STEM Origins Foundation

Program Funding Goals

(10 Feb 2025)

Scope & Purpose: This document outlines the STEM Origins Foundation's goals for programs which require funding. Other high priority initiatives like STEM Mentoring & Coaching do not require significant funding and are therefore not included herein.

Plan Timeframe: Jan 2025 through Aug 2026, hereafter the annual goals will align to the school year.

Top Level Funding Goals: The table below summarizes the funding goals for the 4 major programs we plan to execute in 2025, which require funding. Other high priority initiatives like STEM Mentoring & Coaching do not require significant funding and are therefore not included herein.

Overall Program Funding Goals - 2025			
Item #	**Description**	**Funding**	**Notes**
1	**Bay Base** STEM Pilot	**$5,000**	We have NIHF Grant of $8,000 which reduced cost from $13,000 to $5,000. Must make commitment by 1 Apr 2025 to get the grant.
2	**STEM Equipment** Wishlist from Hutchinson Beach Elementary	**$15,934**	This wishlist contains 11 items in 7 groups. Each group can be purchase separately over time.
3	**STEM Camp** scholarships 9 students of the month & 6 ICEF participants – most are for next school year.	**$1,100**	Each scholarship is $100 for tuition to STEM camp. This overall goal is somewhat scalable between 9 and 15, depending on how many students are selected from ICEF. The Minimum goal is 9.
4	**Rising Star** advance scholarships to GCSC college for one 5th grade STEM Student	**$1,500**	Each scholarship is $500 for GCSC tuition. This goal is somewhat scalable between 1and 3 scholarships, depending on funding availability. Min Goal is 1.
	Total	**$23,534**	

Major Program Summaries:

(1) Bay Base STEM Pilot: The Bay Base summer program currently provides full-day child care for the students of Bay County. We have partnered with the National Inventors Hall of Fame (NIHF) to provide STEM Kits for use in the Bay Base summer 2025 program for students in grades 3-5 at two school sites, for 50 students at each site. These kits will provide a hands-on, inquiry-based experience that inspire curiosity, encourage creativity, and build 21st-century STEM skills. NIHF has provided an $8,000 grant which will reduce our cost-share to $5,000, but to get that grant we must commit by 1 April 2025. Under this plan, each participating school will get the following STEM kits during this pilot program:

- **Lost Treasure** Modules of NIHF Invention Project series (50/school)
- **Robotic Pet Vet** Modules of NIHF Invention Project series (50/school).
- **NIHFTY Bot** Explores (50/school)
- **GAMES** Kits of NIHF Camp Invention series (1/school)
- **BASE CAMP** kits of NIHF Camp Invention series (1/school)

Appendix A contains detailed description of each of these kits**. Appendix B** provides a summary of evidence-based research and evaluation of the impact of NIHF STEM programs, which is tremendous.

The purpose of this pilot project is twofold:

1. To have an immediate and direct impact on the students involved and
2. To serve as a test case that evaluates the value and impact of these STEM kits on local students in a manner that will enable potential transition to separate thrust areas:
    a. Expansion to the full Bay Base program which includes approximately 1300 students and
    b. Selective incorporation into mainstream STEM classrooms in cases where the teachers have not been trained in STEM education.

Funding for this second phase will be sought from corporate donors as well as federal grants. This initial pilot, if successful, will provide the evidence based and impact driven data required to make a very strong case to seek that funding.

(2) STEM Wishlist from Beach Elementary: The STEM teacher at Hutchinson Beach Elementary School has provided a detailed wishlist of STEM equipment for her classroom (see table below). She also prioritized each item into one of three bins (1= high, 2= medium, 3=low), relative to each other. It should be noted that even a low priority item is highly desired by this teacher. Everything on list will have a very positive impact on her students and it is the Foundation's desire to deliver as many as possible. Overall, this list includes kits that teach skills in computer science, engineering, robotics, and life sciences. A brief description of each item can be found in Appendix C.

Hutchison Beach Elementary School STEM Wish Lists							
Focus Areas	**Grade Level**	**Notes**	**Item**	**Cost Per Item**	**Qty**	**Cost**	**Priority Level**
Life Science	K-5		Aquaponics System	$3,599	1	$3,499	**1**
	K-5	Linked to Greenhouse	Greenhouse	$1,991	1	$1,991	**1**
	K-5		Shelf Bundle with Plant Hangers	$211	2	$422	**1**
	K-5		Roof Vent Opener	$84	2	$168	**1**
Engineering	K-5		STEM Maker Supply Cart	$7,998	1	$7,998	**2**
	3-5		Bristle Bots	$70	13	$910	**3**
Computer Science	K-5		Ozobot Magnets	$30	6	$180	**3**
Robotics	K-5	Linked to Angelfish ROV	Angelfish ROV Kit	$290	1	$290	**3**
			Hydraulics Kit	$18	1	$18	**3**
	K-5		Power Supply	$90	1	$90	**3**
	K-5		Testing Pool	$369	1	$369	**3**
			TOTAL			**$15,934**	

Priority Ranking		**Totals for Beach Elementary**
1	High Priority	$6,079
2	Medium Priority	$7,998
3	Low Priority	$1,857
	Totals	$15,934

(3) Summer STEM Camp Scholarships: This program will provide scholarships to summer STEM camps for students showing aptitude and interest in STEM fields. Our long-term goal is to provide one per middle and high school (22 schools) as well as two for each of the 3 major categories in the regional the Invention Convention (6 students). However, for this year our goal is to fund three scholarships for students in the ICEF and one to each STEM Student of the Month designee for a total of 11 scholarships.

These summer camps are held on the GCSC main campus and each camp is led by a master-class STEM teacher. GCSC does an excellent job in training these teachers as well as orchestrating the overall process. A cost sharing between GCSC & the Navy has managed to get the cost down to $100/student/camp. They hold separate camps for each age group, and cover all ages ranging from kindergarten (4yrs old) through high school. Yet, there are many students who never get to attend for a variety of reasons. We hope to bridge some of those barriers with our scholarships.

(4) Rising Star College Scholarships: This program will select 5th grade students who show aptitude for STEM and award them with a $500 college scholarship at Gulf Coast State College (GCSC) which is reserved in their name and will be waiting for them when they graduate high school. The objective of these advanced scholarships is to promote and sustain interest in STEM as these students as they climb the academic ladder from elementary school through high school. The GCSC Foundation has done this sort of thing in the past and it has proven to be an incredibly powerful way of encouraging STEM students to maintain and grow their interests in STEM fields as they mature and move upward in the academic grades. It also gives them a 6-year goal to strive for and a destination to reach after high school. Our long-term goal is to provide one for each elementary school in the Bay District (20 schools = $500x20 = $10,000) each year. However, for this year we will start with just a few (~3).

APPENDIX A:
Bay Base STEM Pilot Project

Like all National Inventors Hall of Fame® education programs, Invention Project is designed to lead students to build the I Can Invent® Mindset — a growth mindset encompassing essential skills and traits demonstrated by innovators including our Inductees. This mindset is instilled through hands-on exploration and strengthened through application.

Invention Project equips educators to foster each aspect of the I Can Invent Mindset, enabling students to unlock their full potential, discover the power of their own creativity and confidently overcome challenges in any area of life.

WHAT'S INCLUDED

EDUCATOR RESOURCES

- Step-by-step curriculum aligned to national and state standards
- Pre- and post-test to track student progress
- Curriculum supports such as videos and presentations

STUDENT RESOURCES

- Step-by-step activity guides
- Individually packaged materials
- Supplemental online resources

FIRST-CLASS CUSTOMER SERVICE

- Available 24/7 for questions that come up
- Offers a complete and customized training program to prepare for classroom implementation
- Supports submitting paperwork for grants and other state/national funding
- Will work with each district to build the right set of modules and program for them

Learn more about Invention Project here.

KEY SKILLS AND CONCEPTS

- English Language Arts (Writing)
- Earth Science
- Design Thinking
- Engineering Design
- Responsible Decision-Making

LOST TREASURE™ MODULE OVERVIEW

Children are recruited by Professor Ivana Dig-It to help find the lost treasure of Archaic Island! They must develop an exciting adventure story that will persuade investors to fund their expedition, investigate data about volcanic eruptions, build gadgets to reach fruit in trees, create a treasure map and carefully navigate challenging terrain.

CURRICULUM HIGHLIGHTS

THIS MODULE EMPHASIZES THESE ASPECTS OF THE I CAN INVENT MINDSET:

CREATIVE PROBLEM SOLVING

Using creative problem solving to design volcano-safe protective gear.

DESIGN THINKING

Sketching and building a shelter to stay safe from island weather.

PERSISTENCE

Demonstrating persistence to complete challenges and decode a secret message.

Learn more about Invention Project here.

KEY SKILLS AND CONCEPTS

- Animal Science
- Biology
- Engineering
- Measurement and Data

ROBOTIC PET VET™ MODULE OVERVIEW

By developing their knowledge and skills in biology, physiology and circuitry to take apart and diagnose their robotic dogs, students are able to enhance their problem-solving skills. After helping their pets recover, children celebrate the homecoming of their customized robotic pet as they demonstrate design engineering concepts by constructing an interactive dog park attraction.

CURRICULUM HIGHLIGHTS

THIS MODULE EMPHASIZES THESE ASPECTS OF THE I CAN INVENT MINDSET:

STEM

Exploring the inner workings of a robotic dog and discovering basic engineering principles.

CREATIVE PROBLEM SOLVING

Following step-by-step instructions to investigate dog anatomy to perform surgery.

CONFIDENCE

Realizing they are capable problem solvers as they fix a robotic dog.

Learn more about Invention Project here.

KEY SKILLS AND CONCEPTS

- Responsible Decision-Making
- Design Thinking
- Engineering Design
- Speaking and Listening
- Art
- Forces and Interactions

NIHFTY BOT EXPLORES™ MODULE OVERVIEW

Using their very own NIHFty Bot™ plushie, students apply STEM and creative problem-solving skills to design solutions and engineer new innovations to bring NIHFty's world to life. Combine the NIHFty Bot Explores materials with classroom materials, recycleables and creativity supplies to enhance students' designs as they create gadgets, devices, accessories and adventure items for NIHFty Bot. NIHFty Bot Explores provides six hours of hands-on content for your students.

CURRICULUM HIGHLIGHTS

NIHFTY BOT EXPLORES EMPHASIZES THESE ASPECTS OF THE I CAN INVENT MINDSET:

STEM

Exploring STEM concepts, like physics and engineering design, through hands-on activities.

CREATIVE PROBLEM SOLVING

Applying creative problem solving to create, test and recreate solutions to invention challenges.

PERSISTENCE

Building persistence to overcome fun challenges, from chain reactions to deep-sea gear.

Learn more about Invention Project here.

KEY SKILLS AND CONCEPTS

- Gross Motor Skills
- Fine Motor Skills
- Teamwork
- Creative Thinking

GAMES OVERVIEW

Games supplement our modules by giving children the opportunity to engage in more teamwork, out-of-the-box thinking and physical fun through energetic and enriching activities.

CURRICULUM HIGHLIGHTS

GAMES EMPHASIZE THESE I CAN INVENT HABITS:

CONFIDENCE

Gaining confidence and building agility through both collaboration and competition.

CREATIVE PROBLEM SOLVING

Applying creative problem solving to devise strategies in games using unusual objects and new rules.

PERSISTENCE

Building persistence to overcome fun challenges, from balloon tosses to relay races.

Learn more about Invention Project here.

KEY SKILLS AND CONCEPTS

- Gross Motor Skills
- Fine Motor Skills
- Teamwork
- Creative Thinking

BASE CAMP OVERVIEW

Base Camp fosters teamwork and nurtures creative thinking by exploring challenges that encourage children to think critically. The energetic and enriching activities set the tone for continuous learning, creating a dynamic environment.

CURRICULUM HIGHLIGHTS

BASE CAMP EMPHASIZES THESE I CAN INVENT HABITS:

STEM

Exploring STEM concepts, like physics and engineering design, through hands-on activities.

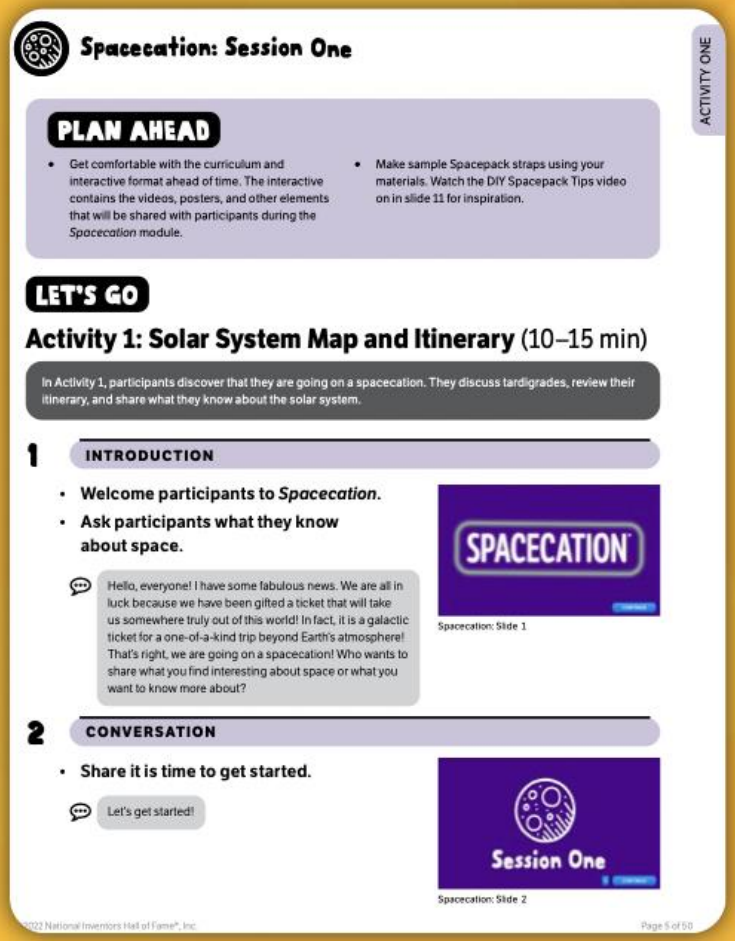
CREATIVE PROBLEM SOLVING

Applying creative problem solving to devise strategies in games using unusual objects and new rules.

PERSISTENCE

Building persistence to overcome fun challenges, from tower builds to invention trivia.

Learn more about Invention Project here.



Spacecation: Session One

ACTIVITY ONE

PLAN AHEAD

- Get comfortable with the curriculum and interactive format ahead of time. The interactive contains the videos, posters, and other elements that will be shared with participants during the *Spacecation* module.
- Make sample Spacepack straps using your materials. Watch the DIY Spacepack Tips video on in slide 11 for inspiration.

LET'S GO

Activity 1: Solar System Map and Itinerary (10–15 min)

In Activity 1, participants discover that they are going on a spacecation. They discuss tardigrades, review their itinerary, and share what they know about the solar system.

1 INTRODUCTION

- **Welcome participants to *Spacecation*.**
- **Ask participants what they know about space.**

Hello, everyone! I have some fabulous news. We are all in luck because we have been gifted a ticket that will take us somewhere truly out of this world! In fact, it is a galactic ticket for a one-of-a-kind trip beyond Earth's atmosphere! That's right, we are going on a spacecation! Who wants to share what you find interesting about space or what you want to know more about?

Spacecation: Slide 1

2 CONVERSATION

- **Share it is time to get started.**

Let's get started!

Spacecation: Slide 2

CURRICULUM EXCERPT

View a sample of our curriculum to see how we provide detailed guidance for easy-to-implement program experiences.

APPENDIX B:

Evidence-Based Research & Evaluation of Impact

of NIHF STEM Kits & Programs

National Inventors Hall of Fame®
EDUCATION PROGRAMS

Inspiring Future Innovators®

EVIDENCE-BASED RESEARCH AND EVALUATION IMPACT

The National Inventors Hall of Fame® has been engaged in research and evaluation studies to examine the effectiveness of its education programs for more than two decades. These studies address the following areas of impact:

1. Teacher preparedness through STEM (science, technology, engineering and mathematics) and inquiry-based learning
2. Combating chronic absenteeism
3. Closing the opportunity gap
4. Family engagement
5. Affecting STEM and innovation interest (PreK-8)
6. i-Ready math and reading scores (SEI)
7. Supporting English language learners and language acquisition
8. Opportunity for career pathway exploration
9. Social-emotional learning

Independent evaluations and collaborative, research-based partnerships include:

- Center for Creative Learning (Dr. Donald Treffinger)
- Center for Education Policy Research (CEPR) at Harvard University
- ChangeMaker Consulting (Dr. Denise Roseland)
- Georgia Institute of Technology (Dr. Roxanne Moore)
- H.A. Praxis (Dr. Bill Hauser and Dr. Annie Hauser)
- Institute for Learning Innovation (Dr. John Falk)
- Learning Heroes (Bibb Hubbard)
- Old Dominion University (Dr. Joanna Garner)
- Summit Education Initiative (Dr. David James)

Camp Invention® Club Invention® Invention Project®

1. IMPACT FOCUS: TEACHER PREPAREDNESS THROUGH STEM AND INQUIRY-BASED LEARNING

EVALUATION STUDY:
ChangeMaker Consulting is an independent evaluation agency that focused on evaluating National Inventors Hall of Fame education programs to gain insight into whether, after participating in the programming, students had an increased interest in pursuing STEM careers and their attitude toward creativity, innovation, and invention.

> **HIGHLIGHTS:** Overall, instructors reported **improved attitudes about STEM and STEM teaching**, as well as frequent use of techniques that foster creative thinking in their regular classrooms after instructing National Inventors Hall of Fame education programs. They also expressed more willingness to incorporate **evidence-based strategies** into their teaching in the future.

RESEARCH/EVALUATION STUDY:
Researchers from the University of Akron completed large-scale studies of National Inventors Hall of Fame education programs.

> **HIGHLIGHTS:** Teachers' participation in instructing National Inventors Hall of Fame education programs correlated with an elevation in teacher transference of valuable classroom skills in facilitating hands-on, student-led learning through creating an environment that encourages inquiry and creativity.

MARKET RESEARCH STUDY:
Program evaluators from Meeting Street Marketing surveyed current program providers and partners, and prospective partners to evaluate the curriculum, instructor resources, and student materials provided.

> **HIGHLIGHTS:** Survey data revealed that National Inventors Hall of Fame education programs offer multiple **key features and benefits**. The following program factors were specifically highlighted. The modules:
>
> - Offer engaging, creative problem solving, and critical thinking experiences in a hands-on setting.
> - Are turnkey for implementation with low stress for instructors.
> - Include opportunities for English language arts, math and science learning.
> - Are differentiated for student-aligned experiences.
> - Are aligned with state standards.
> - Include Instructor resources (e.g., curriculum, media, planning guides) and are simple, intuitive and comprehensive.

TESTIMONIALS:

"Our teachers shared that using the Invention Project curriculum relieved their anxiety about teaching hands-on learning." – Director of Federal Programs, St. Lucie Public Schools, St. Lucie, Florida

"[We] loved how well developed the resources are, and particularly the interactive slide deck with the inserts of background music and timers were a great addition. All resources were easy to access and understand." – Program Coordinator, Lamar Consolidated Independent School District, Rosenberg, Texas

"Both of my daughters love Camp Invention, and this was our fourth year! We even participated remotely during 2020. The ability for children to learn patience and determination through constructing, testing, analyzing improvement opportunities, redesigning, and reconstructing are valuable life skills and bring them so much confidence!" – Parent, Dade City, Florida

2. IMPACT FOCUS: COMBATING CHRONIC ABSENTEEISM

RESEARCH STUDY:
Summit Education Initiative independently analyzed the impact of National Inventors Hall of Fame education programs on students' **academic outcomes** in 2018-22, utilizing **control groups**.

> **HIGHLIGHTS:** Most recent data shows the mean number of **student absences dropped** for students attending National Inventors Hall of Fame education programs when comparing the last grading period of the 2021-22 school year with the first grading period of the 2022-23 school year.

TESTIMONIALS:
"At first I did not want to come, but I'm glad I came to the afterschool program." – Third grade student, Fresno, California

"I really think that it [Friday Fun Days featuring National Inventors Hall of Fame education programs] helped with attendance because I noticed that a lot of my students were not coming to school on Fridays. Now that they know we're going to be doing Invention Project® on Friday, they look forward to the projects because they get their own bag [of materials], they get to create their own project and they get to take it home with them to show their parents. It's a really great initiative." – Third-grade teacher, Petersburg, Virginia

"For many years, she's heard the word STEM and been like, 'Oh math, oh science,' [and] not enjoyed it. But coming to the Summer Bridge experience is why she's gotten up some mornings. She said, 'I'm not going to miss out on the STEM project.' So, it's been very exciting to see her shift [her] thinking that STEM was boring to STEM is so fun and creative." – Parent, third-grade student, Pinellas County Schools, Florida

3. IMPACT FOCUS: CLOSING THE OPPORTUNITY GAP

RESEARCH/EVALUATION STUDY:
The Center for Creative Learning (CCL) investigated the impacts of National Inventors Hall of Fame education programming on children's creativity.

> **HIGHLIGHTS:** CCL found a statistically significant, **positive change in children's creativity scores** after participating in National Inventors Hall of Fame education programs.

RESEARCH/EVALUATION STUDY:
Independent research and evaluation conducted by Old Dominion University with National Inventors Hall of Fame education programs mapped the invention identities of female and Black, Indigenous, and other people of color (BIPOC) program participants.

> **HIGHLIGHTS:** These **research findings support the pressing need for a diverse, innovation driven workforce**. The studies unveiled significant insights into understanding the inclusive, inventive mindset by examining invention identity among elementary-aged children. Categorized into ingenuity and solution-seeking, the findings **illuminated themes and gender-related disparities in children's perceptions of inventive characteristics and STEM subjects**. Moreover, the research underscores the importance of separate considerations for STEM identification and inventive mindset, suggesting that invention education could redefine children's self-perceptions, and pave the way for a more equitable and innovative future.

TESTIMONIALS:
"After [the program], my house has become a lab. I have new inventions everywhere, and he has used various random materials to do so. He came home so happy each day and was excited to share his inventions with his extended family. I was impressed with the information he retained from camp."
– Parent, Midlothian, Texas

"I liked learning about the shelter because it was fun to build with a lot of materials." – First grader, Fresno, California

"This is the first year that we've rolled out Summer Bridge STEM and one of the main reasons that we did it is because we feel that every kid in Pinellas County Schools should be able to have the ability to do the critical and creative thinking." – Gifted Staff Developer and Summer Program Coordinator, Pinellas County Schools, Florida

4. IMPACT FOCUS: FAMILY ENGAGEMENT

RESEARCH-BASED PARTNERSHIP:
Between 2021 and 2023, the National Inventors Hall of Fame partnered with Learning Heroes, an educational equity organization that empowers families by providing practical information to aid in their children's academic and developmental success.

HIGHLIGHTS: Learning Heroes conducted a comprehensive review of the National Inventors Hall of Fame education program materials visible to parents. Their **recommendations were applied** (e.g., in curricula and Inventor Logs) **to improve the accessibility of STEM for families**, including the **increase of diverse inventor profiles**. In addition, the transparency of the value of the programs was increased to help families better understand what their child could gain from engagement in National Inventors Hall of Fame education programs. Explore the "See the Benefits Your Child Will Gain With Our STEM Education Programs" webpage for the following featured stories:

- Are National Inventors Hall of Fame Education Programs Right for My Child?
- Creating a Supportive Environment for Every Child
- Building Confidence, Joy and a Sense of Belonging
- Growing Creative Problem Solvers and Solution Finders
- Introducing Innovative Role Models

TESTIMONIALS:
"We were able to provide engaging STEM kits that kept our students' attention (afterschool program, so kids are tired and been in school all day-finding engaging activities can be tough). The kids started to get excited each time we built up to the STEM kits and couldn't wait to continue working on them at home with their families." – District Decision-Maker, Payette Lakes Community Association, McCall, Idaho

5. IMPACT FOCUS: AFFECTING STEM AND INNOVATION INTEREST (PreK-8)

RESEARCH/EVALUATION STUDY:
NIHF partnered with a research team from the Georgia Institute of Technology to examine whether and how students participating in the Camp Invention summer program reported changes in STEM fear, anxiety, and confidence as well as invention engineering skills.

> **HIGHLIGHTS:** Findings from this research study (n=940 third- through sixth-grade students engaged in National Inventors Hall of Fame education programs from rural and suburban areas in Georgia and Ohio) showed an **increase in science and math interest**; an **increase in problem-solving and inventing skills**; and a **lowering of science and math anxiety** in just four days of programming for students who reported at least some room for improvement at the program's start.

RESEARCH/EVALUATION STUDY:
A research study conducted by Old Dominion University from 2019-22 concluded that an invention education pedagogy (the National Inventors Hall of Fame's I Can Invent® Mindset) is a well-designed format for encouraging students' self-perception of seeing themselves as inventive and creative.

> **HIGHLIGHTS:** As documented in this journal article: Invention Education as a Context for Children's Identity Exploration, the study confirmed that providing children an opportunity to experience an engaging, hands-on learning program focused on **invention and creativity offers a context for identity exploration** but must be taught in a framework that allows for their understanding of STEAM (science, technology, engineering, arts and mathematics) concepts. In addition to the journal article, the following co-authored paper, "A Measure of Inventive Mindset for Use in K-12 Engineering and Invention Education," was presented at the 2023 American Society for Engineering Education Conference.

TESTIMONIALS:
"After day one, my son came home saying, 'Mom, I love science.' He told me all about the things he learned every day and had so much fun being part of something. I got to see a light switch turn on for my kid and that was priceless. He enjoys school and science, but he came out of there wanting to learn and think in a different way, and he's ready to learn and do everything he can. This program was amazing." – Parent, Cedar Falls, Iowa

"I think every part of this program was meaningful. Each of the activities had a reason behind it. And being able to play videos, show students how real inventors followed each one of the steps that students were going through was meaningful to them." – Instructor, Yuma Elementary School District, Arizona

6. IMPACT FOCUS: i-Ready MATH AND READING SCORES (SEI)

RESEARCH STUDY:
Summit Education Initiative (SEI) utilized i-Ready® Diagnostic assessments as part of their evaluation of National Inventors Hall of Fame education program impacts from 2017 and beyond. These assessments "align to college and career-ready standards so that results can inform student placement decisions, offer explicit instructional advice and prescribe resources for targeted instruction and intervention." Following multiple studies supporting the validity and accuracy of this assessment, as well as its consistency with educational standards across the United States, 21 states have approved the i-Ready Diagnostic as an assessment, instructional resource, or intervention.

> **HIGHLIGHTS:** For students who attended National Inventors Hall of Fame education programs in Akron, Ohio during the 2022-23 school year, both average (44) and median (40) percentile **scores in math were higher than the district average** for all students, including students who attended other summer programs during the same time.
>
> The i-Ready **reading scores**, both average (47) and median (43) percentile **scores for students who participated in the program were higher than the district average for all students**, including all summer program participants.

TESTIMONIALS:
"I really like it! It was fun for me. Writing a hook was really fun during the treasure. I liked putting the map together." – Second grader, Fresno, California

"Escondido was really purposeful in selecting the National Inventors Hall of Fame curriculum so that we can address the achievement gap, but also the engagement gap." – District Administrator, Director of Extended Leaning Interventions & Enrichment, Escondido Union School District, California

7. IMPACT FOCUS: SUPPORTING ENGLISH LANGUAGE LEARNERS (ELL) AND LANGUAGE ACQUISITION

RESEARCH STUDY:
Summit Education Initiative independently analyzed the impact of National Inventors Hall of Fame education programs on children's academic outcomes in 2018-23, utilizing control groups.

HIGHLIGHTS: In the 2022-23 study, encompassing a student population where 10% were English language learners, there were consistent improvements in reading and significant academic gains:

- The mean GPA increased over that same period.
- The average i-Ready reading percentile scores were also above those of children who had attended other summer programs.

TESTIMONIALS:
"Students were very proud of the products they were designing, and they could hear the students talking about it at lunch, which also was a sign they were excited and engaged to continue conversations at lunch." – Instructor, Leavenworth Unified School District 453, Leavenworth, Kansas

"Turnout/attendance was great! STEM and this level of engagement motivates parents and students. They are now going to expect this as part of summer learning." – Instructor, Clayton County Schools, Georgia

8. IMPACT FOCUS: OPPORTUNITY FOR CAREER PATHWAY EXPLORATION

EVALUATION STUDY:
ChangeMaker Consulting is an independent evaluation agency that focused on evaluating National Inventors Hall of Fame education programs to gain insight into whether, after participating in the programming, students had an increased interest in pursuing STEM careers and their attitude toward creativity, innovation, and invention.

> **HIGHLIGHTS:** National Inventors Hall of Fame education program participants had gains **in convergent thinking skills and STEM aspirations**. Gains in convergent and divergent thinking, characterized by logical reasoning and focusing on finding precise solutions, directly benefit STEM aspirations. These skills enhance problem solving, technical proficiency and innovation within constraints, aligning well with the demands of STEM careers such as engineering, mathematics, computer science, and scientific research.

RESEARCH/EVALUATION STUDY:
The Institute for Learning Innovation conducted longitudinal research on the effectiveness and impact of National Inventors Hall of Fame education programs by interviewing a cohort of program participants 10 years after their experience (2007 to 2017).

> **HIGHLIGHTS:** Evidence was found that participation in one week of National Inventors Hall of Fame education programs in **statistically significant short-term and long-term improvements in all three outcome measures: creativity, STEM interest and problem-solving skills**. Over the long-term, from one to four years post-program, there was even stronger evidence of statistically significant growth in creativity, STEM interest and problem-solving skills – all indicators of career choice in STEM fields.

TESTIMONIALS:
"Now my daughter loves science. She said she might become a scientist when she grows up." – Parent, North Las Vegas, Nevada

"This program helped widen my son's imagination and creativity. Also helped him see what career he wants to work toward." – Parent, New Haven, Indiana

"My daughter has loved attending and is looking forward to attending next year. She has decided on STEM for her future career thanks in part to this program." – Parent, Conway, Arizona

9. IMPACT FOCUS: SOCIAL-EMOTIONAL LEARNING

RESEARCH STUDY:
In 2022, the Summit Education Initiative used the YouthView™ tool with participants of National Inventors Hall of Fame education programs in New York City, Chicago, Dallas, and Akron to gain insight into how these programs support social-emotional learning, motivation, growth, and a feeling of belonging.

> **HIGHLIGHTS:** Based on the aggregate pre-survey scores (68%), compared to aggregate post-survey scores (80%), there was a definitive indication that **social growth and an increased sense of belonging** occurred after participation in National Inventors Hall of Fame education programs.

TESTIMONIALS:
"We offered Invention Project modules during the school year to our middle school students. The camaraderie that formed as the modules progressed was really great to see. The program was enticing to the students who some would describe as introverted. Watching them blossom and make new friends as the modules progressed was a great added bonus." – Educator, Delta Academy, Las Vegas, Nevada

"Most of my shy students are starting to speak up, like, 'Look what I have created,' or 'This is how you're supposed to do this this way,' or 'You could do it this way because this way works.' They are starting to share out more…because they are interested in what they are doing." – Second-grade teacher, Petersburg, Virginia

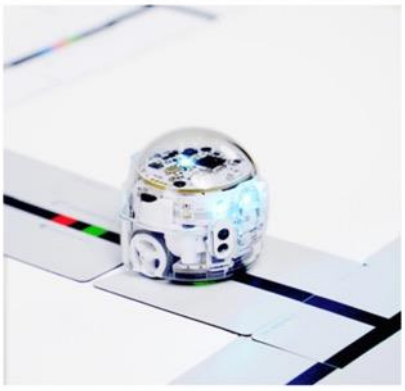
APPENDIX C:

Short Descriptions of STEM Kit Wishlist Items

From Hutchison Beach Elementary

Ozobot Magnets

Ozobot makes award-winning programmable robots, patented screen-free coding programs and STEAM-based education solutions that transform the way students learn and create across all grades, subjects, and environments.



- INTERACTIVE CODING FOR YOUNG MINDS: The Ozobot Color Code Magnets Base Kit offers an engaging introduction to coding for students as young as 6 years old. With the magnetic board, wet erase marker and 36 puzzle pieces, it provides a hands-on learning experience that is both fun and educational, setting it apart from traditional coding tools. Evo robot is required and sold separately.

- FOUNDATIONAL CODING CONCEPTS MADE EASY: This kit simplifies complex coding concepts with a mix of Color Codes and line-following pieces. It's designed to help young learners grasp the basics of sequencing and logic, enhancing their problem-solving skills in a way that is accessible and enjoyable.

- DURABLE AND CLASSROOM-READY: Crafted with durability in mind, the Color Code Magnets are built to withstand regular classroom use. Their robust construction ensures longevity, making them a reliable educational resource for educators looking to invest in long-lasting teaching tools.

- EXPANDABLE LEARNING EXPERIENCE: While the Base Kit offers a complete coding experience, the Special Moves Kit and Speed Kit (sold separately) can be added for even more coding fun. This expandability makes the Ozobot Color Code Magnets a versatile tool for growing with the student's learning journey.

- SUPPORTS VARIOUS LEARNING ENVIRONMENTS: Perfect for both individual and group learning, the Color Code Magnets engage up to 3-4 students per kit. Their size and ease of use make them ideal for a range of educational settings, from classrooms to homeschooling, offering more flexibility than many other educational coding products.

36 magnetic tiles, featuring lines and color codes.

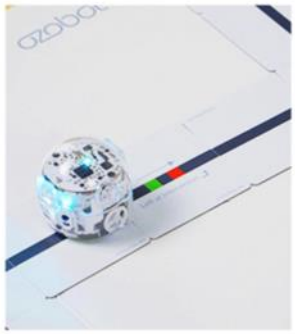
Long-lasting, ensuring that they can withstand the wear and tear of regular use in the classroom.

Interactive, hands-on project. Recommended for ages 4+.

Pair with the Speed and Special Moves Kits for expanded learning opportunities.

How to create tracks?

Create your track using the line tiles.



Add color code tiles or mix and match Speed and Special Moves tiles.

Extend tracks using the Ozobot wet erase marker.

STEM Maker Supply Carts

Roll it into your classroom, lab, or library for the *ultimate* Maker/STEM solution. With over 40+ STEM projects and almost every component we manufacture, this cart can easily support hundreds of kids.

Each cart includes a pallet of replacement supplies *(way more supplies than you see in the cart, over 15,000 components in total!!)* and sturdy tools to create almost any project. The sign is dry erase. NGSS Aligned. Grades K-12.

Students will learn science and engineering concepts through experimentation, grow their understanding and evolve projects through the design & engineering process. The TeacherGeek Maker Cart provides ample opportunities for amazing true STEM projects for as little as a few dollars a kit (average project cost: $1.37*). With prices this low, kids can take projects home and continue to engineer and tinker right at the breakfast table!

*$1.37 average project cost is based on students working in groups of 2-3 and taking projects home.

Incredible Resources

Roll it in and download over 60 engineering challenges from the TeacherGeek website. Our videos get you started, energized and soaring. Optional labs grow understanding to get students innovating. Documents are uniquely graphical, self-directed, NGSS (school) aligned and designed to support students of all abilities and learning profiles. They are available as PDF or MS Word documents, so you can edit and make them your own. The Maker Cart provides activity materials for years to come, and new activities are constantly being added to the TeacherGeek website. Keep stopping back to uncover new activities, labs, and resources.

More Engineering. Less Babysitting.

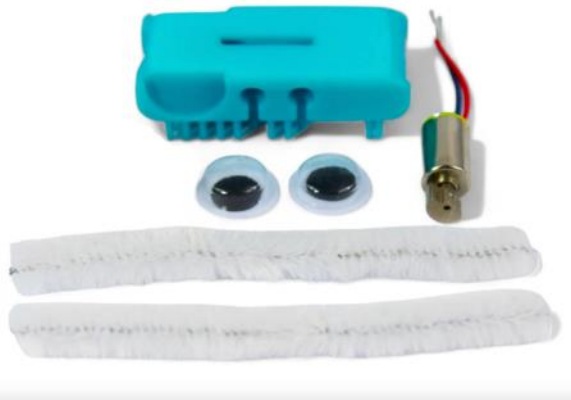
TeacherGeek materials and resources allow for real engineering. This means that kids work to the last second improving and evolving designs. Teachers can be facilitators, allowing for quality interactions without worrying about classroom management.

Bristle Bots

A Bristlebot is a small robot made by combining a toothbrush head and a vibrating pager motor. The vibrations from the motor travel down the bristles and cause the brush to move and spin on flat surfaces.

Build a Bristlebot in your home or classroom to teach basic engineering, motors, circuits, and physics concepts (i.e., balance principles).

Once completed, they buzz along the top of a table like bugs. Adjust different parts by bending, twisting, and angling the chenille stems into different positions and see how it affects the movement and direction of your Bristlebot.

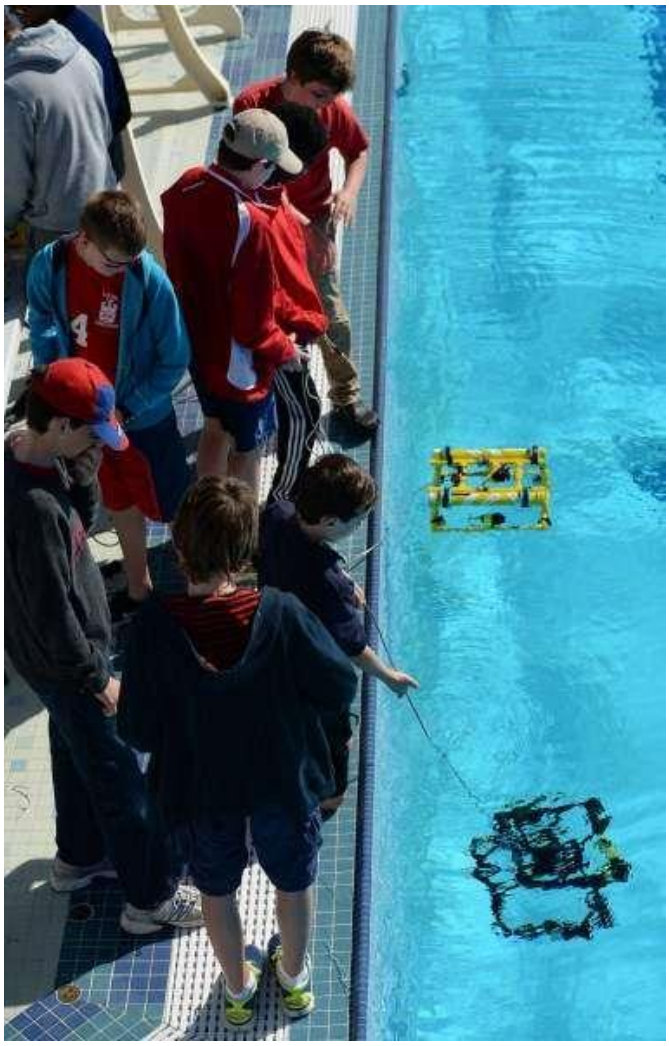


- Engineering: This kit provides an exciting and creative hands-on kids activity that allows students to learn basic engineering and enjoy racing bristlebots

- Robotics: This kit includes everything your kids need to create small robotics with their own hands. This kit comes with everything you need to build 25 Bristlebots.

- Perfect introduction to the world of robotics and electronics! All electronic components come ready to be assembled, no soldering or wire stripping needed, making this kit ideal for beginners.

AngelFish ROV Kit



- The AngelFish is a basic ROV kit that is designed to introduce students to ROV building.

- The AngelFish ROV kit consists of a control system, wires to receive and deliver power, and thrusters (motors, propeller adapters, and propellers).

- A frame is not included in the kit, but frame materials can be purchased from your local hardware store.

- The assembled AngelFish kit is used for the ROV-in-a-Bag activity which is recommended as an activity to introduce and get students excited about designing and building their own ROVs.

- ROV-in-a-Bag allows students to quickly build then operate – "fly" – an ROV in a swimming pool or test tank.

Accessories for AngelFish ROV Kit

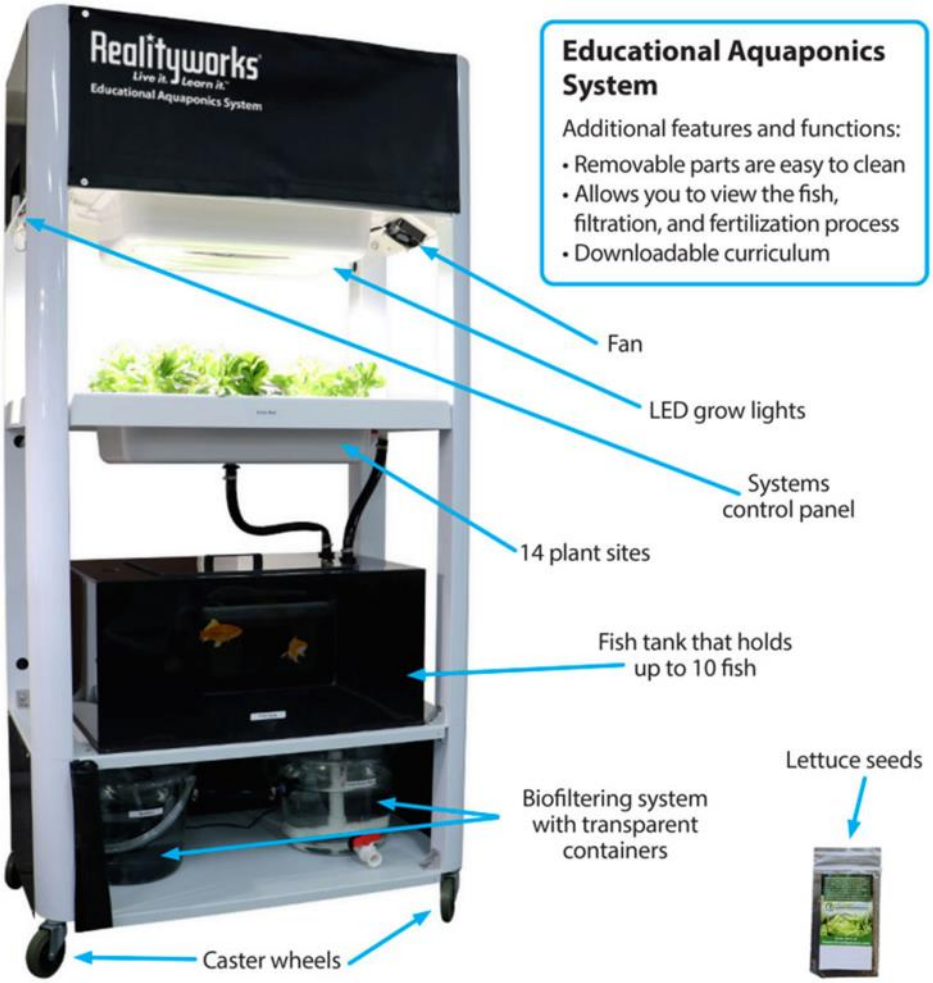
- **Hydraulics Kit:** This simple hydraulics kit is perfect for taking your ROV's manipulator to the next level with hydraulically-powered motion

- **Power Supply:** This is the power supply for the AngelFish ROV. It provides Type-C input/output 15W port and dual USB ports. The specially designed indicator notifies you of incorrect use with an audible buzz and flashing lights. The digital LCD screen clearly displays the remaining power. The 12V/10A DC port can power for other products (cigarette lighter adapter is included). Advanced intelligent technology has spark proof protection, over charge protection, short circuit protection, over current protection, overload protection, over-voltage protection, reverse polarity protection, high temperature protection, low temperature protection etc.

- **ROV Testing Pool:** This Pool measures 6.5ft diameter x 3ft high with a maximum capacity of 3100L. It is made of PVC double sided composite waterproof fabric with a thickness:0.9MM at 1150g/sqm. It is safe, non-toxic, odorless, anti-aging, anti-static, sunscreen, anti-tear, easy to fold, and durable.

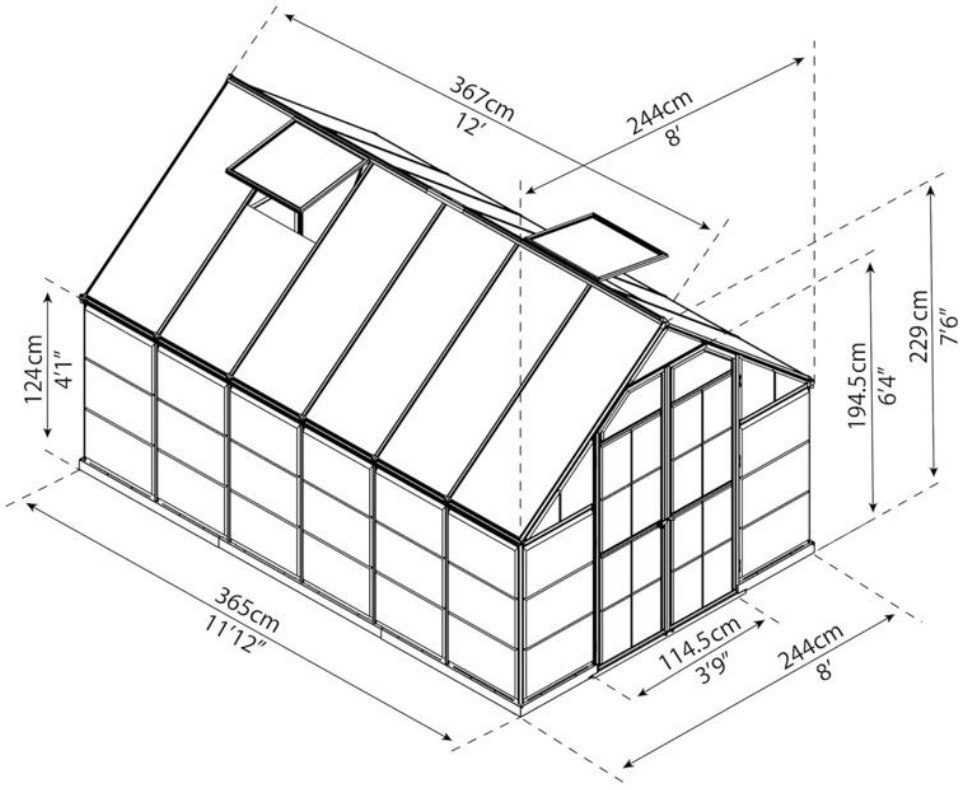
Aquaponics System

- Introduce students to sustainable agriculture with our Educational Aquaponics System.
- Students can observe the interconnected processes of fish, filtration, and plant fertilization as they witness plants growing through the biofilter process. In this process, the waste products of the fish serve to fertilize the plants, and the plants serve as a waste filter for the fish tank in a mutually beneficial and sustainably system.
- This self-contained system supports up to 10 fish and 14 plants, providing a real-world opportunity to experiment with aquaponic growth methods.



Greenhouse (Palram brand)

- **Polycarbonate Greenhouse:** This 8 ft. x 12 ft polycarbonate greenhouse is a perfect space for outdoor gardening. Equipped with 4mm clear polycarbonate panels, this walk-in garden house ensures plants get the right amount of sunlight.
- **Durable and Resilient:** Constructed with wind and weather-resistant features, our greenhouses kits prove to be sturdy greenhouses for outdoors. The clear roof panels can withstand harsh weather, ensuring the longevity of your garden.
- **UV Protected Panels:** The greenhouse kits are designed with UV protected, clear panels that allow maximum sunlight while protecting your plants. This large greenhouse is a perfect addition to your backyard greenhouses for outdoors.
- **Easy Maintenance and Warranty:** This greenhouse shed is maintenance-free, making it a convenient greenhouse kit for all your gardening needs. Furthermore, we offer a 5-year warranty on our greenhouse outdoor kits.
- **Walk-In Design:** This 12x8 greenhouse features a walk-in design, providing ample space for your gardening activities. The green color blends with your outdoor garden, enhancing the overall aesthetic of your backyard.



Accessories for Greenhouse

- **Shelf Bundle:** This contains four 23" x 16.5" heavy duty aluminum greenhouse shelves (90 lb. capacity) with steel brackets easily mount to Palram greenhouses. It Includes 12 polypropylene plant hangers for baskets or trellising vegetables. It has steel brackets which allow flexible positioning of shelves to customize greenhouse storage. Plant hangers can also be used to install shade cloth inside Palram greenhouses. Corrosion resistant materials provide durable greenhouse storage and organization.

- **Automatic Vent Opener:** This device automatically opens the ceiling vent when the temperature is high and closes it when it gets cold. No electricity is required.