Southeast Florida SECME Alliance

2024-2025 Survival Guide

for All Levels

Diversity in STEM Education

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COX SCIENCE CENTER AND AQUARIUM

Southeast Florida SECME Alliance

SECME 2024-2025

RULES MANUAL AND SURVIVAL GUIDE

The 2024-2025 Southeast Florida SECME Alliance Rules Manual and Survival Guide was written in an effort to better prepare local programs to offer their students the best possible SECME experience. Included in this manual are updated rules for District Competitions, how to start a SECME club, and a complete section of competition forms. Additionally, readers will find helpful hints on how to develop exciting programs at the school level.

Southeast Florida SECME Alliance Rules Committee

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Table of Contents

SECME Overview

SECME is a strategic alliance to renew and strengthen the professional capacity of K-12 educators, motivate and mentor students, and empower parents so that all students can learn and achieve at higher levels.

Our Mission

To increase the pool of historically underrepresented and under-served students who will be prepared to enter and complete post-secondary studies in science, technology, engineering and mathematics (STEM); thus creating a diverse and globally competitive workforce.

Profile

SECME, Inc., a premier pre-college (K-12) alliance, links engineering universities, school systems, and corporate/government investors. Its mission is 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, mathematics, engineering, and technology.

SECME was established in 1975 by the Engineering Deans at seven Southeastern universities: Alabama, Florida, Georgia Tech, South Carolina, Tennessee, Tennessee State, and Tuskegee. Today that alliance extends to schools, universities, science- and technology-based business and industry, and public and private agencies in 17 states (from New York to Arizona), the District of Columbia, and Grand Bahamas.

For its first 22 years, SECME was an acronym for Southeastern Consortium for Minorities in Engineering. In 1997, the name was changed to SECME, Inc. SECME is chartered in the State of Georgia as a nonprofit, 501(c) (3) corporation. From the beginning, its National Office and administrative home has been in the College of Engineering at the Georgia Institute of Technology in midtown Atlanta. SECME now commonly refers to Science, Engineering, Communication, Mathematics and Enrichment.

In creating SECME, the founding deans acted to address two urgent--and enduring--national challenges: 1) declining engineering enrollments on campuses across the U.S., and 2) growing evidence of shortfalls in technical talent to sustain an economy--and global leadership position--increasingly dependent on technology and innovation as primary engines of growth. Their solution was to tap new talent in two highly under-represented groups (at less than 1 percent each) in the engineering profession--namely, minorities and women.

Thus SECME began as a collaborative effort of school districts, universities with engineering programs, business and industry, and government. The noble dream and determined pursuit of the founders was excellence and equity as well as a needed change in K-12 education. The school-university partnership was the defining element in the original SECME *framework.* That model is, very intentionally, teacher-centered. By impacting teachers, all students benefit.

Our Vision

To be a beacon and benchmark for excellence and equity in pre-college education.

Southeast Florida SECME Alliance

SECME 2024-2025
Rules Manual and Survival Guide

General Instructions

To participate in any level of competition, schools must be registered with the SECME National Office and must be in good standing. A school will be considered in good standing if the school has submitted its longitudinal data for the current year, any applicable final grant reports for the previous school year, and End-of-Year Summary report for previous school year to the District Program Director and to SECME's National Office.

To compete at the District level each school must enter the following competitions: Essay/Poem, Mousetrap Car Design, Water Bottle Rocket and Banner. However, schools are encouraged to participate in all scheduled events in order to increase their chances of winning the overall championship.

To compete in the Bridge competition, Mousetrap car competition, Generator competition, and Water Bottle Rocket competition, a team must submit all parts of the design competition. See below for a listing of the required submissions for each competition:
Mousetrap Car: Engineering notebook, presentation, 3 photos of the MTC showing top, side and front views
Water Bottle Rocket: Engineering notebook, presentation
Bridge: Technical report, technical drawing (secondary only)
Generator: Technical report, technical drawing (secondary only)

Directors, Industry Partners, Coordinators, Students and Parents are advised to check the **SECME** website often throughout the year in order to receive rule and policy changes, themes, and general information that may occur after the publication of the Survival Guide.

The schools placing 1st, 2nd & 3rd in the events offered at each level will earn participation points. Overall competition winners will be selected at all three levels of competition-- elementary, middle and high school. Elementary school students will compete only with other elementary school students. Middle school students will compete only with other middle school students. High school students will compete only with other high school students.

Each school entering the DISTRICT level Olympiad may enter a maximum of two (2) design teams per engineering event. Each design team will consist of two to four students and may enter a bridge, a mousetrap car, a generator and a water rocket competition. The BrainBowl Reloaded competition consists of four students.

Note: Only extenuating circumstances may allow changes in the composition of a team for Bridge/Truss, Mousetrap Car, and Water Rocket competitions.

Additionally, each school may enter one (1) Essay (or Poem for elementary level only), and one (1) Brain Bowl Team. The Banner, Essay/Poem, Mousetrap Car, Water Bottle Rocket competitions are required events for all.

All school Mousetrap Car teams are required to complete the Mousetrap Car construction and run, an Engineering notebook and presentation and three (3) photographs showing different views of the car.

Essay/Poem Competitions are individual competitions and will be judged as such. **Elementary and secondary first place essays are submitted to the National SECME competition.**

Each pre-designed project (Mousetrap Car, Bridge, Generator Build and Rocket) should be packaged separately and will be checked-in at the competition. The packaging must be sufficient to protect the project during normal handling and transport. Each package **must** be labeled with the following information:

- **Team name**
- **Date of competition**

Notes:

- **Projects that do not meet the design qualifications will not be judged, however, they may be run, crushed or launched (at the judges discretion)**
- **Only a design team member can represent that team's projects. Other team members may watch the competitions from the spectator area or virtually (if available).**
- **If a member is responsible for another simultaneous competition, a substitute from that design team must be available.**

Eligible First Place projects from the District Olympiads will represent Palm Beach County and Broward County at the National SECME Competition.

Getting Started

Initiating a SECME program at your school can be one of the most rewarding experiences of your educational career. When starting a SECME program, one of the first questions that comes to mind is "How Do I Get Started?" Here are a few ideas that may be of assistance as you are planning your school's SECME program.

1. If your school has had an established SECME program in the past, check with your administration and/or the previous SECME coordinator to see if a **SECME Implementation Plan** exists for your school. This plan will provide you with such items as SECME program goals, objectives, rationale, recruiting strategies, and past SECME activities. After reading through this plan, you will identify items that need to be updated, added or deleted to make the plan more relevant to the program you wish to implement.

   If this is the first year for SECME at your school, you will have the opportunity to begin building from the ground up. This is a rewarding and exciting venture. You may wish to meet with coordinators from other SECME schools inside and outside of your area to review their SECME Implementation Plans. This will provide you with ideas of proven successful program activities.

   A successful SECME program is one that meets the needs of students on a variety of academic levels. Through SECME competitions, students are trained in scientific and research methodologies, are exposed to state-of-the-art technology inside and outside of the classroom, and solve real-world engineering problems. However, SECME is much more than engineering design competitions. SECME provides students with the opportunity to develop a comprehensive educational plan designed to prepare students to be successful in science, mathematics, engineering, and technology educational programs through college and into their selected professions. Thus it is important to plan a program that will provide students with the following experiences:
   - Career and occupational orientations
   - College and university visitations
   - Mentoring and internship programs with local industries
   - Problem-solving strategies and higher-level thinking skills
   - Comprehensive test preparation for exams i.e., FSA, PSAT, SAT and ACT exams

By addressing all of these educational needs, your SECME program will be the stepping stone your students will need to successfully make tracks in the 21st century.

2. Read carefully through this guide (the Southeast Florida SECME Alliance SECME Rules and Survival Guide). This document will give you a basic outline of program activities and competitions, important dates and deadlines, scholarship opportunities, and a plethora of other valuable information you will need to establish your program.

a) Select three, four or more staff members from your school to serve on the SECME team. These staff members might include a math teacher, a science teacher, a technology teacher, a guidance counselor, an art teacher and/or an assistant principal. This SECME team led by the SECME coordinator will work together to develop and carry out the SECME program plan.

b) After the SECME team establishes the annual SECME activities and meeting calendar, the coordinator is encouraged to begin advertising the program. This is generally best accomplished via public address announcements, posters, flyers to teachers and students, classroom visits, etc. All advertising materials need to include the date, time and location of the first SECME meeting of the year.

c) It is recommended that the first meeting include both parents and students and should be a general orientation and registration meeting. A sample agenda for this meeting might include:

- Overview of the SECME program (brochure)
- Philosophy and rationale
- Goals and objectives
- Calendar of events and schedule of club meetings
- Competitions and contests
- Membership requirements
- Introduction to the Southeast Florida SECME Alliance Survival Guide
- Distribution and collection of completed student membership application forms
- Refreshments

d) Following the first general meeting, you should continue to advertise the program. The core group of students who attended the first general meeting and are involved in the program, will establish duties of club officers and schedule meetings for campaign speeches and elections.

e) Begin building a database of SECME members inputting the member applications collected at your first meeting into your favorite computer file or word processing program.

f) Once you have determined the competitions in which your club will participate, you must begin gathering the materials and supplies your students will need to get started. It is not necessary to supply students with everything they need. Allow students to be creative in the designs and in the materials they use. They will collect some of the needed materials on their own. For example, when building the mousetrap car, provide the students with one Victor mousetrap. Challenge them to gather household materials and other sources for the materials they need. Don't let them go too long without needed materials. Provide materials they can't locate to avoid frustration.

g) At this point, you should be well on your way to establishing a successful SECME program at your school. Remember, program initiations at each school site will vary. Select the implementation method that best meets the needs of your student population. Here are a few more suggestions:

- Meet at least once weekly or bi-weekly after school
- Include other disciplines in developing projects (English Department when writing essays)
- Offer SECME as a part of your after-school program, if possible
- Combine activities with a SECME school in your area

h) Be sure to attend all district-level coordinator meetings. These meetings will keep you updated on all SECME information and provide additional ideas on how to manage your SECME program. Best wishes for a wonderful *SECMEtized* experience.

(back to top)

SECME Olympiad At-A-Glance

What is the SECME Olympiad?

The Olympiad, the culminating event of the regional SECME year, is a day-long series of competitions. Students put their long months of work to the test—hoping to come out on top. The first place Essay at all levels, first place Mousetrap Car teams (cars for secondary level only travel) and rocket teams go on to compete at the SECME National Competition. At the Olympiad, elementary students compete only with other elementary students, the same holds true for both middle and high school students.

What are the Olympiad events and competitions?

Elementary Level – Required Events	Secondary Level – Required Events
Mousetrap Car (including Engineering notebook and presentation and three (3) photographs)	Mousetrap Car (including Engineering notebook and presentation and three (3) photographs)
One of the following: Essay, Poem	Essay
Water Rocket (including Engineering notebook and presentation)	Water Rocket (including Engineering notebook and presentation)
Banner	Banner

Elementary Level – Optional Events	Secondary Level – Optional Events
Generator Build	Generator Build (including Technical Report and Technical Drawing)
Balsa Wood Bridge	Balsa Wood Bridge (including Technical Report and Technical Drawing)
BrainBowl Reloaded	BrainBowl Reloaded

(back to top)

What do I submit before the day of the Olympiad?

Essays, poems, engineering notebook presentations, mousetrap car photographs, and banner photographs will be submitted electronically. Coordinators will also submit an electronic version of the Coordinator Competition Agreement and the names of student teams at that time (via online registration).

How do I win the SECME Olympiad?

The more competitions your SECME team participates in, the more points your team could accrue, and therefore more likely your team will place overall. Points are earned for placing first, second, or third in each competition as follows:

- First Place = 3 points
- Second Place = 2 points
- Third Place = 1 point

The team with the most accumulated points after all competitions wins SECME Overall County Champion. In the event of a tie, judges will adhere to the tiebreakers listed in the Survival Guide.

Notes:

- **Should your school fail to participate in any required event, your team will be unable to place in the Overall Category.**
- **Should your school fail to submit any of the criteria, the team is ineligible to compete in that event.**
- **Schools are required to participate in the four required events in order to participate in any one event.**

What are my responsibilities at the Olympiad?

Coordinators have a busy day at SECME Olympiad; therefore, it is highly recommended that you enlist the assistance of at least one volunteer. Coordinator duties include:

- Registration and check-in of all projects (electronically)
- On site drop-off of design builds per instructions on day of competition.
- Ensuring that student teams arrive at the prescribed time for all competitions.
- Maintaining a positive attitude of good sportsmanship.

(back to top)

Responsibilities of SECME School Coordinators 2024-2025 SCHOOL YEAR

- Form an after-school SECME club or incorporate SECME activities into existing curriculum.
- Prepare students for SSA/EOCs using SECME activities.
- Have students develop and maintain portfolios (optional).
- Obtain guest speakers/role models to serve as mentors for students.
- Provide opportunities for students to learn about careers in science, technology, engineering, and mathematics (STEM).
- Provide opportunities for parental involvement.
- Market your school's SECME program.
- Coordinate opportunities for student participation in SECME and non-SECME competitions and other hands-on activities (e.g., science/math fair, robotics, etc).
- Attend regularly scheduled SECME coordinator meetings and design seminars.
- Prepare a team of students to participate in the SECME District Olympiad. Arrange transportation for students to and from Olympiad. Chaperone students during the Olympiad for the entire day.
- Submit appropriate forms and reports (e.g. online registration, End-of-Year Report, student surveys) to the SECME National Office.
- Submit appropriate forms and reports (e.g. Membership Form, Implementation Plan with activity calendar and club attendance, Olympiad Registration Form) to the SECME District Coordinator.
- Share information about scholarship opportunities with all SECME students (high school coordinators only).

First semester stipend eligibility is contingent upon:

1) Submission of SECME Implementation Plan by Friday, December 6, 2024.
2) Registration of your school's SECME program with the SECME National Office by Friday, December 6, 2024.
3) Submission of first semester student attendance, including indications for collection of completed school permission slips and District photo release for all SECME members via shared document on Google Drive by Friday December 6, 2024.
4) Submission of required Olympiad online registration via upload of all required paperwork/materials by January 28, 2025 (Elementary only) or February 4, 2025 (Middle & High only).

Note: Coordinators earn one-quarter (25%) of the first semester stipend for meeting each of the above criteria.

Second semester stipend eligibility is contingent upon:

1) Olympiad participation by school coordinator and school SECME team, including full participation in all required events as described in the FY25 SECME Survival Guide.
2) Submission of the Coordinator End-of-Year Report to the SECME National Office by Friday, April 25, 2025.
3) Submission of second semester student attendance including all student information on template, updated via Google Drive by Friday, April 25, 2025.
4) Attend all four SECME coordinators' meetings. If the coordinator cannot attend, another representative from the school must attend.

Note: Coordinators earn one-quarter (25%) of the second semester stipend for meeting each of the above criteria.

(back to top)

SECME Implementation Plan FY25

Use the outline below as a basis for your SECME Implementation Plan. Plan for approximately one paragraph per bullet. Please keep a copy for your records.

School Name	School Number	Phone or PX

SECME School Coordinator Name	Email
Co-Coordinator Name	Email

I. Overview

- Describe school demographics (name, grade levels, location, etc.).
- Give a brief history of school's SECME program.

II. Who

- List district contacts (name/email/phone):
  - i. SECME coordinator(s)
  - ii. Program Director
  - iii. University Partner
- List school contacts (name/role):
  - i. Faculty Team Members
  - ii. Student Members
  - iii. Parent/Community Volunteers

III. What

- Explain your school's SECME program goals and how district SECME can help you meet them (non-measurable, timeless, directional, broad, etc.).
- Explain your school's SECME program objectives and how district SECME can help you meet them (measurable, specific, student outcomes, etc.).

IV. When

- Describe when and how often you intend to host your SECME program.
- Give a projected timeline/calendar of events.

V. Where

- Describe intended activities for your SECME program (i.e. career counseling, field trips, club activities, guest speakers, standardized test prep, interdisciplinary, etc.).
- Describe the competitions you intend your students to enter (i.e. science fairs, engineering/math competitions, SECME Olympiad, etc.).

VI. How

- Describe your student recruitment plan in terms of marketing, retaining members, targeting under-represented students, etc.
- Describe your parent engagement plan in terms of marketing, involvement, etc.
- Identify local organizations that can provide support to your school's SECME program (business/industry partners, university partners, professional organizations, internships, community organizations, etc.).
- Give a brief description of anticipated needed supplies, budget, and funding opportunities.

(back to top)

SECME Student Membership 2024-2025

Student Last Name	**Student First Name**	
Student ID#	**Grade Level**	**Age**
Homeroom Teacher	**Ethnic Background**	**Gender**
Home Phone	**Email**	
Home Address		
City and Zip Code		
Parent/Guardian Name	**Emergency Contact**	**Emergency Phone**

1) Please explain if you have any previous SECME experience.

2) Please list your current math and science courses:

3) Will you attend SECME competitions on Saturdays? ____ YES ____ NO _____ SOMETIMES

4) Will you be able to stay after school to prepare for the competition on a day other than the regular SECME club meeting day? ____ YES ____ NO

5) Is your parent/guardian willing to serve as a chaperon and/or volunteer for SECME events?

"In consideration for being allowed to participate in the SECME program, I/we, for my/our heirs, executors and administrators, release and forever discharge The School Board of Palm Beach County, Florida, its agents, representatives and employees of all liability, claims, actions, damages, costs or expenses which I/we may have against them arising out of or in any way connected with my child's participation in the SECME program. I/we understand that this waiver includes any claims based on negligence, action or inaction of any of the above named entities and persons."

_____ _____
Student signature date

_____ _____
Parent/Guardian signature date

It is highly recommended by SDPBC that SECME coordinators collect and keep a copy of this form for all student club members.

Palm Beach County Only

Diversity in STEM Education

Photography Liability Release Form Palm Beach County SECME

The undersigned parent/guardian of _____
(print student's name) understands that the student will be attending various SECME events throughout the 2024-2025 school year, which will be held at various locations (including School District of Palm Beach County properties) throughout the year. The student will be participating in the Palm Beach County SECME program which will include school-based meetings, design seminars, Olympiad and similar events. during the 2024-2025 school year.

Release: (PLEASE READ CAREFULLY!)

"For value received and without further considerations, I hereby consent that all photographs and /or video tape images taken of and /or recording made of my voice and/or written extraction, in whole or in part, of such recordings at Palm Beach County SECME events, by Palm Beach County SECME may be used by Palm Beach County SECME and/or others with the consent of Palm Beach County SECME for the purpose of illustration, advertising, or publication in any manner."

O I do hereby give my consent that the above-named student may be filmed, video-taped, recorded or other images for the purposes of Palm Beach County SECME.

O I hereby do not give my consent that the above-named student may be filmed, video-taped, recorded or other images for the purposes of Palm Beach County SECME.

_____	_____	_____
STUDENT SIGNATURE	DATE	SCHOOL
_____	_____	_____
PARENT/GUARDIAN SIGNATURE	DATE	SCHOOL

SECME Coordinators must collect and keep a copy of this paper for all SECME club members.

(back to top)

COMPETITION GUIDELINES & SCORING SHEETS

2024-2025 Theme:

Energy is Everywhere!

(back to top)

ALL LEVELS

DISTRICT

2024-2025 SECME BANNER COMPETITION GUIDELINES

Think of the banner as an advertisement for your school and its SECME club.

Design and Competition Rules

1. Banners must be 70 inches long and 34 inches wide (plus or minus 2 inches) including all embellishments (borders, perimeter decorations, etc.), and must be submitted on quality fabric (cloth or vinyl).

2. All entries must include school name, school mascot, school colors, city, state, current year (2024-2025), and the SECME emblem. Entries missing these items will have points deducted.

3. Banners must be a hand-made work.

4. Banners must be two-dimensional and orientation can be horizontal or vertical.

5. The banners will be scored in the following categories: content, originality, creativity, appearance.

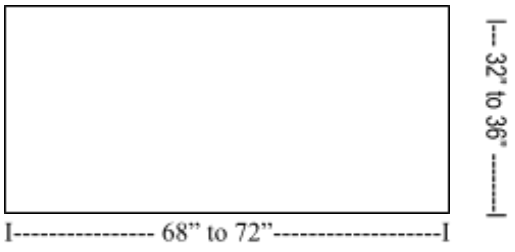
6. In submitting the banner for competition, students are stating that the submission is their own original work.

Note: Any attachments for pole supports will not be included in the measurement of the banner.

Note: The full SECME emblem is:

SECME
Diversity in STEM Education

Note: The manner of presentation:



For specific scoring and judging information, please see the evaluation sheet. Judge's decision is final.

Evaluation Sheet **School Code:_____**

SECME Banner

☐ **Elementary School** ☐ **Middle School** ☐ **High School**

Your School Mascot	Your School Colors

In submitting the banner for competition, students are stating that submission is their own original work.

CATEGORY	Max. Points	Points Earned
REQUIREMENTS		
School name is clearly evident and easily located	3	
Use of school colors is evident	3	
School mascot is clearly evident and easily located	3	
Banner fabric is of quality (cloth or vinyl)	3	
School city and state are clearly evident and easily located	3	
Current year is stated in the banner design	3	
Exact SECME emblem appears on banner – "old" emblem or "new" emblem	5	
includes "INC"	1	
includes "Diversity in STEM Education"	1	
Spelling is correct	3	
Total this category	28	
CONTENT		
Banner appears as a positive "advertisement" for school and its SECME club	6	
Information is depicted as high quality	6	
Information is well organized	6	
SECME theme is clearly evident	6	
Total this category	24	
ORIGINALITY		
Banner design appears to be student-designed and handmade	6	
Banner design is innovative	6	
Ideas are well-presented	6	
Total this category	18	
CREATIVITY		
Information depicted is unique	6	
Demonstrates "out of the box" thinking with design concept	6	
Total this category	12	
APPEARANCE		
Overall banner is visually pleasing	6	
Banner is neat and well-crafted	6	
Objects appear integrated into the entire banner design concept	6	
Total this category	18	

Any banner design deemed inappropriate or using copyrighted designs will be pulled from the competition. *Any banner that does not meet the size requirements listed in the competition rules will be disqualified.*

Please provide constructive, specific feedback: **Total Points earned_____/100**

(back to top)

ALL LEVELS

DISTRICT

2024-2025 SECME BRAIN BOWL-*RELOADED* COMPETITION GUIDELINES

In the Brain Bowl-*Reloaded* Competition, students compete against the clock and each other in a contest filled with STEM-related questions. The questions are generated randomly in the following areas: Science, Mathematics, Engineering, Technology, and selected fields within these areas of study. The questions abide by and follow the Next Generation Sunshine State Standards and the Mathematics Florida Standards for elementary and secondary schools.
Each school may enter one (1) team and each team must consist of a minimum of three (3) to a maximum of four (4) members. One of the members must be designated as the team captain.

A sudden elimination round with teams in a Google Meet will determine who goes on to the final round. Each school team will be invited to a Google Meet at a specific time to compete in a preliminary heat in order to make the Meet manageable. For example, if there are 50 schools that are participating in the BrainBowl, 10 schools will be invited from 8:30 to 9:00, another 10 schools from 9:10 to 9:40 etc.(official times to be announced) During the sudden elimination round, teams will compete against the other teams present during that competition. Individual teams will be in their own break-out room that will be monitored by SECME staff. Teams will have 20 seconds for each question to collaborate with their teammates live on the Google Meet and input an answer. At the end of the 15 question sudden elimination round, the team with the highest score as determined by the Quizizz platform will move on to the main event during the SECME Olympiad.

Participants should know:

- The Brain Bowl is an optional event (your school is not required to compete).
- Disruptive behavior will not be tolerated and may lead to disqualification. The judges' discretion applies.
- All team members must know how to log into a District wifi- or web-enabled device.
- Scores are based upon the fastest and most accurate answers as determined by the Quizizz platform.
- Teams are not able to return to prior questions and alter answer choices.
- The selected platform is Quizizz.com. Coordinators may create a free account to allow for team practice.
- **For both the Sudden Elimination Round and the Final Round, teams may only answer questions based upon their brain power. No adults may assist students with answers during any portion of the competition. Outside assistance from Apple watches, other internet sites, cell phones, electronics, etcetera are not permitted and will result in disqualification. Students are expected to be facing the camera with no other devices in use. If judges suspect any form of cheating by any member of a school team, that team will be disqualified immediately at the judges discretion.**

(back to top)

ALL LEVELS

DISTRICT

2024-2025 SECME BRIDGE COMPETITION GUIDELINES

Materials

Balsa wood **(¼" X ¼" only)** and any type of glue are to be the only materials used.

Design and Competition Requirements

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

1. A design team of three (3) students shall construct the bridge. No more than two teams per school.
2. The bridge must be free standing and stable during inspection and testing or the bridge will be disqualified from competition.
3. Refer to the Bridge Illustration (Diagram 1) for an explanation of dimensions.
4. The bridge **must be built from balsa wood**. Basswood may **not** be used. Balsa wood sticks must be 0.635cm (1/4") by 0.635cm (1/4") in width only. Individual pieces with these dimensions may be glued together to form larger sections to be used in the construction of the bridge. No exposed surface of the bridge may be coated with any substance (i.e., resin, glue, paint, etc.).
5. The total mass of the bridge must not exceed 110 grams in weight.
6. The length of the bridge, including all supports, must be between 40.0cm and 50.0cm.
7. The maximum width of the bridge, including all supports, is 10.0cm.
8. The highest point of the bridge, called the roadway, is measured from the base of the bridge to its tallest point. This distance must be between 10.0cm and 20.0cm in height.
9. The roadway must be of a solid design that will allow a small metal car to roll from one end to the other and be supported along its entire length.
10. The surface of the roadway must have a width of between 4.3cm and 5.2cm.
11. The length of the roadway must be between 30.0cm and 50.0cm.
12. The roadway may have a slight arc, provided the center of the arc is no higher than 2.54 cm (1") above the end points and all parts of the roadway are supported.
13. **Sufficient clearance must be provided at the base of the bridge to allow an object measuring 40.0cm in length by 2.0cm in height to pass freely underneath it.**
14. At no time during the test may the bridge flex to such a point or break in such a way that any part of the bridge becomes a solid support leg directly under the ram. If so, then the test is stopped and the force will be recorded at that point.
15. No fastening method other than the interlock of the balsa wood pieces and /or glue is allowed.
16. The bridge design must allow the testing equipment to easily fit the roadway. See the drawing of the SECME Bridge Tester (Diagram 2).

Judging

Once a bridge has been submitted for competition, no modifications may be made. Please ensure your bridge meets all of the above criteria prior submission to avoid possible disqualification.

Every bridge will be inspected, measured and weighed for compliance with all rules. If all guidelines are satisfied, the bridge will be qualified for competition. Each bridge that qualifies for competition will be tested first.

Note: If, at the discretion of competition staff and there is time available, any bridge which did not pass inspection may be tested if the student wishes. This testing will be only for experience and not for any award.

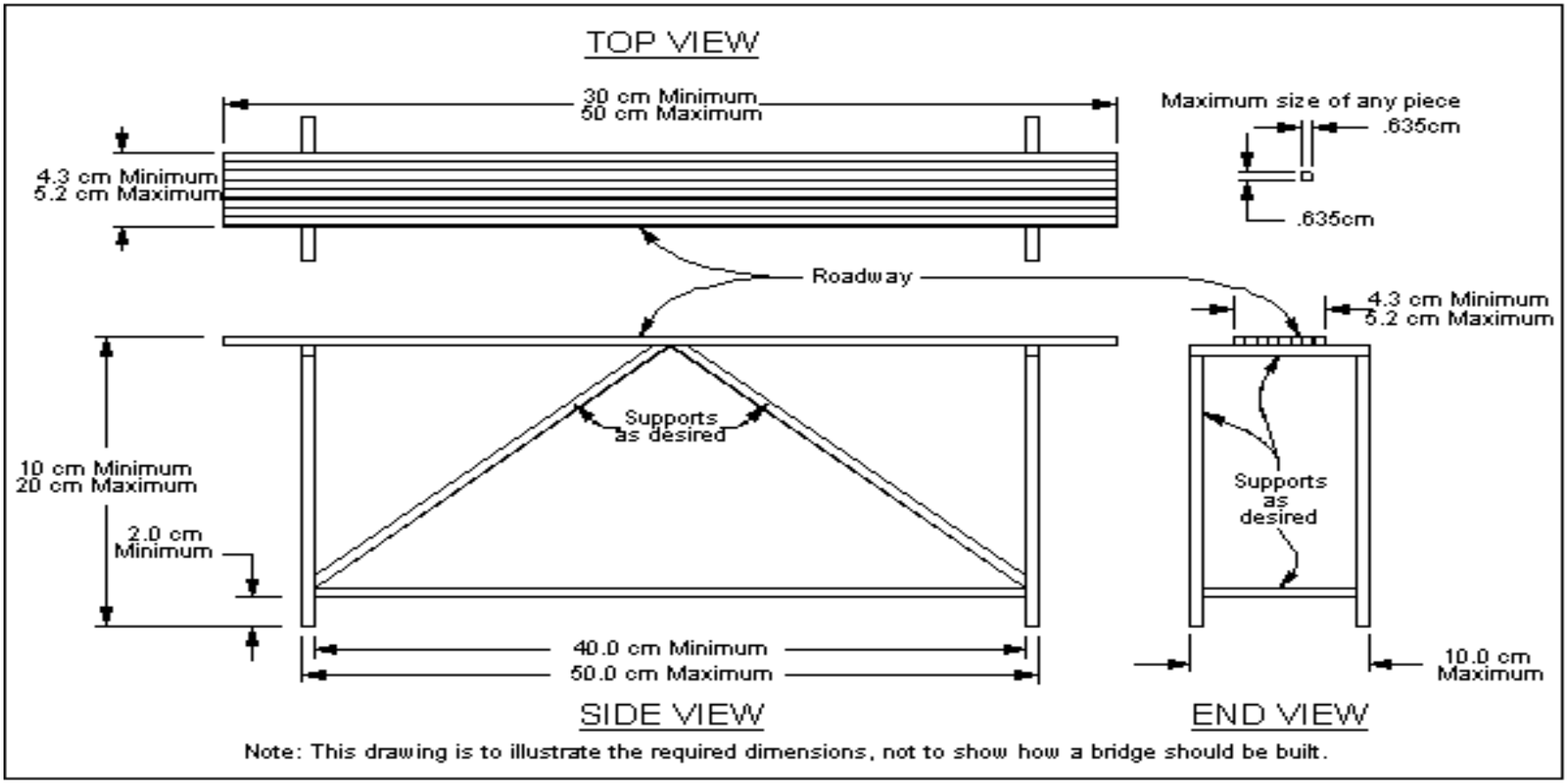
Points are awarded solely on the basis of how much force the bridge holds. No additional points will be awarded for craftsmanship or originality. The decision of the judges will be final.

Every effort will be made to place the bridge on the centerline of the testing device. However, if setting the bridge in place is done by the human eye, missing the center will not be the sole reason for filing a grievance.

Using a SECME testing device, the bridge will be load tested until it fails. The total load will be recorded. The bridge that holds the highest load and has the best score for the technical report and drawing (secondary) will be the winner.

Any bridge that does not break after having the maximum amount of load applied by the testing device will be sawed in half.

For specific scoring and judging information, please see the evaluation sheet. **Judge's decision is final.**



Bridge Illustration

Diagram 2

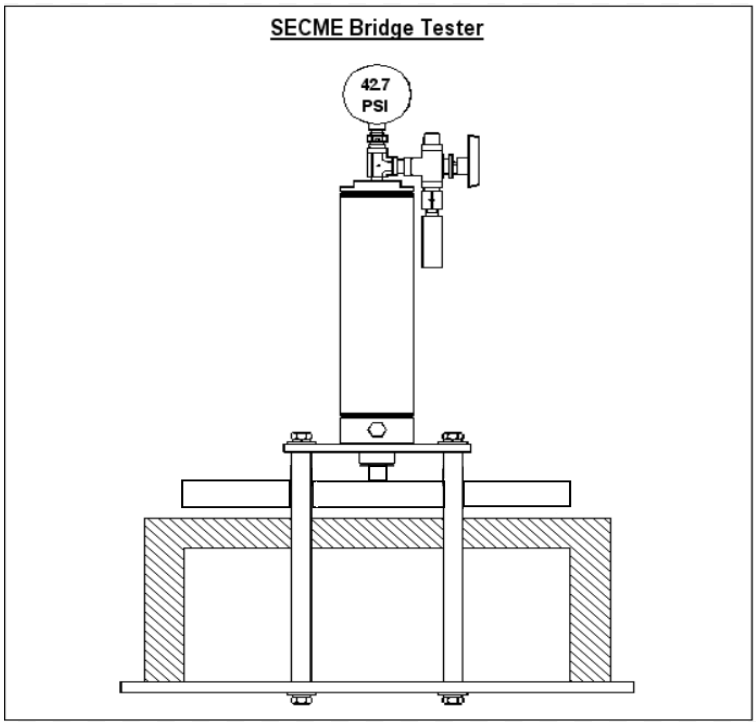
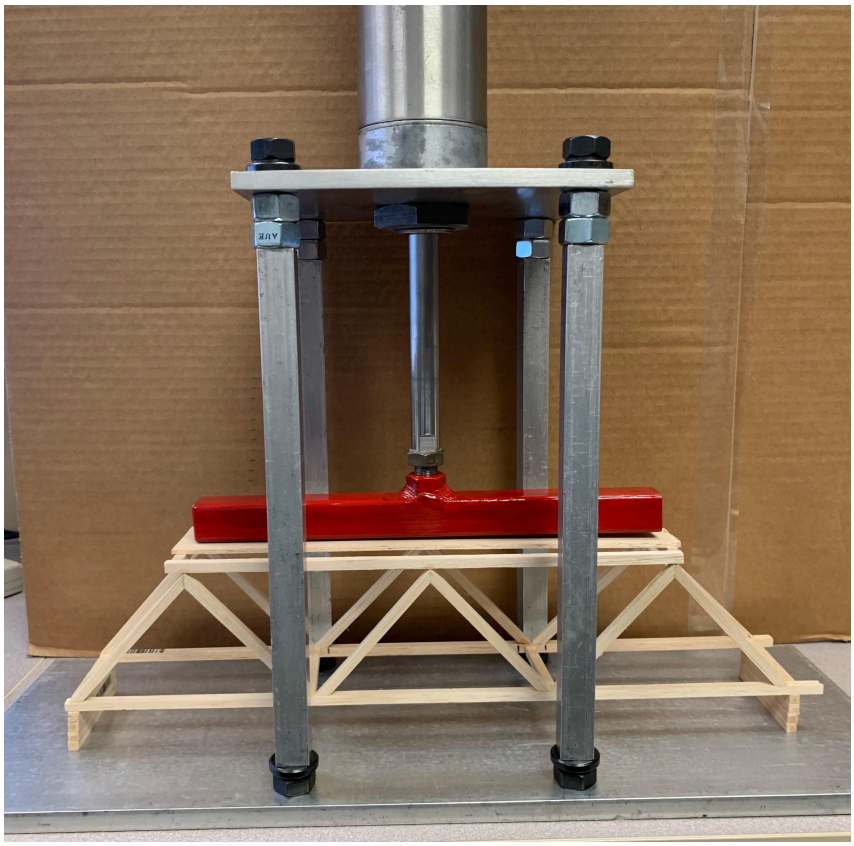


Diagram 3



Evaluation Sheet

SECME Bridge Construction and Operation

☐ **Elementary School**

Team Name (School)	

Bridge Weight		Pass Fail	Bridge Weight
Bridge Height		Pass Fail	Bridge Height
Bridge Length		Pass Fail	Bridge Length
Base Clearance			Pass Fail
Road Surface	Solid Surface	Pass Fail	
	Length	Pass Fail	Actual Length
	Width	Pass Fail	Actual Width
Gauge PSI			

Total Load = Gauge PSI * 12.0 sq.in.

Total Load _____

Evaluation Sheet

SECME Bridge Construction and Operation

☐ **Middle School**

Team Name (School)	

Bridge Weight		Pass Fail	Bridge Weight
Bridge Height		Pass Fail	Bridge Height
Bridge Length		Pass Fail	Bridge Length
Base Clearance		Pass Fail	
Road Surface	Solid surface	Pass Fail	
	Length	Pass Fail	Actual Length
	Width	Pass Fail	Actual Width
Gauge PSI			
Resemblance	Drawing visually accurate compared to actual bridge(1-10)		
	Components in drawing match those in the actual bridge (1-10)		

Total Load = Gauge PSI * 12.0 sq.in.

Total Score = Total Load + Technical Drawing + Technical Report

Total Load _____

Technical Drawing_____

Technical Report _____

Total Score_____

Evaluation Sheet

SECME Bridge Construction and Operation

☐ **High School**

Team Name (School)	

Bridge Weight		Pass Fail	Bridge Weight
Bridge Height		Pass Fail	Bridge Height
Bridge Length		Pass Fail	Bridge Length
Base Clearance		Pass Fail	
Road Surface	Solid Surface	Pass Fail	
	Length	Pass Fail	Actual Length
	Width	Pass Fail	Actual Width
Gauge PSI			
Resemblance	Drawing visually accurate compared to actual bridge(1-10)		
	Components in drawing match those in the actual bridge (1-10)		

Total Load = Gauge PSI * 12.0 sq.in.

Efficiency Value = Total Load ÷ Bridge Weight

Technical Score = Technical Report + Technical Drawing

Total Score = Efficiency Value * Technical Score

Total Load _____

Efficiency Value_____

Technical Score_____

Total Score_____

(back to top)

SECONDARY

DISTRICT

2024-2025 SECME DESIGN COMPETITION GUIDELINES

BRIDGE/TRUSS DESIGN TECHNICAL REPORT

As part of the design competition the team is required to write a technical report describing the design and construction of the bridge.

While two (2) teams from each school may compete and to some extent their bridges may be similar, the two reports must be original and distinctly different. If not, then both teams will earn a score of zero.

Technical Report Requirements and Guidelines

1. **Cover page**
   - Title
   - Team Name
   - School Name
   - Team members' first name, last initial and grade levels
   - SECME school coordinator's initials
   - Date of Competition

2. **Content**
   - Table of Contents
   - Abstract
   - Introduction
   - Design philosophy
   - Description of construction procedures
   - Conclusion
   - Bibliography or Works Cited

3. Drawings, sketches and tables may be included in an optional ***Appendix***.

4. You may include your school's bridge building, but concentrate on bridges from earliest times (introduction). Tell why you choose the bridge/truss design you implemented this year (Design Philosophy)

5. Please note: Should your team(s) fail to submit a technical report, the team(s) are ineligible to compete in the Bridge Competition.

For specific scoring and judging information, please see the evaluation form. Judge's decision is final.

Evaluation Sheet

SECME Bridge Technical Report

☐ **Middle School** ☐ **High School**

CATEGORY	Max Points	Points Earned
STRUCTURE		
Cover page: title, team name, school name, team members' first name w/ last initial & grade level, coordinator's initials, date of competition	4	
8.5" x 11" white paper with 1" margins	4	
12 point standard font – Times New Roman, Arial, Calibri, Courier New	4	
Double-spaced throughout	4	
All pages are numbered and labeled with school name and team A/B if applicable	4	
CONTENT		
Table of Contents – one page, indicates which page each part of report is located	4	
Abstract – includes essential points, approximately 250 words	4	
Introduction – background information and references to research in terms of: the history of bridges	4	
sections of a constructed bridge	4	
designs of bridges	4	
Design philosophy – discussion of design ideas/origination based on research	6	
discussion of experimental process	6	
Description of construction procedures – materials/tools (list format)	5	
clear description of steps taken to build and test the bridge (paragraph form)	5	
Conclusion – documents the anticipated success/failure of the team's bridge	6	
explains what was learned re: breaking of bridge in terms of force, stress, & energy	6	
Bibliography/Works Cited	6	
MECHANICS		
Grammatically correct (punctuation, capitalization, spelling)	6	
Accurate use of past tense and passive voice, no pronouns	6	
Report flows logically from one idea to the next, minimal fragmentation	4	
Citations are made in APA format (preferred)	4	

At the judges' discretion, teams may be interviewed to determine the originality of their submitted work.

Please provide constructive, specific feedback: **Total points earned**_____**/ 100**

(back to top)

SECONDARY
DISTRICT
2024-2025 SECME DESIGN COMPETITION GUIDELINES
BRIDGE DESIGN TECHNICAL DRAWING

As part of the Design Competition the team is required to prepare a scale drawing depicting the bridge that they have designed and built.

Bridge Drawing Requirements and Guidelines

1. The bridge drawing is required to illustrate the actual bridge built by the team for competition. (Photographs or computer-generated drawings will NOT be allowed).

2. The bridge will be drawn to half scale. Drawing units will be in metric units.

3. The drawing will be on 17" x 22" size drawing paper. A 1" margin is required around the outside of the drawing. No mounting of the drawing or frames are allowed. **If a hardcopy is submitted, please fold the drawing so it is approximately 8 ½" by 11" in size with the title block showing in the lower left corner.**

4. The drawing is to be fully dimensioned including but not limited to length, width, and height. Include all dimensions that will fully illustrate the size of the bridge.

5. The drawing is required to show three (3) correctly orientated views as indicated on the Bridge Illustration drawing **(Diagram 1).** The views are top, side, and end, and they should be oriented as shown. Dimensions should be accurate and consistent within all projections of the drawing. For example, if the roadway width is shown as 2 cm in the "Top" view, it should also be 2 cm in the "End" view.

6. All parts of the bridge are required to be labeled. Roadway and supports are an example; however, use as many descriptions as needed to clearly explain the bridge design.

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

8. The bottom left corner of the drawing will have a title block. Do not use 3" x 5" index cards to identify drawings.

9. The bridge technical drawing will be scored on the following criteria: resemblance, appearance, neatness.

10. **Note: Should your team(s) fail to submit a technical drawing, the team(s) are ineligible to compete in the Bridge Competition.**

For specific scoring and judging information, please see the evaluation sheet. Judge's decision is final.

Evaluation Sheet

SECME Bridge Technical Drawing

☐ **Middle School** ☐ **High School**

CATEGORY	Max. Points	Points Earned
ENGINEERING PAPER REQUIREMENTS		
17" x 22" engineering paper, non-gridded (no cardboard/posterboard)	4	
1" margin on all sides	4	
Bridge is drawn to scale (1:2) and units are in metric	4	
Legend in lower left corner: school name, team name, team members' first name w/ last initial & grade level, coordinator's initials, date of competition, scale of drawing	4	
Top view, side view, and end view present and correctly located on drawing	4	
RESEMBLANCE		
Dimensions – minimum of six, each dimension is accurate to within +/- 1 mm	30	
Drawing is visually accurate compared to actual bridge	10	
Components in drawing match those in the actual bridge	10	
APPEARANCE/NEATNESS		
Paper is clear of extraneous marks (smudges, holes, erasures, etc)	5	
Lines are straight and neat with definitive end marks	5	
Text is legible and consistent throughout	5	
All components labeled – roadway, supports, etc	5	
All views are labeled	5	
Overall visual presentation	5	

Please provide constructive, specific feedback: **Total points earned: _____/100**

(back to top)

ELEMENTARY

DISTRICT

2024-2025 SECME ESSAY COMPETITION GUIDELINES

The essay is a National SECME competition.

- **Each entry is to be prepared and submitted by an individual student (not team).**
- **An individual elementary school student will compete only with other students at the elementary level.**

Students may choose the topic for their essay as follows: (subject to change)
Non-fiction topics:
What is Energy? How do you see and use energy in your everyday life? Where does energy come from? Where does energy go to?
STEM Role Model: Who do you consider to be your STEM role model? It could be an inventor, an engineer, an architect, an artist, or anyone who has succeeded in the STEM industry. Why do you admire this individual? How did their story impact or inspire you on your journey in STEM?
Alternative Energy
Pick an example of alternative energy and explain how it works and how it is used. Why is this form of energy important to you and to the environment. What are benefits and risks of this technology?
Fiction Topics:
New Forms of Energy: What are some sources of energy that could be harvested that are currently not being used, for example – waste heat from sweat, car engines or light bulbs, or energy from walking or sound energy from talking…. Explain how you would harvest energy and how the energy could be used.
Inventing things to help harness the energy of storms
Hurricanes feed off the heat energy of the water to make large storms. Invent a way to help keep the storms from getting developed and becoming large and powerful.

1. Cover Page: Students name and grade, competition type, SECME topic chosen, school name, district, school city and state, SECME coordinators name and email
2. Reference Page: Student includes a reference page listing all of the sources used to support the chosen topic. Books, magazines, newspapers: provides the title of the reference and author's last and first name.
3. Grammar, Spelling, Formatting: Student's writing is free of spelling errors, punctuation errors, and sentence errors (e.g. misplaced sentence parts, subject/verb agreement issues, sentence fragments, run-ons). Essay is double-spaced, 1 inch margins, 12-point font. Includes an introduction, well-structured body paragraphs, and a conclusion.
4. Adherence to Topic: Does the student's writing address the chosen topic effectively? Does the student's writing maintain focus and relevance throughout the essay?
5. Originality and Coherence: Does the student's writing present an original perspective? Is the essay age-appropriate, logical, and cohesive? Does the student maintain a strong and convincing voice? Does the student maintain a well-organized and logically structured essay with appropriate transitions?
6. Creativity: Does the student's writing show creativity and imagination?
7. Analysis and Use of Evidence: Does the student demonstrate a deep understanding of their chosen essay topic? Does the student utilize credible sources effectively to support arguments made in their essay? Does the student ensure ideas are fully developed and well-supported by the sources in their Works Cited page? Does the student integrate sources into their essay content in a way that enhances their argument? Does the student ensure that the evidence from their sources is relevant, accurate, and convincing?
8. Word Count: Does the student's essay meet the required word count of 350 – 500 words?

SECONDARY

DISTRICT

2024-2025 SECME ESSAY COMPETITION GUIDELINES

The essay is a National SECME competition.

- **Each entry is to be prepared and submitted by an individual student (not team).**
- **An individual middle or high school student will compete only with other students at the middle or high school level.**

Students may choose the topic for their essay as follows: (Subject to change)

Non-fiction topics:

What is Energy? What is energy? How do you see and use energy in your everyday life? Where does energy come from? Where does energy go to?

STEM Role Model Who do you consider to be your STEM role model? It could be an inventor, an engineer, an architect, an artist, or anyone who has succeeded in the STEM industry. Why do you admire this individual? How did their story impact or inspire you on your journey in STEM?

Alternative Energy Pick an example of alternative energy and explain how it works and how it is used. Why is this form of energy important to you and to the environment. What are benefits and risks of this technology?

FOR HIGH SCHOOL ONLY: Energy is Everywhere: The theme for this year is "Energy is Everywhere". How can energy be everywhere? Explain how energy is everywhere in our lives and the way energy flows and transforms throughout the world and the universe through systems.

Fiction Topics:

New Forms of Energy: What are some sources of energy that could be harvested that are currently not being used, for example – waste heat from sweat, car engines or light bulbs, or energy from walking or sound energy from talking…. Explain how you would harvest energy and how the energy could be used.

Inventing things to help harness the energy of storms: Hurricanes feed off the heat energy of the water to make large storms. Invent a way to help keep the storms from getting developed and becoming large and powerful.

1. Cover Page: Students name and grade, competition type, SECME topic chosen, school name, district, school city and state, SECME coordinators name and email

2. Works Cited Page (MLA format): Does the student have a Works Cited page listing all sources used to support their chosen essay topic? Does the student have a Works Cited page in MLA format?

3. Grammar, Spelling, Formatting: Student's writing is free of spelling errors, punctuation errors, and sentence errors (e.g. misplaced sentence parts, subject/verb agreement issues, sentence fragments, run-ons). Essay is double-spaced, 1 inch margins, 12-point font. Includes an introduction, well-structured body paragraphs, and a conclusion.

4. Adherence to Topic: Does the student's writing address the chosen topic effectively? Does the student's writing maintain focus and relevance throughout the essay?

5. Originality and Coherence: Does the student's writing present an original perspective? Is the essay age-appropriate, logical, and cohesive? Does the student maintain a strong and convincing voice? Does the student maintain a well-organized and logically structured essay with appropriate transitions?

6. Creativity: Does the student's writing show creativity and imagination?

7. Analysis and Use of Evidence: Does the student demonstrate a deep understanding of their chosen essay topic? Does the student utilize credible sources effectively to support arguments made in their essay? Does the student ensure ideas are fully developed and well-supported by the sources in their Works Cited page? Does the student integrate sources into their essay content in a way that enhances their argument? Does the student ensure that the evidence from their sources is relevant, accurate, and convincing?

8. Word Count: Required word count for middle school: 500 – 750 words; required word count for high school: 750 - 1000 words

Evaluation Sheet **SECME Student Essay**

☐ Elementary School ☐ Middle School ☐ High School

STATEMENT OF AUTHENTICITY:
This is to certify that the attached essay is my own original, independent work. All direct and paraphrased quotes, passages and sources have been cited properly.

student signature

Student essays will be submitted digitally.

CATEGORY	Max. Points	Points Earned
ESSAY COVER PAGE		
Students name and grade, chosen topic, school name, district name, school city and state, SECME coordinators name and email	5	
REFERENCE PAGE/WORKS CITED PAGE		
Elementary: listing of all sources used to support topic; provide article/book title, authors last and first name	15	
Secondary: listing of all sources used to support topic in MLA format		
E		
GRAMMAR, SPELLING AND FORMATTING		
Writing is free of spelling errors, punctuation errors, and sentence errors	10	
Essay is double spaced, 1" margins, approved 12 point font		
Essay includes an introduction, well-structured body paragraphs, and a conclusion		
ADHERENCE TO TOPIC		
Writing addresses the chosen topic	10	
Writing maintains focus and relevance throughout the essay		
ORIGINALITY AND COHERENCE		
Writing presents an original perspective	15	
Essay is age-appropriate, logical and cohesive		
Writer maintains strong and convincing voice		
Writing is well-organized and logically structured with appropriate transitions		
CREATIVITY		
Writing shows creativity and imagination	10	
ANALYSIS AND USE OF EVIDENCE		
Writer demonstrates deep understanding of the chosen topic	30	
Writer utilizes credible sources to support arguments in essay		
Essay has fully developed ideas supported by sources from Reference/Works Cited page		
Writing integrates sources into the essay that enhances argument		
Writer ensures that evidence from sources is relevant, accurate and convincing		
WORD COUNT		
Essay meets required word count: (Elem:350-500) (Middle: 500-750) (High: 750-1000)	5	

At the judges' discretion, teams may be interviewed to determine the originality of their submitted work.

Please provide constructive, specific feedback: **Total points earned** _____/100

(back to top)

ELEMENTARY

DISTRICT

2024-2025 SECME GENERATOR BUILD AND OPERATION GUIDELINES

1. The Engineering Design Competition requires participation in each of these areas:
    a. Generator build and operation
    b. Team interview
    c. Electrical knowledge assessment

2. This is a team competition and should reflect the coordinated efforts of all members. All members of the team should be able to serve as a spokesperson during the team interview (written and oral).

3. Three (3) students must be on each team. Each school may enter a maximum of two (2) teams.

4. Teams will build a generator from 500' maximum of #28 AWG magnetic wire, **four (4)** ceramic 3/8" x ½" x 1-7/8" magnets, and measure the maximum peak voltage output (for 10 seconds), with the maximum voltage being recorded. Magnets sample. **Magnets cannot be cut or altered from their original shape.**

5. The use of gears is not permitted at the elementary level.

6. The rotor will be turned by a standard electric drill at a set speed of approximately 200 rpm. Rotors should stick out a minimum of 2 cm for the judges to attach the electric drill. The students must have an adult to assist them with the drill portion when the testing begins. Output will be measured using a digital multimeter attached to wire leads coming from the generator.

7. The maximum dimensions of the generator are 30cm x 30cm x 30cm (not including the base) at any time of the competition.

8. The following are prohibited: generator kits, batteries, and other external voltage sources.

9. All items must be hand-assembled. Generators must be able to be clamped to a desk to ensure the generator is stable during its run.

For specific scoring and judging information, please see the evaluation sheet. Judge's decision is final.

(back to top)

SECONDARY

DISTRICT

2024-2025 SECME GENERATOR BUILD AND OPERATION GUIDELINES

1. The Engineering Design Competition requires participation in each of these areas: Generator build and operation, Technical drawing, Technical report, Team interview and Electrical knowledge assessment.

2. This is a team competition and should reflect the coordinated efforts of all members. All members of the team should be able to serve as a spokesperson during the team interview (written and oral).

3. Three (3) students must be on each team. Each school may enter a maximum of two (2) teams.

4. Teams will build a generator from 500' maximum of #28 AWG magnetic wire, **four (4)** ceramic 3/8" x ½" x 1-7/8" magnets, and measure the peak voltage output using a digital multimeter (for 10 seconds), with the maximum voltage being recorded. Magnets sample. **Magnets cannot be cut or altered from their original shape.**

5. Middle school teams will build wind-powered generators that will use air emitted from a shop/home vacuum. The air will act upon the rotor blades causing the rotor shaft to turn.

6. High school teams will build a water-powered generator that utilizes the potential energy stored in flowing water that will be poured from a container into a specific funnel that will yield a flow rate of 2 gallons per minute. This flowing water must contact the rotor blades to cause the rotor shaft to move. **Reservoirs or temporarily storing water to increase output energy is prohibited.**

7. No trigger mechanism can be used to activate the rotor shaft.

8. No external modification may be attached to the funnel outlet or vacuum nozzle.

9. Gearing may not exceed a 3:1 turndown ratio (i.e. teams may use 1:1, 2:1 or 3:1).

10. The maximum dimensions of the generator are 30cm x 30cm x 30cm (not including the base) at any time of the competition.

11. The following are prohibited: generator kits, batteries, and other external voltage sources.

12. All items must be hand-assembled. Generators must be able to be clamped to a desk to ensure the generator is stable during its run.

For specific scoring and judging information, please see the evaluation sheet. Judge's decision is final.

Evaluation Sheet

SECME Generator Build

☐ **Elementary School**

Team Name (School)	

Generator Output (peak voltage within 10s duration)	
Output Score (generator output ÷ maximum generator output) *100%)	

Team Interview Criteria	Max Points	Points Earned
Creativity	20	
Knowledge to Team's Design	20	
Knowledge of Ohm's Law	20	
Application of technical principles (1)	10	
Application of technical principles (2)	10	
Application of technical principles (3)	10	
Application of technical principles (4)	10	
Total Interview Score	**100**	

Output Score (60%) _____

Interview (40%) _____

Total Score_____

Evaluation Sheet

SECME Generator Build

☐ **Middle School** (wind powered) ☐ **High School** (water powered)

Team Name (School)	

Generator Output (maximum peak voltage within 30s duration)	
Output Score (generator output ÷ maximum generator output) *100%	

Team Interview Criteria	Max Points	Points Earned
Creativity	20	
Knowledge to Team's Design	20	
Knowledge of Ohm's Law	20	
Application of technical principles (1)	10	
Application of technical principles (2)	10	
Application of technical principles (3)	10	
Application of technical principles (4)	10	
Total Interview Score	**100**	

Output Score (55%) _____

Technical Drawing (15%) _____

Technical Report (15%) _____

Interview (15%) _____

Total Score_____

(back to top)

(back to top)

SECONDARY

DISTRICT

2024-2025 SECME GENERATOR TECHNICAL REPORT GUIDELINES

As part of the design competition the team is required to prepare a report explaining the generator that they have designed and built.

GENERATOR TECHNICAL REPORT REQUIREMENTS:

1. **Cover page**
   - Title
   - School Name
   - Team name
   - Team members' first name, last initial and grade levels
   - SECME school coordinator's initials
   - Date of competition
2. **Content**
   - Table of contents
   - Abstract
   - Introduction
   - Description of design
   - Description of construction procedures Conclusion
   - Bibliography or Works Cited

3. Drawings, sketches and tables may be included in an optional **Appendix.**
4. The technical report will count as 15% of the total score for the Generator Competition.
5. **Note: Should your team(s) fail to submit a technical report, the team(s) are ineligible to compete in the Generator Competition.**

For specific scoring and judging information, please see the evaluation sheet.

Evaluation Sheet

SECME Generator Build Technical Report

☐ **Middle School** ☐ **High School**

CATEGORY	Max Points	Points Earned
STRUCTURE		
Cover page: title, school name, team name, team members' first name w/ last initial & grade level, coordinator's initials, date of competition	4	
8.5" x 11" white paper with 1" margins	4	
12 point standard font – Times New Roman, Arial, Calibri, Courier New	4	
Double-spaced throughout	4	
All pages are numbered and labeled with school code (team A/B if applicable)	4	
CONTENT		
Table of Contents – one page, indicates which page each part of report is located	4	
Abstract – includes essential points, approximately 250 words	4	
Introduction - explains engineering problem	4	
background information/research	4	
references to Ohm's Law, Faraday's Law, etc	4	
Description of design- discussion of design ideas/origination	6	
discussion of experimental process	6	
Description of construction procedures - materials/tools (list format)	5	
clear description of the steps taken to build and test the generator (paragraph form)	5	
Conclusion - discusses result of final designs in relation to previous designs	6	
discusses how future generators can be improved	6	
Bibliography/Works Cited	6	
.		
Grammatically correct (punctuation, capitalization, spelling)	6	
Accurate use of past tense and passive voice, no pronouns	6	
Report flows logically from one idea to the next, minimal fragmentation	4	
Citations are made in APA format	4	

At the judges' discretion, teams may be interviewed to determine the originality of their submitted work.

Please provide constructive, specific feedback: **Total points earned**_____**/100**

(back to top)

SECONDARY

DISTRICT

2024-2025 SECME GENERATOR BUILD TECHNICAL DRAWING GUIDELINES

As part of the design competition the team is required to prepare a scale drawing depicting the generator that they have designed and built.

Generator Build Technical Drawing Requirements

1. The generator drawing is required to illustrate the actual generator built by the team for competition. (Photographs or computer-generated drawings will **not** be allowed).

2. The generator will be drawn to scale using metric units.

3. The drawing will be on 17" x 22" size drawing paper. A 1" margin is required around the outside of the drawing. No mounting of the drawing or frames are allowed. **If a hardcopy is submitted, please fold the drawing so it is approximately 8 ½" by 11" in size with the title block showing in the lower left corner.**

4. The drawing is to be fully dimensioned including but not limited to length, width, and height. Include all dimensions that will fully illustrate the generator.

5. The drawing is required to show three (3) views so as to best represent the generator.

6. All parts of the generator are required to be labeled. Rotors and wires are an example; however, use as many descriptions as needed to clearly explain the generator design.

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

8. The bottom left corner of the drawing will have a title block. Do not use 3" x 5" index cards to identify drawings.

9. The generator build technical drawing will be scored on the following criteria: labeling, scaling, resemblance, appearance and neatness.

10. The technical drawing will count as 15% of the total score for the Generator Build Competition.

11. **Note: Should your team(s) fail to submit a technical drawing, the team(s) are ineligible to compete in the Generator Build Competition**.

For specific scoring and judging information, please see the evaluation sheet.

Evaluation Sheet

SECME Generator Build Technical Drawing

☐ **Middle School** ☐ **High School**

CATEGORY	Max Points	Points Earned
ENGINEERING PAPER REQUIREMENTS		
17" x 22" engineering paper, non-gridded	3	
1" margin on all sides	3	
Dimensions, scale, and metric units are noted	3	
Legend in lower left corner: school name, team name, team members' first name w/ last initial & grade level, coordinator's initials, date of competition	3	
Three views that best represent the generator	3	
NAMING/LABELING		
Rotor is labeled	4	
Rotor poles are labeled	4	
Rotor blades are labeled	4	
Magnets and poles are labeled	4	
Stator is labeled	4	
Wire is labeled	4	
Names/labels present for all other components	4	
All views are labeled	3	
SCALE		
Scale is appropriately selected to fill drawing area	4	
Same scale is used within a view and between views	4	
Scale of items is proportionally and mathematically accurate	4	
Scale is noted in legend	4	
RESEMBLANCE		
Components in drawing match those in the actual generator	11	
Proportions in drawing correctly relate to the actual generator	11	
APPEARANCE/NEATNESS		
Paper is clear of extraneous marks (smudges, holes, erasures, etc.)	4	
Lines are straight and neat with definitive end marks	4	
Text is legible and consistent throughout	4	
Overall visual presentation	4	

Please provide constructive, specific feedback: **Total points earned_____/100**

(back to top)

ALL LEVELS

DISTRICT

2024-2025 SECME GUIDELINES FOR DESIGN COMPETITION: MOUSETRAP CAR DESIGN AND CONSTRUCTION

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

1. The Engineering Design Competition requires participation in the following areas:
   - Mousetrap Car construction
   - Mousetrap Car run
   - Three (3) photographs of Mousetrap Car, submitted digitally and included in your Engineering notebook presentation.

Please note: Should your team(s) fail to submit any of the above criteria, the team(s) are ineligible to compete in the Mousetrap Car Competition.

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

3. Two to four (2-4) students should be on each team and should be present on the day of the competition. No more than two teams per school.

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

5. **Three (3) photographs should be taken of the mousetrap car from different angles/views to best represent the car. These photographs must be submitted digitally by the date set forth on the required events calendar and included in your Engineering notebook presentation.**

6. Use a standard **"VICTOR"** (usually about 4.5 x 10 centimeters and weighing about 25 grams) mousetrap to build a car. The goal of the mousetrap car design shall be to build a car that will travel a maximum distance.

7. Components of the mousetrap are: base (on which all other components are mounted), spring, bail, locking lever, and bait hook. (See component sketch on page 43.)

8. Use the spring on the mousetrap as the sole source of power. (**Do not use rubber bands, $C0_2$ boosters or anything else for extra power**). No primary or secondary remote control is allowed.

9. 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 & added on to but it cannot exceed 6" (15.24 cm) in length. It must remain as a component of the completed car.

10. The spring must be visible and/or accessible to the judges for inspection. **No 3D printed parts are allowed anywhere on the car.**
11. The car must have a minimum of three wheels. There is no maximum or minimum length requirement for mousetrap cars, however, a longer car is usually heavier and will not travel as far as a shorter car. In most cases, the car will be tested on a smooth flat surface, such as a gym floor. The distance will be measured from **the starting line to the farthest point traveled,** utilizing a **straight line (vector)** to connect the two points. However, if the surface at the competition site available on the date scheduled is not perfectly smooth, there will be no special consideration for cars that encounter any problems with the existing surface imperfections.
12. **The car should be designed so that it travels as far as possible. The Mousetrap Car MUST travel a MINIMUM distance of 2 meters (elem.), 5 meters (middle) or 10 meters (high) to qualify to place in competition.**The starting line is exactly 100 centimeters in length. The car can be released at any point along the starting line. There will be two runs for each car; the best single performance will be used for final scoring.
13. All cars should be packed in a rigid container to protect them during transport. The car will be checked and registered on the day of the competition. For elementary teams, the car will remain in the possession of the student team all day. For secondary, the car will be collected and held by SECME staff until the time of the competition. Any modifications or changes made to the configuration of the car after registration will result in disqualification from the competition.
14. Students must be able to wind and set up their car without the assistance of an adult. At the competition, adults will not be permitted to assist with this process.

The performance score for the car run is as follows:

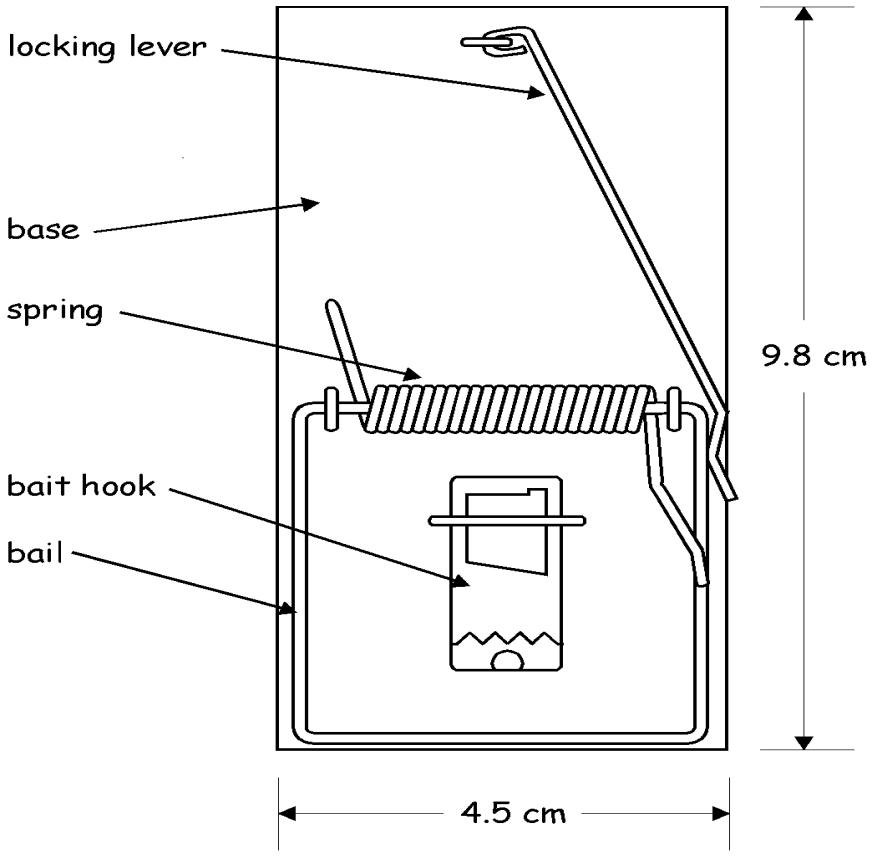
All levels: $D = \frac{(Team\ Distance)}{(Maximum\ Distance)}$

Where:
D = Distance Score (this makes up 50% of the total score for this competition)
Team Distance = Longest distance the Mousetrap Car travels
Maximum Distance = Longest distance traveled by any car at the competition

Note: Distance will be measured from the front of the front wheel (s) at the starting point to the front of the front wheel (s) at the stopping point of travel, utilizing a straight line to connect the two points. If the mousetrap car stops due to hitting an object or wall, the distance will be measured from the starting point to the point of impact. So that all teams have the same advantages/disadvantages, objects will not be moved (chairs, cones, tables, signs, etc.) during the competition to allow the mousetrap car to gain more distance.

For specific scoring and judging information, please see the evaluation sheet. Judge's decision is final.

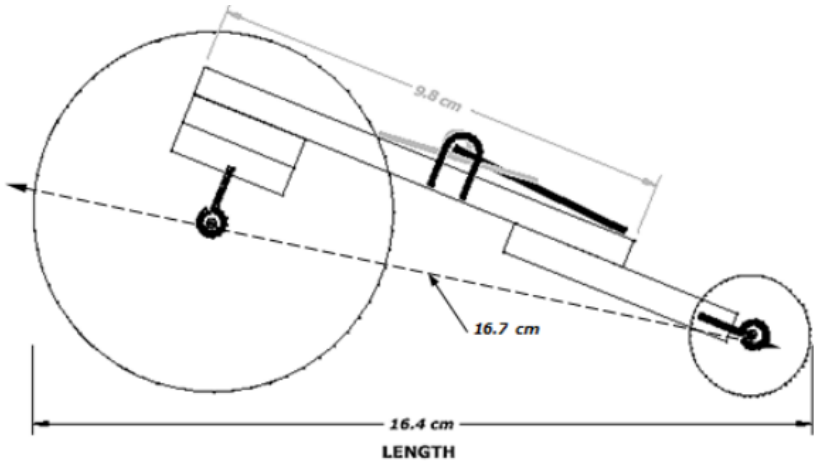
Diagram 1



Measurement of "L," the Mousetrap Car's Longest Dimension

"L" is the car's longest dimension in the x, y, or z-axis length (measured in centimeters), In other words, it could be the length, width, or height of the completed mousetrap car, whichever is the longest. (see diagram 2)

Diagram 2



Example: L = 16.4 cm

Evaluation Sheet

SECME Mousetrap Car Construction and Operation

☐ **Elementary School** ☐ **Middle School** ☐ **High School**

Team Name (School)	

	Distance
First Run	
Second Run	

In order to place in the Mousetrap Car competition, this team must have submitted a corresponding engineering notebook and presentation by the noted deadlines.

$$D = \frac{(Team\ Distance)}{(Maximum\ Distance)}$$

Where:
D = Distance Score
Team Distance = Longest distance the Mousetrap Car travels (in either first run or second run)
Maximum Distance = Longest distance traveled by any car at the competition

Note: Distance will be measured from the front of the front wheel (s) at the starting point to the front of the front wheel (s) at the stopping point of travel, utilizing a straight line to connect the two points. If the mousetrap car stops due to hitting an object or wall, the distance will be measured from the starting point to the point of impact. So that all teams have the same advantages/disadvantages, objects will not be moved (chairs, cones, tables, signs, etc.) during the competition to allow the mousetrap car to gain more distance.

Overall Team Score in this competition is the sum of the 1. Distance score (D) as calculated above (50%), and 2. Engineering Notebook Presentation (50%) The maximum total is 100 points.

Distance Score (50%)
Engineering Notebook Presentation (50%)

Total Score _____

2024-2025 SECME DESIGN COMPETITION GUIDELINES

Mousetrap Car Engineering Notebook and Engineering Presentation

As part of the Design Competition the team is required to prepare a digital Engineering Notebook that documents the conception and building of the car that they have designed. The SECME Engineering Notebook will allow your team to show all your hard work.

Mousetrap Car Engineering Notebook Presentation Requirements

This is the digitized version of your Engineering Notebook. The Presentation will allow your team to showcase your work in a presentation format (Google Slides). Through this presentation, your team will be able to showcase further your design and all the hard work you have done. The presentation will be submitted to judges prior to the competition for scoring.

Title Slide: SECME Team Name, team's competition type and division, each team member's name and grade, school name and district name, school city and state, name and email of the SECME coordinator.

About Your Team Slide: team photo, team members' names, grade levels, and their roles, years involved with SECME.

Brainstorm and Sketches: Include the final ideas (you do not need to include all your ideas) that your team considered in the brainstorming process. Explain why you DID NOT use them in your final design. Include any sketches you used in your brainstorming process.

Drawings of the Final Design: Include a photo of your sketch of the final design (this is NOT your technical drawing). Explain what you used from your brainstorming process and why you included it.

Materials list and Budget: Provide a list of ALL materials used in your design and pictures of the materials. Include the cost of ALL materials EXCEPT recycled materials. For recycled materials, include documentation of where you obtained it. Include a photo of receipts for ALL purchased materials. Include the final cost of all materials.

Technical Drawings: The team's technical drawings are required to show the front, side, and top views of the design. Label all parts of the design and explain their functionality. Label all relevant dimensions of the design in centimeters (For example, Length, Width, or Height). Explain why you chose your mousetrap car's bail length. Include a color photo of your mousetrap car next to the technical drawing

Trial Runs: Include the trial run data for your final design

Conclusions and Future Recommendations: Provide your team's conclusion on your design process and any recommendations you have to better your design in the future (For example, if cost were not a constraint)

Evaluation Sheet

SECME Mousetrap Car Engineering Notebook Presentation

☐ **Elementary School** ☐ **Middle School** ☐ **High School**

ENGINEERING NOTEBOOK	Max Points	Points Earned
ORGANIZATION		
Cover page:competition and division, team name, members, district, school, coordinator	15	
Table of Contents: headings and page numbers		
Team Norms and Team Roles		
Meeting Notes: dated entries with summaries		
PLANNING AND DESIGN		
Brainstorm: planning is evident throughout the design process	20	
Concept art/sketches: sketches reflect different versions of the design		
Materials List and Budget: receipts for purchases and descriptions of donations and/or recycled materials		
RESULTS		
Technical drawings: drawing of final design with all parts and measurements labeled	10	
Photos: front, side, and top views of the design		
Trial Runs: data for 3 trial runs of each design version, minimum of 2 designs and 6 total trial runs		
Conclusions and Recommendations: Provide your team's conclusion on your design process and any recommendations you have to better your design in the future (For example, if cost were not a constraint)	5	

At the judges' discretion, teams may be interviewed to determine the originality of their submitted work.
In order to place in the Mousetrap Car competition, each team must submit a corresponding engineering notebook presentation by the paperwork drop-off deadline.

Please provide constructive, specific feedback: **Total points earned:_____/ 50**

(back to top)

ELEMENTARY SCHOOL

DISTRICT

2024-2025 SECME POEM COMPETITION GUIDELINES

Each entry is to be prepared and submitted by an individual student (not a team). An individual elementary school student will compete only with other elementary school students.

The theme for the 2024-2025 SECME Poem Competition is the same as the national theme when available (please see page 15 of the Survival Guide) . Students must choose a topic within the theme because the theme is too broad for a poem.

Poem Competition Requirements

Cover page	Poem's title School name Student's first name and last initial Student's grade level SECME school coordinator's initials Date of competition
Poem	25-line poem 8.5" x 11" white paper, 1" margins 12 point standard font

Note: Correct Rules of mechanics must be consistent throughout the poem.

JUDGING

Poems will be judged on the following criteria: key ideas, craft, language, and mechanics.

For specific scoring and judging information, please see the evaluation sheet. Judge's decision is final.

Evaluation Sheet

SECME Student Poem

☐ Elementary School

Student poems will be submitted digitally.

STATEMENT OF AUTHENTICITY:
This is to certify that the attached poem is my own original, independent work.

student first name, last initial signature:

CATEGORY	Max Points	Points Earned
STRUCTURE		
Cover page: poem title, school name, student's first name & last initial, student's grade level, coordinator's initials, date of competition	4	
8.5" x 11" white paper with 1" margins	4	
12 point standard font – Times New Roman, Arial, Calibri, Courier New	4	
All pages are numbered and labeled with school name	4	
Poem is of an appropriate length (25 lines)	4	
KEY IDEAS & DETAILS IN CONTENT		
This year's SECME theme is the focal point of the poem	5	
Details in the text clearly indicate this year's SECME theme	5	
The text of the poem shows understanding of this year's SECME theme	5	
CRAFT & STRUCTURAL ELEMENTS		
Use of age-appropriate meter/rhythm (meter is the basic plan of the line, rhythm is how the words flow)	5	
Use of verse or stanzas (verses are individual lines of the poem, stanzas are groupings of verses to form a section of a poem)	5	
LITERARY FIGURATIVE LANGUAGE		
Word/phrase choices effectively convey this year's SECME theme	5	
Metaphors/simile use effectively conveys this year's SECME theme	5	
Contrast/comparisons effectively convey this year's SECME theme	5	
Expanding/combining/reducing stanzas or verses piques reader interest	5	
Sensory details and language create vivid images	5	
Poem demonstrates "out of the box" thinking	5	
Poem's content and structure is more effective than others	10	
MECHANICS		
Writing utilizes age-appropriate vocabulary	5	
Writing is free of age-appropriate spelling errors	5	
Organization of the poem is clear and easy to follow	5	

At the judges' discretion, student may be interviewed to determine the originality of his/her submitted work.

Please provide constructive, specific feedback: Total points earned:_____ /100

(back to top)

ALL LEVELS

DISTRICT

2024-2025 SECME WATER ROCKET CONSTRUCTION GUIDELINES

The mission is to design a water rocket capable of remaining airborne for as long as possible (elementary) or to reach the highest possible height (secondary) given specific launch criteria.

Water Rocket Requirements

1. Maximum number of two (2) teams per school consisting of two to four (2-4) students.
2. Teams are required to submit a completed evaluation sheet and Engineering notebook per rocket entry. **Should your team(s) fail to submit any of these criteria, the team(s) is ineligible to compete in the Water Rocket Competition.**
3. On the day of the Olympiad, prior to launch, each rocket must pass a visual inspection and meet the 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.
4. The pressure vessel must be one (1) clear two-liter bottle (the use of a tinted bottle for the pressure vessel will result in disqualification).**The cap ring must be removed.**
5. Water (up to 355 mL) and air (at 80 psi) pressure will be the sole source of propellant.
6. All rockets will be launched at approximately 90° (degrees) to the ground..
7. Do not use metal, glass, hard, rigid plastics (e.g. PVC pipe), antennas, rocks, or spikes to construct the rocket. No 3D printed parts are to be used. **Use of these materials or any questionable materials not specifically addressed here will disqualify the rocket from the competition at the judge's discretion.**
8. Maximum total height of the rocket is 76.0 cm. On the bottom of the rocket, leave 7.5 cm from the throat of the exit plane clear of any other coverings (paint, markings, etc.) See **Diagram 1**.
9. Nose-cone tip must have a minimum radius of 1.5cm. See **Diagram 2**.
10. Fins may extend to the throat exit plane. No forward swept type of fins are allowed to be used on the rocket. Maximum fin width distance from the bottle is 10.0 cm. See **Diagram 3**.
11. The use of a parachute of any kind is not allowed.
12. **For All Levels**: **:** Rockets will be launched at approximately 90° and kept the same for all rockets being launched. Each rocket will be launched using 355 ml of water and 80 PSI of pressure. The maximum height (apogee) of the rocket will be measured by three judges using an altitude tracker and averaged. This average height will be used for scoring and will count as 50% of the total score for the Water Rocket competition.

For specific scoring and judging information, please see the evaluation sheet. Judge's decision is final.

Diagram 1

Rocket Identification

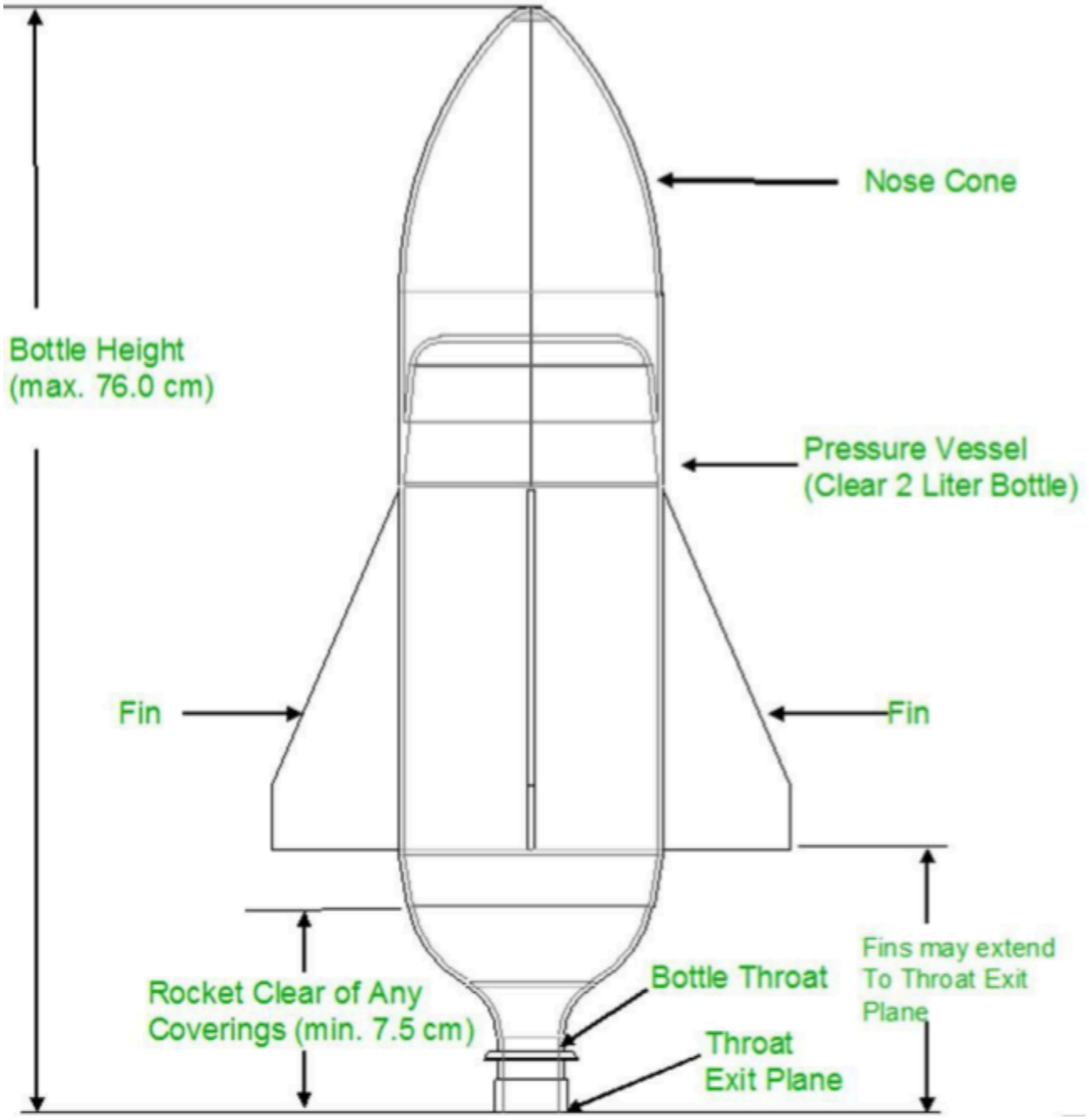


Diagram 2

Nose Cone Diagram

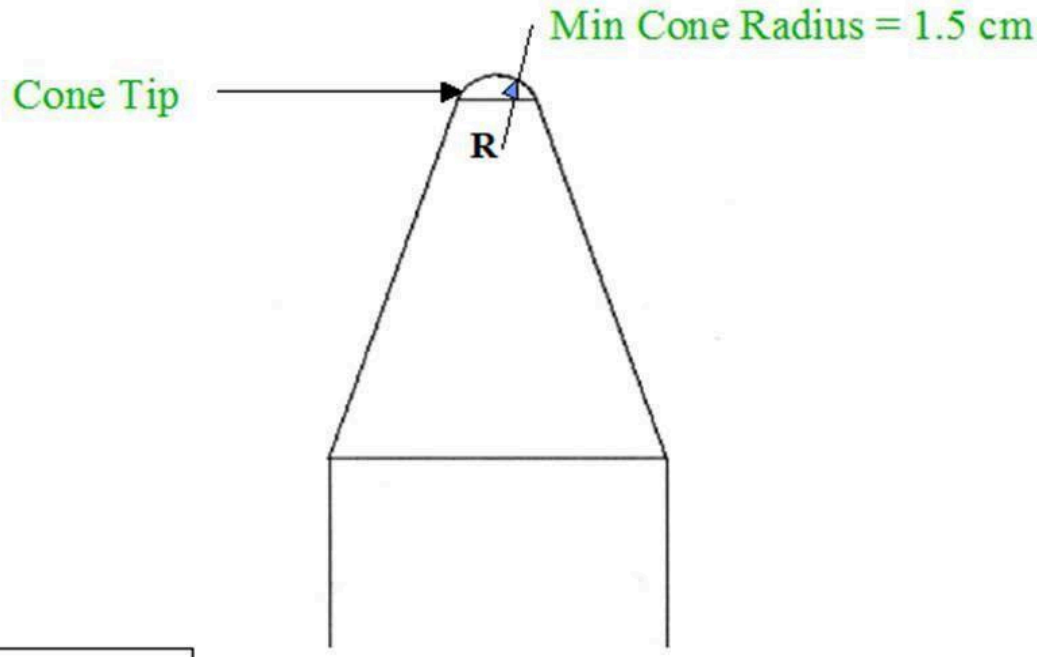
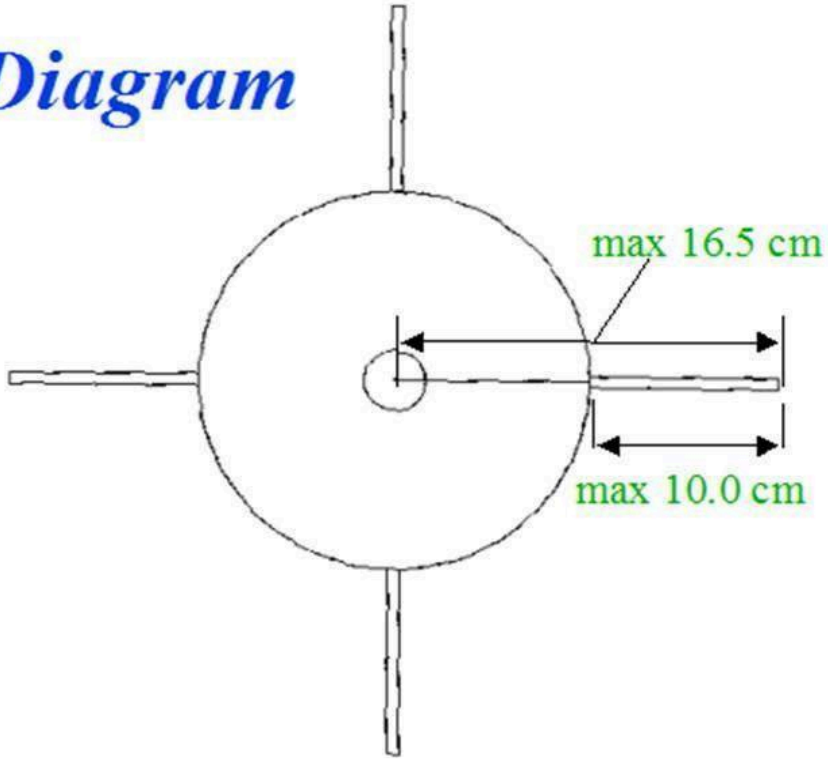


Diagram 3

Fin Diagram



Evaluation Sheet

SECME Water Rocket Construction and Operation

☐ **Elementary School** ☐ **Middle School** ☐ **High School**

Team Name (School)

Average Measured Angle a (degrees)	**Apogee (meters)**

Apogee = L x *tan* (a)

Apogee = the height obtained by the rocket
L = distance between rocket launcher and where the measurement was taken (meters)
a = the angle measured using the altitude tracker (clinometer)

Apogee score = (team apogee ÷ maximum apogee) * 50%

Water Rocket Requirements:

	Requirement Met Yes/No
Overall Height (max. 76 cm)	☐
Fin Width Distance (from pressure vessel) (max. 10 cm)	☐
Nose Cone Tip Radius (min. 1.5 cm)	☐
Throat Exit Clearance: (min 7.5 cm)	☐

Apogee average (50%)_____

Engineering Notebook

Presentation (50%) _____

Total Score _____

DISTRICT

2024-2025 SECME DESIGN COMPETITION GUIDELINES

Rocket Engineering Notebook Presentation

As part of the Design Competition the team is required to prepare a digital Engineering Notebook that documents the conception and building of the rocket that they have designed. The SECME Engineering Notebook will allow your team to show all your hard work.

Water Bottle Rocket Engineering Notebook Presentation Requirements

This is the digitized version of your Engineering Notebook. The Presentation will allow your team to showcase your work in a presentation format (Google Slides). Through this presentation, your team will be able to showcase further your design and all the hard work you have done. The presentation will be submitted to judges prior to the competition for scoring. **Teams are NOT required to bring the physical engineering notebook to the competition to complete the scoring process**.

Title Slide: SECME Team Name, team's competition type and division, each team member's name and grade, school name and district name, school city and state, name and the SECME coordinator's email.

About Your Team Slide: team photo, team members' names, grade levels, and their roles, years involved with SECME.

Brainstorm and Sketches: Include the final ideas (you do not need to include all your ideas) that your team considered in the brainstorming process. Explain why you DID NOT use them in your final design. Include any sketches you used in your brainstorming process.

Drawings of the Final Design: Include a photo of your sketch of the final design (this is NOT your technical drawing). Explain what you used from your brainstorming process and why you included it.

Materials list and Budget: Provide a list of ALL materials used in your design and pictures of the materials. Include the cost of ALL materials EXCEPT recycled materials. For recycled materials, include documentation of where you obtained it. Include a photo of receipts for ALL purchased materials. Include the final cost of all materials.

Technical Drawings: The team's technical drawings are required to show the front, side, and top views of the design. Label all parts of the design and explain their functionality. Label all relevant dimensions of the design in centimeters (For example, Length, Width, or Height). Include a color photo of your rocket next to the technical drawing

Trial Runs: Include the trial run data for your final design

Conclusions and Future Recommendations: Provide your team's conclusion on your design process and any recommendations you have to better your design in the future (For example, if cost were not a constraint)

For Teams Proceeding to the National Competition Teams who place 1st at the SECME Olympiad Competition and proceed to the National Competitions must submit a video recording of themselves presenting their design.

Please use the information below as a guide for your video recording.

- **Introduction**

  State your School Name, School City, School State, Team Name, and Competition Type/Division

  Introduce your team with your names and grade levels

- **Engineering Notebook**

  Please present and show all aspects of your engineering notebook

  Explain all aspects of your design and your design process

  Avoid reading directly from your Engineering Notebook

- **Conclusions and Future Recommendations**

  Provide any conclusions you have on your design process and any recommendations you have to better your design in the future (For example, if cost were not a constraint)

- **Expectations and Requirements**

  ALL team members should be in their Video Presentation and have a speaking role

  The video should be between 5 and 7 minutes, in mp4 format, and with the file name "SECME_WBR_Video_ Elementary_Your School Name". (Substitute Middle or High as appropriate for your level)

Evaluation Sheet

SECME Water Bottle Rocket Engineering Notebook and Presentation

☐ **Elementary School** ☐ **Middle School** ☐ **High School**

ENGINEERING NOTEBOOK PRESENTATION	Max Points	Points Earned
ORGANIZATION		
Cover page:competition and division, team name, members, district, school, school city/state, coordinator name & email	15	
Table of Contents: headings and page numbers		
Team Norms and Team Roles		
Meeting Notes: dated entries with summaries		
PLANNING AND DESIGN		
Brainstorm: planning is evident throughout the design process	20	
Concept art/sketches: sketches reflect different versions of the design		
Materials List and Budget: receipts for purchases and descriptions of donations and/or recycled materials		
RESULTS		
Technical drawings: drawing of final design with all parts and measurements labeled	10	
Photos: front, side, and top views of the design		
Trial Runs: data for 3 trial runs of each design version, minimum of 2 designs and 6 total trial runs		
Conclusions and Recommendations: Provide your team's conclusion on your design process and any recommendations you have to better your design in the future (For example, if cost were not a constraint)	5	

At the judges' discretion, teams may be interviewed to determine the originality of their submitted work.
In order to place in the Rocket competition, each team must submit a corresponding engineering notebook presentation by the paperwork drop-off deadline.

Please provide constructive, specific feedback: **Total points earned:_____/ 50**

(back to top)

Quick Guide Reference

PROJECT NAME	GRADE LEVEL	COMPETITION LEVEL	COMPETITION TYPE	JUDGING PROCEDURES
Banner	Elementary Middle High	District	School Team	Banners will be evaluated by a panel of judges based on criteria listed on the evaluation sheet.
Brain Bowl *Reloaded*	Elementary Middle High	District	Team of 3 or 4 students	The highest scoring team in each round will move on to the next round. The winner is based on the highest score achieved in the final round.
Bridge	Elementary Middle High	District	Team of 3 students	Winner determined by the bridge that holds the greatest amount of weight (maximum load-bearing capacity) and score on technical drawing & technical report (secondary)
Essay	Elementary Middle High	District National	Individual	Essays will be evaluated by a panel of judges based on criteria listed on the evaluation sheet.
Generator Build	Elementary Middle High	District	Team of 3 students	Winners based on the generator function output, & technical report and technical drawing (secondary).
Mousetrap Car	Elementary Middle High	District National	Team of 2-4 students	Winners based on the car run, engineering notebook and presentation..
Poem	Elementary	District	Individual	Poems will be evaluated by a panel of judges based on criteria listed on the evaluation sheet.
Water Rocket	Elementary Middle High	District scores sent to National	Team of 2-4 students	Winner based on the rocket that has the best hang time, engineering notebook and presentation (elementary only). Winner based on the rocket that achieves the highest height, engineering notebook and presentation (secondary only).

2024-25 Coordinator Competition Agreement

- I have provided guidance for my SECME students to the best of my ability.
- I have ensured that all SECME entries submitted for competition are student-made and student-developed.
- I have ensured that my students have developed new, creative designs for each competition.
- I have carefully read and fully understand the rubrics and competition rules for all the Olympiad competitions.
- I will display an attitude of good sportsmanship throughout competition events at the SECME Olympiad.

_____ _____

Coordinator's Signature Date

_____ _____

Co-Coordinator's Signature Date

_____ _____

School Name SECME School Code

This form must be turned in with all other Olympiad paperwork.

Grievance Procedures 2024-2025

The Broward and Palm Beach SECME Industry Partners strive to ensure that every student participating in the District Olympiad has the best possible learning experience. In an effort to achieve this goal, every effort will be made to make sure that each project submitted for judging and/or competition is evaluated fairly according to the rules and regulations established in this manual. However, there may be an occasion when it appears that the rules were not adequately considered during the evaluation process. If this unfortunate event should occur, a **SECME Coordinator** may file a formal Grievance with the Olympiad Grievance Committee.

The Olympiad Grievance Committee will consist of 3 to 5 individuals (***if applicable*****,** at least one non-school based administrator from each county participating in the Olympiad, one individual who served on Survival Guide Writing Team, one representative from Florida Atlantic University, and one representative from industry). This committee will be responsible for thoroughly investigating the filed grievance and making an official ruling based on the guidelines and regulations established in this guide. **The decision of the Grievance Committee is FINAL.**

Filing a Grievance

1. Fill out a Formal Grievance Initiation form COMPLETELY.

2. All grievances must be filed BEFORE the end of the day at the Olympiad.

3. Submit the completed form to one of the Industry Partners or District Personnel.

4. ***At an appropriate time,*** the Grievance Committee will convene to investigate the concern.

5. The Grievance Committee chairperson will write a formal statement/ruling considering the matter based on the committee's findings.

6. The statement/ruling will be delivered to the SECME Coordinator who filed the grievance.

FORMAL GRIEVANCE INITIATION FORM

Name and title of the person filing the grievance

SECME school name_____

Location (county)_____

Date_____

Time_____

Describe in detail the nature of the concern, citing the specific issue being grieved and the rule/guideline (listing page numbers and exact item from the Survival Guide) it relates to:

_____

_____

Signature_____
(attach any additional sheets if needed)

Grievance Committee Response:

_____
Signature of Grievance Committee Chairperson/designee:

Date_____

Time_____

COMPETITION AWARDS

COMPETITION AWARDS GUIDELINES

First, second, and third place awards will be presented in the competition categories below.

Banner Competition	Elementary, Middle, High
Bridge Design	Elementary, Middle, High
Essay Competition *	Elementary, Middle, High
Generator Build	Elementary, Middle, High
Mousetrap Car Design*	Elementary, Middle, High
Poem Competition	Elementary
Water Rocket Design*	Elementary, Middle, High
Overall	Elementary, Middle, High

***Projects Advancing to the SECME National Student Competition.**

Essay: First place elementary school, middle school, and high school

Mousetrap Car: First place middle school and high school teams travel; elementary non-travel.

Water Rocket Design: First place teams at all levels submitted to SECME National.

The Overall County Winners

The Overall School Winners at each level will be determined in the following manner:
Each first place award will be worth 3 points, each second place award will be worth 2 points, and each third place award will be worth 1 point.
A panel of scorekeepers will maintain a running total of all awards won at the District Olympiad in the individual competitions. The school (at each level) with the highest overall point total at the conclusion of all of the competitions will be recognized as the Overall School Winner.

Note: Should your school fail to participate in any required event your team(s) will be unable to place in the Overall category.

In the event of a tie score, the mousetrap car will be the first tiebreaker. Should a tie still exist, banner then essay score will be used as tiebreakers.

RESOURCES

SECME Industry Partners Advisory Council

Name	Company	Work #	Email
Nick Clavelo	Florida Engineering Society		nick.clavelo@kimley-horn.com
Eric Obel	Florida Drawbridge Inc.		eobel@floridadrawbridges.com
Mike Calandra	Aerojet Rocketdyne		michael.calandra@rocket.com
Edward Speck-Kern	Florida Power & Light		edward.speck-kern@fpl.com

School District Partners

Broward County Schools

Dr. Lisa Milenkovic	(754) 321-2119		lisa.milenkovic@browardschools.com
Chris Kohnke	(754) 323-5100	X4153015	christopher.kohnke@browardschools.com

Palm Beach County Schools

Norman Riemer	(561) 629-8561	norman.riemer@palmbeachschools.org
Robert Tutoni	(561) 434-8336	robert.tutoni@palmbeachschools.org

SECME National Headquarters Central Office Personnel

Kim Jacobs	Executive Director	kmjacobs@eng.ufl.edu
Julaunica Tigner	Program Coordinator	julanicatigner@ufl.edu

SECME National website

SECME National Office

University of Florida College of Engineering
527 Gale Lemerand Drive
PO Box 116550
Gainesville, FL 32611-6550

SECME Member Universities

Some Suggested Merchants for Materials and Supplies

(Not an exhaustive list)

The SECME program, in listing the following businesses is not indicating support for, the availability of, or sponsorship of their products.

Felix Hobby
3772 W. Oakland Park Blvd.
Lauderdale Lakes, FL
305-895-5362

Pitsco Innovative Education
1-800-835-0686

Pitsco Lego Dacta-Partners in Innovative Education
1-800-362-4308

Sargent Welch
1-800-727-4368

Macroenter (paper resources) 1-800-622-7568 http://www.macroenter.com/

Graytex
http://www.graytex.com/d-size-paper.htm
1-800-813-5828

Ward's
1-800-962-2660

Fischer Science Education
1-800-955-1177

Paxton/Patterson 1-800-336-5998

Michaels Stores
521 N State Road 7, Royal Palm Beach, FL
561- 784-8574

Glue Products Plus (preferred vendor)
4115 Georgia Ave. West Palm Beach, FL
561-833-1863

JOANN Fabrics
940 S. State Road 7, Wellington, FL
561-204-5622

Radio Controlled Revolution
2528 Okeechobee Blvd, West Palm Beach, FL
561-684-2772

Easel Art Center
810 Park Ave, Lake Park, FL
561-844-3111

Boca Bargoons Incorporated (fabrics)
910 Federal Hwy. Lake Park, FL
561-842-7444

Fastframe
10949 N. Military Trail, Palm Beach Gardens, FL
561-627-5221

Wal-Mart

My Frame Shop & Gallery Incorporated
3901 S. Dixie Hwy, West Palm Beach, FL
561-478-8281

Alligator Art Custom Framing
13873 Wellington Trace, Suite B8, Wellington, FL
561-792-9020

Allen's Custom Framing Incorporated
6600 W Rogers Cir, Suite 7, Boca Raton, FL
561-241-5040

Legend RC
1695 W. Indiantown Rd, Suite 26, Jupiter, FL
561-744-3800

Marlin P. Jones and Associates (for generator wire)
mpja.com
8380 Resource Road
West Palm Beach, FL 33404
800-652-6733

Beginning Tool List

1. Tool box
2. Hammer
3. Small hand saws
4. Rulers
5. Scissors
6. Exacto knives (utility knives)
7. Screwdrivers (flathead and Phillips)
8. Drill (or drill press) and drill bits
9. Dremel tool and accessories
10. Pliers (needle nose and standard)
11. Adhesives (Insta-cure, glues, and glue sticks) AND glue remover(s)
12. Tape measure
13. Sandpaper (various grits)

Beginning Technical Drawing Tool List

1. Roll pencils
2. # 0-5 pencils
3. Flat surface/drawing board
4. Eraser shield
5. Erasers
6. T square
7. Triangle
8. Drafting stencil

Southeast Florida SECME Alliance Annual Awards Ceremony

2024-2025 ANNUAL SOUTHEAST FLORIDA
SECME ALLIANCE
AWARDS CEREMONY

Date TBD

ANNUAL SECME AWARDS NOMINATIONS

The primary mission of the SECME Banquet Committee is to honor students and teachers. The committee would appreciate your help in nominating outstanding individuals for the following awards. The categories are listed below:

1. **County Administrator of the Year** – This award is nominated by the school's SECME Coordinator.

2. **County Coordinator of the Year** – This award is a self-nominating award. There will be three awards per county (one elementary, one middle, and one high school.)

3. **Outstanding Angel Award** – The person receiving this award will be nominated by his/her SECME School Coordinator. There will be a total of three awards per county (one elementary, one middle, and one high school.) Criteria for this award should include contributions to and support of the school's SECME program.

4. **SECME Student of the Year** – This award is to honor an outstanding SECME student participant. Students nominated for this award must be a graduating fifth, eighth, or twelfth grade student and nominations are limited to one per school. Criteria for this award should include specific examples of such things as: most team spirit, best attendance, hardest worker, or most improved SECME student. Candidates should be nominated by the SECME Coordinator. There will be three recipients per county-- one at each of the elementary, middle, and high school levels.

If you have any questions regarding these awards, please contact your District SECME Program Director.

Next Generation Sunshine State Standards Correlation

Next Generation Sunshine State Standards (NGSSS) Science Benchmarks

KINDERGARTEN

MTC WBR VEX BWB	SC.K.N.1.1	Collaborate with a partner to collect information.
MTC WBR VEX BWB	SC.K.N.1.2	Make observations of the natural world and know that they are descriptors collected using the five senses.
MTC WBR VEX BWB	SC.K.N.1.3	Keep records as appropriate -- such as pictorial records -- of investigations conducted.
MTC WBR VEX BWB Banner	SC.K.N.1.4	Observe and create a visual representation of an object which includes its major features.
MTC WBR VEX BWB	SC.K.N.1.5	Recognize that learning can come from careful observation.
WBR VEX	SC.K.E.5.1	Explore the Law of Gravity by investigating how objects are pulled toward the ground unless something holds them up.
MTC WPR BWB VEX	SC.K.P.8.1	Sort objects by observable properties, such as size, shape, color, temperature (hot or cold), weight (heavy or light) and texture.
WBR BWB	SC.K.P.9.1	Recognize that the shape of materials such as paper and clay can be changed by cutting, tearing, crumpling, smashing, or rolling.
MTC WBR VEX	SC.K.P.12.1	Investigate that things move in different ways, such as fast, slow, etc.
MTC WBR VEX	SC.K.P.13.1	Observe that a push or a pull can change the way an object is moving.

GRADE 1

MTC WBR VEX BWB	SC.1.N.1.1	Raise questions about the natural world, investigate them in teams through free exploration, and generate appropriate explanations based on those explorations.
MTC WBR VEX BWB	SC.1.N.1.2	Using the five senses as tools, make careful observations, describe objects in terms of number, shape, texture, size, weight, color, and motion, and compare their observations with others.
MTC WBR VEX BWB	SC.1.N.1.3	Keep records as appropriate - such as pictorial and written records - of investigations conducted.
TV WBR VEX BWB	SC.1.N.1.4	Ask "how do you know?" in appropriate situations.
WBR	SC.1.E.5.2	Explore the Law of Gravity by demonstrating that Earth's gravity pulls any object on or near Earth toward it even though nothing is touching the object.
MTC WBR BWB VEX	SC.1.P.8.1	Sort objects by observable properties, such as size, shape, color, temperature (hot or cold), weight (heavy or light), texture, and whether objects sink or float.
MTC WBR VEX	SC.1.P.12.1	Demonstrate and describe the various ways that objects can move, such as in a straight line, zigzag, back-and-forth, round-and-round, fast, and slow.
WBR MTC VEX	SC.1.P.13.1	Demonstrate that the way to change the motion of an object is by applying a push or a pull.

GRADE 2

MTC WBR BWB	SC.2.N.1.1	Raise questions about the natural world, investigate them in teams through free exploration and systematic observations, and generate appropriate explanations based on those explorations.
MTC WBR BWB	SC.2.N.1.2	Compare the observations made by different groups using the same tools.
MTC WBR BWB	SC.2.N.1.3	Ask "how do you know?" in appropriate situations and attempt reasonable answers when asked the same question by others.
MTC WBR BWB	SC.2.N.1.4	Explain how particular scientific investigations should yield similar conclusions when repeated.
MTC WBR	SC.2.N.1.5	Distinguish between empirical observation (what you see, hear, feel, smell, or taste) and ideas or inferences (what you think).

BWB		
MTC WBR BWB	SC.2.N.1.6	Explain how scientists alone or in groups are always investigating new ways to solve problems.
WBR BWB	SC.2.P.8.1	Observe and measure objects in terms of their properties, including size, shape, color, temperature, weight, texture, sinking or floating in water, and attraction and repulsion of magnets.
WBR	SC.2.P.8.2	Identify objects and materials as solid, liquid, or gas.
WBR BWB	SC.2.P.8.3	Recognize that solids have a definite shape and that liquids and gases take the shape of their container.
WBR	SC.2.P.8.4	Observe and describe water in its solid, liquid, and gaseous states.
WBR	SC.2.P.8.6	Measure and compare the volume of liquids using containers of various shapes and sizes.
WBR BWB	SC.2.P.9.1	Investigate that materials can be altered to change some of their properties, but not all materials respond the same way to any one alteration.
VEX	SC.2.P.10.1	Discuss that people use electricity or other forms of energy to cook their food, cool or warm their homes, and power their cars.
WBR MTC	SC.2.P.13.1	Investigate the effect of applying various pushes and pulls on different objects.
WBR	SC.2.P.13.3	Recognize that objects are pulled toward the ground unless something holds them up.
MTC WBR	SC.2.P.13.4	Demonstrate that the greater the force (push or pull) applied to an object, the greater the change in motion of the object.

GRADE 3

MTC WBR	SC.3.N.1.1	Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.
MTC WBR	SC.3.N.1.2	Compare the observations made by different groups using the same tools and seek reasons to explain the differences across groups.
MTC WBR Banner	SC.3.N.1.3	Keep records as appropriate, such as pictorial, written, or simple charts and graphs, of investigations conducted.
MTC WBR	SC.3.N.1.4	Recognize the importance of communication among scientists.
MTC WBR	SC.3.N.1.5	Recognize that scientists question, discuss, and check each other's evidence and explanations.
MTC WBR	SC.3.N.1.6	Infer based on observation.

MTC WBR	SC.3.N.1.7	Explain that empirical evidence is information, such as observations or measurements that is used to help validate explanations of natural phenomena.
MTC WBR	SC.3.N.3.2	Recognize that scientists use models to help understand and explain how things work.
MTC WBR	SC.3.N.3.3	Recognize that all models are approximations of natural phenomena; as such, they do not perfectly account for all observations.
WBR	SC.3.E.5.4	Explore the Law of Gravity by demonstrating that gravity is a force that can be overcome.
MTC WBR	SC.3.P.8.2	Measure and compare the mass and volume of solids and liquids.
MTC WBR	SC.3.P.8.3	Compare materials and objects according to properties such as size, shape, color, texture, and hardness.
MTC WBR VEX	SC.3.P.10.1	Identify some basic forms of energy such as light, heat, sound, electrical, and mechanical.
MTC WBR VEX	SC.3.P.10.2	Recognize that energy has the ability to cause motion or create change.
MTC WBR VEX	SC.3.P.11.2	Investigate, observe, and explain that heat is produced when one object rubs against another, such as rubbing one's hands together. (friction and drag)

GRADE 4

MTC WBR	SC.4.N.1.1	Raise questions about the natural world, use appropriate reference materials that support understanding to obtain information (identifying the source), conduct both individual and team investigations through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.
MTC WBR	SC.4.N.1.2	Compare the observations made by different groups using multiple tools and seek reasons to explain the differences across groups.
MTC WBR	SC.4.N.1.3	Explain that science does not always follow a rigidly defined method ("the scientific method") but that science does involve the use of observations and empirical evidence.
MTC WBR	SC.4.N.1.4	Attempt reasonable answers to scientific questions and cite evidence in support.
MTC WBR	SC.4.N.1.5	Compare the methods and results of investigations done by other classmates.

MTC WBR	SC.4.N.1.6	Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations.
MTC WBR	SC.4.N.1.7	Recognize and explain that scientists base their explanations on evidence.
MTC WBR	SC.4.N.1.8	Recognize that science involves creativity in designing experiments.
Banner	SC.4.N.2.1	Explain that science focuses solely on the natural world.
MTC WBR B WB	SC.4.N.3.1	Explain that models can be three dimensional, two dimensional, an explanation in your mind, or a computer model.
WBR	SC.4.E.5.5	Investigate and report the effects of space research and exploration on the economy and culture of Florida.
MTC WBR	SC.4.P.8.1	Measure and compare objects and materials based on their physical properties including: mass, shape, volume, color, hardness, texture, odor, taste, attraction to magnets.
WBR	SC.4.P.8.2	Identify properties and common uses of water in each of its states
MTC WBR	SC.4.P.8.3	Explore the Law of Conservation of Mass by demonstrating that the mass of a whole object is always the same as the sum of the masses of its parts.
MTC WBR	SC.4.P.9.1	Identify some familiar changes in materials that result in other materials with different characteristics, such as decaying animal or plant matter, burning, rusting, and cooking.
MTC WBR VEX	SC.4.P.10.1	Observe and describe some basic forms of energy, including light, heat, sound, electrical, and the energy of motion.
MTC WBR VEX	SC.4.P.10.2	Investigate and describe that energy has the ability to cause motion or create change.
WBR	SC.4.P.10.4	Describe how moving water and air are sources of energy and can be used to move things.
MTC	SC.4.P.12.1	Recognize that an object in motion always changes its position and may

WBR VEX		Change its direction.
MTC WBR VEX	SC.4.P.12.2	Investigate and describe that the speed of an object is determined by the distance it travels in a unit of time and that objects can move at different speeds.

GRADE 5

MTC WBR VEX	SC.5.N.1.1	Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identification of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
MTC WBR V EX	SC.5.N.1.2	Explain the difference between an experiment and other types of scientific investigation.
MTC WBR VEX	SC.5.N.1.3	Recognize and explain the need for repeated experimental trials.
MTC WBR VEX	SC.5.N.1.4	Identify a control group and explain its importance in an experiment.
MTC WBR VEX	SC.5.N.1.5	Recognize and explain that authentic scientific investigation frequently does not parallel the steps of "the scientific method."
MTC WBR VEX	SC.5.N.1.6	Recognize and explain the difference between personal opinion/interpretation and verified observation.
MTC WBR VEX	SC.5.N.2.1	Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.
MTC WBR VEX	SC.5.N.2.2	Recognize and explain that when scientific investigations are carried out, the evidence produced by those investigations should be replicable by others.
WBR	SC.5.E.7.3	Recognize how air temperature, barometric pressure, humidity, wind speed and direction, and precipitation determine the weather in a particular place and time.
MTC WBR VEX	SC.5.P.8.1	Compare and contrast the basic properties of solids, liquids, and gases, such as mass, volume, color, texture, and temperature.
WBR BWB	SC.5.P.8.2	Investigate and identify materials that will dissolve in water and those that will not and identify the conditions that will speed up or slow down the dissolving process. (Fins & Glue)
BWB	SC.5.P.9.1	Investigate and describe that many physical and chemical changes are affected by temperature.
MTC WBR VEX	SC.5.P.10.1	Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical.
MTC WBR VEX	SC.5.P.10.2	Investigate and explain that energy has the ability to cause motion or create change.

VEX	SC.5.P.10.4	Investigate and explain that electrical energy can be transformed into heat, light, and sound energy, as well as the energy of motion.
VEX	SC.5.P.11.1	Investigate and illustrate the fact that the flow of electricity requires a closed circuit (a complete loop).
VEX	SC.5.P.11.2	Identify and classify materials that conduct electricity and materials that do not
MTC WBR VEX	SC.5.P.13.1	Identify familiar forces that cause objects to move, such as pushes, pulls, including gravity acting on falling objects.

MTC WBR VEX	SC.5.P.13.2	Investigate and describe that the greater the force applied to it, the greater the change in motion of a given object.
MTC WBR VEX	SC.5.P.13.3	Investigate and describe that the more mass an object has, the less effect a given force will have on the object's motion.
MTC WBR VEX	SC.5.P.13.4	Investigate and explain that when a force is applied to an object but it does not move, it is because another opposing force is being applied by something in the environment so that the forces are balanced.

GRADE 6

MTC WBR VEX BWB	SC.6.N.1.1	Define a problem from the sixth grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
MTC WBR VEX BWB	SC.6.N.1.2	Explain why scientific investigations should be replicable.
MTC WBR VEX BWB	SC.6.N.1.3	Explain the difference between an experiment and other types of scientific investigation, and explain the relative benefits and limitations of each.
MTC WBR VEX BWB	SC.6.N.1.4	Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation.
MTC WBR BWB VEX	SC.6.N.1.5	Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence.

Banner	SC.6.N.2.1	Distinguish science from other activities involving thought.
MTC WBR BWB VEX	SC.6.N.2.2	Explain that scientific knowledge is durable because it is open to change as new evidence or interpretations are encountered.
MTC WBR BWB VEX	SC.6.N.2.3	Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goals.
MTC WBR BWB VEX	SC.6.N.3.1	Recognize and explain that a scientific theory is a well-supported and widely accepted explanation of nature and is not simply a claim posed by an individual. Thus, the use of the term theory in science is very different than how it is used in everyday life.
MTC WBR BWB VEX	SC.6.N.3.2	Recognize and explain that a scientific law is a description of a specific relationship under given conditions in the natural world. Thus, scientific laws are different from societal laws.
MTC WBR BWB VEX	SC.6.N.3.3	Give several examples of scientific laws.
MTC WBR BWB VEX	SC.6.N.3.4	Identify the role of models in the context of the sixth grade science benchmarks.
MTC WBR VEX	SC.6.P.11.1	Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.
MTC WBR VEX	SC.6.P.12.1	Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship.
MTC WBR VEX	SC.6.P.13.1	Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational.

MTC	SC.6.P.13.2	Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are.
MTC WBR VEX	SC.6.P.13.3	Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both.

BWB		

GRADE 7

MTC WBR VEX BWB	SC.7.N.1.1	Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
MTC WBR VEX BWB	SC.7.N.1.2	Differentiate replication (by others) from repetition (multiple trials).
MTC WBR VEX BWB	SC.7.N.1.3	Distinguish between an experiment (which must involve the identification and control of variables) and other forms of scientific investigation and explain that not all scientific knowledge is derived from experimentation.
MTC WBR VEX BWB	SC.7.N.1.4	Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.
MTC WBR VEX BWB	SC.7.N.1.5	Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.
MTC WBR VEX BWB	SC.7.N.1.6	Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.
MTC WBR VEX BWB	SC.7.N.1.7	Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.
MTC WBR VEX BWB	SC.7.N.3.1	Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that supports them.
MTC WBR VEX BWB	SC.7.N.3.2	Identify the benefits and limitations of the use of scientific models.
MTC WBR VEX BWB	SC.7.P.11.2	Investigate and describe the transformation of energy from one form to another.

MTC WBR VEX BWB	SC.7.P.11.3	Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.

GRADE 8

MTC WBR VEX BWB	SC.8.N.1.1	Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
MTC WBR VEX BWB	SC.8.N.1.2	Design and conduct a study using repeated trials and replication.
MTC WBR VEX BWB	SC.8.N.1.3	Use phrases such as "results support" or "fail to support" in science, understanding that science does not offer conclusive 'proof' of a knowledge claim.
MTC WBR VEX BWB	SC.8.N.1.4	Explain how hypotheses are valuable if they lead to further investigations, even if they turn out not to be supported by the data.
MTC WBR VEX BWB	SC.8.N.1.5	Analyze the methods used to develop a scientific explanation as seen in different fields of science.
MTC WBR VEX BWB	SC.8.N.1.6	Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence.
MTC WBR VEX BWB	SC.8.N.2.1	Distinguish between scientific and pseudoscientific ideas.
MTC WBR VEX BWB	SC.8.N.2.2	Discuss what characterizes science and its methods.
MTC WBR VEX BWB	SC.8.N.3.1	Select models useful in relating the results of their own investigations.

MTC WBR VEX BWB	SC.8.N.3.2	Explain why theories may be modified but are rarely discarded.
MTC WBR VEX BWB	SC.8.N.4.1	Explain that science is one of the processes that can be used to inform decision making at the community, state, national, and international levels.
MTC WBR VEX BWB	SC.8.N.4.2	Explain how political, social, and economic concerns can affect science, and vice versa.
WBR	SC.8.E.5.1	Recognize that there are enormous distances between objects in space and apply our knowledge of light and space travel to understand this distance.
VEX	SC.8.E.5.10	Assess how technology is essential to science for such purposes as access to outer space and other remote locations, sample collection, measurement, data collection and storage, computation, and communication of information.
WBR	SC.8.E.5.12	Summarize the effects of space exploration on the economy and culture of Florida.

WBR BWB	SC.8.P.8.2	Differentiate between weight and mass recognizing that weight is the amount of gravitational pull on an object and is distinct from, though proportional to mass.
WBR BWB	SC.8.P.8.3	Explore and describe the densities of various materials through measurement of their masses and volumes.

GRADE 9-12

WBR	SC.912.P.8.1	Differentiate among the four states of matter.
MTC WBR VEX BWB	SC.912.P.8.2	Differentiate between physical and chemical properties and physical and chemical changes of matter.
MTC WBR VEX BWB	SC.912.P.10.1	Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.
MTC WBR VEX BWB	SC.912.P.10.2	Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.

MTC WBR VEX BWB	SC.912.P.10.3	Compare and contrast work and power qualitatively and quantitatively.
MTC WBR VEX BWB	SC.912.P.10.6	Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.
MTC WBR VEX	SC.912.P.10.8	Explain entropy's role in determining the efficiency of processes that convert energy to work.
VEX	SC.912.P.10.14	Differentiate among conductors, semiconductors, and insulators.
VEX	SC.912.P.10.15	Investigate and explain the relationships among current, voltage, resistance, and power.
VEX	SC.912.P.10.16	Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.
MTC WBR VEX BWB	SC.912.P.12.1	Distinguish between scalar and vector quantities and assess which should be used to describe an event.
MTC WBR VEX BWB	SC.912.P.12.2	Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.
MTC WBR VEX BWB	SC.912.P.12.3	Interpret and apply Newton's three laws of motion.
WBR	SC.912.P.12.4	Describe how the gravitational force between two objects depends on their masses and the distance between them.
MTC WBR VEX	SC.912.P.12.5	Apply the law of conservation of linear momentum to interactions, such as collisions between objects.
MTC WBR VEX	SC.912.P.12.6	Qualitatively apply the concept of angular momentum.
MTC WBR VEX BWB	SC.912.P.12.9	Recognize that time, length, and energy depend on the frame of reference.
WBR	SC.912.E.5.7	Relate the history of and explain the justification for future space exploration and continuing technology development.

WBR	SC.912.E.5.9	Analyze the broad effects of space exploration on the economy and culture of Florida.
MTC WBR VEX BWB	SC.912.N.1.1	Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: 1. pose questions about the natural world, 2. conduct systematic observations, 3. examine books and other sources of information to see what is already known, 4. review what is known in light of empirical evidence, 5. plan investigations, 6. use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), 7. pose answers, explanations, or descriptions of events, 8. generate explanations that explicate or describe natural phenomena (inferences), 9. use appropriate evidence and reasoning to justify these explanations to others, 10. communicate results of scientific investigations, and 11. evaluate the merits of the explanations produced by others.
MTC WBR VEX BWB	SC.912.N.1.2	Describe and explain what characterizes science and its methods.
MTC WBR VEX BWB	SC.912.N.1.3	Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.
MTC WBR VEX BWB	SC.912.N.1.4	Identify sources of information and assess their reliability according to the strict standards of scientific investigation
MTC WBR VEX BWB	SC.912.N.1.5	Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.
MTC WBR VEX BWB	SC.912.N.1.6	Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.
MTC WBR VEX	SC.912.N.1.7	Recognize the role of creativity in constructing scientific questions, methods and explanations.

BWB		
MTC WBR VEX BWB	SC.912.N.2.1	Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).
Banner	SC.912.N.2.2	Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.
MTC WBR VEX BWB	SC.912.N.2.5	Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas)

		potential to add new evidence to support one or another of the explanations.
MTC WBR VEX BWB	SC 912.N.3.1	Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.
MTC WBR VEX BWB Banner	SC.912.N.3.2	Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science
MTC WBR VEX BWB	SC.912.N.3.3	Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.
MTC WBR VEX BWB	SC.912.N.3.4	Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.
MTC WBR VEX BWB	SC.912.N.3.5	Describe the function of models in science, and identify the wide range of models used in science.
MTC WBR VEX BWB Banner	SC.912.N.4.1	Explain how scientific knowledge and reasoning provide an empirically- based perspective to inform society's decision making.

MTC WBR VEX BWB Banner	SC.912.N.4.2	Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.

Suggestions and Additional Activities

SOLAR WATER HEATER CONTEST GUIDELINES

Design and Contest Rules

1. Each apparatus will have a collecting area of not less than 100 square cm and no more than 3,000 square cm to be exposed to the sun. The surface area will be measured and calculated to at least three significant figures.
2. **Each apparatus must be provided with**:
    a. Only a white border, in white poster board, extending at least 10 cm from the collecting area and preventing direct sunlight from falling on the sides or back of the apparatus, and
    b. A cover of white poster board which will hook on and cover the entire collecting area. This will be removed to start the competition and replaced to end the competition.
3. No device will be allowed to provide any type of additional solar energy input, including solar voltaic cells. Absolutely no battery power is permitted.
4. Each entry will have a separate shaded water reservoir to accommodate water in the amount of one cubic cm per square cm of collector area, less the volume needed to fill the collector, plus a small reserve volume for water expansion. No dimension of the reservoir shall be less than one half of the longest dimension.

Judging

1. Each entry will be placed indoors or in the shade for a period of at least one hour to allow the entire apparatus to come to room temperature.
2. Each water reservoir should be empty at the start of the competition and should provide a convenient opening for filling with a funnel. A port for the insertion of a standard mercury laboratory thermometer (provided by the judging team) into the main body of the water within the reservoir must be provided, and the extension of the thermometer outside of the reservoir must remain shaded.
3. The judges will fill each apparatus with exactly one cubic cm of water per square cm of collector area from a large volume of water stored at room temperature for at least 24 hours. All filling will be completed before the devices are removed from the shade.
3. Any device that leaks will be disqualified.
4. A standard mercury-in-glass thermometer will be kept in each device during testing.
5. One student from the solar water heater team must be present during the entire contest.
6. All devices will begin at approximately the same initial temperature, within 0.5 degrees Celsius, and at approximately the same time.
7. The maximum time allowed for exposure to the sun is three (3) hours.
8. Once the competition has started, students are not permitted to physically manipulate the device in any way.

TOOTHPICK FERRIS WHEEL CONTEST GUIDELINES

General

Design and construct a completely operational Ferris wheel that will permit eight standard-sized glass marbles (each housed in their own compartment) to rotate smoothly around the wheels' axis. The only materials that may be used in the construction of this project are standard wooden toothpicks and glue. While there are no specific maximum size limitations and no restrictions on the number of toothpicks that can be used, the entire apparatus must be at least 24 inches in height and should operate smoothly with the use of a battery-powered motor.

Judging

1. Best of three trial runs of the marble
2. Craftsmanship and Originality

TOOTHPICK ROLLER COASTER CONTEST RULES

General

Design and construct a complete roller coaster that will permit a standard-sized glass marble to roll through it from beginning to end. The only materials that may be used in the construction of this project are standard wood toothpicks and glue. There are no specific size limitations on the roller coaster and no restrictions on the number of toothpicks that can be used. However, the roller coaster **MUST HAVE AT LEAST ONE COMPLETE LOOP AND TWO HILLS**. Additionally, the end of the roller coaster must curve around to meet the base of its starting point. Once the marble is released from the starting point, it cannot be touched or assisted in any way until it reaches its target location.

Judging

1. Best of three trial runs of the marble
2. Craftsmanship and Originality

MINORITY CONTRIBUTORS PROJECT

This project is designed to stimulate interest in the study of minority contributors to the fields of engineering, science, technology, and mathematics. All completed projects must contain the following elements:

1. Written Report (15 to 20 typed pages)
   - A. Cover Page
   - B. Table of Contents

C. Introduction

   - D. Reports on four minority contributors. These reports should reflect the student's understanding of the contribution, as well as its implication to society.
   - E. One interview with any minority person who is a professional in the fields of math, science, or engineering should be conducted. This interview should highlight the individual's contributions to society, preparation leading to their current occupational status, future short-term and long-term goals, and the individual's opinion about the study of minority contributors.
   - F. Conclusion
   - G. Reference list

2. Presentation Backboard (standard size)
   A. Pictures of all contributors highlighted in the written report
   B. Diagrams, sketches, and/or pictures of the contributions made to society by the highlighted individuals
   C. Any other supportive materials

TEAM EMBLEM CONTEST RULES

Design and Contest Rules

1. Team emblems must be submitted on full standard-sized poster board.
2. All entries must include team name, team colors, team symbol, school name, current year, and the SECME emblem. Any entries not bearing these items will be automatically disqualified.
3. All entries must be in full color.
4. Team emblems must be a hand-made original work for the year it is submitted.
5. Team emblems will be scored in the following categories:

Content - Quality and organization of the information on the emblem.

Originality -Innovation of the design and how well it presents the ideas on the entry. Creativity - The uniqueness of the information depicted.

Appearance - The attractiveness and neatness, scale and balance of the presentation.

SPACE STATION PROJECT GUIDELINES

General Contest Rules

The purpose of this project is to design, construct and establish a management system for an orbiting space station living colony. The designed colony must provide all of the necessities for human inhabitants. The group must complete all of the activities listed below.

1. Draw a formal blueprint of the entire Space Station facility.
2. Build a model of the Space Station facility using materials such as: PVC pipe connectors, 2-liter soft drink bottles, cardboard, foil glue tape, paints and other materials.
3. Create a portfolio: three-inch binder
   a) Identify all of the problems faced by the space station.
   b) Offer viable solutions to the problems faced by the space station.
   c) Develop a newspaper advertisement attracting tourists to your space station.
   d) Invent a monetary system for the space station. Publish current exchange rates for at least three other monetary systems on Earth.
   e) Adopt or develop a standard unit of measurement to be used on the space station. Provide a chart illustrating equivalency among the space station system and English system of measurement.
   f) Establish a formal system of government. Develop a chart illustrating the chain of command and listing all official titles of government personnel. Include means of public safety, as well as specific laws and ordinances by which your government will operate.

g) Invent a new sport to be played in your space station. Detail specific rules and regulations, playing materials, and playing field.
h) Design clothes for the inhabitants of your space station to wear at both work and play.
i) Design a shuttle system that will transport people back and forth from the Earth to your space station.
j) Design an official flag and choose a name for your space station.
k) Write an essay explaining how wastes and pollution will be controlled in the space station.
l) Write an essay explaining how electricity will be produced and utilized in the station.
m) Write an essay explaining how running water will be produced and piped throughout the entire space station.
n) Write an essay explaining how fresh fruits and vegetables, as well as other food items will be grown and/or produced in your space station.
o) Write an essay explaining how oxygen will be produced, and how the climate will be controlled throughout the space station.

Points will be assigned for the successful completion of each activity contained in the above list.

ROLLING GLIDER CONTEST GUIDELINES

General

The purpose of this project is to build an apparatus that will roll smoothly down a 1' x 3' wooden board, and then glide across a room for a total gliding distance of at least 50 feet. The runway board will be angled at 35 degrees above the horizon. The top of the runway will be at least 20 feet above the ground. During its roll, the apparatus must have at least three wheels in contact with the runway at all times. Further, the wheels of the apparatus must actually ROLL (not SLIDE) down the runway. The winning glider will be the glider with the longest net displacement from the lower edge of the ramp.

MARVELOUS MACHINES

General

The purpose of this project is to use as many simple machines as possible to build a device that can lift a steel or iron washer from a tabletop to a height of exactly 15 cm. Then, drop it from that height into a paper cup placed next to the washer. Any combination of the following six simple machines may be used: levers, inclined planes, pulleys, screws, wheel and axles, and wedges.

Additionally, such items as magnets, string, empty plastic soda bottles, mousetraps, drinking straws, coat hangers, steel spheres, marbles, etc. may be used.

a. No electrical or battery-powered devices may be used.
b. Any combination of simple machines may be used.
c. No two simple machines may touch in any way.
d. Objects (such as marbles, ping pong balls, etc.) must be moved through your device.
e. The washer and paper cup must be placed next to each other on the table top, separated by no more than 15 cm.
f. Once the motion starts, you may not touch anything on your device. The washer must be lifted from the table top and dropped into the cup without human assistance.

g. Your device must have a theme.

Scoring

Task	**Points**
Simple machines on list used	3 points each
Object(s) climbs up inclined plane	2 points for each inclined plane & each object moved
Object transported across a 30 cm (+) gap by a moving part	5 points for each object
Object propelled across a 30 cm (+) gap	5 points for each object
Washer lifted to EXACTLY 10 cm in height	10 points
Theme is evident	5 points

BOATS AND MOATS DESIGN CONTEST

General

The purpose of this project is to build a boat-like device that will travel the longest distance down a 305.5 cm rain gutter using only the power of a standard box fan (set on medium speed) placed at one end of the rain gutter. The boat that travels down the rain gutter in the shortest time will be declared the winner. The length of the boat cannot exceed 15.1 cm. The width of the boat cannot exceed 7.6 cm. There are no restrictions on the height of the boat. The student is free to use any **TYPE** of materials they choose. However, **NO PRE-FORMED CONTAINERS** can be used in the design of the device.

The dimensions of the rain gutter to be used to test this design project are as follows:

Length	3.5 cm
Depth	5.0 cm
Base Width	7.0 cm
Opening Width	10.0 cm
Water Level	3.5 cm

TECHNICAL PORTFOLIO

The technical portfolio is optional but highly recommended for high school students wishing to secure SECME-related scholarships.

OPTION 1

New clean one-inch 3-ring binder

Design a cover for the binder

Break portfolio into tabs or sections

OPTION 2

Use a high density **removable storage drives**

I. Commendations
- A. Student Information
  1. General information sheet
  2. Information about you (updated as needed)
  3. Honors and awards (updated as needed).
  4. Personal resume (updated yearly)
- B. 3 letters of recommendation (updated yearly)

II. School Related Activities
- A. Sports
- B. Clubs and extra-curricular activities
- C. School-related summer activities

III. Community Activities
- A. Time-log of community service hours earned
- B. Listing of other community service activities

IV. Goals for the Future
- A. Short-term Goals
  1. Goals that can be achieved within one calendar year
  2. Updated yearly
- B. Long-term Goals
  1. Goals that can be achieved in 2 to 10 years
  2. Updated yearly
- C. Descriptive Paragraph(s)
  1. Paragraph(s) detailing the steps that have been taken, or will be taken in an effort to reach your long-terms goals
  2. Updated yearly
- D. Four year educational plan
  1. Listing of courses and other programs that will assist the student in their long-term goals.

2. Updated as the student matriculates from one school to another or from one program to another.
3. A guidance counselor and parent should sign the accepted four-year plan.

V. Time Management Chart

A. General lists of time considerations
   1. school hours
   2. study time
   3. employment hours
   4. sports and recreation time

B. Time management charts for every week

Each section or tab of the portfolio should be accompanied by a set of supportive pictures.

Southeast Florida SECME Alliance

Suggestions and Additional Activities
2024-2025

Make learning interesting and engaging for students of varied skills and development levels by engaging in some of the following activities/practices.

1. Invite students to visit classrooms and experience first-hand how they might best prepare (and be prepared) for various careers.
2. Implement inquiry-based teaching strategies and "hands-on" problem solving.
3. Generate ideas and implementation strategies for interdisciplinary units and innovative instructional approaches.
4. Advocate and model authentic assessment.
5. Encourage students to test their ideas through independent research and to share results with peers and communicate new understandings.
6. Connect the "world of work" to the school curriculum via internet research, field trips, internships, work experience, and visiting scientists/engineers in the classroom.
7. Involve parents and community curricular/extracurricular learning and instruction.

Additional Activities (feel free to expand/modify any activity to meet the needs of your students)

1. Make a paper helicopter for a strand (stick) of spaghetti that win fall more slowly than a paper clip if both are dropped from the same height
2. Design and construct a paper parachute. It carries a payload of a plastic film container that has 20ml of water.
3. Build a paper glider that will fly carrying five paper clips.
4. Design and construct a kite that will fly at least a 45-degree angle to the ground
5. Construct a hot air balloon made of tissue paper that will fly.
6. Design, construct and learn to fly a cylinder aircraft well enough to hit a ditto paper target at a distance of 2m.
7. Build a rubber band-powered Popsicle sack and soda straw speedboat that can go at least 1m and hit a 20cm target.
8. Who can build the sailboat that goes the fastest?
9. Make a clay boat capable of floating 20 paper clips.
10. Design and construct a cantilever that can reach a distance of 35cm from its base. A cantilever is a beam supported at only one end. One example is a diving board. The arm of the cantilever may not touch the table that the base rests on.
11. Build a paper column at least 8 centimeters (cm) tall that will support a coffee can full of water.
12. Build a ½-meter high paper tower that will support a plastic film container that is full of water.
13. Design and construct a landing pad from ditto paper and masking tape. The landing pad must prevent a RAW chicken egg from breaking after it has accelerated under the force of gravity for a distance of one meter (1m) or more.
14. Design and construct "armor" for a boiled egg that will keep it from cracking after a ten- decimeter (10dm) fall.
15. Build a model badge entirely out of toothpicks that can support 500 milliliters (ml) of water in a coffee can.
16. Starting from a germinated seed, grow a healthy sunflower plant.
17. How many different kinds of bread mold can you grow in one week?
18. Design and construct a cage in which to raise a caterpillar to adulthood.
19. Find and collect several different kinds of beetles. Find out which beetle is the fastest.
20. Design and construct a cylinder racer that can travel forward for at least 1 meter. Can you make a cylinder racer that will go up or down a 1-meter hill, or complete a 26-meter marathon?
21. Build an electromagnet that will pick up 15 paper clips.
22. Design and construct an apparatus (something! that will generate (make) and collect ½ liter (L) of a gas under water.
23. Design and construct a five-link paper chain that is capable of lifting a coffee can half-full of water.
24. Design and construct a solar energy collector out of empty coffee cans that will keep an internal temperature at least 20 degrees greater than the ambient (outside) temperature.
25. Find a solid fuel that will raise the temperature of 50 milliliters (ml) of water 10 degrees Celsius when a 2-gram (gm) sample is burned. The fuel must be a natural substance.
26. Design and construct a wind turbine powering a drive shaft that will wind up 1 meter of thread.