

# TEN80

## EDUCATION





Ten80 is a team of educators and STEM professionals who:

- believe that our society should cultivate STEM literacy and skills with the same rigor, passion and investment that we do for sports.
- expand the number of students inspired to engage in STEM learning because it is relevant to their lives
- change the perception that STEM careers are narrow and lacking in creativity and provide content that prepares students to meet rigorous post-graduation academic and career requirements



# The Art of STEM

Project-based learning that doesn't forget the learning . . .

STEAMstart  
K-2  
Project-based  
Literacy Focused  
Geometry at the Core

Instill a deep  
understanding of core  
subjects and math  
literacy in the context of  
problem solving.

Driving STEM  
Grades 3-6  
Project-based  
Problem Solving Focused  
Physical Science at the Core

Honed over a decade to  
provide a solid grasp of  
collaborative problem  
solving and prepare  
students for thinking in the  
innovation space.

National STEM League  
Grades 6-12  
Project-based  
Innovation Focused  
Science, Mathematics,  
Design Process, STEM  
Literacy and STEM Career  
at the Core

Prepare students for  
success in a world where  
innovation is the norm.

## Growth Nationally

### NATIONAL HUB Growth

- + 4 Hubs and 40 Schools in 2012
- + 10 Hubs and 100 Schools in 2013
- + 100 Schools in 2014
- + 12 Hubs and 120 Schools in 2015
- Growing at an average rate of 500 new students each month.



“Some groups have their audience and like one program. Other groups like others. It is universal that everyone backs the Ten80 partnership.”

--CPT Selwyn Johnson, AMRG

“We keep seeing “STEM” come down in orders and have no idea what they mean. After this event . . . it is making sense to me.”

– USAREC officer, Birmingham, AL



**TEN80 IS ...**

**INSPIRING**

**Expanding the number of students INSPIRED to engage in STEM learning because it is relevant to their lives as individuals and as citizens.**

**Every student is a STEM student.**



TEN80 IS ...

INSPIRING  
& PREPARING

Channeling that inspiration  
into relevant, long-term  
learning that **PREPARES**  
students to succeed in their  
chosen professional paths.

“Exemplary” STEM education  
is the key.

**In order to think outside of the box,  
you have to know what is inside of it.**

**Major General Peggy C. Combs**

Commanding General of  
U.S. Army Cadet Command





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#### Change the Equation Endorsement for Ten80 Education National STEM League

Change the Equation, a nonprofit, non-partisan partnership of CEOs that works at the intersection of business and education to ensure that all Americans succeed in STEM literacy, is pleased to recognize Ten80 National STEM League with its STEM Rising-Honor, Energy and Innovation Challenges as one of the nation's most effective and innovative scalable STEM learning programs. We have included Ten80 in STEMworks, a database of programs that meet high standards for quality and impact with the special additional designation as "ready-to-scale."

Every program in STEMworks has met Change the Equation's rigorous Design Principles for Effective STEM Philanthropy. Created in conjunction with leaders in corporate social responsibility, these Principles embody the most current research and expertise on what works in STEM learning. The Principles set a high bar by requiring programs to demonstrate success in areas such as the capacity to meet a critical need, sustain and replicate themselves in new places, forge effective partnerships, and demonstrate their impact through diverse activities. Programs in STEMworks must also offer challenging STEM content, incorporate hands-on STEM practices, inspire interest in STEM, and address the needs of youth, such as females and minorities, who are less likely to pursue STEM fields.

In addition, Ten80 has demonstrated that it has the organizational capacity and strategic plans to expand quickly to many new sites across the country.

A team of independent experts from WestEd, a nonprofit research and evaluation firm, carefully reviewed and selected STEMworks programs from a broad pool of applicants. Using a detailed evaluation rubric, reviewers chose only three programs that provided concrete evidence demonstrating how they meet the Design Principles. WestEd then reviewed a well-substantiated subset of STEMworks programs against additional criteria for their readiness to scale nationwide. WestEd endorses only four STEMworks programs for this additional criterion.

We are very confident that supporters of Ten80 will receive a strong return on their investment in STEM learning.

Please direct any questions about STEMworks or Change the Equation to Christopher Zarrow, Change the Equation CEO and Director of Research, at 202.626.5754 or [christopher.zarrow@changetheequation.org](mailto:christopher.zarrow@changetheequation.org).

Sincerely,

A handwritten signature in black ink that reads "Linda P. Rosen".

Linda P. Rosen, Ph.D.  
CEO, Change the Equation

# STEMWORKS

## CERTIFIED READY-TO-SCALE

This actually means something. WHEN all the pieces come together for students, what we are offering works.

## What is Intellectual Property?

"Creations of the mind" (intellectual) that you are made using STEM skills.

**Patent** A legal document that prevents using or selling your invention.

Example of a patented invention: mp3

**Trademark** Words, logos, or slogans used by source or manufacturer of a good

Example: iPod is a trademark used to identify manufacturer

**Copyright** Original works that express a form such as such as music, books, plays

Example: music on the iPod



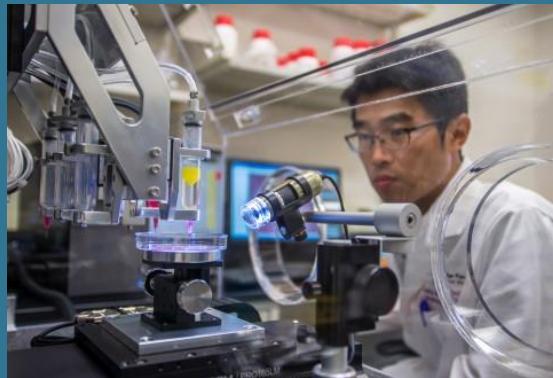
TEN80



# The Good

&

the Motivation to  
Enhance Ten80's  
Sustainability in 2016



# How We Work

“Micro-Publisher”



# Elementary STEAM



$$180 \times 6 = 1,080$$

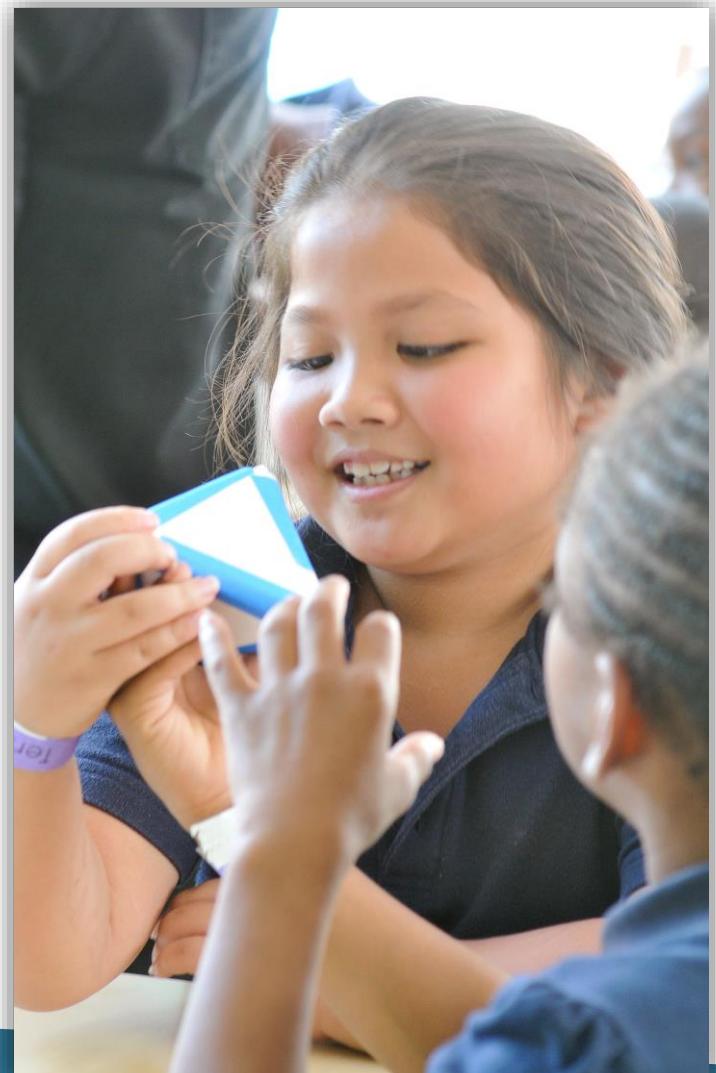
There are 1,080 school days in a student's first 6 years of formal education.

That is 1,080 opportunities to lay a strong foundation in STEM and a deep love of learning.



# Elementary STEAM

Starting with the end in mind, the formal K-5 curriculum, summer camps and clubs deliver skills to meet the challenges of growing up in a high-tech, highly mathematical age.



# Secondary STEM

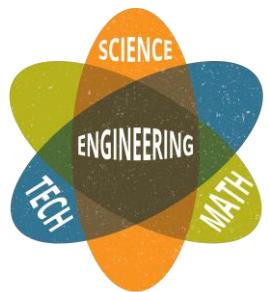


$$360 \times 3 = 1,080$$

Ten80's logo is a Venn Diagram made of 1,080 degrees.

Engineering as the intersection of science, math and technology applied to a problem or opportunity

A vision of society as the intersection of three spheres of influence: cultural, economic and political.





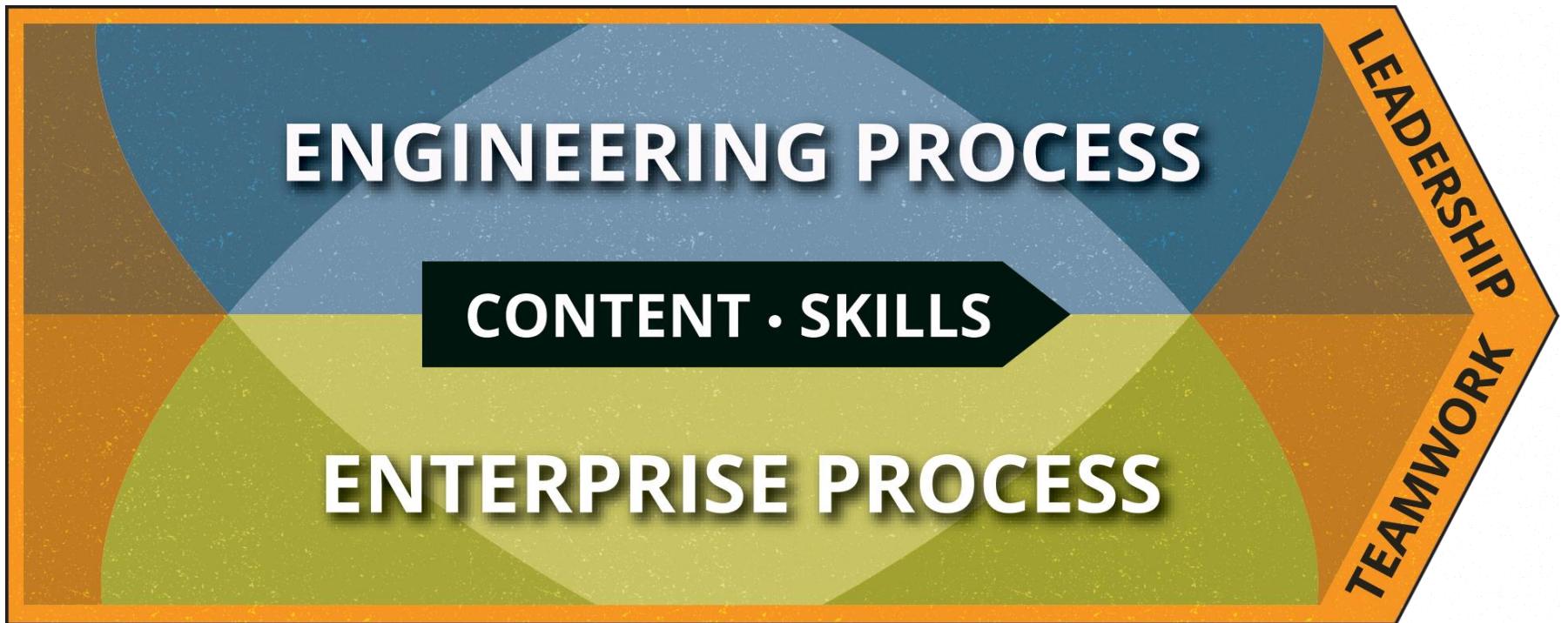
# Secondary STEM

Designed to help students become partners and leaders in building an even stronger, more prosperous and fair society through team-oriented challenges organized around a process of innovation.

Innovation, like any process, takes practice.



# A Real Model for Innovation





# A Real Path Toward Innovation

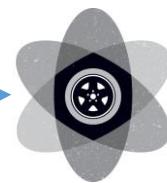
Learn to lead a team, engineer solutions, manage and market yourselves. Learn specific skills through owning a racing or robotics and computer science business.



The “Ideas & Research” Phases 1-3:

- Pitch
- Plan
- Propose

Student-led and no materials required (FREE video challenge for students).



TEN80 STUDENT  
**RACING**  
CHALLENGE



TEN80 STUDENT  
**COMPSCI**  
CHALLENGE



TEN80 STUDENT  
**ROVER**  
CHALLENGE



TEN80 STUDENT  
**ENERGY**  
CHALLENGE

Optimize energy strategy in all of them.



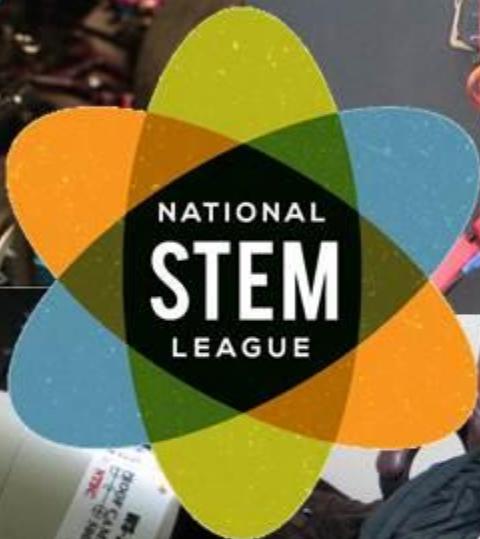
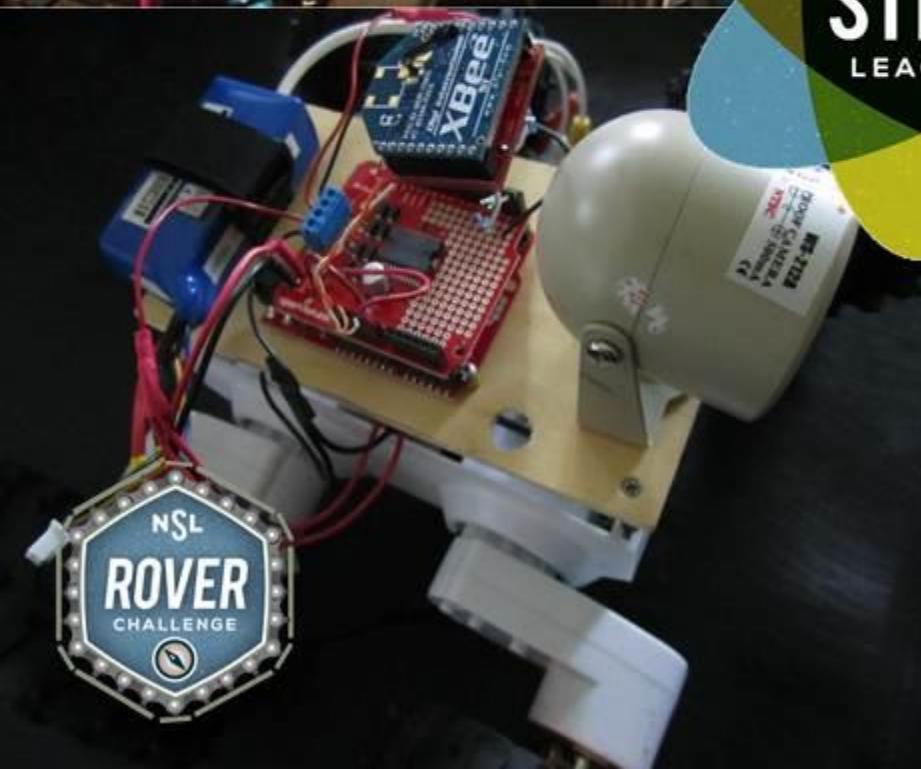
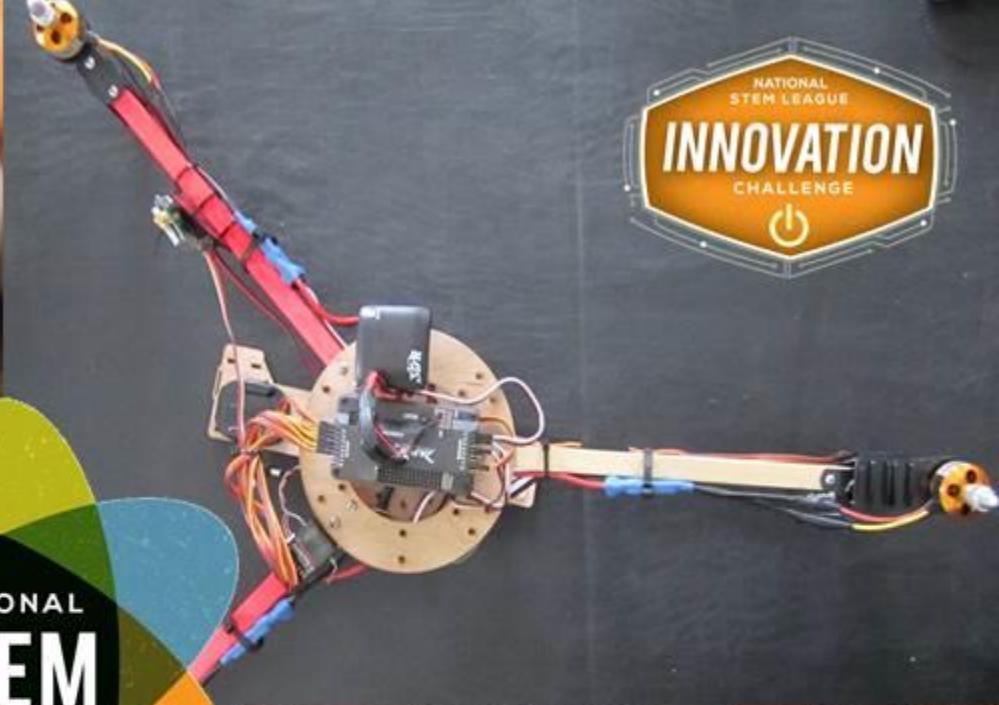
Every team manages and markets themselves.

- Evidence-Based Enterprise
- Engineering Design Process
- Project Management
- Marketing & PR
- Business Modeling & Planning

Revisit “Ideas”. Add “Implementation”

- Pitch
- Plan
- Propose
- Implement & Evaluate

Phase 4 requires registration and materials and KNOW-HOW.



Students develop and present the team's business plan.

1. Create and present a 1-minute pitch to sell the National STEM League team or company.
2. Design and create a team logo on the RaceCar or Rover.
3. Construct a RaceCar, Rover or new (even if just new to you) Innovation with LED.



# RACING CHALLENGE

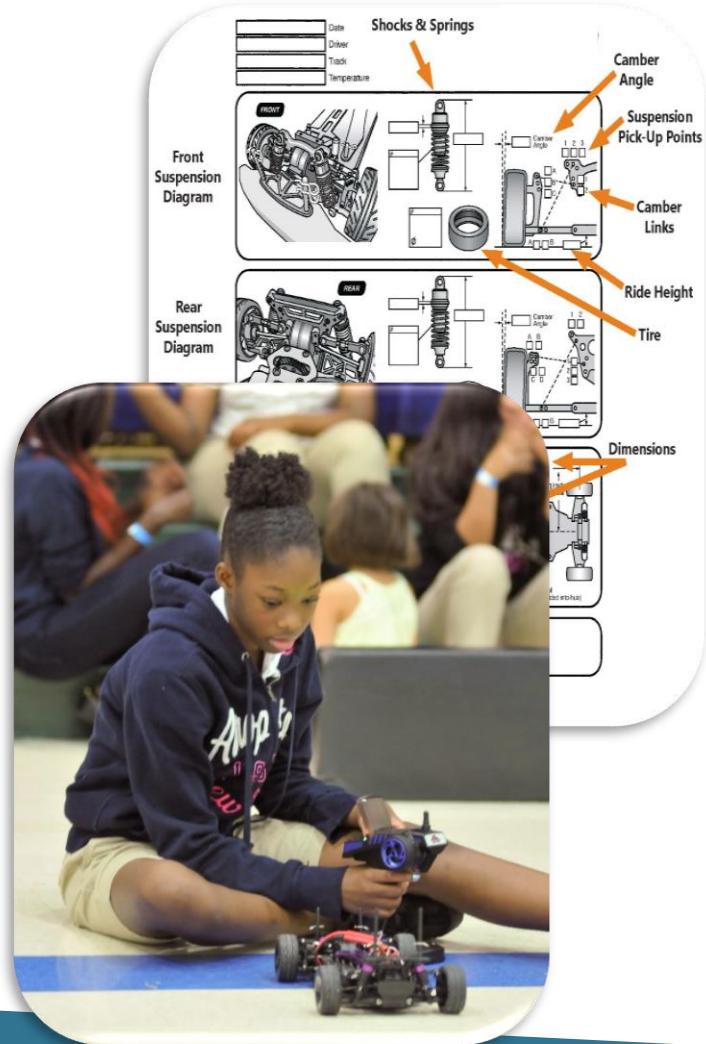
The curriculum is infinitely flexible.

## Certify

Learn the fundamentals of problem solving through data and of mechanical systems.

## Specialize

Once certified, specialize in areas of interest including marketing, management, 3-D CAD, graphic design, desktop manufacturing, robotics, rovers, 3D printing, programming, energies, and the broad field of innovation.



## Certify

- Learn to teach robots to act more like humans, beginning with the epistemology of robots.
- Master the language.
- Learn to work with a variety of open-source hardware and software.

## Specialize

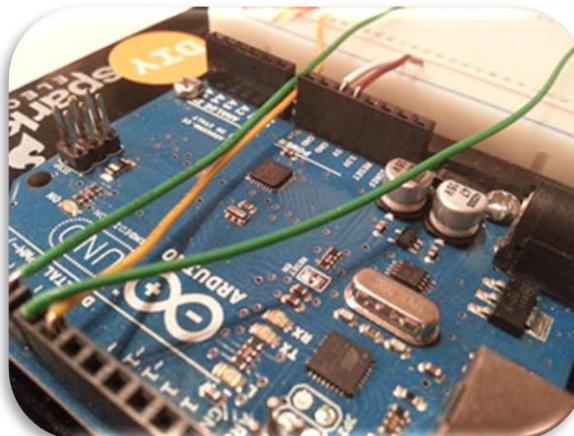
- Teach robots to navigate a maze.
- Collaborate and compete head-to-head with other teams in a strategy game.



## Certify

Through Innovators in Training Challenge, combine hardware and software to solve a problem or innovate something new the world didn't know it wanted!

- Innovation takes practice. Learn the alphabet of computers.
- String those two bits together to make ideas into realities.



## Specialize

- Convert the battery charging system for 1:10 electric Student Racing Challenge car to one that runs on renewable energies such as solar, wind and even hydrogen.
- Distinguish your team by optimizing the system and effectively marketing the vision of a company based on that product and process.
- Present to two panels of judges that will:
  - Evaluate the marketing value of the company.
  - Decide whether or not to invest in the company based on the technology and team.



# ENERGY CHALLENGE

## Specialize

- 6 – 10 week unit (45 -90 minutes per day)
  - Summer camp (30 contact units)
  - Individual 3-6 week projects.
- 
1. Evaluate ambient conditions and community energy sources
  2. Engage in activities that focus on electricity and energy.
  3. Materials kits are available for the following technologies.
    - Solar Energy
    - Wind Energy
    - Hydrogen Fuel Cells



## Fully Funded High School Events

500 local high school students are invited to attend a fully funded STEM Expo in 12 different cities across the United States.

- FREE to schools (including travel and lunch)
- Interactive agenda
- Introduces participants to hands on STEM
  - Race Engineering
  - Mechanical Certification
  - Rovers, Robots, Programming
- Schools receive FREE materials kits that include first and second year's NSL competition registration.





# UNLIMITED CURRICULUM FLEXIBILITY

Time & Format	NSL Challenge Options
5-day camp	Racing, Rover, Energy, Innovation (2015)
6-10 week project	Racing, Rover, energy, Innovation
1 semester course	Racing or rover
Full year course	Racing specializing into energy and data driven design
After school club – short	Racing, Rover, Energy, Innovation
After school club – forever!	Racing, Rover, Energy & Innovation

# How We Work

## Event Organizers





# NSL YEAR -ROUND ENGAGEMENT

Local Meets \* Regional STEM Expos \* Invitational \* National Finals



# Events Motivate.

A large, diverse crowd of young people, likely students, are gathered at an event. Many individuals have their hands raised in the air, some in excitement or cheering. The crowd is dense, with people of various ethnicities and styles of dress. In the background, there are signs and banners, suggesting a school or community gathering. The overall atmosphere appears energetic and positive.

# Events Offer EXTERNAL Evaluation



# Expos offer a Great Start





# Ten80 Organized Events

## Two models for Ten80-Organized Invitationals.

Ten80 provides:

1. Track Operator
2. Event Manager\*
3. Sanctioned Official\*
4. Checklist Support to host
5. Equipment
6. Lunch
7. Trophies

Local partners provide:

1. Venue (host)
2. Judges

OR

Ten80 provides:

1. Checklist Support to host
2. Equipment
3. Lunch
4. Funding up to \$700

Local partners provide:

1. Venue (host)
2. Judges
3. Track Operator
4. Event Manager
5. Sanctioned Official\*

Example: Miami

Example: Carolinas



\* May be remote depending on event size and regional budget. Event manager is often the same person as the Sanctioned Official.



# Locally Organized Events

**Local partners and educators organize these types of events because they help meet local educational goals:**

## 1. Mini-Expos, Workshops, Presentations

## 2. Competitions/Invitationals

- Scrimmages
- Sanctioned Points Event
- Sanctioned Invitational / Regional Finals

Ten80 provides:

- OPS Checklist Support
- OPS Guides & Training
- Equipment for the cost of shipping (if available)
- Connection to a local SO if available, remote assistance if not

# How We Work

## Hub Organizers & Supporters



# Why do we need Hubs?

When we say that Ten80's programs are “Exemplary” when all the pieces come together, organizing hub partners is how we pull the pieces together.

## Partners Include:

1. Hub Organizer\*
2. Associate Partners
3. Financial Sponsors
4. University/College to provide credits

## Hub Organizers ...

- Attend Ten80 training and get free demo materials.
- Promote the program and earn commission for new teams
- Organize summer camps and can generate revenue from them.
- Organize a fall and spring competition.
- Help connect mentors with students and educators.
- Work to build new partnerships, seek funding, mentors, etc.

\* Hopefully one person or group but could be a combination of several entities.

# Hub Goal



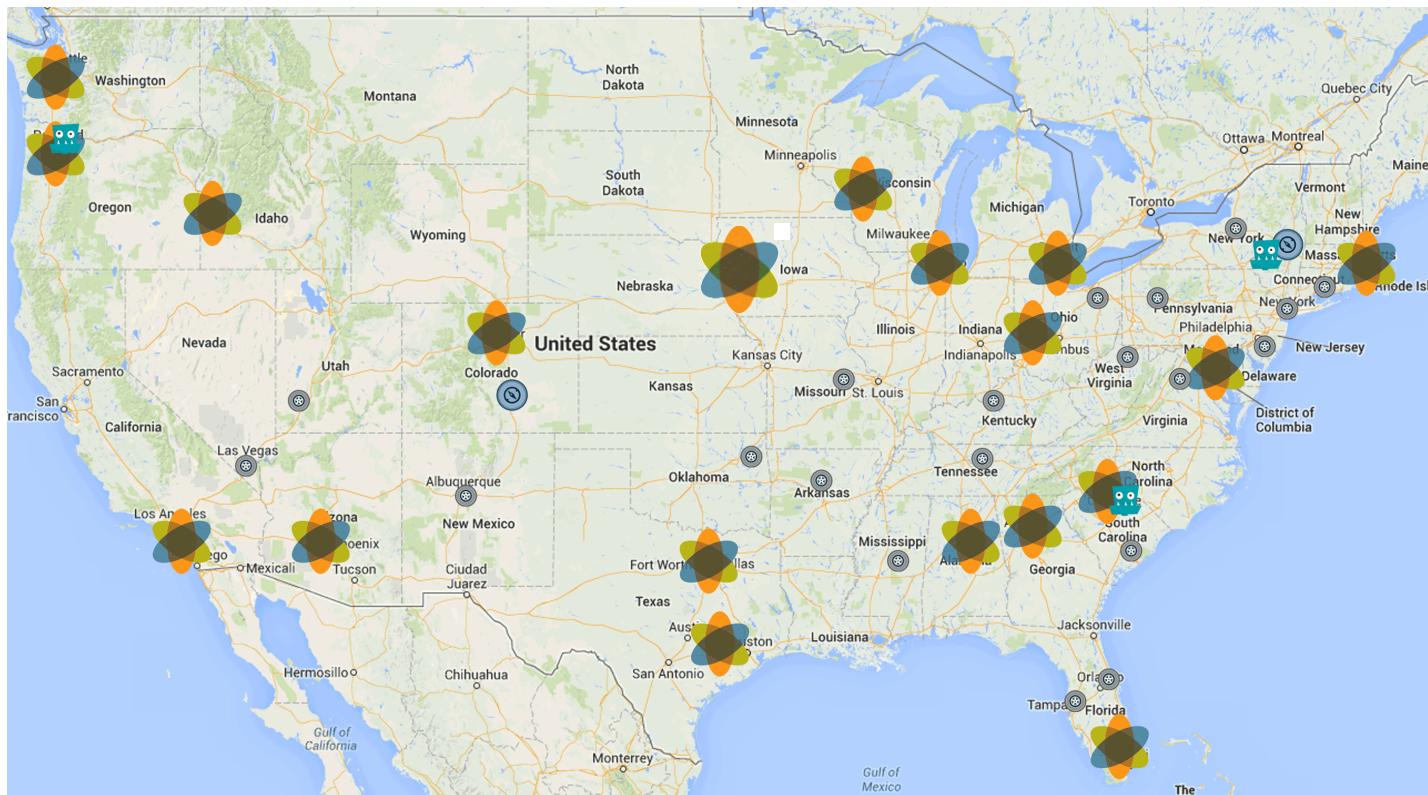
“Hubs” of Activity where Face-to-Face (F2F) competitions and Expos are held



NSL camps,  
courses or clubs  
outside of “Hubs”



2014 Elementary  
Pilot Sites





## CONTACT INFORMATION

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Web NSL

[www.ten80education.com](http://www.ten80education.com)

NEW Ten80 Art of STEM Project

[www.artofstem.com](http://www.artofstem.com)

### TEN80 Foundation

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