Middle and High School Robotics ~~Competition~~

STEM *Learning*

and

Workforce Development Program

Consider this…

Tomorrow's workforce

is in <u>your</u> middle schools right now

Many will be joining the workforce in as little as 5 years from now.

What is your organization or community doing to help get them ready?

Where BEST Comes In

- BEST is a non-profit, **volunteer-based** organization.
- Our mission: engage, excite, and inspire middle and high school students to pursue Science, Technology, Engineering, and Mathematics (STEM)-related careers.
- We accomplish this by providing students with a **six-week long**, fall robotics competition experience.
- We enlist local industries and organizations to provide **mentors**—technical professionals and engineers—to help guide the students.

BEST
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We're *not* about robotics.

We're about teaching students how to think through a problem **(any kind)**, analyze it, and solve it.

This is what 's needed to build *capacity* in our communities and local workforce.

Our Guiding Principles

- Students are the primary participants, decision-makers, designers, and builders
- **BEST is open to all schools**, regardless of type, size, location, or socioeconomic status
- **BEST charges no fees** to schools or students to participate
- All robotics equipment and construction materials **are provided at no cost to participating schools**

Our Core Objectives

- ***Provide teachers*** with a hands-on, project-based, co- and extra-curricular learning experience for their students
- ***Provide students*** with a real-world engineering experience that incorporates the practical application of math and science
- ***Prepare students*** to be technologically literate and thus better prepared to enter the workforce

Core Objectives *(cont.)*

Help students develop…

- Leadership, project management, teamwork, and organizational skills
- Decision-making, critical thinking, and problem-solving skills
- Self-confidence and competence
- Career interests

2012 Hubs & Regionals

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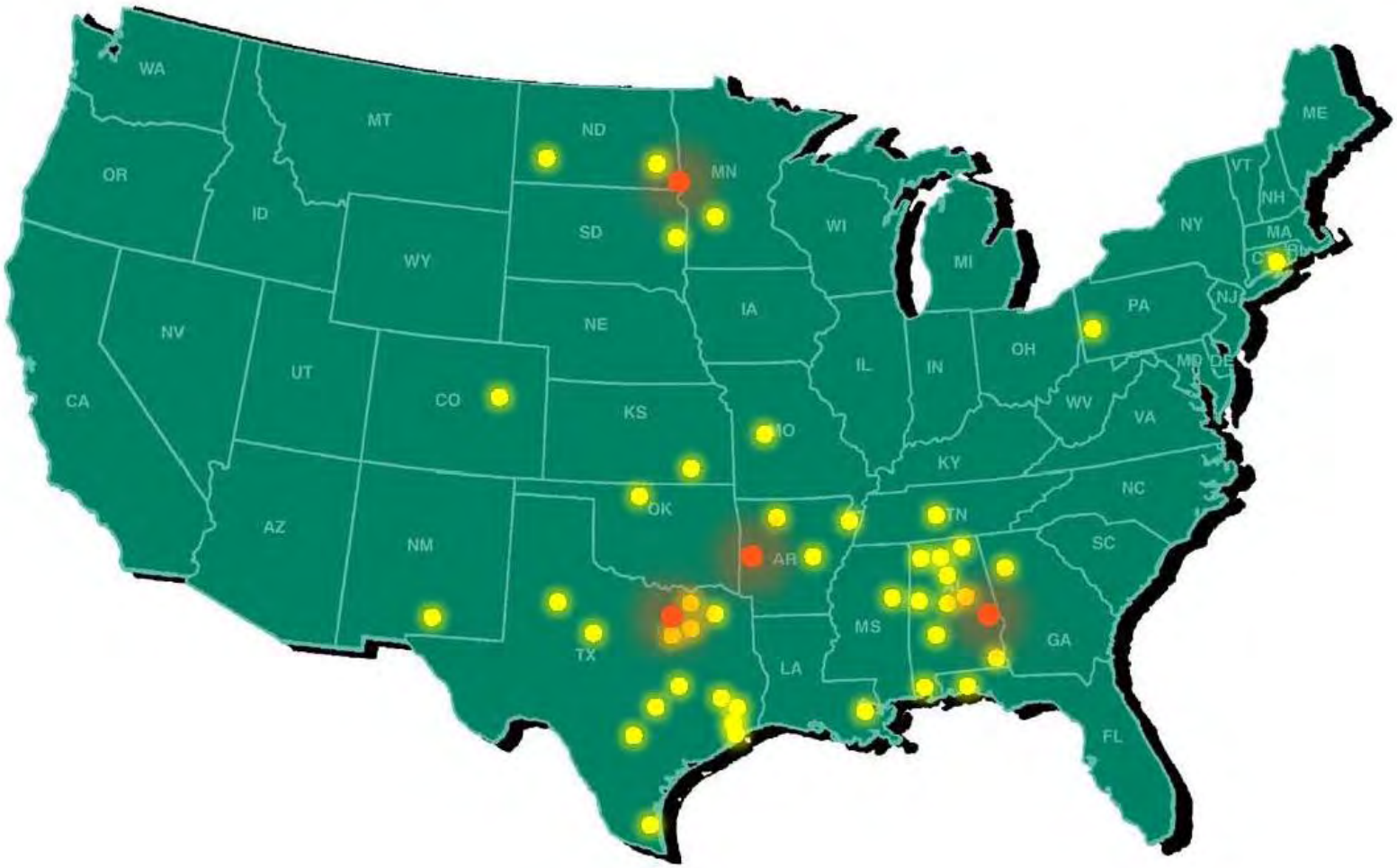

2012 Colleges and Universities

Arkansas State University
Auburn University (AL)
Calhoun Community College (AL)
Central Alabama Community College
Central Connecticut State University
Dickinson University (ND)
Grove City College (PA)
Lipscomb University (TN)
Mississippi State University
New Mexico State University at Las Cruces
North Arkansas College
North Dakota State College of Science
North Dakota State University
Northeast Alabama Community College
Northwest Oklahoma State University
Northwest Shoals Community College (AL)
Sam Houston State University (TX)
Shelton State Community College (AL)
South Dakota State University
Southern Polytechnic State University (GA)
State Fair Community College (MO)
Texas A&M University - Commerce
Texas State Technical College - Harlingen
Texas State Technical College - Waco
Texas State Technical College - West Texas
Texas Tech University
University of Alabama at Birmingham
University of Arkansas - Fort Smith
University of Arkansas Little Rock
University of North Texas
University of Texas - Medical Branch
University of West Florida
Wallace Community College Selma (AL)
Wallace State Community College (AL)
Wichita State University (KS)

National Impact

BEST
Boosting Engineering, Science & Technology™

- 20-year established program with proven success
- The only national program of its kind and size that is *free to schools*
- Grassroots, community-based, volunteer-run program
- In 2012…
  - 46 hubs in 18 states
    35 based at community colleges and universities
  - Estimated 1000+ schools and 18,000+ students
  - Approx. 8000 volunteers (staff, event personnel, judges, & mentors)

Educational Impact

BEST
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- Connects hands-on, applied math and science to STEM curriculum
- Creates collaborative relationships among teachers – **no more academic "silos"**
- **Provides intellectual & innovative challenge for getting kids excited about STEM**
- Encourages school-wide participation and community-wide involvement

Role in STEM Education

- Woven into STEM curricula in 60% of all BEST schools
- Project-based learning experience
- Real-world application of math and physics
- Satisfies state standards for Science and Tech. Ed.
- Ideal foundation for engineering start-up programs
- Career exploration and development experiences

As a Result of BEST…

BEST students…

- Better understand mathematical concepts and applied physics.
- Experience **real-world** science and engineering challenges.
- Understand what engineers do – **engineering is "demystified."**
- Experience "design-to-market" product development - **experience that is transferable to all career pursuits.**

A Teacher's Testimonial

"The BEST experience is like an education greenhouse; what happens during six weeks of competition would take an entire year in the classroom."

Dr. Mark Conner, Head, The Engineering Academy at Hoover High School (AL)

Workforce Dev. Impact

- Engages students in a real-world business experience
  - Budget, time, and materials constraints
  - Research & development
  - Technical documentation
  - Business and marketing plan
- Helps students develop the **skill sets** industry needs in its future workforce
- **Introduces rural, urban, and at-risk students to career opportunities they might otherwise have missed**

Workforce Dev. Impact

- Manufacturers have a direct impact on students through team mentorship
- Establishes **on-going relationships** between industries and K-12 schools in **new and innovative ways** that industry alone cannot achieve
- Creates opportunities for students to be exposed to well-paying jobs and great careers in local industries

Competition Overview

Competition Divisions

Robotics (Game)

- Engineering design challenge/educational game
- *Engineering Design Notebook* – documentation of the team's application of the Engineering Design Process in their robot design

The BEST Award

- In addition to robotics, teams may opt to compete for the BEST Award
- Categories:
  - **Engineering Design Notebook**
  - **Marketing Presentation**
  - **Team Exhibit**
  - **Judges Interview**
  - **Spirit & Sportsmanship**
  - **Robot Performance**

Educational Theme Examples

2003: "Transfusion Confusion"

Nanorobotics

2006: "Mission to Hubble"

NASA's Hubble Repair Mission

Educational Theme Examples

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2010: "Total Recall"

Lean Manufacturing and Six-Sigma

Educational Theme Examples

2012: "Warp XX"

Space Elevators

Robotics/Game Division

- Teams compete in a series of matches to determine advancement to semi-final and final rounds
- Points are awarded for successful completion of tasks
- 4 teams compete per 3-minute match
- Each team competes in 8 matches during the “seeding” round
- The 8 highest scoring teams advance to a semi-final round of 6 matches
- The top 4 teams advance to a final round of 4 matches

BEST Award Division

The **BEST Award** is presented to teams that best exemplify BEST's mission of "Boosting Engineering, Science and Technology." **It is the top award in the competition.**

Award criteria includes:

- **Teamwork**
- **Positive Attitude/Enthusiasm**
- **Sportsmanship**
- **School/Community Involvement**
- **Creativity**
- **Ethics**
- **Diversity of Participation**
- **Application of the Engineering Design Process**

Fall Program Overview

- **Kick Off Day (Week One)**
  - Early-to-mid September
  - Unveiling of playing field and overview of game objectives
  - Distribution of robotics equipment and materials to schools
- **Mall Day (Week Four)**
  - Playing field set up at local mall
  - Robot practice-driving and community awareness
- **Game Day (Week Six)**
- **Regional Championship (Early December)**
  - Top Robotics and BEST Award teams from hub competitions

Founding Partner

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National Corporate Partner

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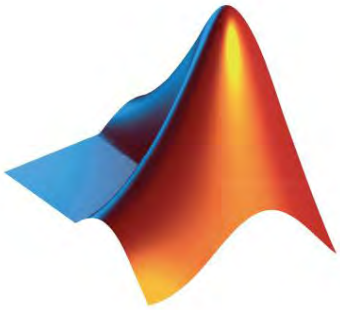

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