



*An initiative of the  
Oklahoma Innovation Institute*





## Oklahoma Innovation INSTITUTE



- 501(c)(3) not-for-profit corporation
- Committed to building an innovative economy in the Tulsa region
- “Research to High Impact Jobs”

### ***GOALS***

- Collaborative research and development
- Entrepreneurship
- Company creation and retention
- Life-long learning and creativity
- Future-oriented thinking
- STEM education

### ***PROGRAMS***

- Tulsa Research Partners
- Entrepreneurship Center
- Community Innovation Fund
- Best Thinking Forum
- Tandy Supercomputing Center
- Tulsa Regional STEM Alliance





*Science*



*Technology*



*Engineering*



*Math*



# ***Top 5 Industries in Tulsa:***



***Aerospace***



***Energy***



***Health***



***IT***



***Agriculture***



## Why STEM?

Alarming statistics on the weakened state of US global competitiveness due to our “leaking STEM pipeline”:

- US HS student performance in STEM tests is far behind our economic peers and *falling* our country
- Current and forecast future skilled job openings exceeds our appropriately skilled workforce to meet demand
  - By 2020, **THREE** million new job openings in STEM fields
  - The US is on track to staff **ONE** million of those openings
- A declining % of students select rigorous STEM post secondary courses of study
- A significant % of college STEM students do not graduate with a STEM degree
- The US currently ranks 23<sup>rd</sup> in science performance in international tests, and 31<sup>st</sup> in math!
- These realities undermine the economic and social strength of our country



## ***STEM Workforce as a Contributor to Economic Vitality***

- STEM drives advancement in Oklahoma's key industries such as aerospace, energy, manufacturing, IT and agriculture.
- National salaries for science and technology jobs average \$74,958 annually which is more than twice the average current wage in Oklahoma.
- Science and technology occupations in Oklahoma are projected to produce \$14.5 billion in wages by the year 2020.



## **The formation of the Tulsa Regional STEM Alliance (TRSA):**

- October 2013, 4 month study through Teaching Institute for Excellence in STEM (TIES)
- Collaborative vision of more than 60 STEM stakeholders from across Oklahoma
- Identified existing STEM assets as well as needs of the STEM education ecosystem



## ***TRSA VISION***

The Tulsa Regional STEM Alliance (TRSA) works as a catalyst to create a collaborative ecosystem that encourages business / industry and the education community to produce innovative pathways resulting in a highly skilled STEM workforce able to drive economic prosperity while meeting the needs of a globally competitive Tulsa region.





# GOALS

*TRSA will serve as a catalyst for creation of a collaborative STEM ecosystem producing broad and deep innovative pathways resulting in robust STEM workforce.*

- **CALCULATE** - Create common performance metrics for region's STEM education
- **COMMUNICATE** - Laser focus on communicating STEM opportunities across region
- **COLLABORATE** - Use shared resources to broaden impact of current efforts
- **CULTIVATE** - Bring needed nutrients to STEM ecosystem
  - Collaborative Funding
  - Programming
  - Tulsa Resource Area for STEM Educators (TRASE)
  - Professional Development
  - Mentorship



# EARLY VICTORIES

## ***US2020 City Competition***

- Launched in June of 2013 by the Clinton Global Initiative; experiment to determine best practices in establishing STEM mentorship programs
- January 2014, Tulsa was selected as one of 13 finalists out of 52 cities
- Benefits include two visits by a TRSA representative to the US2020 City Competition gathering, quarterly coaching calls from US2020 staff and access to AmeriCorps volunteer staff

## ***NORDAM – Tulsa Charity Flight Night***

- March 2014, TRSA was selected to receive a grant of approximately \$160,000
- TRSA was invited to blend its proposal with Hardesty Center for Fab Lab Tulsa, furthering the goal of TRSA to create dynamic “mesh networks”
- Projects Include:
  - Mobile Fab Lab
  - STEM Exploratorium
  - Quadcopter Camp and Challenge
  - Over 20 STEM access ramp events
  - Funding for STEM mentoring kits, transportation and food

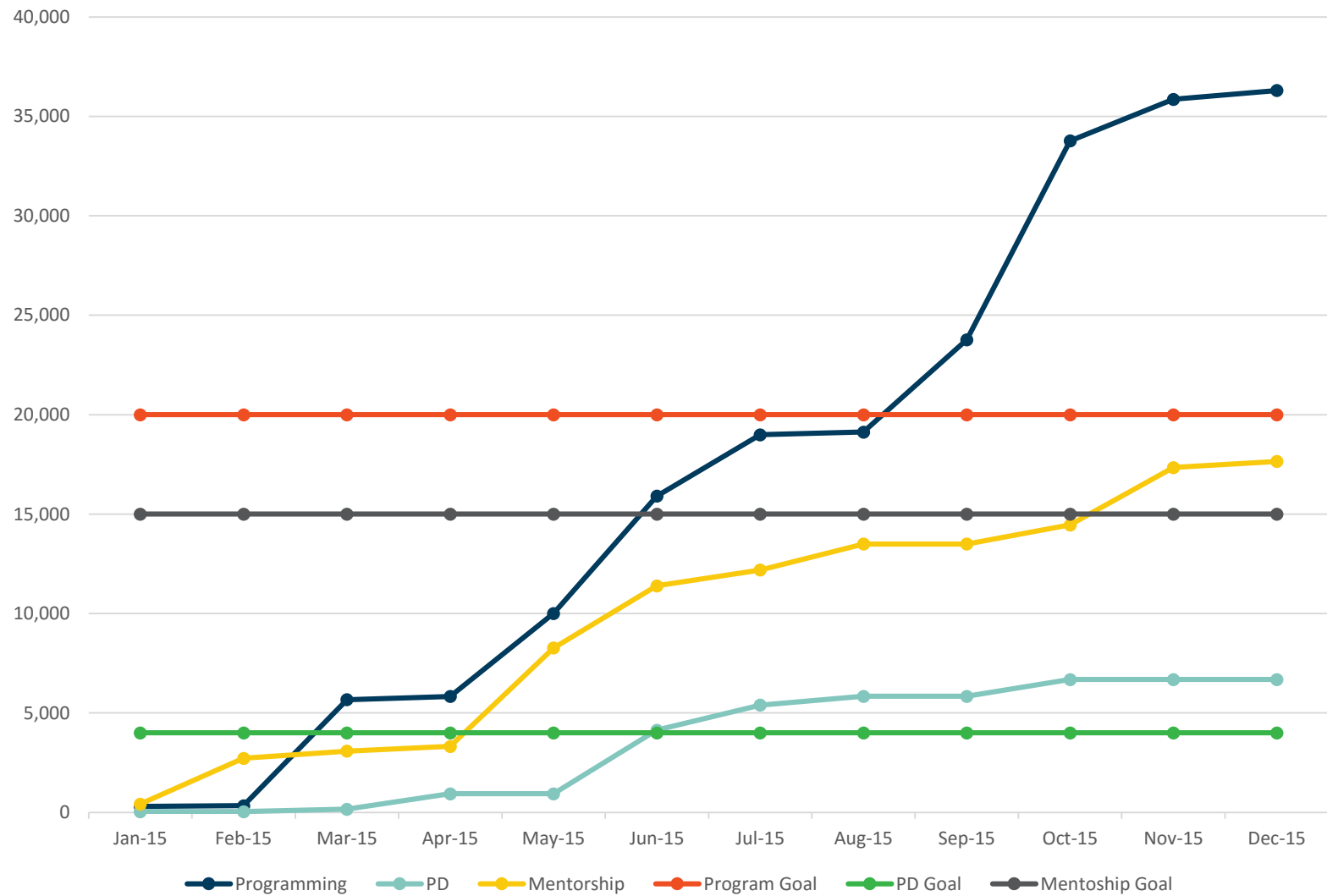


# INTENDED OUTCOMES

- ***Community-wide STEM Programming Support and Growth***
  - 10,000 Tulsa regional students will be empowered by high-impact, experiential STEM activities and events.
  - 500 Tulsa area educators will be trained and equipped in hands-on STEM education for their classrooms.
  - 1,500 Tulsa regional students will experience multi-session, hands-on STEM mentorship with a STEM professional resulting in a performance or product.
  - TRSA will host 100 STEM events that will engage 80% of TRSA Guiding Coalition Partners in effective STEM outreach.
  - 75% of students involved in STEM ramp activities will report a desire to become engaged in STEM mentorship.
  - 20% of Tulsa residents will express increased awareness of STEM.
  - Tulsa area employers and Chambers of Commerce will show an upward trend in the number of qualified applications for STEM related careers.
- **Improved Effectiveness of Corporate and Philanthropic Grant Making to STEM Organizations**



TRSA Annual Goals



## ***EVENTS***

TRSA offers around 100 events per year, reaching around 10,000 students. Below are just a few of our main events:

- STEM Exploratorium
- Engineer Games
- Tech Trek Camp
- Tulsa Research Kids
- Oklahoma Women in STEM
- SeaPerch Challenge
- Girls' Coding Camp
- Engineer Signing Day
- City Wide Kite Festival
- Builders' Club
- You're Kind of a Big Deal Banquet
- Midshipmen Outreach



## ***INNOVATION ROOMS (IRs)***

TRSA members work together in focused groups called Innovation Rooms (committees). Active engagement and collaboration of partners form a partial “mesh network” which is an aggregation of work programs that intentionally spread the individual opportunities in a mesh formation among the organizational framework to eliminate silos or other rigid structures that discourage collaboration. The opportunities or programs of interest will be generated organically by the Advisory Council or any TRSA member organization.

### **DYNAMIC IRs:**

Global STEM  
Kite Festival  
Legislation  
Macro / Micro  
OERB  
Project Lead The Way  
Tech Trek  
STEM ^ Arts  
Science Fairs  
Sonia Kovalevsky Day  
Tulsa State Fair

### **STANDING IRs:**

- Communications
- Computer Science
- Curriculum
- Data Collection, Analysis and Reporting
- Governance
- Professional Development
- STEM Mentorship

# ***MENTORING STRATEGIES***

- Activities
  - High impact, hands-on, multi-session programs
  - STEM tutoring
  - Special events
- Delivery
  - By STEM Professionals
  - In-School and Extra Curricular
- Leverage
  - Complement (not compete) with existing mentoring efforts
  - Utilize the power of organizations (industry, clubs, faith based, education, etc.) for scale and sustainability (Adopt-A-School model)
  - Bias on mentoring curriculum towards Adopt/Adapt vs. Develop
  - Pilot new efforts then scale up with success



## ***ELEMENTARY:***

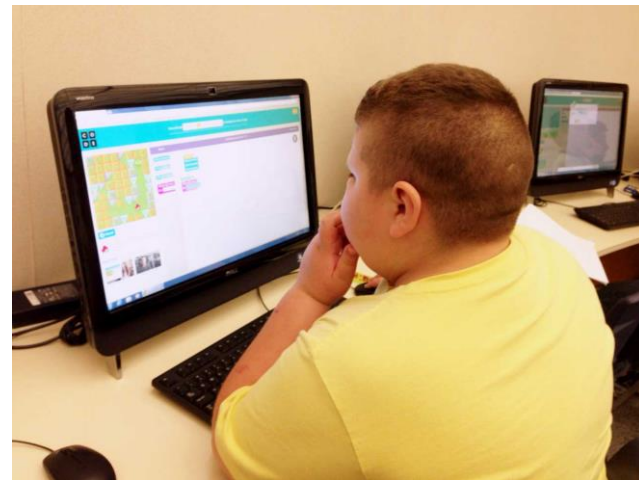
**Me & My Math Mentor – M<sup>4</sup> - 3 Schools, 100 Students, 30 Mentors**  
**Builders' Club - 2 Schools, 40 Students**





*MIDDLE SCHOOL:*

Google | CS First



## *HIGH SCHOOL:*



Engineers Alliance  
for the Arts (EAA)



# ADVISORY COUNCIL



- Ambler Architects
- American Airlines
- Arts & Humanities Council of Tulsa
- APSCO
- Baker Hughes
- Bama Companies
- Booker T. Washington High School
- Broken Arrow Public Schools
- Camp Fire Green Country
- Cancer Treatment Centers of America
- Charles and Lynn Schusterman Family Foundation
- Forest for the Trees
- Jenks Public Schools
- John Hope Franklin Center for Reconciliation
- Junior Achievement of Oklahoma
- KIPP Tulsa
- Matrix Service Company
- Miss Helen's Private School
- Muncie Power
- Muscogee Creek Nation
- NORDAM
- Oklahoma State Department of Education
- OSU - Tulsa
- Oklahoma Innovation Institute
- Osage County Interlocal Cooperative
- Osage Nation
- Project Lead the Way
- Society of Exploration Geophysicists
- STARBASE Oklahoma
- Tandy Supercomputing Center
- T.D. Williamson
- The University of Tulsa
- Tulsa Air & Space Museum & Planetarium
- Tulsa Chamber of Commerce
- Tulsa Children's Museum
- Tulsa City County Library
- Tulsa Community College
- Tulsa Community Foundation
- Tulsa Engineering Foundation
- Tulsa Opera
- Tulsa Public Schools
- Tulsa Symphony
- Tulsa Technology Center
- Union Public Schools
- Williams Companies
- YMCA Tulsa

# ***PARTNERSHIP OPPORTUNITIES***

*Funding  
Advisory Council  
Mentorship*



# ***JOIN US IN CHANGING LIVES!***



# *Thank You!*

Xan Black, Program Director

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