Agenda

• **Speed Networking**—Three Rounds

• **Opening Remarks** —Talia Milgrom-Elcott, Co-Founder and Executive Director, 100Kin10

• **Panel Discussion**—**Deep Dive on Science Centers and STEM Education Ecosystems**
  o Ron Ottinger, Executive Director, STEM Next (*moderator*)
  o Chevy Humphrey, The Hazel A. Hare President and CEO, Arizona Science Center
  o Alfred Mays, Program Officer, Burroughs Wellcome Fund
  o Steve Snyder, President and CEO, Fleet Science Center

• **Breakout Discussion #1**—**Identifying Common Community Challenges and Unlikely Partners**

• **Breakout Discussion #2**—**Root-Cause Mapping and Science-Center Roles**

• **Try This at Home**

• **What to Expect at the 2018 ASTC Annual Conference**
SPEED NETWORKING
What superpower do you wish you had?

How would you use it?
What is something inspiring you saw in science engagement recently outside of your center?

What made it particularly impressive and memorable?
What you would write on a postcard to a loved one about why you’re here today?

What wish would you share on that postcard for what a lifelong engagement with science and technology could mean for them?
OPENING REMARKS

TALIA MILGROM-ELCOTT
Co-Founder and Executive Director
100Kin10
Keystone Species
New STEM Teachers Produced by 100Kin10 Partners

- 6K (2012)
- 12K (2013)
- 20K (2014)
- 30K (2015)
- 40K (2016)
- 54K (2017)
- 62K (2018)
- 74K (2019)
- 86K (2020)
- 100K (2021)

SURPASSED 50K TARGET
Why is it so hard to get and keep great teachers, especially in STEM?
the number of teacher preparation programs that have high admissions standards
the pool of qualified PK-12 STEM teachers that are available for school leaders to hire
the number of states with strong PK-12 science standards
the number of opportunities that preparation programs provide to PK-12 student-teachers to observe high-quality teaching
the number of professional development opportunities for PK-12 STEM teachers who are prepared to meet the diverse learning needs of students
the number of states with updated STEM content standards
the number of PK-12 STEM teachers who are prepared to meet the unique challenges experienced by students in rural schools
the number of families that are aware of how to support their children's science, technology, and engineering learning
the number of states that have certification tests requiring demonstration of STEM content knowledge
the number of STEM teachers who are trained to provide active learning experiences
the number of states that require preparation programs to include substantial real-world professional experiences for PK-12 student-teachers
the number of schools with systems to identify and support model PK-12 STEM teachers to serve as peer coaches
the time for PK-12 STEM teachers to participate in professional development during the school day
the number of alternate certification routes for PK-12 STEM teachers offered by states
the number of people who perceive PK-12 STEM teaching as an intellectually rigorous career
the agreement among educators on the purpose for professional development at the different stages of PK-12 STEM teachers' careers
the number of elementary teachers who have positive STEM experiences in PK-12 schools
the number of professional development opportunities for PK-12 teachers that focus on how to engage students in active STEM learning experiences
the number of people who perceive that elementary teachers are interested in teaching STEM
the number of families that are aware of the importance of science, technology, engineering, and mathematics skills in the current and future job market
the availability of resources for PK-12 STEM teachers to integrate engineering concepts into instruction
the number of school leaders who are trained in fostering collaborative work environments
the alignment between STEM professional development opportunities and individual teacher's needs
the number of PK-12 STEM teachers who have access to culturally-relevant curricula and resources
the number of PK-12 STEM teachers who have access to support from PK-12 STEM education careers
the presence and visibility of a variety of STEM jobs in rural communities
the availability of resources for PK-12 STEM teachers to integrate science standards into instruction
the number of school leaders with PK-12 STEM training and experience
the number of school leaders allocating resources for elementary teacher professional development in science, technology, and engineering
the number of states with accountability measures for science, technology, and engineering teaching and learning
the number of principals who support STEM instruction
the number of preparation programs with accountability measures for elementary teachers to have STEM content knowledge
the number of PK-12 teachers who encourage their students to pursue PK-12 STEM teaching careers
the number of PK-12 STEM mentor teachers
the number of STEM content area training for pre-service elementary teachers
the number of practice teaching programs that collaborate with local districts around preparation for PK-12 STEM teachers
the number of PK-12 STEM teachers who are able to identify high-quality STEM instructional resources
the number of districts providing high-quality, STEM-focused induction and mentoring supports for new PK-12 STEM teachers
the time for PK-12 STEM teachers to collaborate during the school day
the number of districts implementing schedules to foster PK-12 STEM teacher collaboration
autonomy for PK-12 teachers to experiment with new STEM teaching strategies
the time for PK-12 teachers to experiment with new STEM teaching strategies
the number of people who perceive PK-12 STEM teaching as a career for people of any gender
the number of PK-12 STEM teachers who are prepared to meet the diverse learning needs of students
the number of universities that publicly recognize the importance of STEM teachers
the number of districts that hold school leaders accountable for creating positive work environments
bonuses for PK-12 STEM teachers
the number of people who perceive PK-12 STEM teaching as a STEM job
the number of states with PK-12 computer science standards
the number of people who perceive that girls, minority, and low-income students can excel in science, technology, and engineering
scholarships or loan forgiveness for STEM college majors entering PK-12 STEM teaching jobs
the number of states that have rigorous STEM coursework requirements for PK-12 preservice teachers
the number of districts that designate funds for STEM instructional resources
the number of high-quality professional development and learning opportunities for PK-12 STEM mentor teachers
the number of PK-12 STEM teachers who perceive that school leaders prioritize time for teacher collaboration
the number of PK-12 STEM teachers who are prepared to use culturally-relevant teaching strategies
the ability of districts to identify high-quality engineering curriculum
the transition of teaching strategies that focus on how to teach higher-order thinking skills
the number of schools using integrated STEM instructional models
the number of school leaders effectively using student assessment data to inform professional development for PK-12 STEM teachers
the number of school leaders that provide opportunities for PK-12 STEM teacher leadership
the number of hours that preparation programs require for PK-12 student-teachers to practice high-quality teaching
the number of universities with education and STEM departments that collaborate around PK-12 STEM teacher preparation
the alignment between teacher evaluation criteria and the different stages of a teacher's career
the diversity of PK-12 STEM teachers
the accuracy of pre-service tests in predicting teacher effectiveness
the number of women working in STEM
the number of STEM professionals that are willing to reduce revenue because they reform their education departments
the number of testing and accountability systems that promote PK-12 STEM teacher creativity in the classroom
the number of school leaders who understand the professional development needs of PK-12 STEM teachers
the ability of districts to identify high-quality computer science curriculum
the number of school leaders who are interested in becoming a leader for teacher professional development
the number and range of STEM courses that high schools are required to offer
the number of states that consider the job performance of graduates when approving preparation programs
the alignment between teacher evaluation criteria and teachers' professional growth needs
the number of states with PK-12 standards that include engineering design practices
the number of teacher preparation faculty with PK-12 STEM education credentials
the number of professional development providers that collaborate with districts to ensure coherence in training across PK-12 STEM teachers' career stages
the amount of STEM-specific instructional resources available to elementary teachers
the ability of districts to identify high-quality technology curriculum
the number of school leaders who have access to engineering experts
the number of states that require PK-12 STEM teachers to be certified
the number of states that track PK-12 STEM teacher supply and demand
the number of professors who model strategies that PK-12 STEM teachers will need to use in their instruction
the number of districts that ensure school leaders are prepared to evaluate PK-12 STEM teaching
the number of school leaders who understand how to integrate technology, engineering, and computer science into the curriculum
the number of states that require PK-12 STEM teachers to be certified
the number of high-quality professional development opportunities for PK-12 STEM teachers
the number of opportunities for PK-12 STEM teachers to collaborate with STEM experts
accountability for student learning in science, technology, and engineering
the number of universities that classify PK-12 STEM teaching as a STEM profession among their alumni
the number of PK-12 STEM teachers who require rigorous coursework for pre-service elementary teachers
the number of states and districts requiring competency-based professional development for re-licensure
the number of families that encourage PK-12 STEM teaching careers
the number of people who perceive that PK-12 STEM teachers have intellectually dynamic work environments
the number of qualifications for PK-12 STEM teachers to integrate computer science concepts into instruction
the availability of resources for PK-12 STEM teachers to integrate technology concepts into instruction
salaries for PK-12 STEM teachers
funding for schools to purchase PK-12 STEM materials
the availability of STEM professional development available to elementary teachers
the number of school leaders with an appreciation for science, technology, and engineering
the number of states and districts with career ladders for PK-12 STEM teachers
the number of PK-12 STEM teachers with access to STEM labs
the number of STEM teachers with PK-12 standards that include technology proficiencyes and measures
the number of male PK-12 STEM teachers.
If problem “A” improved, would it make some other problem “B” better, worse, or leave it the same?
750+ experts
35,000+ votes
EVERYTHING IS CONNECTED
NOT EQUALLY
EVERYTHING IS CONNECTED
\wedge
NOT RANDOMLY
EVERYTHING IS CONNECTED
NON-RANDOMNESS HELPS US SIMPLIFY, SO WE CAN FIND OUR STARFISH
Teacher Leadership

School leaders’ responsibility for creating positive work environments

Professional Growth

Time for teachers to collaborate and participate in PD during the school day

Elementary STEM

Teacher prep faculty with expertise in elementary STEM

Values of S, T and E

The number and range of STEM courses offered in high schools

Instructional Materials

Districts’ ability to select high-quality engineering curriculum

Prestige

Scholarships or loan forgiveness for STEM students entering teaching

Preparation

Statewide tracking of teacher supply and demand
THANK YOU.
SCIENCE CENTERS + STEM EDUCATION ECOSYSTEMS

RON OTTINGER
Executive Director, STEM Next
The Role of Science Centers in Changing and Shaping local STEM education ecosystems

September 28, 2018
New Research: Afterschool STEM Works

**INSPIRE**
78% of students said they had a more positive attitude about STEM because of their afterschool experience.

**EDUCATE**
73% of students said they had a more positive STEM identity because of their afterschool experience.

**EXPLORE**
80% of students said their STEM career knowledge increased because of their afterschool experience.

**PREPARE**
72% of students said their perseverance and critical thinking skills increased because of their afterschool experience.
STEM Funders Network

[Logos of various organizations]

[STEMnext Opportunity Fund logo]
We Believe:

STEM Learning Opportunities Happen at Charging Stations

Youth who plug into STEM organizations like science centers get engaged, inspired, and knowledgeable about science, technology, engineering, and mathematics.
Statewide & Citywide Networks + Science Centers

Frontiers in Urban Science Exploration

- New York, NY
- Nashville, TN
- Providence, RI
- Boston, MA
- Chicago, IL

THE 50 STATE AFTERSCHOOL NETWORK

- 32 STEM States
  - Explora, New Mexico
  - New York Hall of Science, New York
Panel Discussion: Science Centers + STEM Education Ecosystems

Moderator

Ron Ottinger, Executive Director, STEM Next

Panelists

• Chevy Humphrey, The Hazel A. Hare President and CEO, Arizona Science Center

• Alfred Mays, Program Officer, Burroughs Wellcome Fund

• Steve Snyder, President and CEO, Fleet Science Center
BREAKOUT DISCUSSION

Identifying Common Community Challenges and Unlikely Partners
• Pick a common and seemingly intractable challenge that you aim to address.
  o What impact are you aiming to have in your community?
  o How will your community be different (better) if you are successful?

• Who else needs to be at the table to help you understand and map the challenge?
Root-Cause Mapping and Science-Center Roles
• Why it is so hard to solve the challenge you identified in the last session? What are a few root causes and obstacles in the way?

• Which “keystone” root causes, if addressed, would allow the most progress?

• For these “keystone” root causes, which new, novel, or unlikely partners would you bring to your planning table first?

• What is highest impact role for science centers and where might they start (or expand) their work towards the identified challenge?
THREE THINGS TO TRY AT HOME

Put Network Mapping to Work in Your Own Community
TRY THIS AT HOME

1. What is the **big goal** that will inspire and mobilize likely and unlikely allies?

2. Who is **one unlikely partner** you will reach out to before the sun sets next Friday?

3. What is **one thing you will stop doing** to make room for this work?