

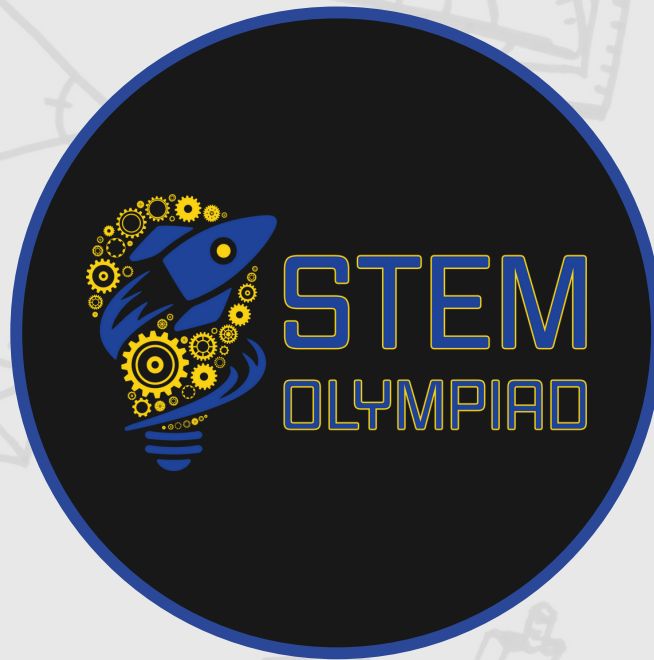


STEMducate

STEM
OLYMPIAD

COMPETITION MANUAL

2023 Season



Competition Guidelines

The STEM Olympiad is an annual competition in which teams of students compete to win awards, test and learn new STEM skills, and complete STEM projects. **Teams may consist of 1 to 5 students.** The 2023 Competition will kick off on November 8th, 2023 and will last **until January 20th, 2024 at 11:59 PM.** We have an elementary, middle, and high school challenge. Students are eligible to compete in any challenge of a grade level **higher** than or equal to their own. This means elementary and middle schoolers can compete in the middle or high school competitions, but, high schoolers can only compete in the high school competition. The acronym STEM has been used since 2001, but a lot of people don't know what it stands for. Each letter represents a different field- Science, Technology, Engineering, and Math. All of these fields require a unique set of skills, and one of those critical qualities is their need for an innovative mindset. Ingenuity is a central part of advancing any STEM oriented field. Thus, The theme for the 2023 STEM Olympiad is **Incredible Innovation.**

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Elementary School Competition

Sink or Swim Boat Challenge

Challenge Overview:

It is never too early to start in the STEM field, but it definitely is hard- and for this project, its sink or swim. For the Elementary School competition, your job is to design a boat that can stay afloat while carrying increasing amounts of weight. Using any household materials, your boat must fit into a 1ft by 1ft by 0.25ft (0.3 x 0.3 x 0.08 meter) sizing cube. Starting with no weight, increase the weight on The boat by 8 ounces/0.5lbs. every minute. The boat to hold the most weight without being fully submerged or breaking wins!

Design Specifics:

your boat must have a flat, level surface that weights can be placed on. The entire apparatus must fit the 1 foot x 1 foot x 1/4 foot (0.3 x 0.3 x 0.08 meter) dimensions, and weigh less than 1 pound (.45kg) The boat must float on its own, with no outside force for stabilization. Let your creativity run wild and decorate and design as you please.

Testing Procedure:

Fill any tub, container, or sink that has the proper dimensions to fit a 1ft x 1ft x 1/4ft (0.3 x 0.3 x 0.08 meter) boat, place the weights on your ship in 30 second increments! If the STEMducate team is working with you in person, buckets and weights for testing will be provided, but materials must be sourced independently.

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Middle School Competition

Temperate Thermos Challenge

Challenge Overview:

What would a STEM leader do in an Avalanche? They would innovate, and we believe our STEM Olympiad teams can too! Middle school students are tasked with constricting a thermos to test heat retention and liquid cooling!

Use any 16.9 fl oz. (0.5 liter) beverage bottle and household materials, construct a thermos that will best retain the temperature of water heated to 50°C.

Design Specifics:

For the design of your thermos, you may use any materials as long as you do not incorporate electronic or battery powered components. The Thermos and bottle must weigh less than 2 pounds (.90kg) without any liquid inside.

Testing Procedure:

Heat water to 50°C and pour it in your thermos. Take the temperature of the water at 5 minutes, 10 minutes, and 15 minutes, then calculate the temperature loss for the earned time interval. The winner will be the engineer who's thermos measures the lowest temperature loss.



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High School Competition

Powerful Prosthetics Challenge

Challenge Overview:

Every year, the prosthetic industry innovates to release new mind blowing designs that directly improve the quality of life for amputees. For the High School category, students are tasked to design a prosthetic leg to test compression strength.

Design Specifics:

No electronic or battery powered materials can be utilized, but beyond that, utilize any resource to the best of your ability! The leg must have a flat surface with a minimum surface area of 16 square in. (103 square cm.) to place weights on and the base must fit into a standard sneaker. With the average prosthetic leg weighing about 8 lbs. (3.6kg), Your design cannot exceed 10 lbs. (4.5kg) and must be 18 inches (0.46m) tall. The base of the leg must fit into and be entirely supported by a shoe. There are no other design requirements.

Testing Procedure:

To test, the leg must be free standing with no outside source for stabilization. Increase the weight on the top of the leg by 1 pound (0.45kg) per 30 seconds until the leg breaks. The leg that is able to withstand the most weight wins.

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Contact Us



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About STEMducate

STEMducate is a non-profit organization dedicated to creating and promoting STEM to students from a young age to increase their curiosity and imagination. Our goal is to expose students to STEM opportunities and careers, enabling them to dream big and make their dreams a reality. We provide positive and powerful opportunities and experiences in STEM fields for people of all ages. These initiatives will hopefully entice students toward becoming the next innovators, educators, researchers, and leaders. We aim to reduce the number of unfilled jobs due to the lack of specialized skills that are needed to perform job tasks.

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