

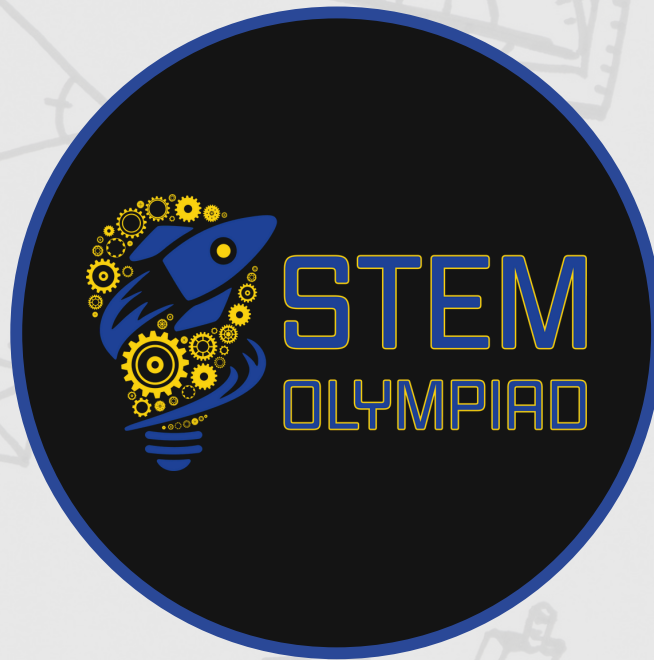


STEMducate

**STEM
OLYMPIAD**

COMPETITION MANUAL

2025 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 2025 Competition will kick off on September 29th, 2025 and will last **until November 24th, 2025 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. This year, the STEM Olympiad will shine a spotlight on biomedical sciences, a field that blends science, technology, engineering, and math to improve human health and quality of life. From designing life-saving medical devices to developing cutting-edge prosthetics and diagnostic tools, biomedical science demonstrates the true power of innovation--and provides the perfect theme for this season's competition.

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Elementary School Competition

Eggbulatory Emergency!

Challenge Overview:

What would a STEM leader do in a crash? They would find a way to keep people safe—and now it's your turn! In this challenge, elementary school students will design and build their very own ambulance using simple materials like cardboard, tape, and glue. But this isn't just any ambulance—it needs to carry a very special passenger: an egg! Your mission is to protect the egg “patient” inside the ambulance during a crash test. The ambulance that keeps its egg safe through the crash earns the win!

Design Specifics:

For the design of your “Eggbulance”, you may use any materials as long as you do not incorporate electronic or battery powered components. The ambulance can be any size as long as it fits in the ramp which can be found [here](#).

Testing Procedure:

Students will be judged on the time it takes the ambulance to arrive at the hospital, amount of damage sustained by their egg, and their design choices.



Middle School Competition

LifeLine Buoyancy Challenge

Challenge Overview:

In biomedical engineering, buoyancy and fluid dynamics are more than just physics concepts—they are critical in designing systems that deliver life-saving drugs within the body. Tiny capsules and carriers must “stay afloat” and travel through fluids without sinking, leaking, or drifting off course.

In this challenge, you will take these same principles to the water. Your task is to design a floating lifesaver that protects and carries a watertight “medical kit” (a decorated box). Using materials such as plastic containers, balloons, tape, and string, you must ensure your kit can hold as much weight as possible before sinking—while staying sealed, easy to handle with wet hands, and resistant to drifting away.

Design Specifics:

Your box must be no larger than 4.5 in x 4.5 in x 4.5 in. Students will need to use at least 5 items that would help in a water related emergency, and make the box hold it without water damaging. Balloons or other things like sealed plastic boxes provide buoyancy. Students will use the best option for the job.

Testing Procedure:

Fill any tub, container, or sink that has the proper dimensions to fit your box, place the medical items (weights) on your lifeline in 30 second increments! If the STEMducate team is working with you in person, testing materials will be provided, but materials must be sourced independently.



High School Competition

Helping Hand Challenge

Challenge Overview:

Every year, the prosthetic industry innovates to release new mind blowing designs that directly improve the quality of life for amputees. Students will make a “helping” to pick up various objects (they will just be creating a basic grabber).

They will be objectively judged based on whether they can hold each of the different objects that they need to, and how much weight the arm can hold. There will also be some subjective judging, such as creativity.

Design Specifics:

No electronic or battery powered materials can be utilized, but beyond that, utilize any resource to the best of your ability! The hand may not be larger than 7in (18cm) in length and no wider than 5in (13cm) in length. You may use simple materials like cardboard, string, and rubber bands to create your design. Make sure your hand can be able to hold a bag (with weights), or weights.

Testing Procedure:

To test, the hand must be suspended in the air with no outside source for stabilization. Increase the weight on the hand by 1 pound (0.45kg) per 15 seconds until the hand breaks. The project will be judged on objective criteria such as performance and strength, as well as subjective elements like creativity and design innovation.



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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