What needs exist?
December / January 2018

What are the greatest <u>social needs</u> in our region?

- No place for parents to meet other parents or families
- Poverty – families can't get basic needs
- High food insecurity
- Adult supervision – latch key afterschool; mentorship
- Convening Space – families, industry, education, teens
- Apprenticeships

Why might the Mid-Hudson Valley need a science center?

- Doesn't have one
- Lots of Tech Biz in the area – need people who understand data – can translate to useful info for business – novel ways of interpreting data and skills and ability to think / communicate data
- "Design Thinking" (big at IBM) – a while way of thinking – knowing customer, meeting needs; it's a process – creates results you'd not immediately think of
- Environmental challenges (needed for engineering) – design challenges, need fluency in environmental science, geology, hydrology, protected habitats/species.
- Technology – keeping up with CAD
- Manufacturing – push button vs. design, rebuild and writing the programs for process
- Sustainability - economic, environmental, social (triple bottom line)
- Shift away from information economy to knowledge economy
- Make science COOL – lots fighting it – peers, parent comfort with science, educators – scientists as role models
- Provide support for parents – homework support, give them experiences to build their confidence in science (to then help/encourage kids)
- Creates opportunities
- Sparks interest – connects to careers and pathways
- Fills in gaps
- Afterschool place to go – non athletic thing to do
- Region has technologic history
- Outlet for industry to share
- Gender diversity
- Brings people to Poughkeepsie
- Community Center
- Revealing human side of STEM – stories, real people do this

- Citizen Science no one else is doing it here
- Workforce development
- Work outside the limits of a classroom
- Enhance existing education opportunities
- Diversify opportunities
- Motivate kids to be curious
- Exposure to careers
- In conjunction with schools
- An evolving community need an evolving science center
- Classes – production of a product
- Specific problem-solving activities
- Local contribution – feature local industry (manufacturing, data traffic)
- P-tech involvement
- Family interests
- Technology supplementation
- University involvement – outreach

DEMOGRAPHIC NEEDS

What do <u>families</u> in the community need from a science center?

- Immersive experiences – make a day of it layered experiences
- New material presented – rotate out to have reason to return
- Invitation in –welcome environment
- Progressive learning experiences
- Multiple entry pathways (first timers to PhDs)
- Accessibility of content, cost, language
- Conscious of diversity, inclusion, of all abilities
- Real world connections to STEM/STEAM (encourage both)
    - Winter family activities for a larger age range
    - Existing resources to expand
    - More family activities in general
    - New facilities
    - Mobility issues
    - Programming – diversity; wide age range; interesting for all ages; theater – IMAX
    - Social connections
    - Accessibility
        - Protect natural resources
        - Family cohesion
        - Educational setting attached to school – integration of school with community
        - Sustainable

- Adapts to changing needs of society
- Awareness of waterfront projects
- Demonstrating to youth in community sense of community ("it takes a village")
- Focus on sustainable communities
- Utilize client data to project future trends in development
    - Entertainment
    - Shared experiences – learning together as families
    - Fun + learning (the experience)
    - Something new and unusual (not normally accessible) – strengthened by take-away / token to remember
    - Information / ideas – changes in thinking
    - Inspire volunteerism, philanthropy
    - Exposure – more of STEM
    - Build on/ make more tangible home and school experiences with STEM
    - Exposure to diverse new community members – new social networks
    - Expanded opportunities to learn

What do <u>young adults</u> in the community need from a science center?

- Career exposure – what's out there? (apprenticeships, internships, immersion experiences) – to get into science and technical fields… long term will lead to economic and global impact
- Real world connections – trending / what's "in"
- Turn passion into a job / career
- Learn of local careers (ex. chemistry can lead to food/ beverage jobs)
- Increased science literacy
- Environmental education – ties to environment opportunities
    - Science cafes / science pubs
    - They need a nice place to gather and break boundaries
    - A social and cultural intellectual space to convene
    - (Is there a risk of going to broad?)
    - employment
    - volunteer opportunities / opps to give back

What do <u>seniors</u> in the community need from a science center?

- Destination to take grandkids
- Places to "give back" and share knowledge
- Companionship and connection
- To learn technology from younger people?
- Intergenerational connection
- Quality of life

- Community
- Volunteer opportunities
- Different perspectives
- Oral history
- Intergenerational cohesion
- Solutions for heat and food insecurity
- Opportunity to use expertise and to socialize
    - Career center for lifetime studies (huge demand)
    - Public social spaces / cultural spaces
    - Intergenerational environments
    - Volunteer opportunities
    - Opportunities to give back

INDUSTRY

What does your <u>industry or company</u> need from a science center right now?

- What is engineering? Kids don't know the end game. Are being told to go into engineering without sense of what it is. They can't know if they might have an interest or now.
- Local opportunities in engineering, STEM careers – showcase local companies – hub
- Attraction for young families
- Activity for children
- Getting children interested early
- Keeping interest through school
- Advertising opportunities / visibility in STEM
- Important component of educational ecology
- Make science cool
- Pace to return to practice skills
- Full-day programs
- CTE (Career Technical)
- A bigger definition for STEM
- Learning through play
- Working in teams
- Opportunity to fail
- Partnership with schools
- Partnership with families
- Economic viability
- Lessons learned

What does your industry or company not have from the community right now?

- People in CAD/design – fluency in design skill, adaptive
- P-Tech – hs + associates degree programs in tech trades and computer science (Ulster, Newburg has these)
- *Trades – machining*
- *Need a clearing house – companies need a centralized hub from where they can recruit, trades especially. Hard to find.*
- Mid/ Senior level engineers
- Critical thinking skills
- Communication and people skills
- mid-level hands-on manufacturing
- math skills
- diversity
- curiosity (skills, cultural, environmental, generational, scholastic)
- continuing education
- scholars
- integration with curricula

What are you predicting your industry will need in 5 years?

- Aging workforce – new blood; more trades and hands-on machining, operators needed
- Lights-out manufacturing
- Robotics
- AI
- Block chain
- Materials science knowledge
- Data analytics (esp in health field) – pattern analysis – so much data collected – need to make sense of it all
- Trending and forecasting skills
- Creating a "cool" town
- Quantum technology
- Robots to help people/ AI
- Human centered design
- Sustainability
- Climate change
- Flexible housing

… 10 years?

- Every STEM job is going to evolve – must have basic math and technical skills to keep up

What trends are you watching/seeing that a science center should be aware of?

- Women / diversity / inclusion = big deal

- New and emerging industries are using products originally designed for another purpose (ex. fasteners from landing gear now in amazon warehouses)
- Info to knowledge based economy – ability to process and synthesize data; STEM literacy will be required skills
- Democratization of technology – individuals have unprecedented access to technology; allows individuals to be competitive with businesses (everyone can become their own CEO) but will need to round out skills to do that – HR, PR/communications, legal, etc.
- People don't work at one company for their entire career anymore.

What trends is your industry aware of that the future science center should be paying attention to?

- Need for companies to differentiate on global scale – differentiation is a driver – businesses need to stay competitive by reinventing themselves constantly
- Environmental trends
- AI
- Displacing people with systems and tech
- Power/energy
- Losing combustion engines
- Smart vehicles / roads
- Growing (transforming) medical infrastructure – medical destination
- Town centers – mixed use buildings
- High end skill in demand
- Bio-tech
- Big data
- Robotics and animation
- AI
- Data analytics
- Maker
- Internet of Things
- Cyber Security
- Lack of college programs
- Lack of basic Math Skills
- Data Science – how data translates to information
- Automation
- AI
- Block Chain
- CTE needs
- Lights out Manufacturing
- Internet of Things
- Design Thinking

What research are you aware of that we should be paying attention to?

- Data and pattern analysis – across industries
- Data analytic = new buzz – go deeper than the buzz, b/c there is a lot of reality behind it
- Self education on evolution of trends

EDUCATION

What could a science center provide for school that is not being provided through other means?

- Accessibility of science center is critical, especially afterschool - Older kids could help younger kids with homework (esp. in POK)
- Complement curriculum, structure activities, labs and demonstrations to support classroom learning
- Special Ed needs vary – depends on how integrated students are into classrooms (continuum)
- Normalizing content with respect to gender
- Caution about tailoring program to NYS curriculum – it's ALWAYS changing, so it would be a moving target
- What's relevant in terms of technology is also a moving target
- Center could offer a forum / summit for teachers to come together ** museum as convener
- Address "summer slide" and afterschool void in learning
- Help students think beyond just getting the right answer and highlight the process of science/STEM
- Reconnect parents with science – help them feel more confident so they can better support kids, help with homework, be more encouraging etc
- Stay on top of trends. Robotics – is it on the way out? Video production skills on way in?
- Provide support for CTE – trade and vocational exposure and training… welding, plumbing, electrical – could help kids get employment skills needed for local manufacturing jobs
- Kids need to have the ability and opportunity to conduct research and validate the results (practice what is being required in NYS science curriculum) – need citizen science opportunities
- Less physical space and less time to experiment in schools (could science center fill the gap?)
- Connecting education with relevant career opportunities in the area

What trends are we seeing in formal STEM education?

- Experiential project-based learning is big
- Technology education is tapping into gaming and digital media production

- New science standards now focus on “phenomenon” and “modeling”
- Biochemistry and molecular biology in high school
- Computer modeling
- Increased inquiry-based approach to STEM; focusing students on learning to ask questions (this tends to be conference themes for educators)
- Decline in science education prep, especially among elementary teachers; elementary teachers have extremely limited time to teach science. They start to specialize in 4th/5th grades. Result is lack of confidence teaching science.
- Coding is increasing
- Kids have misconceptions around STEM – weak skills carry through from elementary through middle to high school
- Opportunities and encouragement for girls in STEM are decreasing
- Interest in engineering increasing
- In general, traditional communication skills (writing, speaking) declining, despite everyone being constantly connected through devices/social media