

BIONIC / ROBOTIC HAND KIT®




2022 C O M P E T I T I O N

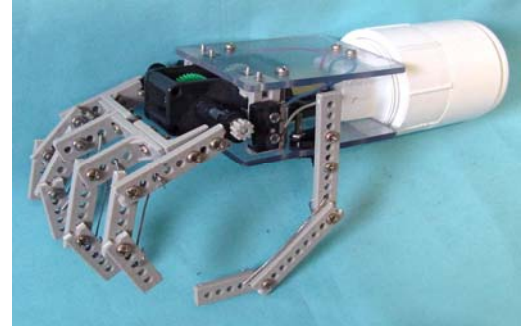
18th Annual Expo at the Miami Dade District SECME Olympiad

New Video Semi-Finals & Live Finals Format for Teams

Video submissions due January 18 • Live finalist presentations @ the Olympiad on January 29

Imagine the excitement of:

-  Forming a biotech team with your classmates
-  Creating a functioning bionic hand prototype
-  Competing with other teams for awards!



THE CHALLENGE – Your team will act as founders of a new biomedical company that is pursuing a large U. S. Government prosthetics contract. To win the contract you must redesign the Mark I, an existing bionic hand. All parts, tools and instructions to build the Mark I will be provided. You must improve the function and appearance of this Hand without exceeding a fixed budget. To compete you must: (A) complete a functioning re-engineered hand prototype; and (B) create a video presentation which thoroughly explains and demonstrates your prototype.



THE COMPETITION – Your video will be evaluated by a panel of judges. If selected as a finalist, you will be invited to present live for Olympiad judges. Prizes will be awarded to finalists who score the highest points overall in four judging categories.



ELIGIBILITY – Teams of up to three (3) students can enter the Middle School or Senior High Divisions. Only one team per Division can represent your school.

HOW TO ENTER – To receive the official Mark I Bionic/Robotic Hand Kit, complete the Entry Form and return with \$125 registration fee (credit card, Zelle or check). For forms and information please contact *The Yaeger Foundation, Inc.* at: 305.751-4208; fax 305.691-3784; info@yaegerco.com. **You must submit a 2022 entry form to us and use this year's Kit (Version 14.0) to compete.**



2022 BIONIC/ROBOTIC HAND KIT® COMPETITION

This Competition provides a hands-on STEM career exploration experience. Students will re-engineer a prosthesis and simulate presentations delivered by biotechnology entrepreneurs. The Bionic/Robotic Hand Kit Competition was created by Ivan Yaeger, Chief Executive Officer of The Yaeger Companies and inventor of the patented Yaeger Arm prosthesis.

VIDEO SEMI-FINALS AND LIVE FINALS FORMAT *Please read carefully!*

- There will be pre-judging of submitted video presentations, followed by judging of finalists' live presentations.
- You must compete in a team of 2 to 3 students.
- For the Semi-Finals you must create and submit a video, 3 minutes maximum length, consisting of: **(1) Display and operation of hand prototype; (2) Presentation of drawings/photos showing engineering changes; (3) Explanation of all modifications, features and budget; and (4) Demonstration of prototype handling several objects.** Demonstration must show: **(a) pick up and release a sheet of paper; (b) pick up and release a drinking cup (plastic, paper or Styrofoam) and (c) pick up a full 16.9 OZ (500ML) bottle of water and pour contents into the cup (you will supply these items).**

1/18/22 – Deadline to upload video entries to SECME SharePoint site for pre-judging.

We will select at least 5 middle school and 5 high school finalists.

1/21/22 -- Finalists will be announced and invited to present live at the Olympiad

1/29/22 -- Finalists will be judged at the Olympiad (winners announced at Awards Ceremony)

DESIGN PARAMETERS

You will begin by building this year's Bionic/Robotic Hand Kit (Version 14.0), which you will receive upon submitting the \$125.00 registration fee. Then, re-engineer the Hand to produce your custom-designed prototype. The prototype must be designed to be a wearable prosthesis that can be used by a hand amputee. It must therefore be (1) lightweight; (2) powered by a portable, self-contained power source; (3) provide the ability to grip, manipulate and hold objects; and (4) be easily and safely operated by a physically challenged user. However, the hand can also have other industrial uses in robotics and other applications. You can incorporate virtually any material, mechanical system, power system and control system. Points will be awarded on technical innovation and creative use of improvised materials. Creativity and recycling of salvaged materials will generate greater points. You must spend no more than \$200 for additional materials and components. Expenses must be documented by submitting a detailed budget and copies of receipts.

JUDGING CATAGORIES

Total points awarded from the following will be tallied to determine First, Second and Third Place.

Innovative Engineering – Points are awarded for creative design and construction. Modifications to the original Hand Kit can include added and/or improved motion, functions and control systems.

Product Demonstration – The functionality your design is assessed by evaluating motion, control, dexterity and strength. You should be able to hold the prototype with one natural hand and use it to grasp, manipulate and release the objects listed above.

Most Realistic Prosthesis – Points are awarded for special attention applied to cosmetics and motion which produce the most aesthetically refined prosthetic hand prototype.

Effective Presentation -- Teams will explain their design modifications, unique features, materials used and budget of their prosthetic prototypes. Benefits provided to a patient must be explained.

2022 BIONIC/ROBOTIC HAND KIT COMPETITION™

Sample Rubric Score Sheet

SCHOOL: _____ TEAM: _____

Please evaluate the following with 5 to 1 as Strength (5) to Weakness (1). Comments will be evaluated in case of a tie.

Innovative Engineering	Points	Comments
1. Creative engineering that improves Mark 1 Hand		
2. Modified and/or additional functions and features		
3. Compliance with competition rules and parameters		
4. Innovative use of materials		
Product Demonstration	Points	Comments
1. Completion of object handling tasks		
2. Engineering changes are clearly displayed		
3. Operation of prosthesis using one natural hand		
Most Realistic Prosthesis	Points	Comments
1. Life-like appearance and size		
2. Can be easily operated by a physically-challenged user		
3. Movement closely mimics the human hand		
Effective Presentation	Points	Comments
1. Design modifications and unique features are thoroughly explained		
2. Detailed explanation of function and materials used		
3. Documentation of detailed budget		

Total Points: _____

BIONIC/ROBOTIC HAND KIT® COMPETITION
2022 MIAMI DADE ENTRY FORM

You may purchase additional Bionic/Robotic Hand Kits for a class activity or spare parts.

School: _____

Address: _____ City _____ Zip _____

Phone: _____ Fax: _____

E-Mail: _____

Teacher/Sponsor: _____

Number of Kits Needed _____

Student Names (if not selected yet write TBA):

Item	Price per Kit	Quantity	Total
HK-2 Bionic/Robotic Hand Kit w/Tool Set	\$ 125		\$
TOTAL			\$
Card type (debit, credit)		Exp. Date	
Card #		Security code	
Billing Name			
Billing Address			

Please send this form with credit card information or check for \$125 per team to:

The Yaeger Foundation, Inc.
Attn: 2022 Competition
1177 N. W. 62nd Street
Miami, FL 33150
Fax to: (305) 691-3784
Email to: info@yaegerco.com

Call us at (305) 751-4208 or (305) 342-3005 for other options (Zelle, CashApp, card by phone).