 point.

15. See the pages that follow for guidelines and evaluation sheets on each component of the Mousetrap Car competition.



Component Sketch

Measurement of "L," the Mousetrap Car's Longest Dimension In Any Direction—Length, Width, or Height



"L" is the car's longest measurement along one of the three basic dimensions—length, width, or height—in centimeters, measured with the bail extended or retracted, whichever is greater. The length of the car is defined as the distance from the farthest point at the rear of the car to the farthest point at the front. Likewise, the width of the car is defined as the distance from the farthest point on one side to the furthest point on the other. The height of the car is defined as the distance from the travel surface to the highest point of the car.

L (for this example) = 16.4 cm

2009 SECME MOUSETRAP CAR CONSTRUCTION AND OPERATION
(Evaluation Sheet)

Please Check: ☐ Elementary ☐ Middle ☐ High

Team Name			
School Name			
District		State	
Student Name #1		Grade	
Student Name #2		Grade	
Student Name #3		Grade	
Judge's Name		Date	
Regional Sponsor			
Distance			
First Run		Second Run	

w = 25 grams

W = _____ [Measured weight, in grams]

L = _____ [Longest dimension - length, width, or height - in centimeters]

D = _____ [Maximum D = 2,500]

N = _____ [N=0 if D is less than 300 centimeters for elementary and middle]
[N=0 if D is less than 600 centimeters for high school]

N_L = _____ [Highest Performance score at competition site]

Mousetrap Car Performance Point Score: F = _____

F is combined with scores for Design Drawing, Technical Report, and Team Interview to arrive at Overall Team Score in competition.

MOUSETRAP CAR DRAWING

As a part of the Mousetrap Car competition, each time is required to prepare a scaled drawing depicting the car that they have designed and built.

MOUSETRAP CAR DRAWING REQUIREMENTS AND GUIDELINES**:**

Any entry not meeting the following requirements will be automatically disqualified.

1. The Mousetrap Car Drawing entry is required to illustrate the actual mousetrap car built by the team (photographs and computer generated drawings will NOT be allowed).

2. The size of the engineering paper is required to be the standard 18" x 24" (plain, non-grid, 17-pound vellum sheet). Allowing for the required 1" border on all sides, the actual drawing is to cover an exposed area of 16" x 22" of the paper. **No mounting. No frames allowed.** Drawing may be laminated for protection if desired.

3. All dimensions are required to be illustrated on the drawing.

4. The scale and the units are required to be indicated on the drawing.

5. The team's Mousetrap Car Drawing is required to show front, side, and top views.

6. All parts of the car are required to be labeled.

7. Ink pens, pencils or markers may be used.

8. A 4" x 6" title legend is required to be drawn in the bottom left corner of the drawing inside the 1" border with the following information:

   Team Name
   School Name and Address
   Team Members' Names, Addresses, and Grade Levels
   School Coordinator's Name
   Date of Competition

At all competitions, the mousetrap car drawing will be judged on:

Resemblance between the mousetrap car and the drawing
Scale
Naming/labeling of all of the parts used
Appearance/neatness

2009 SECME MOUSETRAP CAR DRAWING
(Evaluation Sheet)

Please Check: ☐ Elementary ☐ Middle ☐ High

Team Name			
School Name			
District		State	
Student Name #1		Grade	
Student Name #2		Grade	
Student Name #3		Grade	
Judge's Name		Date	
Regional Sponsor			

The drawing is disqualified if any of the following requirements are not met:

Requirements Check: ☐ 18" x 24" Engineering Paper ☐ 1" Border on all sides
☐ Dimensions ☐ 4" x 6" title legend with required information

Please score each of the following four categories:

1. RESEMBLANCE — POINTS
   The accuracy to which the Mousetrap Car Drawing illustrated the actual Mousetrap Car designed and built by the team (1-15 points) _____

2. SCALE
   The proportions in the Drawing correctly relate to and represent the team's actual Mousetrap Car (1-15 points) _____

3. NAMING/LABELING
   The correctness of the names/labels of all of the parts in the Drawing of the Mousetrap Car (1-10 points) _____

4. APPEARANCE/NEATNESS
   The quality of the visual presentation of the Mousetrap Car Drawing entry (1-10 points) _____

   Total (out of maximum 50) _____

MOUSETRAP CAR TECHNICAL REPORT

As a part of the Design Competition, the team is required to write a Technical Report describing the design, construction, and operation of the Mousetrap Car. The Technical Report should be a computer printed/typed document, double-space, on 8.5" x 11" white paper with one-inch borders at the top, bottom, and each side.

Use 12 pt. type in a standard legible text font. **The main body of the report – 4. Introduction, 5. Design Construction, 6. Construction Procedure, and 7. Operation of the Mousetrap Car – should be a maximum of 5 pages total.** Drawings, sketches, and tables may be included in an appendix if desired but this is optional. Entries not meeting these requirements will automatically be disqualified. **Note: Technical Report not required for Elementary!**

MOUSETRAP CAR TECHNICAL REPORT REQUIREMENTS AND GUIDELINES:

Any entry submitted without a cover page containing all of the required information will be disqualified.

1. COVER PAGE
    a. Title of the Technical Report
    b. Name, address, grades of team members
    c. Team's school name and address
    d. School system name
    e. School coordinator's name
    f. Date

2. ABSTRACT (one-half to one-page summary of Technical Report)

3. CONTENTS (one page)

4. INTRODUCTION

5. DESIGN

6. CONSTRUCTION PROCEDURE

7. OPERATION OF THE MOUSETRAP CAR

8. CONCLUSION/RECOMMENDATIONS

9. ACKNOWLEDGEMENTS (optional)

10. APPENDIX (the appendix may contain sketches, tables, and charts)

At all competitions, the mousetrap car technical report will be judged on:

Outline
Organization
Precision
Sentence Formation
Mechanics

2009 SECME MOUSETRAP CAR TECHNICAL REPORT
(Evaluation Sheet)

Please Check: ☐ Middle ☐ High

Team Name			
School Name			
District		State	
Student Name #1		Grade	
Student Name #2		Grade	
Student Name #3		Grade	
Judge's Name		Date	
Regional Sponsor			

Requirements Check: ☐ Cover page with required information ☐ 12 pt. type/standard font
☐ Double-spaced text ☐ 1" borders ☐ White paper

Please score each of the following five categories:

1. OUTLINE — POINTS
   Structure of Technical Report is complete, correct, and consistent with guidelines. (1-10 points) _____

2. ORGANIZATION
   Technical Report follows a logical written description from design to final product. (1-10 points) _____

3. PRECISION
   Procedures and steps followed are explained with clarity and exactness. (1-10 points) _____

4. SENTENCE FORMATION
   Sentences are complete with appropriate coordination and subordination. (1-10 points) _____

5. SENTENCE FORMATION
   Correct punctuation, capitalization, and spelling are evident throughout the report. (1-10 points) _____

   Total (out of maximum 50) _____

MOUSETRAP CAR INTERVIEW WITH JUDGES

As a part of the Mousetrap Car competition, each student team will be interviewed by a panel of judges.

This 5-10 minute discussion will cover details of the car's design and testing as well as the Design Drawing and Technical Report.

TEAM INTERVIEW REQUIREMENTS AND GUIDELINES:

1. Team members are interviewed as a group.

2. The team interview will be conducted apart from the car run and scoring of its performance.

3. Interviews normally will take place after judges have received and scored the Design Drawing and Technical Report and completed the inspection and measurements (size, weight) that precede the car's run and scoring of its performance.

4. The team interview will be on element – along with Performance, Design Drawing, and Technical Report – in arriving at the overall score in competition.

At all competitions, the Mousetrap Car Team Interview will be judged on:

Teamwork
Application of technical principles
Knowledge of design
Oral communication skills

2009 SECME MOUSETRAP CAR INTERVIEW WITH JUDGES
(Evaluation Sheet)

Please Check: ☐ Elementary ☐ Middle ☐ High

Team Name			
School Name			
District		State	
Student Name #1		Grade	
Student Name #2		Grade	
Student Name #3		Grade	
Judge's Name		Date	
Regional Sponsor			

Requirements Check: ☐ All three members present ☐ Each responds to questions
☐ Work is students' own ☐ True team effort is evident

Please score each of the following four categories:

1. TEAMWORK — POINTS
   All three members contributed with identifiable roles in final products and preparing car to run in competition. (1-10 points) _____

2. APPLICATION OF TECHNICAL PRINCIPLES
   Team members analyzed requirements for car to perform and efficient means to transfer energy from spring to propel car. (1-10 points) _____

3. KNOWLEDGE OF DESIGN
   The design reflects knowledge of the formula used to judge performance and systematic efforts to maximize score. (1-20 points) _____

4. ORAL COMMUNICATION SKILLS
   Team members each can speak clearly to the basis for their car's design and how that was applied in construction and testing. (1-10 points) _____

   Total (out of maximum 50) _____

WATER ROCKET COMPETITION

Middle / High Schools – MANDATORY @ Nationals

The mission is to design a Water Rocket Vehicle capable of reaching the highest altitude possible given specific launch criteria to achieve the longest hangtime. The objective of the contest is for each rocket contestant to design and construct a water rocket using a 2-liter bottle as the pressure vessel that is propelled by water and air which will be launched at approximately a 90 degree angle to reach the maximum height possible and maintain the longest hangtime. The rocket must be capable of launching from the SECME Water Rocket Launcher given the specific launch criteria. The contestant's complete success will be judged on rocket's performance.

WATER ROCKET COMPETITION DESIGN AND CONTEST GUIDELINES:

1. On the day of competition, but, prior to launch each actual operating rocket entry must pass a visual inspection and height requirement in order to be eligible to compete. Entries that fail inspection will be given one opportunity to make modifications to pass inspection, prior to the beginning of the water rocket launching competition.

2. An overall winner will be judged upon the Hang Time of Rocket.

3. The objective of the contest is for each team to launch a rocket propelled by water and air and reaches a maximum height. The launch angle, which can be adjusted from approximately 90 degrees, will be kept the SAME for all rockets launching during a particular competition. Each rocket will be launched using 12 ounces of water and at 60 psi of air pressure. The "hangtime" of the rocket will be measured using a stopwatch. The "hangtime" is defined as the time from when the rocket leaves the launch pad until the time it reaches the ground or strikes an object. This measurement will be taken by at least three qualified judges; the average of the judges' times will be used as the final "hangtime". The final score for hang time will be calculated based on the maximum hangtime recorded during the competition, using the following formula:

$$\left(\frac{hangtime}{\max hangtime}\right) X100$$

CONSTRUCTION AND OPERATION REQUIREMENT :

1. The pressure vessel must be ONE clear 2 liter bottle (i.e. NO TINTED or COLOR bottles will be allowed but must be inspected for use as pressure vessel).

2. Water and air pressure will be the sole source of propellant. At check-in, the water volume (12 oz.) will be measured and placed in the rocket fuel chamber (pressure vessel).

3. Do not use metal, glass, fiberglass, hard plastics or spikes to construct the rocket. Use of these materials will automatically disqualify the contestant from the competition.

4. On the bottom of the rocket, leave 7.5 cm from the throat of the exit plane clear of any coverings (paint, markings, drawings, etc.), see Diagram 1.

5. Maximum total height of rocket 76.0 cm, see Diagram 1.

6. Nose-cone tip must have a minimum radius of 1.5 cm, see Diagram 2.

7. Fins must start 10.0 cm from throat exit plane, see Diagram 2. Note: no forward swept type of fins is allowed to be used on the rocket.

8. The maximum fin width distance from the bottle is 10.0 cm (or 16.5 cm from center of bottle axis). See Diagram 3.

9. The use of parachutes is NOT allowed.

DIAGRAM 1 – Rocket Identification

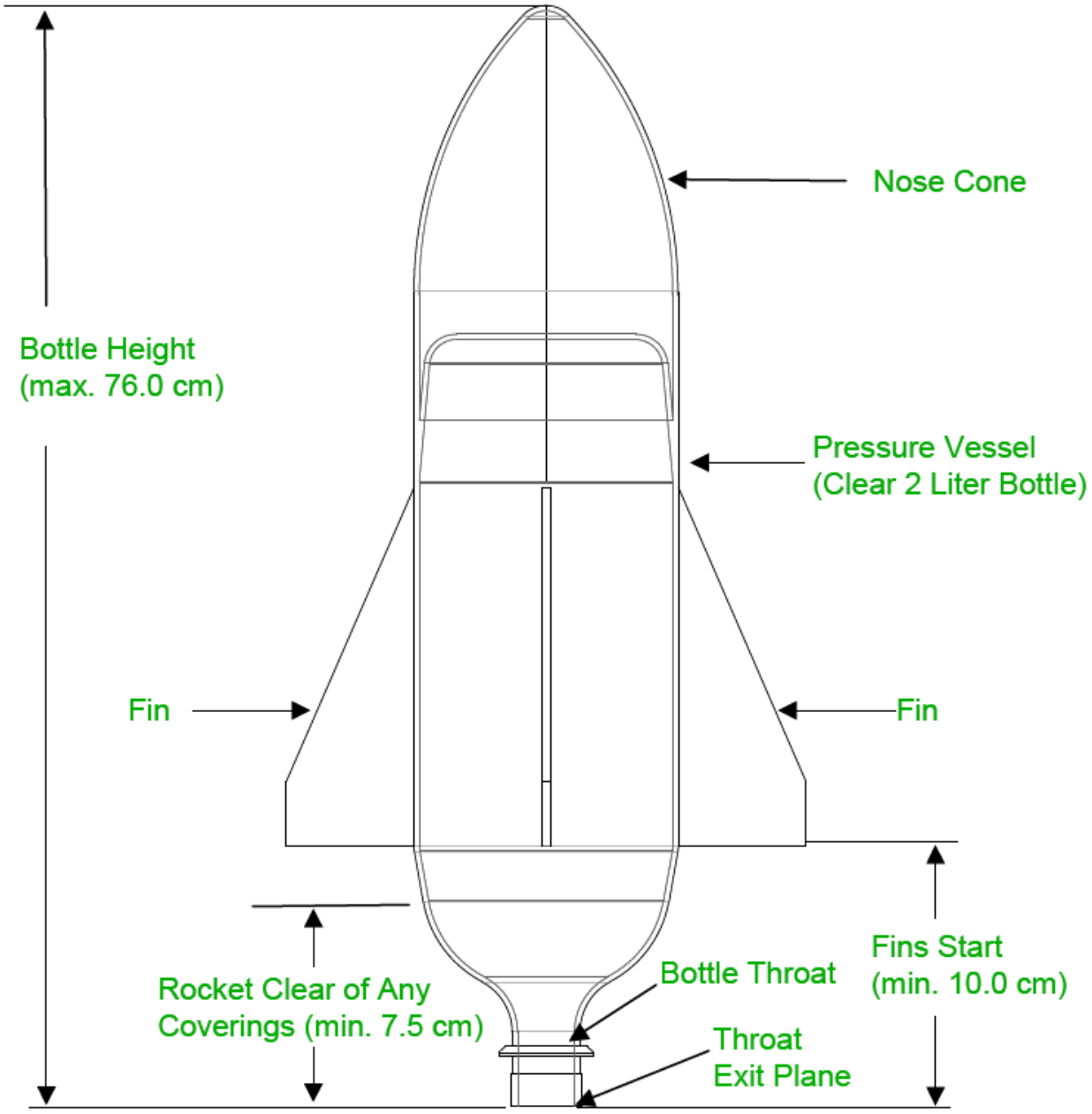


DIAGRAM 2 – Nose Cone Diagram

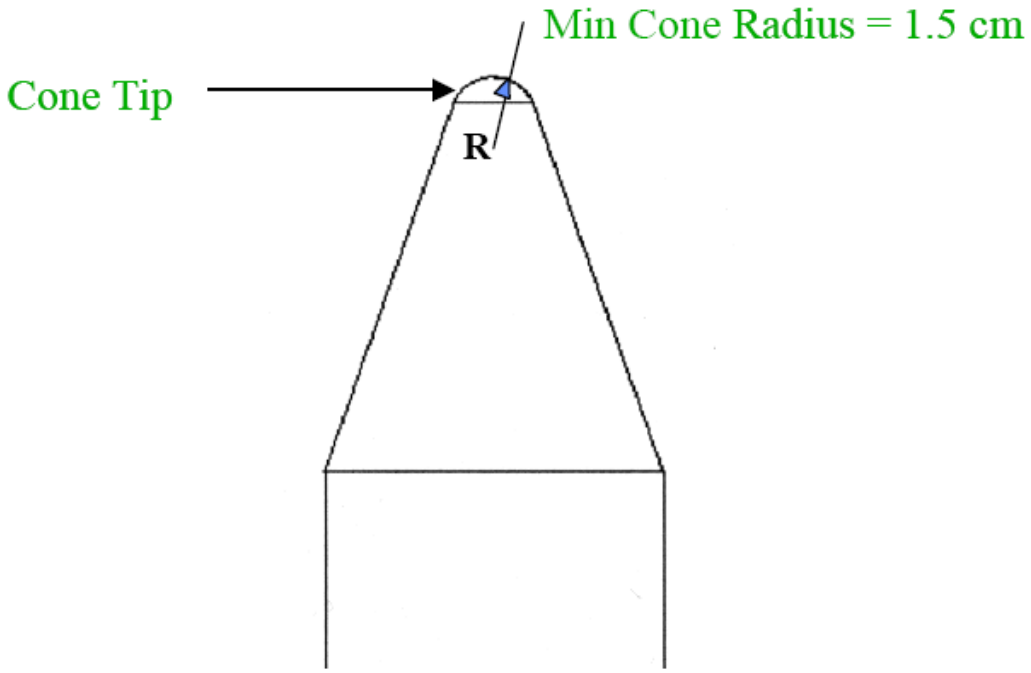
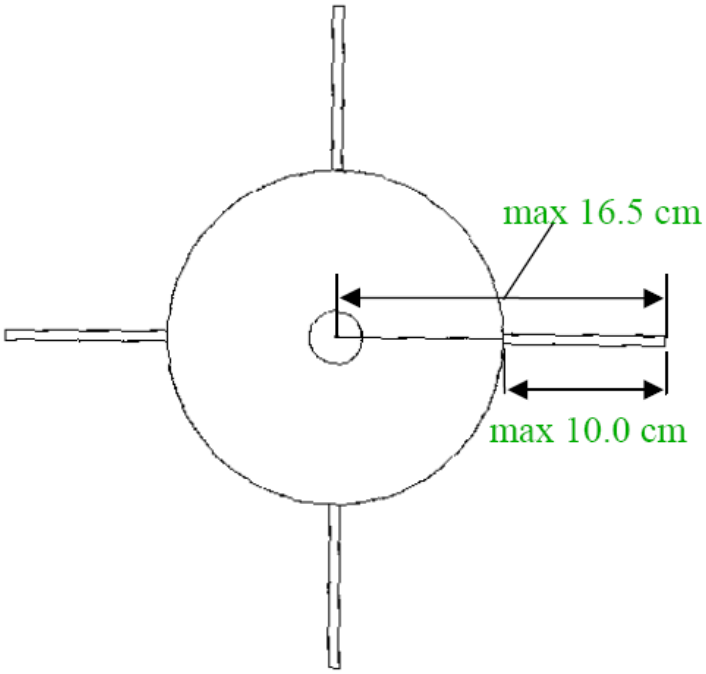


DIAGRAM 3 – Fin Diagram



Water Rocket Vehicle Competition Construction and Operation (Evaluation Worksheet)

Check one: ☐ Middle School ☐ High School

School Name: _____

Rocket Name: _____

Date: _____ Launch Site: _____

Student #1: _____

Student #2: _____

Student #3: _____

EVALUATION CATEGORIES:	Measurement
Overall Height: max. 76.0 cm	_____
Fin Width Distance: max. 10.0 cm	_____
Fin-Base Distance from Throat Exit: min 10.0 cm	_____
Nose Cone Tip Radius: min 1.5 cm	_____
Throat Exit Clearance: min 7.5 cm	_____

SCORING:

JUDGE #1: _____ _____

JUDGE #2: _____ _____

JUDGE #3: _____ _____

AVERAGE HANGTIME (SEC): _____

FINAL SCORE: $\frac{\text{Average Hangtime}}{\text{Max. Hangtime}} \times 100 =$ _____

INTERNET SCIENCE AND TECHNOLOGY FAIR (ISTF)

Middle / High Schools – MANDATORY @ Nationals

The Internet Science and Technology Fair (ISTF) competition is a national technology literacy program that enables student teams from the middle and high school levels to research the application of critical technologies to real world problems. Students work as teams, adhere to guidelines based on national science content standards and locate/work with on-line scientists and engineers as team technical advisors. They present their four-month research projects in a website format for preliminary and national rounds of judging. ISTF national winning teams receive certificate awards from the National Medal of Technology and Innovation at the US Department of Commerce.

To begin the process, an ISTF team must choose a National Critical Technology from http://istf.ucf.edu/Tools/NCTs/ and research the application of the technology to a major problem today.

An "ISTF team" will be composed of 1 to 2 SECME teams. Therefore, an ISTF team cannot be composed of more than 6 students. For example, at a school with 2 SECME teams will be expected to submit at least 1 website. A school with 7 SECME teams will be expected to submit at least 4 websites.

ISTF projects will be submitted to both UF SECME and SECME National Office. At Regionals, we will primarily just be checking for completion. A SECME team in an ISTF team that completes the project and meets the requirements set in the guidelines will receive 100 points towards the Most Awesomely SECME Team Award. An ISTF team that submits a website that does not meet the requirements will receive 50 points for each SECME team, and teams without a submission will receive 0 points.

The number of points contributed to the school sweepstakes award will be 100 * # of submissions / # of submissions required, with a maximum of 100. For example, if a school is supposed to submit 5 websites and they submit 3, the school will receive 100 * 3 / 5 = 60 points towards sweepstakes.

A SECME/ISTF National Middle School and High School Student Team will be selected. National SECME/ISTF winners will not attend the National Student Competition Finals. They will receive awards and be recognized as national SECME/ISTF Winners.

Please visit the ISTF website at istf.ucf.edu for all official ISTF competition details and schedules. If anything is unclear, visit istf.ucf.edu/Winners/Hall_of_Fame/ to see previous winning teams.

The website is a vital tool for participating in the ISTF competition. It contains guidelines and many tips for competition. It also includes examples of past winners, which should be a great help when looking for a successful method to approach research and website design. We have extracted most important pieces from the website, shown below. However, there is still a multitude of information to be looked over on the website.

Guidelines:

Here is an important link that outlines all the guidelines to be followed in doing the research and creating the website. It is organized by grade level and category. Relevant information is copied below: http://istf.ucf.edu/Tools/Guidelines/default.asp

Middle School Content Guidelines

Component One: Investigating the Problem

Task One: Describe in detail the problem your team selected and explain why it is important for your team to investigate the problem.

Task Two: Describe how your team decided on the problem you are investigating and explain what steps you took to narrow the focus of your investigation.

Task Three: Locate and document (using facts and figures) and describe how:
two geographic sites or two population groups have been affected by the problem your team identified, OR, two organizations, educational institutions or research facilities are doing significant research to solve the problem your team identified.

Task Four: Document (using two different sources based on facts and figures) what effect this problem has on people's lives.

Task Five: Document (using two different sources based on facts and figures) the impact the problem has on the economy of our nation or on your community.

Component Two: Understanding existing science and technology

Task One: Provide a history of the National Critical Technology (NCT) technical application your team is researching. Include at least three significant scientific discoveries, advances and milestones using documented facts and figures.

Task Two: Identify two scientists or engineers who have made major contributions to the development of the technical application your team selected and explain how their work is related.

Task Three: Explain how the technical application your team is researching is currently being used to solve the problem in Component One. Include documentation regarding at least two benefits and two limitations.

Task Four: Based on what you have learned in Component Two, explain how science has advanced technology regarding the technical application your team has researched.

Component Three: Innovating an improvement or new use

Task One: Propose an **original** improvement or new use regarding your team's technical application. Explain in detail how it works and provide a link to your design requirement.

Task Two: Explain what economic impact your team's proposed improvement or new use would have as it relates to the problem you identified in Component One.

Task Three: Identify and describe a company, federal agency or academic research laboratory that could carry out your team's proposed new improvement or new use.

Task Four: Using e-mail, obtain the opinion of a scientist or engineer about your team's proposed improvement or new use for the technical application. Add this information to your website by including the individual's name, organization, copies of the e-mail the team sent and the reply it received from its inquiry. **If your team is not able to obtain a response to your inquiry, provide an example of the e-mail request you sent and the names of those whom you sent the request.**

High School Content Guidelines

Component One: Technical Application's Background

Task One: Prepare a 200- to 300-word history about the National Critical Technology (NCT) technical application your team has selected to solve a local or national problem.

Task Two: Cite **three** detailed examples of research done in the past 3 to 5 years which focused on the NCT technical application your team selected. Include: the funding agency, the principal investigator's name, and the institution where the research is or was being conducted.

Task Three: Based on the research your team has done, explain how the NCT application chosen has advanced scientific knowledge.

Component Two: Technical Application's Market

Task One: Identify **two** companies and one product produced by each company that directly relate to the NCT technical application your team has selected.

Task Two: Identify **one** professional association or trade organization associated with the products your team identified. Include: its name, description of its mission, and number of people/companies involved.

Task Three: Propose and describe a new product or new process based on your team's NCT technical application.

Component Two: Technical Application's Market

Task One: Provide a forecast of what the workforce demand would be over a five-year period to produce and market your team's technical application or process. Include the impact such production would have on the marketplace.

Task Two: Give **two** examples of undergraduate or graduate degree programs in science or engineering that directly relate to your team's NCT technical application. For each program, be sure to include the following: the URL address of the institution, the department (for example, chemical engineering,

electronic engineering) where the program is offered, and a brief description of the program of study.

Task Three: Develop an idea for a new science and/or engineering degree program that might emerge given the advancements in scientific knowledge that the team has identified. Provide a title and 100-word description of this new degree program.

Format Guidelines (Middle and High School)

Opening (first) Screen

1. ISTF Project Number, within this statement: " ISTF Project # (give your team's ISTF number _____) was developed in response to the 2008-2009 Internet Science and Technology Fair."

2. Project title.

3. National Critical Technology (NCT) and sub-category.

4. Specific technology application (focus of the project).

5. 50-word statement (showing the relationship between your team's problem and solution).

6. School or organization and the state in which it is located.

Team Profile Screen

1. Students on your team (using only first names and first letters of the last names), but only if your parents, your teacher and your school's administrator approve.

2. Team's teacher and any other educational personnel who provided assistance to your team.

3. Team's school or organization and the state in which it is located.

4. Other people who helped your team (include their title or relationship).

Team's technical advisor(s), if the advisor gives his/her approval, please also include: the company or organization where he or she works, and his or her position/title. NOTE: If your team has more than one technical advisor, please include all advisors on this screen.
And if your team is unable to find a technical advisor, please include information on the team's efforts to get a technical advisor, such as e-mail sent, places contacted, etc.

Team Assessment Screen

1. One 100-word paragraph written by the team on teaming (how it progressed between: students, students and the teacher, and students and the technical advisor)

2. 0ne 100-word paragraph written by the team on communication (how it progressed between: students, students and the teacher, and students and the technical advisor)

3. 0ne 100-word paragraph written by the team on research and innovation (what your team learned about researching and innovating a solution to a real world problem).

4. Three lessons your team learned during the program’s duration.

Design Screen

1. Visual representation that is, for example, a detailed pictorial drawing, illustration, computer-generated image, or flowchart (that specifies the steps involved in a process) of the team's technical solution and relates directly to Component Three - Task One of the Content Guidelines for Middle School or Component Two - Task Three of the Content Guidelines for High School.

2. A description of all major mechanical parts of the design using labels with arrows.

3. In digital format.

General Requirements

1. At least six screens but not more than 25 screens.

2. Direct hyperlinks to exact sources

3. Incorporated links to all Internet references.

4. Graphics, pictures, charts, scanned items, video and/or sound are encouraged if they make your team's project better.

Important Dates for ISTF:

Sep.- Dec. 2008 - Teacher and team enrollment

Jan. 16, 2009 - Team Progress Report

Feb. 27, 2009 - Deadline for submission of final projects' website URLs.

March 13, 2009 - The final process evaluation will be available online through your ISTF Accounts for students, teachers and technical advisors.

March 27, 2009 - Start date of Preliminary Round of Judging

April 3, 2009 - End date of Preliminary Round of Judging

April 24, 2009 - Start date of Final Round of Judging

May 8, 2009 - End date of Final Round of Judging

May 29, 2009 - Winning teams announced at the ISTF website

June 19, 2009 - Certificates of Meritorious Achievement and Honorable Mentions mailed

REGIONAL COMPETITIONS

MATHEMATICS COMPETITION

Elementary / Middle / High Schools - Mandatory

Each student attendee ***MUST*** participate in the mathematics examination. Students will compete in the math course in which they are currently enrolled. In the event they are not currently taking a math class, students must take the test for the math level they completed most recently. It is the school coordinator's responsibility to insure the students are registered for the proper examination. Mathematics examinations shall be written in accordance to the Florida Sunshine Standards. All tests shall be scored by University of Florida SECME officials according to the number of questions answered correctly. In the event of a tie, the student who has the most correct questions in a row, beginning with question one (1) will have the "higher" score.

CEREBRAL CHALLENGE

Elementary / Middle / High Schools

Each team of three (3) will compete in this event. Questions will contain subject matter from the following areas: science, technology, engineering, and nature.

Requirements: Each team must consist of three people. This must be the team that the students have been with for the rest of the competition day. Switching teams or making substitutions will result in disqualification for the entire competition.

Procedure:

1. All teams will answer every question on the screen by using the remote response system
2. There is no penalty for a wrong answer
3. Coaching from anyone outside the team will disqualify the question and its points.
4. Challenges to a question should be brought to the attention of the staff at the end of the competition
5. The moderator will judge the accuracy of the response to each question. The moderator is the final judge of all challenges and scoring.

SURPRISE DESIGN COMPETITION

Elementary / Middle / High Schools

The design competition is structured so that no beforehand preparation is required of the students. The specifics of the competition will not be announced until the start of the competition. As a result, all teams should be equally able to perform well in the event.

EGG DROP COMPETITION

Elementary School Only

Each school must submit one (1) Egg Drop Project per team. This must be the team that the students have been with for the rest of the competition day. Switching teams or making substitutions during the competition will result in disqualification for the entire competition. The contestants shall design and build a container that will prevent an uncooked chicken egg (Grade A Large) from breaking when dropped from an initial height of 15 meters. The container must have no dimension longer than 25 cm. The maximum weight, including the egg, cannot exceed 500 grams. Contestants must be able to remove the egg without damage. A maximum of 30 seconds will be allowed to place the egg in the container and remove it. Each entry must be clearly labeled with the following:

- Names of students on team
- Team name
- Grade level of each student
- Coordinator's name
- School name and address

Any material may be used in the design, as long as the structure meets the design and contest rules outlined.

Design and contest rules state that no kits or pre-made designs may be used. The structure must be the individual's invention. There cannot be anything hanging off of the structure. **NO PARACHUTES!** The structure must land in a designated target area. No propulsion systems will be allowed. No gases (i.e. helium) other than air can be present in the structure when it is weighed.

Judges will inspect all containers before they are dropped. Grade A Large eggs will be supplied at the contest; contestants will not be permitted to bring their own egg. Once an egg is weighed-in (with the structure), that egg cannot be exchanged with another egg. The egg must be placed in the container on-site. A maximum of 30 seconds will be allowed to place the egg in the container and remove it. Exceeding these time limits will result in disqualification from the contest. If the egg is damaged during placement in the container, the team will be disqualified. The egg must be undamaged in order for the height value of the drop to be recorded. The egg will be dropped from an initial height of 15 meters; only two drops will be made. The highest drop distance will determine the winner and in the case of a tie, the contestant with the highest value will be the winner. The value will be based on the following equation:

$$T \quad \frac{100 * 25 * S}{m * L^2}$$

Where S is the success factor with values:
S=100 if egg does not break
S=0 if egg breaks

m = mass of structure with egg (grams)
L= longest dimension (cm)
T=total points value

Upon receipt of the egg, competitors will be given 30 seconds to secure the egg in place. After the 30 seconds has expired, competitors will not be able to make any adjustments. (This includes taping the structure closed, etc.)

Teams cannot receive help from proctors, chaperones, or advisors. Doing so will disqualify the team.

Maximum Length (of longest dimension): 25 cm
Maximum Mass: 500 grams

Containers exceeding the maximum parameters will not be dropped!

2009 FIFTEENTH ANNUAL SECME REGIONAL OLYMPIAD
SCHOOL REGISTRATION FORM

SCHOOL INFORMATION

School: _____

Please Check One: ☐ Elementary ☐ Middle ☐ High County: _____

Coach/Contact Person: _____

Day Phone: (___)_____ Fax: (____)_____

Evening Phone: (___)_____ Email: _____

Number of Teams Competing: _____ Number of Students Attending: _____

Number of Coaches: _____ (T-shirts will be provided for only two coaches.)

Coach 1 T-Shirt Size(s) YS YM YL S M L XL XXL XXXL

Coach 2 T-Shirt Size(s) YS YM YL S M L XL XXL XXXL

REGISTRATION FEES: A $50 school registration fee is required. This flat rate will include the registration fees for the school and all of its participating students and advisors.

School Registration Fee ($50.00) Amount Enclosed: $_____

Make checks payable to: University of Florida College of Engineering - SECME
Please do not send cash.

REGISTRATION MATERIALS SHOULD BE FORWARDED TO:
Margie Williams
Executive Secretary
312 Weil Hall
P.O. Box 116550
Gainesville, FL 32611-6550
Tel: (352) 392-2177
Fax: (352) 392-9673
Email: mwill@eng.ufl.edu

_____ _____
Signature of Coordinator/Contact Person Date
Please make copies of this form as necessary and submit by January 9, 2009.

Student Registration Forms

Student Registration Forms must be postmarked or faxed by **February 13, 2009.** No additional teams will be accepted beyond this date. In the event that a registered student cannot attend, a substitution can be made. However, a school is **not permitted** to increase the total number of students attending after **February 13, 2009.**

The College of Engineering expects that all coordinators will have in their possession emergency contact information for each attending student.

If any participating students have special needs, please notify the SECME Coordinator when submitting the Student Registration Forms.

2009 FIFTEENTH ANNUAL SECME REGIONAL OLYMPIAD
STUDENT REGISTRATION FORM

School: _____

Please Check One: ☐ Elementary ☐ Middle ☐ High

TEAM INFORMATION

Team Name: _____

---

1. Student Name: _____

Parent/Guardian Name: _____

Grade: _____ T-Shirt Size: YS YM YL S M L XL XXL XXXL

---

2. Student Name: _____

Parent/Guardian Name: _____

Grade: _____ T-Shirt Size: YS YM YL S M L XL XXL XXXL

---

3. Student Name: _____

Parent/Guardian Name: _____

Grade: _____ T-Shirt Size: YS YM YL S M L XL XXL XXXL

SECME STUDENT COMPETITION
GRIEVANCES

1. Competition Site/Date_____

2. School _____

3. Team Name _____

4. Adult Leader/Supervisor _____

5. Address _____

_____

6. Telephone/Fax _____

7. Competition Rule_____
or Procedure in Question

8. Specific Concern_____

(Use 2nd sheet if needed to document fully)

_____

_____

_____

_____

_____

9. Submitted by _____
Name

_____
Signature

10. Date _____