

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
“SECME: Thinking Out of the Box”

TABLE OF CONTENTS

	Page
Introduction	2
SECME Logo and 2007-2008 Theme	3
School Summary of Registered Events Form	4
Student Registration Form	5
General Instructions	7
Check-in Procedures	8
Description of Events	9
Banner Competition	11
Brain Bowl Competition	13
Bridge-Building Competition	15
Design and Build (Elementary)	18
Egg-Drop Competition	19
Essay Competition	22
Mousetrap Car Competition	24
Mousetrap Car Design Drawing Rules	29
Mousetrap Car Technical Report Rules	31
Poster Competition	33
Technology Challenge	35
Mathematics Challenge (Middle and Senior)	36
Mathematics Challenge (Elementary)	38
Water-Bottle Rocket Competition	39
Water-Bottle Rocket Technical Report (Middle and Senior)	41
Bionic/Robotic Hand Kit Exposition Event	49
Awards	50
Student Competition Grievance	51
National and International Competition	52

Annual District SECME Olympiad Competition
March 27, 2009
at
Miami Dade College, North Campus
11380 N. W. 27 Avenue
Miami Florida 33167

Introduction

The Miami-Dade County Public Schools (M-DCPS) Division of Mathematics, Science, and Advanced Academics Education is pleased to present the District SECME Olympiad Competition. We are excited to have you join us. Registration and check-in will start at 8:30 a.m. and all activities should conclude at approximately 4:00 p.m. We have planned a full day of activities, designed to give students an opportunity to demonstrate skills learned through the Competency-Based-Curriculum in challenging mathematics, science, computer technology, and language arts courses.

Students should come prepared to purchase lunch.

To the degree possible, this year's theme, ***SECME: Thinking Out of the Box***, should be incorporated into each phase of the contest.

Individuals and teams are asked to model the spirit of good sportsmanship. **The decisions of the judges will be final.**

Students are asked to study this handbook and put forth maximum effort in preparing for the competition. As with all competitions, advance preparations will yield a high degree of comfort and confidence. Students should not underestimate their abilities as individuals nor the collective strength of the school's team. Encourage students to represent their school and to demonstrate pride and courage. **In anticipation of increased participation and in order to finish the competition in a timely manner, the number of entries per school has to be limited. Schools are encouraged to hold school wide challenges for competition events in order to select representative school teams to enter the District Olympiad.**

Remember, "We all have the potential for greatness!" Tell students to find a niche on the team, remind them that they represent their school's SECME program, and encourage them to have fun!

Good Luck,

The M-DCPS District SECME Team
Ms. Beatriz Zarraluqui, Administrative Director
Dr. Cyd Heyliger-Browne, Executive Director
Dr. Marcus Anglin, District Supervisor
Dr. Gladys Barrio, Instructional Supervisor
Ms. Maria Teresa Diaz-Gonzalez, District Supervisor
Ms. Paula Nelson-Shokar, District Supervisor
Ms. Ava D. Rosales, Instructional Supervisor
Ms. Christine Todd-Gibson, Instructional Support Specialist
Ms. Claudette Connor, Competitions Coordinator

LOGO:



2008 – 2009 SECME THEME:

"SECME: Thinking Out of the Box"

The 2008 - 2009 theme reflects SECME's global mission and purpose - to increase the pool of historically under-represented, under-served, and differently-abled students who will be prepared to enter and complete post-secondary studies in science, technology, engineering, and mathematics, thus creating a diverse and globally competitive workforce. The measure of that accomplishment is a student's academic and career success.

School Summary of Registered Events

School: _____

SECME Teacher/Coordinator: _____

Principal's Signature: _____

EVENTS

Each school must enter the following competitions: **Banner, Essay, Poster, and at least one team event. Please indicate below the categories in which your school will participate.**

_____ **BANNER:** Each school **must enter one** banner which will be displayed in the Parade of Schools (team contest)

_____ **ESSAY:** Each elementary school may enter **one** essay. Due: **March 1, 2009** Mark Your Calendar! (**Individual contest**).

_____ **POSTER:** Each school may enter **one** poster (**individual contest**).

_____ **MOUSETRAP CAR:** This is a 3-member student team event. **Only one team per school.**

_____ **BRIDGE-BUILDING:** This is a 3-member student team event. **Only one team per school. Note: Only 1 member of winning team will be allowed to enter International Bridge Competition.**

_____ **EGG-DROP CONTAINER:** This is a 3-member student team event. **Only one team per school (Middle and Senior High School only).**

_____ **BRAIN BOWL:** This is a 4-member student team event. **Only one team per school.**

_____ **MATHEMATICS CHALLENGE:** This is a 4-member student team event. **Only one team per school.**

_____ **COMPUTER INTERNATIONAL SCIENCE AND TECHNOLOGY FAIR (ISTF):** This is a 3-member student team event (**Middle and Senior High School only**) **Submission Due: February 28, 2009** You're your Calendar! Rules and submission information found at: <http://istf.ucf.edu>

_____ **WATER-BOTTLE ROCKET COMPETITION:** This is a 3-member student team event. **Only one team per school.**

_____ **BIONIC/ROBOTIC HAND KIT EXPOSITION:** This is a 2 - 4 member student team event (Middle and Senior High School only).

_____ **DESIGN AND BUILD:** This is a 4-member team event. (Elementary schools only)

STUDENT REGISTRATION FORM

Please PRINT legibly

School Code: _____ School Name: _____

Please print the requested information and submit on March 22, 2008 at the Olympiad check-in.

Student ID #	Last Name	First Name	Grade	Event (s)
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
12.	_____	_____	_____	_____

STUDENT REGISTRATION FORM

Please PRINT legibly

School Code: _____ School Name: _____

Please print the requested information and submit on March 22, 2008 at the Olympiad check-in.

Student ID #	Last name	First name	Grade	Event (s)
13.	_____	_____	_____	_____
14.	_____	_____	_____	_____
15.	_____	_____	_____	_____
16.	_____	_____	_____	_____
17.	_____	_____	_____	_____
18.	_____	_____	_____	_____
19.	_____	_____	_____	_____
20.	_____	_____	_____	_____
21.	_____	_____	_____	_____
22.	_____	_____	_____	_____
23.	_____	_____	_____	_____
24.	_____	_____	_____	_____

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
“SECME: Thinking Out of the Box”

General Instructions

1. Check-in starts at 8:30 a.m. and should be completed by 9:00 a.m. in the assigned rooms. Participating schools must be registered with the Curriculum and Instruction SECME district office. Each school must have on file in the district office its complete list of SECME students (Olympiad and non-Olympiad participants).
2. Two students must be in line outside the auditorium with the school's banner at **9:00 a.m.** for the opening ceremony.
3. Some events will run concurrently. To avoid conflicts, an attempt should be made to have different students participating in each event.
4. The bridge, egg-drop container, water-bottle rocket, and mousetrap car will have a higher scoring factor than other events because of the design, construction, and testing phases that are required.
5. All entries in the competitions are expected to be neat, original, and completed by the students participating in this year's Olympiad.
6. Each school must enter the following contests: banner, and at least one team event (Mousetrap Car, Brain Bowl, Bridge-Building, Egg-Drop Container, Math Challenge, Bionic/Robotic Hand, Water-Bottle Rocket and/or Computer Challenge).
7. Elementary school students will compete against elementary school students only. Similarly for middle and senior high school students
8. Winners of the various contests will be selected at two levels: middle and senior high. First-, second-, and third-place trophies will be awarded. All participants will receive certificates.
9. Overall Region winners for each level (middle and senior high) will be selected based on total points.
10. Each pre-designed project (Bridge, Egg-Drop Container, Water-Bottle Rocket, and Mousetrap Car) must be delivered upon arrival to the appropriate check-in rooms. The packaging must be sufficient to protect the project during normal handling. Each package must be labeled with the following information: school (elementary, middle or senior high) and names of team members.

√ Check-In Procedures on the Day of the Festival and Olympiad

Upon arrival, the SECME Coordinator/Designee should check-in at the general registration area. Be prepared to submit the following:

- School's Summary of Registered Events Form
 - Student Registration Forms
(All information completed, see pages 5 & 6.)
-

Check the program for room locations; then proceed to the room(s) to submit the following:

- Package(s) containing pre-designed project(s)
(Bridges, Mousetrap Cars, Water-Bottle Rockets, Egg-Drop Containers)
- School's Banner
(Please attach "Title" card.)
- School's Poster
(Please attach "Title" card.)

Description of Events

Note: Elementary, middle and high school students compete separately, i.e grades 3 – 5 compete in elementary school events, grades 6 -8 students compete in middle school events, and grades 9 - 12 compete in high school events.

BANNER

Students create banners based on the Olympiad's theme. Banners must contain the school mascot and SECME logo. Each school must have one (1) entry. Schools will parade with their banners at the opening session of the Olympiad.

BRAIN-BOWL

Students compete against the clock and each other in a contest filled with science questions. Each school may enter one (1) team consisting of four (4) students in the Brain- Bowl competition.

BRIDGE-BUILDING

Students build bass wood bridges to pre-determined specifications. Bridges are then tested at the Olympiad. The winner is determined by the most efficient bridge within the specifications. Two individual members from the winning high school team(s) will represent SECME at the International Bridge Contest. Each school may submit one pre-constructed bridge in this team event.

EGG-DROP CONTAINER

Students build containers that meet pre-determined specifications. At the Olympiad, an uncooked egg is placed in the container and dropped from an initial height of 15 meters. The smallest volume container that protects the egg after being dropped at the final height is deemed the winner. Each middle and senior high school may submit one egg-drop container. The eggs will be supplied at the competition.

ESSAY

Students write essays at their schools based on the Olympiad's theme and the best is selected and entered in the District Olympiad. Each elementary school may submit one (1) essay. **Essays are due March 1, 2009. Entries received after that date are not eligible for inclusion in the competition (individual event).**

MOUSETRAP CAR

Students build cars that are propelled by the spring of a mousetrap. All teams must have

- Mousetrap Car (constructed and running)
- Design drawing of Mousetrap Car
- Technical report on Mousetrap Car

A combination of the scores from the race, the report, and the drawing is used to determine the winner. Each school may enter one Mousetrap Car.

POSTER

Students create posters based on the Olympiad's theme. Posters must contain the school mascot and SECME logo. Each school may submit only one (1) entry.

Description of Events, continued

TECHNOLOGY CHALLENGE: INTERNATIONAL SCIENCE AND TECHNOLOGY FAIR (ISTF)

Students participate in a national technology literacy program competition comprised of a 3-member student team (**middle and senior high school only**). Students research the application of critical technologies to real world problems and submit to the University of Central Florida competition site. **Submission deadline is February 27, 2009.** Rules and submission information can be found at: <http://istf.ucf.edu>

MATHEMATICS

Student teams use a variety of strategies to solve mathematics problems using tools such as graphing calculators, calculators, rulers, and manipulatives. The winner is determined by the first team to submit the most correct answers within an hour. Each school may enter one (1) team consisting of four (4) students in the mathematics competition.

WATER BOTTLE ROCKET

Students build a rocket that must meet predetermined specifications. At the Olympiad, rockets will be "fueled" with 355 milliliters of water. The rocket with the greatest combined "hang time" and patch design score will be declared the winner. Each school may enter one (1) rocket built by a team consisting of three (3) students. All teams **must have**:

- Water-Bottle Vehicle (constructed and launch-ready)
- Team Patch

BIONIC/ROBOTIC HAND KIT EXPOSITION EVENT

Students bring a pre-constructed robotic/bionic hand designed from a kit. Presentations will be judged based on innovative engineering, effective presentation, most realistic prosthesis, and product demonstration. Teams present orally and visually with the aid of multimedia. Each school may submit only **one** (1) entry (middle and senior high school only).

DESIGN AND BUILD

Students follow specific instructions to complete an engineering design task in four-member teams (Elementary schools only).

BANNER COMPETITION

BANNER COMPETITION REQUIREMENTS: (Any entries not meeting these requirements will be automatically disqualified).

I. DESIGN AND CONTEST RULES:

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



2. All entries must include the
 - school name and colors,
 - city and state,
 - current year
 - SECME logo
 - SECME Theme (SECME: Thinking Out of the Box)
4. Banners must be hand-made original work for the year it is submitted.

II. SCORING:

1. The maximum points for a banner are 100.
2. The banners will be scored in the following categories:
 - a. Content (25 pts) – Quality and organization of the information of the banner.
 - b. Originality (25 pts) – Innovativeness of the design and how well it presents the ideas on the entry.
 - c. Creativity (25 pts) – The uniqueness of the information depicted.
 - d. Appearance (25 pts) – The attractiveness and neatness, scale and balance of the presentation.

The maximum number of points is 100.

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
"SECME: Thinking Out of the Box"

2008 SECME BANNER COMPETITION
(Evaluation Sheet)

Please Circle: 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 _____

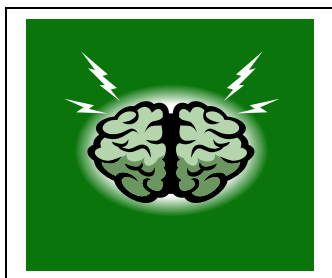
The maximum number of points for a poster is 100.

EVALUATION CATEGORIES

POINTS

I.	CONTENT Measure the quality and organization of the information on the banner (0-25 points)	_____
II.	ORIGINALITY Evaluate the innovativeness of the design, how well it presents the ideas on the entry (0-25 points)	_____
III.	CREATIVITY Judge the uniqueness of the information depicted (0-25 points)	_____
IV.	APPEARANCE Examine the entry for attractiveness and neatness, scale and balance of the presentation (0-25 points)	_____
	TOTAL (Highest possible score is 100)	_____

BRAIN-BOWL COMPETITION



General Rules:

1. Each school will be represented by only one (1) team.
2. Teams will consist of four (4) students.
3. A team will compete with one or two other team in a head-to-head competition. All questions will be taken from **earth/space, life, chemical, and physical science clusters**.
4. Elementary school teams will compete only against other elementary school teams and similarly for middle and senior high school against other high school teams.
5. Scheduling of competing teams will be done by a draw before the end of the opening ceremonies. Preliminary rounds will be by single elimination.
6. A question will be stated only once.
7. Before beginning the match, the judge will ask each contestant to test his or her buzzer. Each team will also designate a captain.
8. The match starts with the toss-up round and is followed by the bonus round. In the tossup round, the judge will ask the question and an answer must be given without conferring. In the bonus round, the judge will ask a specified number of questions. The team may confer, but only the captain may give the answer.
9. In the toss-up round, any contestant, at any time (interruption of a question is allowed), may buzz in to answer the question. A correct answer will give that contestant's team ten-(10) points. An incorrect answer will result in a five-(5) point deduction from the team's total, and the question will be reread for the opposing team.
10. At the end of the toss-up round, the bonus round will begin. The team with the lower point total will begin. The number of correctly answered questions from the toss-up round will be the number of bonus questions each team will be asked. When the question is read, the contestants may confer and the team captain may then deliver an answer. A correct answer will receive ten (10) points. There is no penalty for an incorrect answer in this round.

Procedures:

1. The toss-up round is three-(3) minutes. The competition coordinator will call "last question" at the end of the round to signal the round's conclusion. Bonus questions will then follow.
2. Once a toss-up question is read, the contestants will be allowed only five (5) seconds to buzz in. The contestant who signaled is then allowed only five (5) seconds to answer the question. The timekeeper will mark the time from the moment the contestant is recognized at the time of the answer. Exceeding this time limit will be considered an incorrect answer. If a contestant answers the question without being recognized, that will be considered an incorrect answer as well.

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
“SECME: Thinking Out of the Box”

3. If a contestant responds during a toss-up question, the moderator will stop asking the question immediately. The person who signaled first must answer the question within five (5) seconds.
 - a. If the response is correct, the team will be duly credited with an opportunity to answer a bonus question at the end of the heat.
 - b. If the response is incorrect, the moderator will repeat the question for the contestants of the other team. The team that presupposed the question may not respond again to this question.
4. If a question is completed and a team's response is incorrect, the other team will have a chance to answer. If the other team's answer is incorrect, the moderator will then ask a new toss-up question.
5. Only the captain may voice a dispute regarding a question, answer, or a procedure. This dispute must be made immediately following the incident. **The judges' ruling is final.**
6. The bonus round is conducted without buzzers. Once the judge finishes reading the question, the team captain has ten seconds to give an answer. If there is a tie at the end of the bonus round, one final sudden-death, toss-up question will be given in order to determine the winner.
7. If at any time during the toss-up round, one team is ahead by more than 80 points over the other, the match will be stopped and the leading team will be declared the winner.
8. If, at the end of the toss-up round, it is clear that one team cannot score enough points to tie the game or to win the game, then there is no need to proceed into the bonus round. The leading team will be declared the winner.
9. The scorekeeper will record the running total of points for each team on a board visible to all contestants and spectators. At the end of each heat, the scorekeeper will record the scores on the competition score sheets. The scorekeeper will then submit the score sheet for each heat to the competition coordinator.

Judging:

1. The value of a toss-up question is ten-(10) points for a correct response and minus five-(5) points for an incorrect response. Therefore, it is possible for a team to have a negative score.
2. Points will not be deducted for an incorrect response to a bonus question.
3. The first team to reach an 80 point advantage (raw score) within a heat or the team with the most points at the end of the round will be declared winner of the round.
4. The question will be stated only once.



2009 International Bridge Building Contest Rules

These rules have been developed by the International Bridge Building Committee for the **Thirty Second International Bridge Building Contest**.

The object of this contest is to see who can design, construct and test the **most efficient** bridge within the specifications. Model bridges are intended to be simplified versions of real-world bridges, which are designed to accept a load in any position and permit the load to travel across the entire bridge.

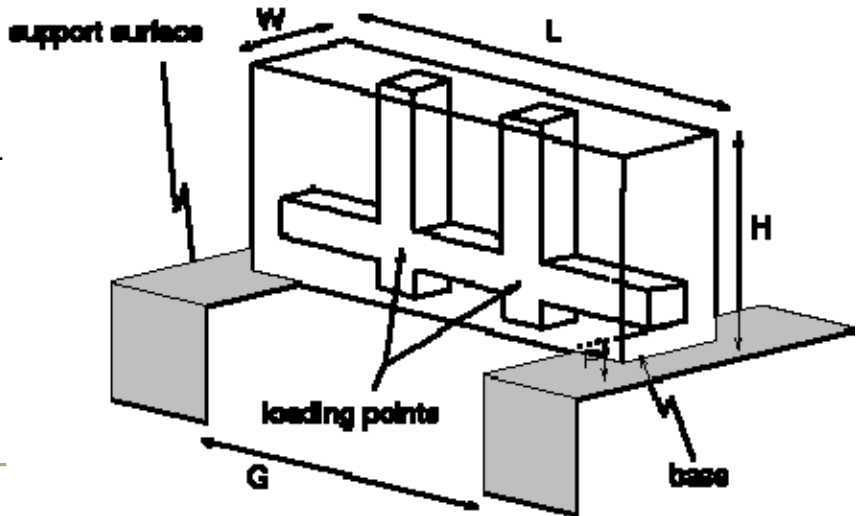


Figure 1. Bridge schematic (not to scale).

1. Materials

- The bridge must be constructed only from 3/32-inch square cross-section basswood and any commonly available adhesive.
- The official basswood may be notched, cut, sanded or laminated in any manner but must still be identifiable as the original official basswood.
- No other materials may be used. The bridge may not be stained, painted or coated in any fashion with any foreign substance.

2. Construction

- The bridge mass shall be no greater than 30.00 grams.
- The bridge (see Figure 1) must span a gap (**G**) of 300. mm, be no longer (**L**) than 400. mm, have a maximum width (**W**) of 80. mm, be no taller (**H**) than 250. mm above the support surfaces.
- No portion of the bridge shall extend below the top of the support surfaces.
- The loading plane (**P**) shall be horizontal and shall lie no more than 15. mm above the support surfaces. The bridge may extend above the loading plane.
- The bridge must be constructed to allow for passage of a 1.5 inch by 1.5 inch by 18 inch long rectangular block vertically through both load points (the block will be centered on the loading point as shown in Figure 1) and horizontally across the load plane (one face of the block will be in contact with the load plane).

3. Loading

- The load will be applied downward, from below, by means of a standard 3/8 inch rod and a steel loading plate with dimensions of 31.75 mm (1 1/4 inch) wide, 6.35 mm (1/4 inch) thick,

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
"SECME: Thinking Out of the Box"

supported on a vertical loading rod suspended from the center of the loading plate. The rod will pass through the bridge and the center of the loading plate and will be secured with a standard hex nut.

- The two long edges of the loading plate will be parallel to the longitudinal axis of the bridge at the time of load application.
- The load will be applied on the longitudinal axis of the bridge with the loading plate centered 50. mm to the right or the left of the center of the 300. mm gap.

4. Testing

The competition loading location will be determined at random at the beginning of the contest, and will be the same location for all the bridges tested.

- The loading plate will be located on the bridge at the specified loading location and the load will be applied from below, as described in section 3 above.
- Competition loading will stop at 180. lbs (~82. kg). However, loading will continue until bridge failure.
- Bridge failure is defined as the inability of the bridge to carry additional load, or a load deflection of 25 mm under the loading location, whichever occurs first.
- The bridge with the highest structural efficiency, E , will be declared the winner.

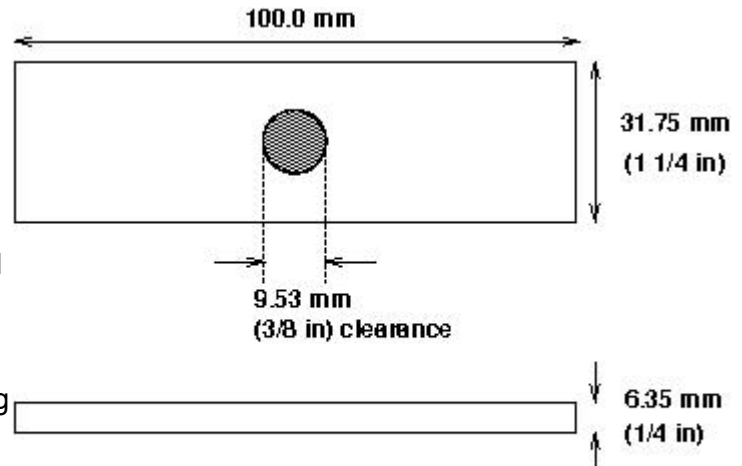


Figure 2. Loading plate detail (not to scale)

$$E = \text{Load supported in grams (82,000g maximum)} / \text{Mass of bridge in grams}$$

5. Qualification

- All construction and material requirements will be checked prior to testing by the judges. Bridges that fail to meet these specifications at the conclusion of the allowable time for checking will be disqualified. Bridges disqualified prior to the start of the contest may be tested as exhibition bridges at the discretion of the builder and the contest directors.
- If, during testing, a condition becomes apparent (i.e., use of ineligible materials, inability to support the loading plate, bridge optimized for a single loading point, etc.) which is a violation of the rules or prevents testing as described above in Section 4, that bridge shall be disqualified. If the disqualified bridge can accommodate loading, it may still be tested as an exhibition bridge as stated above.
- Decisions of the judges are final; these rules may be revised as experience shows the need. (Please check our web site, <http://www.iit.edu/~hsbridge>, after January 15, 2009, to learn whether any changes have been made.)

Last update: october 9, 2008

© International Bridge Building Committee, 2008

Decisions of the judges are final.

BRIDGE-BUILDING COMPETITION (Registration and Evaluation Worksheet)

ID# _____ Check one: ___ Middle School (grade 6-8) ___ High School (grade 9-12)
Students should complete only the School and Team section below. All other sections
will be filled out by the judges and competition administrators.

School Name _____ Team Name: _____

In the event that you place 1st, 2nd, or 3rd, please **CIRCLE the name of the Team Member who will build the bridge for the International Bridge Competition in April.**

Team Member #1 _____

Team Member #2 _____

Team Member #3 _____

School Coordinator _____

EVALUATION CATEGORIES:

The dimensions marked in the figure are as follows: G=300. mm; L=400. mm
MAXIMUM; H=250. mm MAXIMUM; W=80. mm MAXIMUM; P ≤ 15. mm.

1. CONSTRUCTION REQUIREMENTS

SCALE	MEASUREMENT	COMMENTS
Weight (M)	_____ 30 grams or less	_____
Height (H)	_____ 250 mm Max above support surface	_____
Bridge Length (L)	_____ 400 mm or less	_____
Gap Span (G)	_____ 300 mm	_____
Width (W)	_____ 80 mm maximum	_____
Loading Plane (P)	_____ 15 mm or less above support surface	_____

II. SCORING**

Structural Efficiency Score (E) = Load Supported in grams/Mass of bridge in grams

The load will increase until bridge failure occurs*

*Failure-includes deflection of 25 mm under the loading point occurs.

Load Capacity (g) _____ Final Ranking _____

Structural Efficiency _____

Note: The decisions of the judges are final

DESIGN-AND-BUILD COMPETITION

(Elementary Schools Only)

This Design-and-Build Competition will provide the students with an opportunity to demonstrate their engineering skills. They will work cooperatively to design, build, and test a structure according to the specifications and materials provided.

General Rules

1. There will be one team per school containing up to four (4) students, including one team captain.
2. Students will compete as a team.
3. Students will be given a set of materials and directions regarding their construction.
4. The team will work together to build their structure within the time limit given.
5. Points will be awarded according to the directions given.



EGG-DROP COMPETITION

General Rules:

The contestants shall design and build a shipping container that will prevent an uncooked chicken egg (Grade A Large) from cracking when dropped from an initial height of 15 meters. At the discretion of the judges, surviving eggs from the initial drop will then be taken higher and dropped a second time. The container must be less than 800 cm³ in volume, with no single dimension longer than 25 cm. The maximum weight, including the egg, cannot exceed 1,000 grams. Contestants must be able to remove the egg without damage. A maximum of 30 seconds will be allowed to open the container, place the egg in the container and re-seal it. After the drop, 30 seconds to unseal, show the undamaged egg, replace it and re-seal the container.

Materials:

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

Requirements:

1. No kits or pre-made designs may be used. The structure must be the team's invention.
2. The structure must be completely released (no strings or other attachments). **No parachutes.**
3. The structure must land in a designated target area.
4. No propulsion systems will be allowed.
5. No gases (e.g., helium) other than air can be present in the structure when it is weighed.
6. Inside air space will not be subtracted out. Volume will be calculated based on the shape of the containers.

Judging:

1. Grade A large eggs will be supplied at the contest. You cannot bring your own egg.
2. All containers will be inspected by judges before they are dropped.
3. Once an egg is weighed-in with the structure, that egg cannot be exchanged with another.

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
“SECME: Thinking Out of the Box”

4. The egg must be placed into the container on-site. A maximum of 30 seconds will be allowed to place the egg into the container and remove it. Exceeding this time limit will lead to disqualification from the contest.
5. If the egg is damaged during placement in the container, the team will be disqualified.
6. The egg must be undamaged after the drop in order for the value to be recorded. In the event that all eggs do not survive the second drop, the values from the previous drop will be recorded.
7. The score will be based on the equation:

$$S_2 = \frac{75S}{(W + L^2 + V)}$$

Where S is the success factor with values:

S = 100 if egg does not break
S = 1 if egg breaks

W = Weight (grams)
L = Longest dimension
V = Volume (cm³)

S₂ = Total points value

8. The eggs will be dropped from an initial height of 15 meters; the second and final drop will be from a height greater than 15 meters.
9. The winner will be determined by the team with the highest score (S₂).

NOTE: Containers must meet volume requirements to qualify for competition.

**Egg-Drop Competition
(Evaluation Worksheet)**

Check one: ___ Middle School (grade 6-8) ___ High School (grade 9-12)

School Name: _____

Team Name: _____

Students' Names:

Judge's Name: _____ Date: _____

This section to be completed only by the judges.

L= _____ Longest Dimension (centimeters)

V= _____ Volume (cm³)

W= _____ Weight (grams)

S= _____ 100 points if the egg does not break; 1 point if egg does break

$$S_2 = \frac{75S}{(W + L^2 + V)}$$

S₂= _____ S₂ (winner)= _____

FINAL Overall Score:

$$\frac{S_2}{S_2 \text{ (winner)}} \times 100 = \text{_____ points}$$

DROP #1 Survived: _____ Yes _____ No

DROP #2 Survived: _____ Yes _____ No

ESSAY COMPETITION RULES

(Elementary Schools Only)

For this year's Essay Competition:

1. Each entry is to be prepared and submitted by an individual student (not a team).

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

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

I. TITLE PAGE>

- Essay's Title (MUST be this year's theme)
- Student's name, grade, age
- Home address, zip code, and telephone number
- Name of school and address, School System name
- SECME School Coordinator's name
- Date

The title page is to be a computer printed/typed page on 8½" X 11" white paper, double spaced with one inch borders on each side, 12 pt. font size and Times New Roman or CG Times font.

II. ESSAY>

ELEMENTARY 2-3 pages computer printed/typed pages (not including title page) on 8½" X 11" white paper, double spaced with one inch borders on each side, 12 pt. Times New Roman OR CG Times font.

MIDDLE/JUNIOR HIGH ENTRY

3 to 4 neat computer printed/typed pages (not including title page) on 8½" X 11" white paper, double spaced with one inch borders on each side, 12 pt. Times New Roman OR CG Times font.

HIGH SCHOOL ENTRY

4 to 6 neat computer printed/typed pages (not including title page) on 8½" X 11" white paper, double spaced with one inch borders on each side, 12 pt. Times New Roman or CG Times font.

III. BIBLIOGRAPHY>

Reference sources and direct quotations are required to be identified as cited. Bibliography is to be computer printed/typed on 8½" X 11" white paper, double spaced with one inch borders on each side, 12 pt. Times New Roman or CG Times font. (Not included in the required page limit for elementary, middle/junior high, and high school essays)

AT ALL LEVELS OF COMPETITION, ESSAYS WILL BE JUDGED ON:

- ORGANIZATION
- GRAMMAR AND SENTENCE STRUCTURE
- MECHANICS/PUNCTUATION/SPELLING
- CREATIVITY AND STYLE
- RELATIONSHIP TO COMPETITION THEME

The maximum number of points is 100.

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
"SECME: Thinking Out of the Box"

2009 SECME STUDENT ESSAY COMPETITION
Elementary School Only
(Evaluation Sheet)

Student Name _____ Grade _____ Age _____

School Name _____

District _____ City/State _____

Judge's Name _____ Date _____

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

Requirements Check:

Cover page with required information _____ 12 pt / New Times Roman Font _____

Double spaced _____ 1" Borders on each side _____ White paper _____

Proper number of pages (2-3 for ES, 3-4 for MS, 4-6 for HS) _____

Maximum number of points is 100. 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 COMPETITION THEME (1-5 points) _____

TOTAL (Out of Maximum 100) _____

MOUSETRAP CAR COMPETITION

GUIDELINES FOR 2008 – 2009 SECME ENGINEERING DESIGN COMPETITION (MOUSETRAP CAR: CONSTRUCTION AND OPERATION)

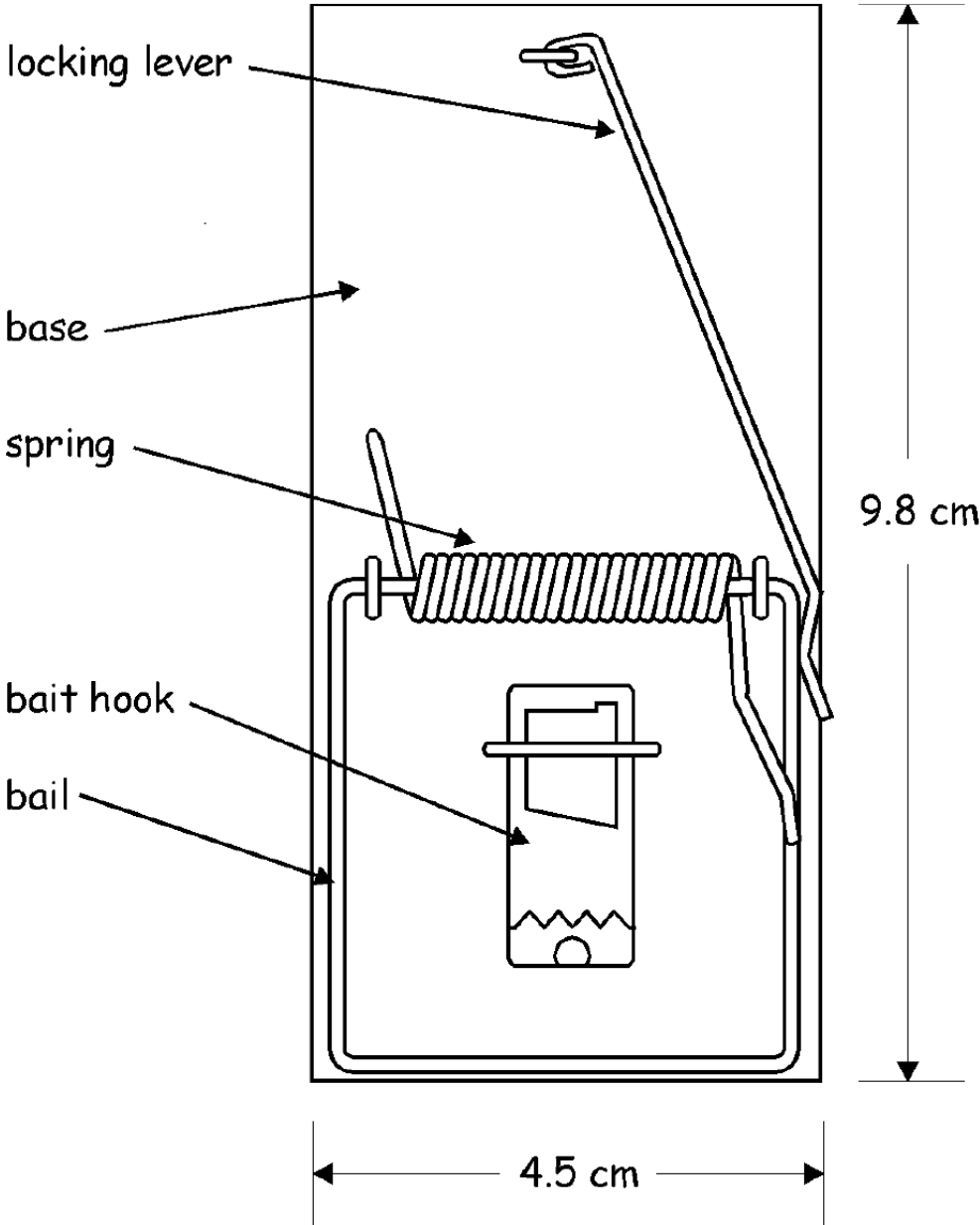
ENGINEERING DESIGN COMPETITION REQUIREMENTS:

(Any entry not meeting the following requirements will be disqualified.)

1. The Engineering Design Competition **requires participation in each of these three areas:**
 - a. Mousetrap Car Construction and Run
 - b. Design Drawing of Mousetrap Car
 - c. Technical Report on Mousetrap Car (*not required for elementary*)
2. This is a **team competition** and should reflect the coordinated efforts of all members. **Three (3) students must be on each team.**
3. 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 on next page).
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.**

(Note: See the page after the mousetrap sketch for Guidelines 13-15.)

Reference Sketch of Original Mousetrap with
Component Identifications



2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
“SECME: Thinking Out of the Box”

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

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

where:

N...is the score.

To ensure that cars actually perform and not just be 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 completed car in grams.

D...is 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 for the Design Drawing, and Technical Report).

**Judges will measure “L” (see illustration on following page) and “W” prior to the mousetrap car Performance runs. These measurements, together with “D” (determined by the car’s run), are used to calculate “N” in the formula above.*

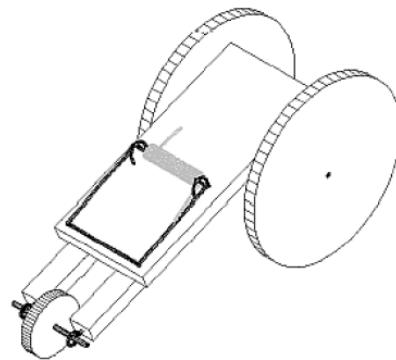
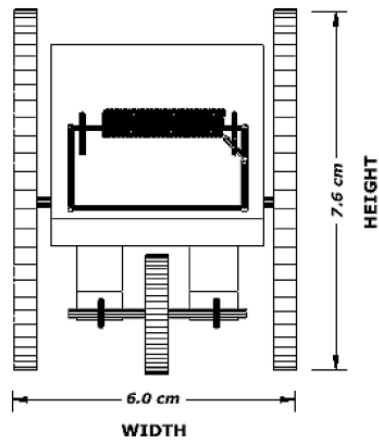
14. Overall Team Score in competition is sum of: 1) Performance (car run) as calculated above (max. 100 points); 2) Design Drawing (max. 50 points); and 3) Technical Report (max. 50 points). **Thus the maximum total is 200 points.**

15. See pages that follow for guidelines and evaluation sheets on each component of the Engineering Design (Mousetrap Car) Competition.

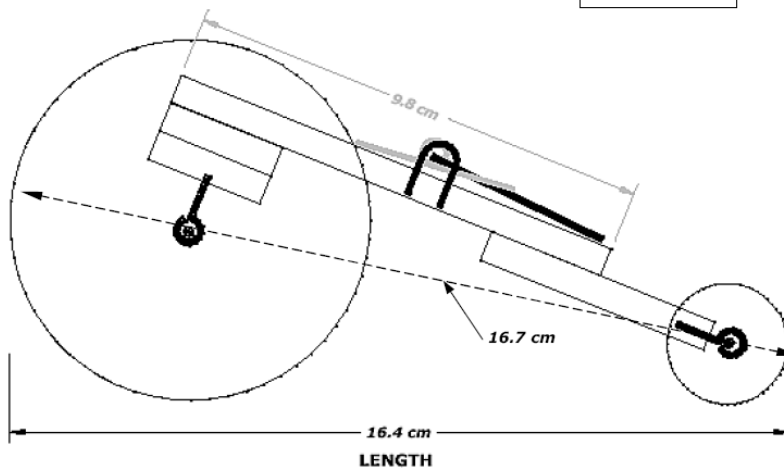
NOTE:

**Measurement of “L,” the Mousetrap Car’s Longest Dimension
In Any Direction—Length, Width, or Height**

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
 "SECME: Thinking Out of the Box"



SCALE
 1.0:1.38



"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) = 16.7 cm

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
"SECME: Thinking Out of the Box"

**2009 SECME ENGINEERING DESIGN COMPETITION:
MOUSETRAP CAR CONSTRUCTION AND OPERATION**
(Evaluation Sheet)

Please Check: Middle School/Junior High____ Senior High School____

Team Name: _____ School Name: _____

District: Miami-Dade City/State _____

Student Name _____ Grade _____ Age _____

Student Name _____ Grade _____ Age _____

Student Name _____ Grade _____ Age _____

Judge's Name: _____ Date: _____

Distance:

First Run _____ Second Run _____

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

w = 25 Grams

W = _____ [Measured weight, in grams]

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

D = _____ [Maximum D=2,500 if measured distance is more than 2,500 cm]

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

N_L = _____ [Highest Performance score at competition site]

Mousetrap Car Performance Point Score: F=_____

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

2009 SECME ENGINEERING DESIGN COMPETITION GUIDELINES: MOUSETRAP CAR DRAWING

As a part of the Engineering Design Competition, each team 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. BUT 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 to be drawn in the bottom left corner of the drawing inside the 1" border with the following information is required:

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 actual mousetrap car and drawing)
SCALE
NAMING/LABELING (Of all of the parts used)
APPEARANCE/NEATNESS

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
"SECME: Thinking Out of the Box"

**2009 SECME ENGINEERING DESIGN COMPETITION GUIDELINES:
MOUSETRAP CAR DRAWING**
(Evaluation Sheet)

Please Check: Elementary School ___ Middle School ___ High School ___

Team Name: _____ School Name _____

City/State: _____

Student Name _____ Grade ___ Age ___

Student Name _____ Grade ___ Age ___

Student Name _____ Grade ___ Age ___

Judge's Name: _____ Date: _____

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

Requirements Check: 18" x 24" Engineering Paper ___ 1" Border (All Sides) ___

Dimensions ___ 4" x 6" Title legend with required information ___

The maximum number of points for the Engineering Design Competition Mousetrap Car Drawing is 50. Please score each of the following four categories:

EVALUATION CATEGORIES

POINTS

I. RESEMBLANCE _____ The accuracy to which the Mousetrap Car Drawing illustrates the actual Mousetrap Car designed and built by the team. (1-15 points)	_____
II. SCALE The proportions in the Drawing correctly relate to and represent the team's actual Mousetrap Car. (1-15 points)	_____
III. NAMING/LABELING _____ The correctness of the names/labels of all of the parts in the Drawing of the Mousetrap Car. (1-10 points)	_____
IV. APPEARANCE/NEATNESS _____ The quality of the visual presentation of the Mousetrap Car Drawing entry (1-10 points)	_____
TOTAL (The highest possible score is 50)	_____

2009 SECME ENGINEERING DESIGN COMPETITION GUIDELINES: MOUSETRAP CAR WRITTEN 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-spaced**, on 8½" X 11" white paper with one-inch borders at the top, bottom, and on 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 and not required. (Entries not meeting these requirements will automatically be disqualified).

TECHNICAL REPORT REQUIREMENTS AND GUIDELINES: (Any entry submitted without a cover page containing all of the required information will automatically be disqualified).

1. COVER PAGE (Required to contain):
 - a. Title of the Technical Report
 - b. Name, addresses, and 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. ACKNOWLEDGMENTS (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 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
"SECME: Thinking Out of the Box"

**2009 SECME ENGINEERING DESIGN COMPETITION GUIDELINES:
MOUSETRAP CAR WRITTEN TECHNICAL REPORT
Middle and Senior High School Only
(Evaluation Sheet)**

Please Check: Middle School ___ High School ___

Team Name: _____ School Name: _____

City/State _____

Each: Student Name _____ Grade _____ Age _____

Student Name _____ Grade _____ Age _____

Student Name _____ Grade _____ Age _____

Judge's Name: _____ Date: _____

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

Requirements Check: Cover page with required information ___ 12 pt. Type/Standard Font ___

Double-spaced Text ___ 1" Borders ___ White paper ___

The maximum number of points for the Engineering Design Competition Mousetrap Car Technical Report is 50. Please score each of the following five categories:

EVALUATION CATEGORIES	<u>POINTS</u>
I. OUTLINE Structure of Technical Report is complete, correct, and consistent with guidelines. (1-10 points)	_____
II. ORGANIZATION Technical Report follows a logical written description from design to final product. (1-10 points)	_____
III. PRECISION Procedures and steps followed are explained with clarity and exactness (1-10 points)	_____
IV. SENTENCE FORMATION Sentences are complete with appropriate coordination and subordination. (1-10 points)	_____
V. MECHANICS Correct punctuation, capitalization, and spelling are evident throughout report (1-10 points)	_____
TOTAL (The highest possible score is 50 points)	_____

**NOTE: DECISION OF THE JUDGES IS FINAL

2009 SECME STUDENT POSTER COMPETITION GUIDELINES

Each entry is to be prepared and submitted by an individual student (not a team).

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

POSTER COMPETITION REQUIREMENTS: (Any entries not meeting these requirements will be automatically disqualified).

- I. TITLE CARD>**
- 4" x 6" card (taped to back of poster)
 - This year's theme must appear on the poster
 - Student's name, grade, age
 - Home address, zip code and telephone number
 - Name of school and address, city, state
 - School System name
 - SECME School Coordinator's name
 - Date
- II. POSTER>**
- ...The size of the poster is required to be 22" X 28" (including frame) All posters must be framed in standard 22" X 28" slide-on metal or plastic poster frames. Framed posters are not to use glass.

The theme must appear on the poster.

NOTE: 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)
- or any combination of the above

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)

THE MAXIMUM NUMBER OF POINTS IS 100.

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
 "SECME: Thinking Out of the Box"

**2008 SECME STUDENT POSTER COMPETITION
 (Evaluation Sheet)**

Please Check: Elementary Middle School/Junior High High School

Student's Name _____ Grade _____ Age _____

School Name _____

District: Miami-Dade City/State _____

Judge's Name _____ Date _____

The poster 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"

Framed (plastic or metal)

The maximum number of points for a poster is 100.

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



TECHNOLOGY CHALLENGE RULES SECME/INTERNET SCIENCE AND TECHNOLOGY FAIR (ISTF)

<http://istf.ucf.edu>

The **University of Central Florida (UCF)** has teamed with the SECME Program to bring their Internet Science and Technology Fair (ISTF) to SECME students in grades 6-12.

□ The **Internet Science and Technology Fair (ISTF)** competition is a national technology literacy program that enables student teams--from the elementary to high school level--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.

□ SECME and the ISTF are working together to challenge SECME student teams to participate in the ISTF competition and the highest scoring teams will be acknowledged at the SECME National competition each summer.

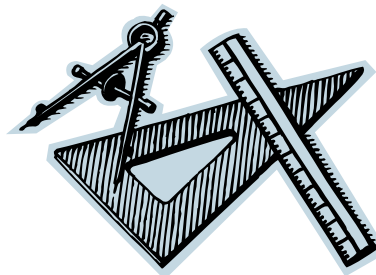
□ SECME/ISTF student teams will be submitted to the SECME National Office and a SECME/ISTF National Middle School and High School Student Team will be selected. National SECME/ISTF winners **will not** attend the National Student Competition Finals. They will receive awards and be recognized as **NATIONAL SECME/ISTF Winners**.

SECME scheduled a series of ISTF orientations during the month of September and we hope you have participated in at least one of them. This information was also presented at the SECME workshop in September. Please visit the ISTF website for all official ISTF competition details and schedules.

<http://istf.ucf.edu>

MATHEMATICS CHALLENGE RULES

(Middle and Senior High School)



Time: 1 hour

Each school may enter one (1) team consisting of four (4) students in the Mathematics Challenge. **There will be separate competitions for middle and high school students.**

This is a team competition that will require students to work cooperatively to complete a comprehensive task.

CONTEST RULES:

1. Each student will be asked to read, comprehend, and analyze scenarios to solve problems. They will then discuss their findings among the team members.
2. The following skills may be involved: following directions, management of information, using different units, comparing and combining information, determining or eliminating data, constructing graphs, data tables, and charts, calculating essential data, and creating model representations.
3. Teams should be prepared to respond to scenarios using knowledge and procedures from various mathematics courses (**Middle School**: Algebra, Geometry; **High School**: Algebra, Geometry, and Pre-calculus).
4. Teams will be asked to make connections across the disciplines and identify real-world connections.
5. Teams will also be asked to provide justifications or explanations at various points.

MATHEMATICS CHALLENGE
(Evaluation Worksheet)

Check one: ___ Middle School (grade 6-8) ___ High School (grade 9-12)

School Name: _____

Student Name: _____ Grade: _____ Age: _____

Student Name: _____ Grade: _____ Age: _____

Student Name: _____ Grade: _____ Age: _____

Student Name: _____ Grade: _____ Age: _____

EVALUATION CATEGORIES:

Points

Correct Calculations _____

Logical Explanations _____

Graphs, Data Tables, Charts _____

Real World and Curriculum Connections _____

Model Drawing/Construction _____

TOTAL POINTS: (maximum score will be 100): _____

NOTE: Decisions of the judges are final.

MATHEMATICS CHALLENGE

Elementary School

General Rules

1. There will be one team per school. Each team will have four (4) students, including one captain per team.
2. The team will solve one problem at a time.
3. If any manipulatives or calculators are to be used, they will be provided. The problem may be solved using a variety of strategies such as: make a table or chart, use objects, work backwards, create a diagram, use arithmetic, etc.
4. Team members will work together to solve the problem.
5. Each time the team has solved its problem, members will write the solution and the school's name on the answer sheet provided. The team captain will hold up the answer sheet for the judges to collect.
6. The judges will score the solution, and points will be given for correct responses.
7. First, second, and third place will be determined according to the total number of points each team has accumulated.
8. In case of a tie, first, second, and third place will be selected according to the earliest completion time.

WATER-ROCKET VEHICLE COMPETITION RULES

The Mission:

The mission is to design a Water-Rocket Vehicle capable of reaching the highest altitude, possible given specific launch criteria.

While promoting Space Propulsion Awareness, the Water Bottle Rocket Competition serves to familiarize students with the basic principles of rocketry, design engineering, and manufacturing engineering. Students will design and manufacture a water rocket using a 2-Liter bottle as the pressure vessel. The rocket must be capable of launching from the SECME Water Rocket Launcher given specific launch criteria. Additionally, each team will develop a patch design, technical report, and technical drawing. The team's complete success will not solely be judged on rocket performance, but the combined effort of the team. **MISSION SUCCESS and Safe Flying !!**

Design and Contest Rules:

1. Each design team must consist of three (3) students.
2. On the day of the competition the following must be submitted:
 - ✓ **Pre -registered completed entry form**
 - ✓ **Operating Rocket (meeting specifications)**
 - ✓ **Patch Design**
 - ✓ **Technical Drawing**
 - ✓ **Technical Paper**

Note: At the competition, each 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.

3. An overall winner will be judged, upon the following criteria (based on 100%):
 - **Hang Time of Rocket** 45%
 - **Patch Design** 15%
 - **Technical Paper** 25%
 - **Technical Drawing** 15%
4. The rocket will be launched at an angle of approximately a **90 degree** using **355 ml (milliliters)** of water and 70 psi of air pressure. The "hang time" of the rocket will be measured using a stopwatch.
5. The "hang time" is defined as the time from the point when the **rocket leaves the launch pad until the time it reaches the ground or strikes an object.** This measurement will be recorded by at least three qualified judges, with the average "hang time" used to determine the final score.
6. The final score for hang time will be calculated based on the maximum hang time recorded during the competition, using the following formula:

$$\frac{\text{average hang time (sec)}}{\text{MAX hang time}} \times 100$$

2009 DISTRICT SECME FESTIVAL AND OLYMPIAD COMPETITION RULES
“SECME: Thinking Out of the Box”

Construction and Operation Requirements continued:

1. The pressure vessel must be ONE (1) clear plastic, 2-liter bottle (i.e., no colored/tinted bottles allowed for the pressure vessel), see Diagram 1.
2. Water and air pressure will be the sole source of propellant. At check-in, the water volume (**355ml**) will be measured and placed in the rocket fuel chamber.
3. **Metal, glass, hard plastic, rocks, Styrofoam, or spikes cannot be used to construct the rocket. Use of these materials will automatically disqualify the team from the competition.**
4. On the bottom of the rocket, 7.5 cm from the throat of the exit plane must be clear of any coverage (paint, markings, drawings, etc.). See Diagram 1.
5. The maximum allowed total height of the rocket is 76.0 cm. See Diagram 1.
6. The nose-cone tip must have a minimum radius of 1.5 cm. See Diagram 2.
7. The fins may extend to the throat exit plane. See Diagram 1.
Note: No forward-swept type of fins are 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 the center of the bottle axis), see Diagram 3.
9. The use of parachutes is NOT allowed.

PATCH DESIGN CRITERIA:

What is a Patch?

A symbolic picture that is a creative display that reflects dedication and the mission of the team

1. Patch designs must be submitted on a 13” x 13” poster board.
2. All entries must contain the team name, crew members’ names, and follow the theme of this year’s SECME competition: **SECME: Thinking Out of the Box.**
3. Patches must be hand-made original work prepared and submitted by the SECME School Team who will be participating in the Water-Rocket Design Competition.
4. Ink pencils, markers, or paint may be used.
5. A short (less than one-page) explanation of the symbols of the patch should be included on the back of the patch.
6. Participating teams must be prepared to display their patches prior to the launch of their rockets.
7. Each entry is to be submitted by the mission captain along with the rocket at the time of check-in. A patch should be clipped to the outside of the bag containing the rocket.

At the competition, the patch will be judged on:

Originality
Creativity
Appearance
Content

WATER-ROCKET VEHICLE TECHNICAL REPORT

(Middle and Senior Only)

As a part of the Water Rocket Competition, the team is required to write a Technical Report describing the design, construction and operation of the Water Rocket. Numbers **1, 2, 3, 4, 5, 7, and 8** are required to be presented together within a maximum of 8 pages. Add pages as appropriate for numbers **6, 9, and 10**. Drawings, sketches, and tables may be included in appendix.

1. COVER PAGE:

- Title of Technical Report
- Name and grade of team members
- The team's school name
- Teacher / Counselor
- Date

2. ABSTRACT: (10 POINTS)

- One half to one page summary of Technical Report

3. TABLE OF CONTENTS

4. INTRODUCTION

5. DESIGN BACKGROUND (15 POINTS)

6. CALCULATIONS: (40 POINTS)

- Table of equations and constants
- High Time Assumptions
- Mass flow rate calculations
- Drag calculations
- Final time aloft in seconds
- (Calculations will be scored on units, assumptions, accuracy, etc..)

7. CONCLUSIONS / RECOMMENDATIONS (20 POINTS)

8. ACKNOWLEDGMENT / REFERENCES

9. APPENDIX

Paper Structure (5 Points)

Grammar (10 Points)

THE MAXIMUM NUMBER OF POINTS IS 100.

Diagram 1

Rocket Identification

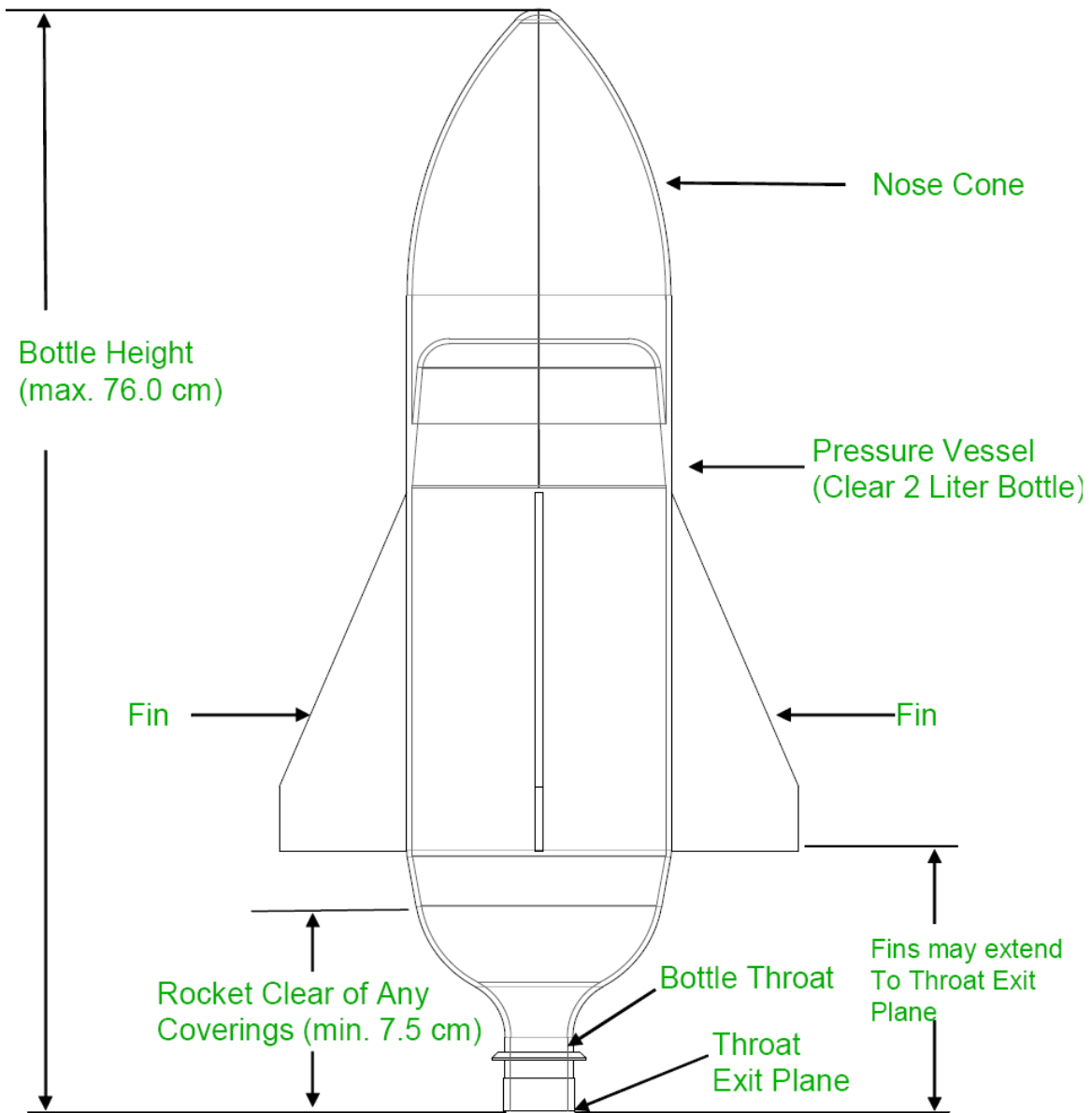


Diagram 2

Nose Cone Diagram

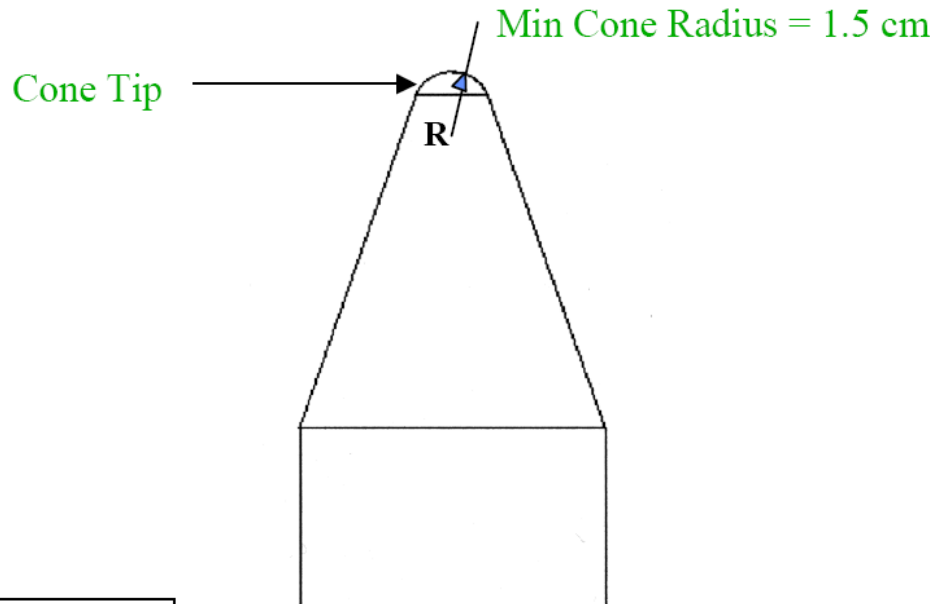
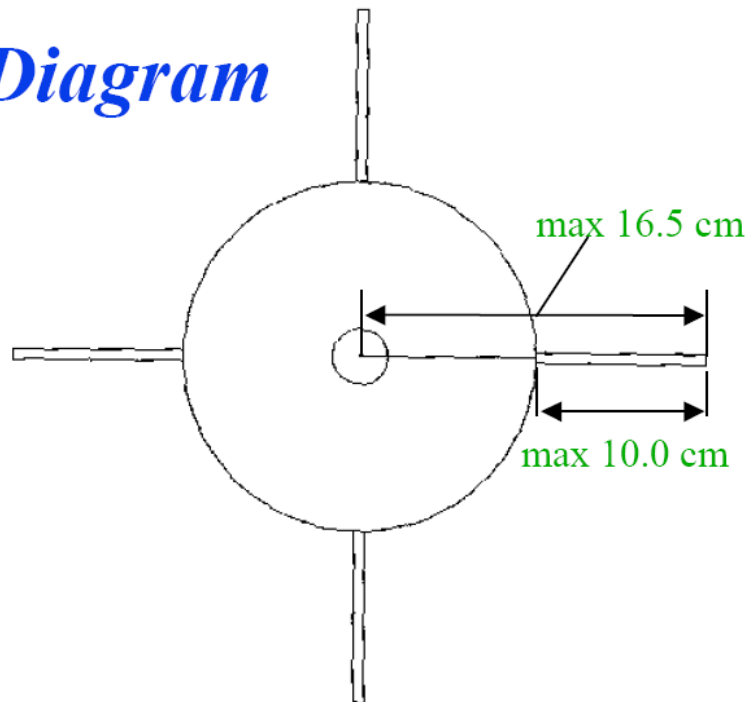


Diagram 3

Fin Diagram



2009 SECME WATER ROCKET TECHNICAL REPORT

Evaluation Sheet (Middle and Senior High School Only)

Please check: ___ Middle (grades 6-8) ___ Senior High (grades 9-12)

School name: _____

Team name: _____

Coordinator's name: _____

The maximum points for the Water Rocket Technical Report are 100.

EVALUATION CATEGORIES: **POINTS:**

Abstract (1-10 points) _____

Design Background (1-15 points) _____

Paper Structure (1-5 points) _____

Calculations (1-40 points) _____

Conclusion/Recommandations (1-20 points) _____

Grammar and Internal and External Citations for all references.

All middle and high schools should use a standard MLA or APA style for all references(1-10 points) _____

TOTAL _____

(ATTACH TECHNICAL REPORT TO EVALUATION SHEET)

**2009 SECME WATER ROCKET TECHNICAL DRAWING
Evaluation Sheet
(Middle and Senior High School Only)**

Please check: _____ Middle School _____ High School

School name: _____

Team name: _____

Coordinator's name: _____

**NOTE: Drawing requirements are 22" x 34" or 34" x 36" size paper.
The maximum points for the Water Rocket Technical Drawing are 100.**

EVALUATION CATEGORIES:	POINTS:
Paper size (1-5 points)	_____
Resemblance (between the actual drawing and rocket) (1-45 points)	_____
Scale (1-20 points)	_____
Naming/labeling of all parts used (1-10 points)	_____
Appearance/Neatness (1-20 points)	_____
TOTAL	_____

(ATTACH TECHNICAL DRAWING TO EVALUATION SHEET)

WATER-ROCKET VEHICLE COMPETITION (Vehicle Patch Design Evaluation Worksheet)

Check one: ___ Elementary (grades 3 - 5) ___ Middle (grades 6-8) ___ Senior High (grades 9-12)

Team Name: _____ School Name: _____

Date: _____

Student Name (Mission Captain): _____ Grade: _____ Age: _____

Student Name: _____ Grade: _____ Age: _____

Student Name: _____ Grade: _____ Age: _____

Judge's Name: _____ Date: _____

The maximum points for the Water-Rocket Vehicle Patch Design is 100. Please score each of the following five categories as indicated.

EVALUATION CATEGORIES:

Points

- | | | |
|------|---|----------------|
| I. | Originality
The innovation of the patch design (1 to 30 points) | _____ |
| II. | Creativity
The uniqueness of the information depicted
(1 to 30 points) | _____
_____ |
| III. | Appearance
The attractiveness and neatness
of the presentation. (1 to 20 points) | _____ |
| IV. | Content
Representation of the team's name,
crew members' names
and SECME theme. (1 to 20 points) | _____ |

TOTAL POINTS (Highest possible score is 100): _____

NOTE: Decisions of the judges are final.

Water Rocket Vehicle Competition Construction and Operation Evaluation Worksheet

Check one: ___Elementary (grades 3 - 5) ___Middle (grades 6-8) ___ Senior High (grades 9-12)

Team Name: _____ School Name: _____

Date: _____

Student Name (Mission Captain): _____ Grade: _____ Age: _____

Student Name (Crew Member): _____ Grade: _____ Age: _____

Student Name (Crew Member): _____ Grade: _____ Age: _____

Judge's Name: _____ Date: _____

EVALUATION CATEGORIES:

Measurement

Overall Height: 76.0 cm or less _____

Fin-Width Distance: 10.0 cm _____

Nose-Cone Tip Radius: 1.5 cm or greater _____

Throat-Exit Clearance: 7.5 cm or greater _____

SCORING:

HANG TIME (Seconds)

JUDGE 1 _____

JUDGE 2 _____

JUDGE 3 _____

AVERAGE HANG TIME (Seconds) _____

$$\frac{\text{average hang time (sec)}}{\text{MAX hang time}} \times 100$$

MAX hang time

2009 SECME WATER ROCKET COMPETITION

Overall Evaluation Sheet

Please check: _____ Elementary School _____ Middle School _____ High
School _____

School name: _____

Team name: _____

Coordinator's name: _____

Student name: _____

Student name: _____

Student name: _____

EVALUATION CATEGORIES:

Hang Time of Rocket (45%) _____

Patch Design (15%) _____

Technical Report (25%) _____

Technical Drawing (15%) _____

Total Score _____

Rank _____

The Yaeger Foundation, Inc.

Bionic / Robotic Hand Kit Competition (An exposition event at the Miami-Dade District SECME Olympiad)

Middle and High School only (grades 6-12)

THE CHALLENGE - Your team will act as founders of a new biomedical company that is pursuing a large U. S. Government prosthetics contract. To win the contract, your company must redesign the Mark I, an existing electric bionic hand. You will be provided with the parts and instructions to build the Mark I. Your team must find ways of improving the function and appearance of this "Hand" without exceeding a fixed budget. The team must complete a functioning prototype and presentation.

THE COMPETITION - Your team will compete against other teams by demonstrating re-engineered hands to a panel of judges for final evaluation. Prizes will be awarded in categories such as Product Demonstration and Innovative Engineering.

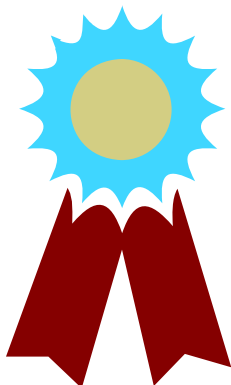
- ✓ **Innovative Engineering** -- This category recognizes the most creative application of engineering and design. Teams that modify and/or add features and functions to the basic hand kit will be eligible for this award.
- ✓ **Effective Presentation** -- Teams that create and deliver the most professional-style presentation will be eligible for this award. This includes use of PowerPoint, visual aids, creative product demonstrations/simulations and video taped/live commercials.
- ✓ **Most Realistic Prosthesis** – This award recognizes the team that applied special attention to cosmetics and motion to produce the most aesthetically refined prosthetic hand prototype.
- ✓ **Product Demonstration** – The functionality of each design is assessed through a series of timed and untimed tests. The student using the prosthesis must be able to hold it with their hand and grasp, manipulate and release a variety of objects.

Teams should prepare a presentation that may involve multimedia. They will also be required to complete a task with their robotic hand.

ELIGIBILITY - Teams of 2 to 4 students, middle and high school (grades 6-12) only.

Schools wishing to participate in this competition should contact The Yaeger Foundation, Inc. at:

telephone: 305-751-4208
by e-mail: IG500@aol.com
Street address: 1177 M. L. King Boulevard, Miami, FL 33150



AWARDS

All participating students will receive certificates. First-, second-, and third place trophies will be awarded for each event at each level (elementary, middle and high school) during the Annual Awards Program held in May. All participating schools will be invited to the ceremony. Additionally, first-, second-, and third-place trophies will be awarded to the overall winning teams at the middle and senior high levels for each school region.



**SECME Student Competition Grievance
Request for Review by Judges**

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 _____

Submit to judges

NATIONAL SECME COMPETITION AND INTERNATIONAL BRIDGE COMPETITION

Each year, selected District Olympiad projects are entered in the **National SECME Competition** and the **International Bridge Competition**. Students are responsible for adhering to the National and International rules, which may vary slightly from the District competition, due to late clarifications and/or changes by the respective competition hosts.

NATIONAL SECME COMPETITION

The following event winners are eligible for National competition:

- **Mousetrap Car**
- **Poster** (Elementary only)
- **Essay** (Elementary only)

Although three (3) projects are sent to the National Student Competition, held this year at Embry Riddle University in Daytona Beach, Florida, **only the students on the winning mousetrap car teams (middle and senior high school)** are invited to travel to the competition and participate in the student program, **June 25 – 28, 2009**. The District and the National SECME offices provide travel, housing, and meal expenses for the students and a teacher chaperone for each team; district funding permitting.

Should the winning mousetrap car team DECLINE participation in the national competition, notification of such action MUST reach the District SECME office prior to April 12, 2009. It is important that each winning school understand that last minute cancellations will cause a financial loss for the school system and would deprive a fellow school of representing the district at the national competition.

(Note: First place Poster and Essay winners are identified prior to the National Mousetrap Competition, and will be invited to the National Student Program, all expenses paid, to accept their awards).

INTERNATIONAL BRIDGE COMPETITION

Two (2) **individual*** Bridge competition winners, from first – second place, will be invited to represent Miami-Dade County Public Schools in the **International Bridge Competition** held this year on **April 25, 2009** in Bellingham, Washington. Bridge entries will be submitted by mail.

(*Please note: The International Bridge Competition is an individual event and not a team competition, therefore only 1 student from the winning teams will compete at the International competition)

******For additional information on the National SECME Competitions, go to: www.secme.org and click on 2008 – 2009 National Guidelines

ANTI-DISCRIMINATION POLICY

Federal and State Laws

The School Board of Miami-Dade County, Florida adheres to a policy of nondiscrimination in employment and educational programs/activities and strives affirmatively to provide equal opportunity for all as required by law:

Title VI of the Civil Rights Act of 1964 - prohibits discrimination on the basis of race, color, religion, or national origin.

Title VII of the Civil Rights Act of 1964, as amended - prohibits discrimination in employment on the basis of race, color, religion, gender, or national origin.

Title IX of the Educational Amendments of 1972 - prohibits discrimination on the basis of gender.

Age Discrimination in Employment Act of 1967 (ADEA), as amended - prohibits discrimination on the basis of age with respect to individuals who are at least 40.

The Equal Pay Act of 1963, as amended - prohibits gender discrimination in payment of wages to women and men performing substantially equal work in the same establishment.

Section 504 of the Rehabilitation Act of 1973 - prohibits discrimination against the disabled.

Americans with Disabilities Act of 1990 (ADA) - prohibits discrimination against individuals with disabilities in employment, public service, public accommodations and telecommunications.

The Family and Medical Leave Act of 1993 (FMLA) - requires covered employers to provide up to 12 weeks of unpaid, job-protected leave to "eligible" employees for certain family and medical reasons.

The Pregnancy Discrimination Act of 1978 - prohibits discrimination in employment on the basis of pregnancy, childbirth, or related medical conditions.

Florida Educational Equity Act (FEEA) - prohibits discrimination on the basis of race, gender, national origin, marital status, or handicap against a student or employee.

Florida Civil Rights Act of 1992 - secures for all individuals within the state freedom from discrimination because of race, color, religion, sex, national origin, age, handicap, or marital status.

Veterans are provided re-employment rights in accordance with P.L. 93-508 (Federal Law) and Section 295.07 (Florida Statutes), which stipulates categorical preferences for employment.

Revised 9/2008