



Linked in Friendship, Connected in Service
Eastern Area

The Eastern Area STEM Toolkit

July 6, 2020

Online Resources for STEMulating
Programs



STEM

Shuana Tucker-Sims, Ph.D., Eastern Area Director
Rhonda Starks Crowder, Eastern Area Program Chair
Crystal Davis, Eastern Area Services to Youth Facet Chair
Stacey G. Mangham, Eastern Area STEM Initiative Committee Chair
Cheri Amado, Eastern Area STEM Initiative Committee Co-Chair

Contents

1.0 Purpose.....	5
2.0 Roadmap	6
3.0 Assessment Guide.....	8
4.0 Eastern Area STEM Products	11
4.1 Eastern Area Collaboration with Black Girls Code	11
4.2 Eastern Area Video Vignettes	12
4.3 Eastern Area Corporate Sponsorship Package	13
4.4 Eastern Area STEM Mentoring Framework.....	14
4.5 Putting the “A” in STEAM: A Collaboration with the Arts Facet	15
4.6 STEM Support to Liberia: A Collaboration with the International Trends and Services Facet	16
5.0 STEM Tools	16
5.1 Novice	17
5.1.1 Novice All Grades	17
5.1.2 Novice Grades K-8	17
5.1.3 Novice Grades 9-12.....	18
5.1.4 Novice College Students	19
5.2 Beginner.....	19
5.2.1 Beginner – All grades	19
5.2.2 Beginner Grades K-8	20
5.2.3 Beginner Grades 9-12	21
5.2.4 Beginner College Students	21
5.3 Foundational.....	22
5.3.1 Foundational – All Grade Levels.....	22
5.3.2 Foundational Grades K-2	24
5.3.3 Foundational Grades 3-8.....	25

5.3.4 Foundational Grades 9-12.....	26
5.3.5 Foundational College Students	27
5.4 Advanced	27
5.4.1 Advanced All Grades.....	27
5.4.2 Advanced Grades K-5.....	30
5.4.3 Advanced Grades 6-8.....	30
5.4.4 Advanced Grades 9-12	30
5.5 Expert	31
5.5.1 Expert All Grades	31
5.5.2 Expert Grades K-5	31
5.5.3 Expert Grades 6-8	31
5.5.4 Expert Grades 9-12	32
6.0 Eastern Area STEM Initiative Committee Members.....	1
Appendix A.....	1
A.1 Is your Program Ready?	1
A.2 Initiating your STEM Program: Making a Plan	4
A.2.1 Form your STEM Team	4
A.2.2 Develop Two to Four STEM Program Goals.....	4
A.2.3 Budget for STEM	5
A.2.4 Identify space, order materials.....	5
A.2.5 Create a Program Plan.....	5
A.3 Getting Your STEM Program Ready	6
A.3.1 Safety and Structure:.....	6
A.3.2 Materials, Space and Storage:	6
A.3.3 Volunteers and Partner Resources:	6
A.3.4 STEM Team and Partnerships:	7
A.3.5 Activities and Lesson Plans:.....	7

A.3.6 Program Assessment and Improvement Resources:	8
--	----------

1.0 Purpose

“Collaborate, Communicate and Celebrate” are the foundational tenants of the Eastern Area STEM toolkit

The Eastern Area STEM Toolkit is a manual to help Eastern Area chapters and STEM leaders to create, operate and sustain STEMulating programs for youth we serve. The STEM toolkit is a framework containing best practices for Eastern Area STEM volunteers and mentors. It is also a guide designed to establish a foundation for strong volunteer and mentor relationships with STEM professionals. The STEM Toolkit contains a roadmap designed to help chapters determine their STEM programming maturity level and an assessment guide to characterize current programming levels and identify tasks required to enhance programming. Created with the Eastern Area tenants of “Collaborate, Communicate and Celebrate” in mind, the contents of the EA STEM Toolkit enables our members to excel in raising awareness of STEM, STEM careers and STEM role models in order to help create a pipeline filled with tomorrow’s STEM professionals.

“Believe in your heart that you're meant to live a life full of passion, purpose, magic and miracles.”

Roy T. Bennett

Special thanks and acknowledgements go to the members of the Eastern Area STEM Initiative Committee members for their many hours of research efforts expended to bring this resource, tool, and template listing to fruition. The Eastern Area STEM Initiative Committee is composed of the following members:

1. Link Stacey G. Mangham, Chair
2. Link Cheri Amado, Co-Chair
3. Link Chenita Daughtry
4. Link Colena Johnson-Kemp
5. Link Monica Freeman Lewis
6. Link Tashanna Myers
7. Link Pamela Walker

2.0 Roadmap

The journey starts with flexible planning, using a holistic approach to mature, evolve and achieve sustainable STEM programs

The **Eastern Area STEM Roadmap** is a flexible planning technique to support strategic and long-range planning, by matching short-term and long-term goals with specific STEM programming solutions. It is also expected that road mapping techniques may help chapters to survive in dynamic environments and help them to plan in a more holistic way to include non-financial goals and drive towards a more sustainable program. A STEM Roadmap also provides a framework to help plan and coordinate the maturation and evolution of chapter STEM programming over time.

Chapters or individuals hear the acronym STEM and are often at a loss of where to start in the process of implementing STEM programs. One may struggle to determine if she or her chapter has the woman power, expertise, capabilities, and resources needed to prepare for such a great work. With this struggle in mind, the Eastern Area STEM Initiative created a simple roadmap designed to help chapters determine where they are on their STEM journey.

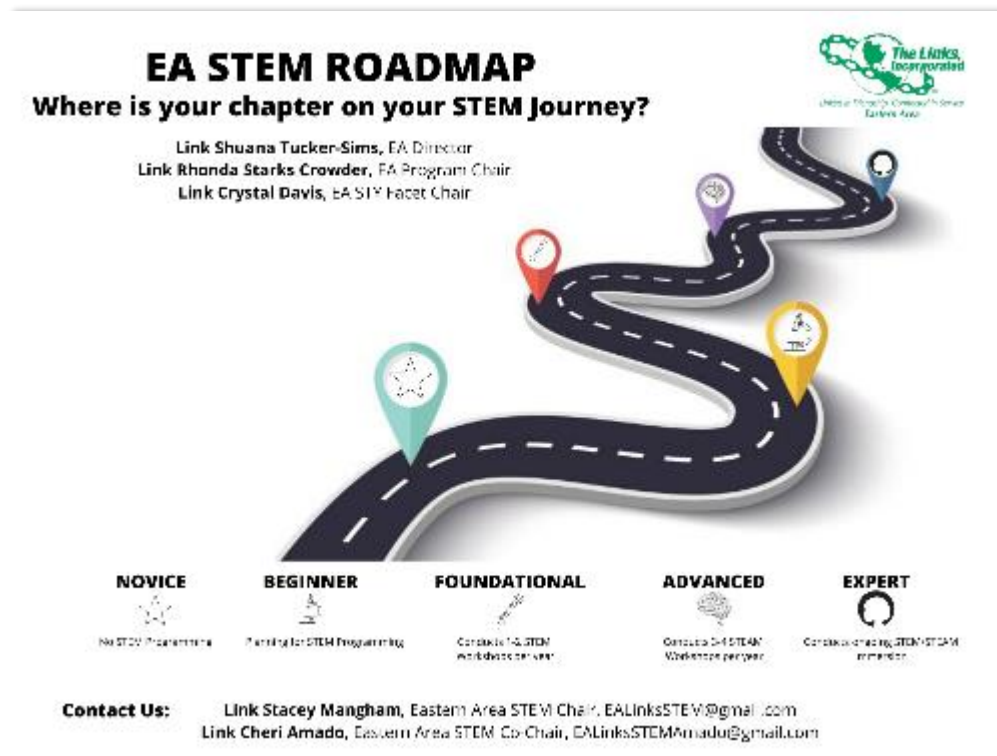


Figure 1 The Eastern Area STEM Roadmap

The following key describes observable characteristics of chapters at each maturity level identified on the STEM Roadmap:

- **Novice**
 - No STEM Programming
 - No access to STEM Expertise
- **Beginner**
 - Planning for STEM Programming
 - Completed STEM Readiness Assessment
- **Foundational**
 - Conducts 1-2 STEM Workshops per year
 - Participates in EA STEM Immersion
- **Advanced**
 - Conducts 3-4 STEAM Workshops per year
 - Planning for ongoing STEM/STEAM Immersion
- **Expert**
 - Conducts ongoing STEM/STEAM Immersion
 - Has established STEM/STEAM partnerships and sponsorships



Figure 2 Eastern Area STEM Maturity Levels

For guidance on how to use the Eastern Area STEM Roadmap, contact Link Stacey G. Mangham by sending an email to EALinksSTEM@gmail.com.

3.0 Assessment Guide

The STEM journey starts with flexible planning, using a holistic approach to evaluate the strengths and opportunities within your chapter. The final goal is to achieve measurable, sustainable, and transformative STEM programs

The **Eastern Area STEM Assessment Guide** is designed to provide a mechanism to assess your existing STEM learning opportunities and assets, determine where your chapter is on the STEM Roadmap, identify next steps to move along the pathway and develop your STEM program plan. By completing the Eastern Area STEM Assessment, you and your chapter members are furthering your commitment to helping young people engage in STEM learning. An overview of how the Eastern Area STEM Assessment Guide works is shown below.

How Does the Eastern Area STEM Assessment Guide Work?

- The STEM Assessment Guide is a checklist containing 23 questions in 5 areas:
 - Safety and Structures
 - Materials, Space and Storage
 - Staffing and Supervision
 - Activities and Lesson Plans
 - Program Assessment and Improvement
- A chapter's maturity level is determined by number of answers resulting in:
 - Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
- The Assessment Score determines which proposed Eastern Area Tools and recommended resources to use

Framework adapted from Assessment and Planning Tool for STEM, California Afterschool Network,

<https://www.afterschoolnetwork.org/post/assessment-and-planning-tool-stem-expanded-learning-programs>

Figure 3 How the Eastern Area STEM Assessment Guide Works

The results of a completed assessment, determines a chapter's maturity level and places them in one of the five areas described below:

◆ Novice

We are not sure that we are ready: We are not implementing any STEM activities other than what comes up in dialogue. We do not have a STEM program yet. We have not identified prospective instructors or workshop activity content. Many of our members are not familiar with the term STEM.

◆ **Beginner**

We are ready to initiate regular STEM programming. We are a pretty stable program which can be slightly altered to add STEM activities. We may already have some STEM programming, but it happens rarely, maybe as a special event or provided by an outside facilitator.

◆ **Foundational**

We are already doing regular STEM programming, but we may need to improve the quality. We hold a consistent set of STEM workshop activities each year. We make good use of local resources (such as museums, parks, etc.) to convey STEM topics. We have a local cache of available instructors to assist in conducting STEM workshops. The impact of our workshop activities is measurable.

◆ **Advanced**

We are STEM /STEAM superstars! We have high-quality, regular STEM programming and we are looking for suggestions to expand and help other programs. Our program integrates the Arts with STEM (for STEAM programming) and is transformative. We seek to obtain a consistent set of STEM/STEAM program partners.

◆ **Expert**

We are STEM/STEAM experts! Our programs fill the STEM/STEAM pipeline. Our students are exposed to ongoing transformative STEM/STEAM immersion activities. We have established partners. We receive external funding to implement our STEM/STEAM programs. We pay it forward by helping other programs to become transformative.

It is important to note that the Eastern Area STEM Assessment Guide is a customized tool based upon established STEM assessment frameworks. It contains:

- Pre-defined checklist questions that help chapters gauge roadmap position of current STEM programming
- Guidance that enables chapters to improve chapter STEM programming
- A cohesive plan designed to strengthen current chapter STEM programming

Chapters can establish a yearly rhythm of using the assessment prior to each program year to reinforce and improve ongoing STEM programming. Chapters implementing STEM programming who meet the milestone criteria for the Beginner level and beyond will be recognized at the Eastern Area level. To obtain the actual Eastern Area STEM Assessment Guide checklist, see Appendix A (to be added in the March 2021 update).

Based upon the Deming Management Model, Chapters are encouraged to build in a yearly rhythm of assessing their chapter's progress along the STEM journey to ensure a continuous improvement pattern as shown below.

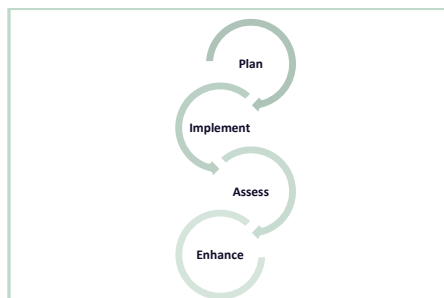


Figure 4 Eastern Area STEM Assessment Tasks

A suggested yearly rhythm for a chapter's continuous improvement in STEM programming could reflect the milestones shown below:

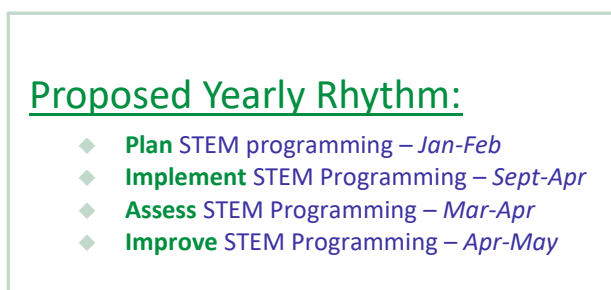


Figure 5 Cycle of Continuous Improvement in STEM Programming

Eastern Area Chapters are requested to assess their chapter's STEM Programming yearly. Chapters will receive a personal communication from the Eastern Area STEM Initiative Committee regarding guidance on how to conduct a STEM Assessment. The STEM Assessment can be found in Appendix A of this document. For more information on how to conduct a STEM Assessment for your chapter, contact Link Stacey G. Mangham by sending an email to EALinksSTEM@gmail.com.

4.0 Eastern Area STEM Products

4.1 Eastern Area Collaboration with Black Girls Code

What is Black Girls Code?

The Eastern Area STEM Initiative Committee has established a partnership with Black Girls Code to help fill the pipeline with girls of color.

- **Vision:** To increase the number of women of color in the digital space by empowering girls of color ages 7 to 17 to become innovators in STEM fields, leaders in their communities, and builders of their own futures through exposure to computer science and technology. To provide African American youth with the skills to occupy some of the 1.4 million computing job openings expected to be available in the U.S. by 2020, and to train 1 million girls by 2040.
- Black Girls CODE is devoted to showing the world that black girls can code and do so much more. By reaching out to the community through workshops, after school programs, and summer camp opportunities, Black Girls CODE introduces computer coding lessons to young girls from underrepresented communities in programming languages such as Scratch or Ruby on Rails
- To learn more about Black Girls Code, go to:
<http://www.blackgirlscode.com/>.

For this collaboration, the Eastern Area Initiative STEM Committee will engage in a phased approach. The phases include the following:

- Initiation: Draft and sign a Memorandum of Understanding (MOU)
- Phase 1: Provide volunteer services by establishing three city teams in Boston (MA), New York City (NY) and Washington (DC). *NOTE: During the COVID-19 restrictions, BGC activities will be conducted virtually. There will be no face-to-face activities.*
- Phase 2: Integrate BGC programming into EA programs by enrolling EA Youth Program participants in BGC events

-
- Phase 3: Bring STEM partners to the table and further expose the need through STEM Immersion events
 - Phase 4: Sponsor youth we mentor to attend BGC Summer Camps
 - Phase 5: Further leverage BGC programs for implementation across the Eastern Area that may include hackathons and the establishment of new BGC Chapters.

The Eastern Area STEM Initiative Committee looks forward to participation of all Eastern Area chapters in one or more phases of our collaboration with Black Girls Code. Chapters will receive regular updates from the Eastern Area STEM Initiative Committee regarding the ongoing collaboration with BGC including virtual STEM workshops. The updates will contain instructions on how chapters can register students they mentor in the virtual STEM workshops provided by BGC. Members shall earn service hour credit for participation.

Eastern Area Chapter members are requested to volunteer to be a part of one of three city teams in Boston (MA), New York City (NY) and Washington (DC) to support BGC workshops in those three cities. Instructions on how members can volunteer are contained in Section 5.2.2 of this document. For more information on this program, contact Link Stacey G. Mangham by sending an email to EALinksSTEM@gmail.com.

4.2 Eastern Area Video Vignettes

Video Vignettes, identified as short impressionistic scenes, delivered in video format that focuses on moment or person and gives a trenchant impression about that person, an idea, setting, and/or object.

Why Video Vignettes?

- A recent study conducted by Microsoft showed that having female STEM role models stimulated interest for young girls to pursue STEM careers by 12% more than girls who do not have role models
- Similarly, the presence of role models can influence a youth's decision to attend an HBCU and can substantiate the importance of mentors in achieving career success

Therefore, the Eastern Area (EA) Services to Youth (STY) Facet desires to:

- Establish an initial foundation for the video vignette series
- Provide a framework for chapters to identify role models that supplement current or new EA Links-related mentoring programs with a vignette series
- Highlight role models who are leaders in STEM, graduates of HBCUs, HBCU students, mentoring leaders or beneficiaries of mentoring, including:
 - Link Members
 - Connecting Links and Heir-O-Links
 - Family Members and Friends
 - Program Partners
 - Youth thriving in STEM
 - Successful HBCU Graduates

The Eastern Area STEM Initiative Committee looks forward to the participation of all Eastern Area chapters. Chapters will receive a personal communication from the Eastern Area STEM Initiative Committee regarding the request for your chapter's participation in the Video Vignettes initiative.

Eastern Area Chapters are requested to submit Video Vignettes that inspire youth to pursue careers in STEM to the designated STEM Drive for Videos. Instructions are contained in Section 5.2.1 of this document. For more information on this program, contact Link Pamela A. Walker by sending an email to PAWalker1@charter.net.

4.3 Eastern Area Corporate Sponsorship Package

The Eastern Area STEM Initiative Committee is creating Corporate Sponsorship Package. The Corporate Sponsorship Package will be used to seek funding from donors to support Eastern Area STEM programming. Additionally, the Donor Solicitation Package will be available to assist chapters in securing secure funding for their chapter STEM Programs.

Eastern Area STEM Awards will be granted at the Area level. Chapters may apply for funding. Additionally, other potential STEM related funding sources including foundations will be considered.

At a minimum, chapters may seek Eastern Area funding for the following:

- Funding of innovative chapter STEM programs
- Funding to support participation in Black Girls Code (BGC) activities including BGC Coding Summer Camps
- Funding to support participation in STEM Competitions
- Financial support for youth participating in professional conferences such as the National Society of Black Engineer's annual conference

Eastern Area Chapters will receive a personal communication from the Eastern Area STEM Initiative Committee regarding the posting of the Corporate Sponsorship Package template that can be used to submit requests to potential donors of all levels, including both corporate and individual sponsors. A notification will also be provided once Eastern Area funding has been secured. In turn, chapters can apply for STEM funding at the Eastern Area level. Eastern Area Chapters are encouraged to seek grants to obtain funding to support ongoing STEM programming. Instructions are contained in Section 5.4.1 of this document. For more information on this program, contact Link Cheri Amado by sending an email to EALinksSTEMAmado@gmail.com.

4.4 Eastern Area STEM Mentoring Framework

The Eastern Area STEM Initiative has established a new STEM Mentoring Framework that focus on college students. Through this program, Eastern Area Links members will mentor college students matriculating in STEM fields by focusing on the following areas:

- **What Success Looks Like:**
 - Increased retention and graduation rates
 - Workforce Placement
- **Common Attributes:**
 - Research Opportunities
 - Strong Ecosystem
 - "Ethic of Care"

The program will be implemented in two cycles. Cycle One will allow Eastern Area chapter members to mentor in one of the following areas through a signup provided by the Eastern Area STEM Initiative Committee:

- Career Development
- Continuing Education
- Contributing to NSBE publications
- Leadership
- Networking
- NSBE Engagement
- Work/Life Balance

Cycle Two will implement a STEM Entrepreneurship Program and focus on the following aspects:

- Solving a problem on campus
- Engaging in Research
- Delivering a presentation to communicate solution to a panel of judges
- Judging and Awarding Scholarships

The Eastern Area STEM Initiative Committee looks forward to participation of at least one chapter in each cluster to participate in Cycles One and Two of the Eastern Area STEM Mentoring Framework. Chapters will receive a personal communication from the Eastern Area STEM Initiative Committee regarding this request.

Eastern Area Chapters are requested to volunteer to participate in the Eastern Area STEM Mentoring Framework. Instructions are contained in Sections 5.2.4 and 5.3.5 of this document. For more information on this program, contact Link Monica Freeman Lewis by sending an email to Monicalewis81@gmail.com.

4.5 Putting the “A” in STEAM: A Collaboration with the Arts Facet

To be provided by March 2021 for the Version 2 update. For more information on this program, please contact Link Stacey G. Mangham by sending an email to EALinksSTEM@gmail.com.

4.6 STEM Support to Liberia: A Collaboration with the International Trends and Services Facet

To be provided by March 2021 for the Version 2 update. For more information on this program, contact Link Pamela A. Walker by sending an email to PAWalker1@charter.net.

5.0 STEM Tools

Customized, integrative, and focused tools enable chapters to tailor STEM programs specific to their individual program needs.

The **Eastern Area STEM Toolkit** is a collection of online tools, resources and templates that enable chapter programming for Science, Technology, Engineering and Mathematics (STEM). The online tools, resources and templates are age-appropriate and address chapter position along the Eastern Area STEM Roadmap. Tools, resources, and templates referenced herein can be tailored for either in-person or virtual STEM activities. The benefits of the Eastern Area STEM Toolkit are:



- The toolkit integrates use of Eastern Area and National Signature Program STEMREADY products
- Chapters can select tools, resources, or templates and select what is needed
- Chapters can add specialized tools, resources, or templates to the toolkit to address unique needs by emailing Eastern Area STEM Toolkit updates to Colena.johnson@icloud.com and EALinksSTEM@gmail.com
- Use of toolkit contents can simplify or reduce the chapter's effort required to establish or enhance STEM programming

5.1 Novice

5.1.1 Novice All Grades

1. Understand the definition of STEM:
 - a. What is STEM? <https://www.topuniversities.com/courses/engineering/what-stem>.
 - b. What is STEM Education? <https://www.livescience.com/43296-what-is-stem-education.html>.
 - c. Why is STEM Education Important? <https://www.engineeringforkids.com/about/news/2016/february/why-is-stem-education-so-important-/>.
 - d. What is STEM Mentoring? <https://nationalmentoringresourcecenter.org/index.php/nmrc-blog/202-stem-mentoring-helping-youth-build-stem-literacy-through-supportive-relationships.html>.

5.1.2 Novice Grades K-8

1. Learn how to engage students on the topic of STEM:
 - a. Engaging Children in STEM education: <https://naturalstart.org/feature-stories/engaging-children-stem-education-early>.
 - b. Talking to kids about STEM: <https://www.fuentek.com/blog-post/talk-to-kids-about-stem/>.
2. Learn about STEM Programs: Everything you need to know about STEM- STEM curriculum Elementary K-5 and Middle school 6-8: <https://kidsparkeducation.org/>.
3. Learn about STEM Careers: <https://educationcloset.com/2018/09/01/steam-careers-for-the-21st-century/>.
4. Become familiar with STEM Resources and Learning Materials such as:
 - a. Books that support STEM: <https://www.naeyc.org/resources/topics/stem>.
 - b. Growing in STEM: STEM Resources and Materials for Engaging Learning Experiences: <https://www.naeyc.org/resources/pubs/yc/mar2017/stem-materials-experiences>.
 - c. Making every lesson a STEM lesson: <https://hechingerreport.org/making-every-lesson-a-stem-lesson/>.
 - d. STEMIE- STEM innovation for Inclusion in Early Education: <https://sites.ed.gov/osers/2019/05/early-education-inclusion-in-stem-can-lay-groundwork-for-future/>.
 - e. Best picks for Early Childhood STEM learning: <https://www.common sense.org/education/top-picks/best-picks-for-early-childhood-stem-learning>.
 - f. Let's Talk, Read and Sing about STEM: <https://www2.ed.gov/about/initiatives/earlylearning/talk-read-sing/stem-toolkit-preschool-teachers.pdf>.
 - g. A Leak in the STEM pipeline: Taking Algebra Early: <https://www2.ed.gov/datastory/stem/algebra/index.html>.
 - h. A List of Black Inventors: <https://interestingengineering.com/the-a-z-list-of-black-inventors>.

-
- i. STEM Educational Games: <https://store.steampowered.com/curator/6860890-Educational-Games/>.

5.1.3 Novice Grades 9-12

1. Learn how to engage students about STEM topics:
 - a. You're the inspiration: Talking to kids about STEM: <https://www.fuentek.com/blog-post/talk-to-kids-about-stem/>.
 - b. Educational Opportunities: <https://tryengineeringinstitute.ieee.org/engineering-camp/engineering-school-ny/>.
 - c. The Hidden Factor that is keeping people out of STEM jobs: <https://www.fastcompany.com/90464764/the-hidden-factor-thats-keeping-people-out-of-stem-jobs>.
2. Research STEM Role Models:
 - a. 100 Inspiring Black Scientists in America: <http://crosstalk.cell.com/blog/100-inspiring-black-scientists-in-america>.
 - b. Famous Black Scientists: <https://www.biography.com/people/groups/black-scientists>.
 - c. A List of Black Inventors: <https://interestingengineering.com/the-a-z-list-of-black-inventors>.
3. Read about STEM Careers:
 - a. Explore top 10 STEM careers: <https://money.usnews.com/careers/slideshows/explore-top-stem-careers>.
 - b. Explore the top careers in STEM: <https://www.learnhowtobecome.org/career-resource-center/careers-in-stem/>.
 - c. Is Medicine included when people talk about STEM careers? <https://www.quora.com/Is-medicine-included-when-people-talk-about-STEM-careers>.
 - d. Popular STEM Careers: <https://careerschoolnow.org/careers/popular-stem-careers>.
 - e. Top 10 Careers combining Science and Math: <https://everfi.com/insights/blog/steam-jobs-list-10-careers-that-combine-art-and-math/>.
4. Review resources for selecting a college and major in the STEM field:
 - a. Full Ranking: Best Colleges For Women And Minorities In STEM: <https://www.forbes.com/2010/12/10/best-colleg.es-minorities-women-science-lifestyle-education-stem-table.html#3382ab495351>.
 - b. How to Choose a STEM Major From All Your Different Options: <https://www.collegexpress.com/interests/science-and-engineering/articles/studying-sciences/how-choose-stem-major-all-your-different-options/>.
 - c. A Guide to STEM Majors: <https://www.usnews.com/education/best-colleges/articles/2019-01-24/a-guide-to-stem-majors>.
 - d. STEM Majors: How to Choose the Right Degree: <https://www.thoughtco.com/stem-majors-degrees-careers-4174455>.
 - e. 30 Best Schools for STEM Majors: <https://www.bachelorsdegreecenter.org/best-schools-stem-majors/>.
 - f. Best HBCUs for STEM Majors, The Top 10 HBCUs With The Best STEM Programs: <https://ripplematch.com/journal/article/the-top-hbcus-with-the-best-stem-programs-55af76cc/>.
 - g. Top STEM HBCUs: <http://www.thehundred-seven.org/stem.html>.
 - h. Top 10 STEM HBCUs: <https://www.edi.nih.gov/blog/communities/top-10-stem-historically-black-colleges-and-universities>.

5.1.4 Novice College Students

1. Understand challenges faced by STEM Majors by reviewing the following articles:
 - a. Cultivating Diversity and Competency in STEM: Challenges and Remedies for Removing Virtual Barriers to Constructing Diverse Higher Education Communities of Success: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3592737/>.
 - b. Report cards on women in STEM fields finds much room for improvement: <https://www.sciencedaily.com/releases/2019/09/190905111636.htm>.
 - c. U.S. higher education. Minority retention rates in science are sore spot for most universities: <https://www.ncbi.nlm.nih.gov/pubmed/19520937/>.
 - d. Enhancing the Number of African Americans Who Pursue STEM PhDs: Meyerhoff Scholarship Program Outcomes, Processes, and Individual Predictors: <https://www.ncbi.nlm.nih.gov/pubmed/21841904/>.
 - e. Minorities are making waves in STEM, but still face significant challenges in entering the field, experts say: <https://www.educationdive.com/news/minorities-are-making-waves-in-stem-but-still-face-significant-challenges/445875/>.
2. Determine how to establish relationships with STEM Professionals by reviewing the following:
 - a. NSBE's College Initiative Toolkit: [https://www.nsbe.org/Professionals/Regions/Region1/Programs/Collegiate-Initiative-Toolkit-\(2\).aspx](https://www.nsbe.org/Professionals/Regions/Region1/Programs/Collegiate-Initiative-Toolkit-(2).aspx).
 - b. Women in STEM Education (WISE) Institute Handbook: http://www.lonestar.edu/departments/mediarelations/WISE_Institute_Mentor_Handbook.pdf.
 - c. STEM Student's Guide to Finding a Mentor: <https://blog.getintocollege.com/the-stem-students-guide-to-finding-a-mentor/>.
 - d. The Science of Effective Mentorship in STEM Online Guide V1.0: <https://www.nap.edu/resource/25568/interactive/program-development-and-management.html>.
 - e. How Many Engineers Does It Take to Inspire a Teenager? <https://www.edsurge.com/news/2015-05-19-five-ways-to-mentor-students-in-stem>.
 - f. Request No-cost Help for your Youth Mentoring Program: <https://nationalmentoringresourcecenter.org/index.php/training-ta/technical-assistance.html>.
 - g. Review an article on Graduate School Mentoring: <https://www.nsbe.org/Programs/Graduate-School/Explore/Graduate-student-life/Mentoring.aspx#.XmkeUsiWwoA>.
 - h. Read How to Get the Mentoring You Want: A Guide for Graduate Students, Rackham Graduate School, University of Michigan: <https://rackham.umich.edu/wp-content/uploads/2018/11/mentoring.pdf>.

5.2 Beginner

5.2.1 Beginner – All grades

1. Identify a STEM curriculum (all grades)
 - a. STEM Curriculum, activities and materials for K-12: <https://www.teachengineering.org/>.

- b. STEAM Resources and activities for Parent and kids (Some activities coming soon). Club OASIS - A free online STEM Club where families, educators and administrators can learn, share and connect around STE(A)M: www.social.oasismatters.com.
2. Start a math tutorial program (all grades)
 - a. Obtain free online Math Tutor/Support grades K-12: www.khanacademy.org.
 - b. Obtain a tutor for homework help, studying and test prep in any math subject: <https://www.tutor.com/subjects/math>.
 - c. Leverage free interactive lessons from award-winning Harvard instructors: <https://schoolyourself.org/>.
 - d. Develop a tutorial program: <https://www.readingrockets.org/article/developing-tutoring-program>.
3. Utilize Eastern Area STEM Video Vignettes to Supplement your STEM Program (all grades)
 - a. Submit Video Vignettes to inspire youth to pursue careers in STEM to the designated STEM Drive for Videos. To obtain access to the drive, send an email entitled “Eastern Area Video Vignette(s)-Name or Chapter Name”, where “Name or Chapter Name” is your individual name or your Eastern Area chapter to: EALinksSTYVideoVignettes@gmail.com. Videos are accepted from Links members, Connecting Links, Heir-o-Links, Program Partners. Videos are accepted on an ongoing basis but due twice yearly by May 30th and September 30th to be eligible for selection for posting to the Eastern Area Portal.
 - b. To gain access the Eastern Area’s Video Vignette on the Eastern Area Portal, send an email to EALinksSTYVideoVignettes@gmail.com. The Eastern Area STY Video Vignettes Subcommittee will provide you with instructions.

5.2.2 Beginner Grades K-8

1. Volunteer at Black Girls Code (BGC) Workshops by joining one of three Eastern Area BGC City Teams in Boston (MA), New York City (NY) or Washington (DC). Sign up at: <https://www.signupgenius.com/go/9040544a5a72fa46-eastem>. Sign-up by November 30th and August 31st each year. NOTE: Due to COVID-19 restrictions, BGC workshops are currently being delivered virtually. The Eastern Area STEM Initiative Committee will notify chapters of any changes once COVID-19 restrictions are lifted.
2. Enroll your female students in a virtual BGC Workshop. See the list of available virtual BGC workshops and register at: <https://www.blackgirlscode.com/programevents.html>.
3. Implement Nutrition Education curriculum/activities for grades K – 8:
 - a. USDA Nutrition Education Materials: <https://www.fns.usda.gov/tn/nutrition-education-materials>.
 - b. FDA Nutrition Education Resources: <https://www.fda.gov/food/nutrition-education-resources-materials/nutrition-facts-label-read-label-youth-outreach-materials#kids>.
4. Establish a Food Diary Program for grades K-8
 - a. Food Diary for Kids (Overview): <https://www.verywellfamily.com/printable-food-diary-2633949>.
 - b. Food Diary Tracker: [https://static1.squarespace.com/static/5aafc13f620b8545513a422c/t/5ab534b703ce648650fe437e/1521824954766/Childrens Food Diary Jan 2014.pdf](https://static1.squarespace.com/static/5aafc13f620b8545513a422c/t/5ab534b703ce648650fe437e/1521824954766/Childrens+Food+Diary+Jan+2014.pdf).
5. Conduct Biology of Body Workshops for grades K-8

-
- a. How The Human Body Works – A Resource Guide For Curious Kids:
<http://www.onlyhealthy.com/how-the-human-body-works-a-resource-guide-for-curious-kids/>.

5.2.3 Beginner Grades 9-12

1. Establish a STEM Partnership with a Local YMCA. Research YMCA Volunteer opportunities/Community Partnerships: <https://volunteermatters.com/ymca/>.

5.2.4 Beginner College Students

1. Mentor a National Society of Black Engineers (NSBE) Students Matriculating in an Eastern Area Historically Black College or University (HBCU) Collaborate with your chapter's HBCU Committee OR mentor students of color matriculating in a STEM field at other universities. First, go to the Eastern Area STEM Mentoring Framework Signup site, located at: xxx to sign up for the HBCU or college at which you volunteer to mentor. You will receive a letter from the Eastern Area STEM Initiative committee providing further instructions. Follow the instructions to participate in the NSBE mentoring program. There are two enrollment cycles:
 - Cycle 1 enrollment and matching: September 1st through September 18th, yearly
 - Cycle 1 mentoring begins: October 1st, yearly
 - Cycle 2 enrollment and matching: January 2nd through January 15th, yearly
 - Cycle 2 mentoring begins: February 1st, yearly
 - Program conclusion (both cycles): April 1st, yearly.

If you have questions regarding the Eastern Area's STEM Mentoring Framework, reach out to Link Monica Lewis Freeman by sending an email to monicalewis81@gmail.com.

2. Learn how to Mentor College Students
 - a. Examining ways to Meaningfully Support Students in STEM:
<https://stemeducationjournal.springeropen.com/articles/10.1186/s40594-018-0150-3>.
 - b. How Colleges Can Help STEM Students Think More Broadly:
<https://www.chronicle.com/article/How-Colleges-Can-Help-STEM/243376>.
 - c. Mentoring Practices Proven to Broaden Participation in STEM Disciplines:
[Mentoring Practices Proven to Broaden Participation in STEM.pdf](#).
 - d. STEM Mentoring: The Elements of Effective Practice for Mentoring:
<https://files.eric.ed.gov/fulltext/ED594110.pdf>.
 - e. Mentoring Resources, Northeastern University, Center for STEM Education:
<https://stem.northeastern.edu/resources/faculty/mentoring/>.
3. STEM Statistics
 - a. STEM Education in the US: Where Are We and What We Can Do, 2017:
<https://www.act.org/content/dam/act/unsecured/documents/STEM/2017/STEM-Education-in-the-US-2017.pdf>.
 - b. The state of STEM education told through 12 stats: <https://www.idtech.com/blog/stem-education-statistics>.
 - c. STEM Occupations: Past, Present and Future, US Bureau of Labor Statistics:
<https://www.bls.gov/spotlight/2017/science-technology-engineering-and-mathematics->

[stem-occupations-past-present-and-future/pdf/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future.pdf](#).

- d. Employment in STEM Occupations, US Bureau of Labor Statistics:
<https://www.bls.gov/emp/tables/stem-employment.htm>.

5.3 Foundational

5.3.1 Foundational – All Grade Levels

1. Create a STEM Service Delivery Model (SDM) for your chapter's programming based upon the National STEMREADY SDM template:
[https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=g\)+Sample+SDM+for+LINKS-NSBE+Jr+Chapters+10-7-17.pdf&subfolder_nav_tracking=1](https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=g)+Sample+SDM+for+LINKS-NSBE+Jr+Chapters+10-7-17.pdf&subfolder_nav_tracking=1).
2. Celebrate one of seven (7) Math Holidays: <https://www.stemjobs.com/math-holidays/>
3. Establish partnerships with STEM-related professional organizations or volunteer professionals employed at one or more of United States government agencies or professional organizations to solicit their help in implementing your chapter's STEM programming:
 - a. American Institute of Chemical Engineers (AIChE): https://www.aiche.org/?gclid=Cj0KCQJwuJz3BRDTARIsAMg-HxXHf5yCp-BNDKIXVna7G_KDxybRBDaUlvbBNYPZvSVCgzCc3GhO7vcaAkydEALw_wcB
 - b. American Society of Civil Engineers (ASCE): <https://www.asce.org/>
 - c. American Society of Mechanical Engineers (ASME): <https://www.asme.org/>
 - d. Biology Professional Organizations: <https://www2.clarku.edu/research/sciencelibrary/organizations/index.cfm>
 - e. Black Data Processors Association (BDPA): <https://www.bdpa.org/default.aspx>
 - f. Engineers Without Borders (EWB): <https://www.ewb-usa.org/>
 - g. Federal Aviation Administration (FAA): <https://www.faa.gov/education/programs/>
 - h. Institute of Electrical and Electronics Engineers (IEEE): <https://www.ieee.org/>
 - i. Math Alliance Partners: <https://mathalliance.org/math-alliance-partners/professional-organizations/>
 - j. Medical Professional Organizations: <https://www.meditec.com/resourcestools/professional-associations-list/>
 - k. National Aeronautics and Space Administration (NASA): <https://www.nasa.gov/stem/contacts.html>
 - l. National Institute of Science and Technology (NIST): <https://www.nist.gov/>
 - m. National Oceanic and Atmospheric Administration (NOAA): <https://www.noaa.gov/>
 - n. National Science Foundation (NSF): <https://www.nsf.gov/>
 - o. National Society of Black Engineers (NSBE): <https://www.nsbe.org/>
 - p. National Society of Professional Engineers (NSPE): <https://www.nspe.org/>
 - q. Science Professional Associations and Organizations: <https://jobstars.com/science-professional-associations-organizations/>
 - r. Society of Women Engineers (SWE): <https://swe.org/>
 - s. Women Interested in Technology International (WITI): <https://witi.com/>
4. Recommend NASA at home for Kids and Families: <https://www.nasa.gov/nasa-at-home-for-kids-and-families>.

-
5. Utilize Science Education Partnership Award (SEPA) Teaching Resources to plan STEM workshops: <https://www.nigms.nih.gov/education/sepa-teaching-resources/>.
 6. Utilize NASA Resources for Educators to plan STEM workshops: <https://www.nasa.gov/stem/foreducators/k-12/index.html>.
 7. Utilize NASA Resources for Students to plan STEM workshops: <https://www.nasa.gov/stem>.
 8. Observe the following International or National STEM holidays each year:
 - a. Observe the International Day of Mathematics (National Pi Day) on March 14th each year: <https://www.idm314.org/>.
 - b. Observe National Engineer's Week in February each year: <http://www.discovere.org/our-programs/engineers-week>.
 - c. Observe National Science Week in March each year: <https://www.sciencetalk.org/science-week-2020.html>.
 - d. Observe National STEM/STEAM Day in November each year: <https://www.nasa.gov/feature/langley/ten-ways-to-celebrate-national-stem-day-with-nasa/> or <https://thelearningcounsel.com/article/5-ways-celebrate-national-stemsteam-day>.
 - e. Observe National Technology Day in January each year: <https://nationaldaycalendar.com/national-technology-day-january-6/>.
 - f. Observe National Earth Science Week in October each year: <http://www.earthsciweek.org/future-dates>.
 9. Provide students with a take-home STEM Kit for the summer: <https://www.whcc.com/rochester-new-york-news/fairport-school-handing-out-stem-kits-for-the-summer/5760514/>.
 10. Review the National STEMREADY Toolkit: https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=Links+STEAMREADY+Toolkit_2019.pdf&subfolder_nav_tracking=1.
 11. Review resources to determine how to start and maintain a NSBE Jr. Chapter:
 - a. NSBE Jr. Overview Handout: [https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=1\)+NSBEJR_Overview_Handout_Sept2018.pdf&subfolder_nav_tracking=1](https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=1)+NSBEJR_Overview_Handout_Sept2018.pdf&subfolder_nav_tracking=1).
 - b. NSBE Jr. How To Guide: https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=Links++-+How+to+Guide+for+Links-NSBE+Jr.+Chapter+Advisors+Final+10-5-19.pdf&subfolder_nav_tracking=1.
 - c. NSBE Jr. Chapter Management Tools Guide: [https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=j\)+NSBE_ChapterManagement_ToolsHandout_Sept2018.pdf&subfolder_nav_tracking=1](https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=j)+NSBE_ChapterManagement_ToolsHandout_Sept2018.pdf&subfolder_nav_tracking=1).

- d. Resources for Chartering and Maintaining your NSBE Jr Chapter: [https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=h\)+Resources+for+Chartering+%26+Maintaining+NSBE+Jr+Chapters.pdf&subfolder_nav_tracking=1](https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=h)+Resources+for+Chartering+%26+Maintaining+NSBE+Jr+Chapters.pdf&subfolder_nav_tracking=1).
- e. STEMREADY Stipend Requirement: https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=STEMREADY+Stipend+Requirements+for+2019-2020+w+att.pdf&subfolder_nav_tracking=1.
- f. NSBE PCI Rulebook: [https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=k\)+NSBE_PCI_RuleBook_2018-2019_Handout.pdf&subfolder_nav_tracking=1](https://www.dropbox.com/sh/y9sanrynmtf1v94/AAA1DqE5PATe_93IOe5UX1Mxa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/LINKS-STEMREADY?dl=0&preview=k)+NSBE_PCI_RuleBook_2018-2019_Handout.pdf&subfolder_nav_tracking=1).

5.3.2 Foundational Grades K-2

1. Sponsor Field trips to local natural science and Please Touch museums:
<https://www.pleasetouchmuseum.org/>
2. Sponsor hands-on STEM experiments or exercises as workshops:
 - a. NASA: <https://www.nasa.gov/stem-at-home-for-students-k-4.html>
3. Plan activities for students in Grades K-2 using the National STEMREADY K-2 Programming Guide.
4. Plan and conduct activities referenced in the National STEMREADY Virtual Programming Guide for Traditional STEM Programs.
5. Plan and conduct activities referenced in the National STEMREADY Virtual Programming Guide for WildSTEM.
6. Participate in NSBE Jr.'s First Lego League Jr.:
<https://mail.google.com/mail/u/0/#inbox?compose=GTvVlcSBnpzKnnLpdsjjRVnwbZxgWbRGfVJzbCxNTqsWcNTfWHhFkCZXTdLggtCKbTktFJdbTDRQf>.
7. Collaborate with your chapter's Services To Youth (STY) and National Trends and Services Facets to provide students you mentor a list of African American Heroes, including those in STEM. Purchase copies of the following book for students your chapter mentors: Black Heroes: A Black History Book for Kids: 51 Inspiring People from Ancient Africa to Modern-Day U.S.A:
https://www.amazon.com/dp/1641527048/ref=sspa_dk_detail_4?psc=1&spLa=ZW5jcmlwdGVkUXVhbGlmaWVyPUEyWEQ1RUlVRDJMQzIRJmVuY3J5cHRlZElkPUEwMDg1ODQ3MkQ2UDNCNFwMVg4WCZlbnNyeXB0ZWRBZEIkPUEwNzY3NTYyMzJZUINGSjQxODkzWCZ3aWRnZXROYWl1PwNwX2RldGFpbDImYWN0aW9uPWNSaWNrUmVkaXJlY3QmZG9Ob3RMb2dDbGljaz10cnVl.

5.3.3 Foundational Grades 3-8

1. Volunteer at Black Girls Code (BGC) workshops by serving on one of the three (3) Eastern Area City Teams of volunteers in Boston (MA), New York City (NY) or Washington (DC) by signing up here: <https://www.signupgenius.com/go/9040544a5a72fa46-eastem>
2. Enroll girls to attend a virtual Black Girls Code (BGC) workshop: <https://www.blackgirlscore.com/programsevents.html>.
3. Register girls to attend a virtual Black Girls Code (BGC) Summer camp: <https://www.blackgirlscore.com/programsevents.html>
4. Participate in NSBE Jr.'s First Lego League Jr. (K-5): <https://mail.google.com/mail/u/0/#inbox?compose=GTvVlcSBnpzKnvLpdsjjRVnwbZxgWbRGfVJzbCxNTqsWcNTfWHhFkCZXTdLggtCKbTktFJdbTDRQf>
5. Participate in NSBE Jr.'s First Lego League (6-8): <https://www.nsbe.org/NSBE-Jr/Programs/FLL.aspx#.Xv56kHdFw2w>.
6. Participate in NSBE Jr.'s MathCounts Competition: <https://www.nsbe.org/NSBE-Jr/Programs/MATHCOUNTS.aspx#.Xv560XdFw2w>
7. Collaborate with your chapter's STY and NTS Facets to purchase the book "What Can I Be? STEM Careers from A to Z" written by Links member, Tiffani Teachey, and share with students you mentor: <https://www.amazon.com/What-Can-Be-STEM-Careers/dp/0578616580>.
8. Sponsor Field trips to local natural science and discovery museums, such as:
 - a. Academy of Natural Sciences of Drexel University (PA): <https://ansp.org/>
 - b. American Museum of Natural History (NY): <https://www.amnh.org/>
 - c. Delaware Museum of Natural History (DE): <https://www.delmnh.org/>
 - d. Discovery Museum (CT): <http://www.discoverymuseum.org/>
 - e. Discovery Museum (MA): <https://www.discoveryacton.org/>
 - f. Discovery Museum (NJ): <https://www.discoverymuseum.com/>
 - g. Maryland Science Museum Directory (MD): <http://www.museumsusa.org/museums/?k=1271407%2CCategoryID%3A200066%3BState%3AMD%3BDirectoryID%3A200454>
 - h. National Museum of Natural History (DC): <https://www.si.edu/museums/natural-history-museum>
 - i. Virginia Science and History Museums (VA): <https://www.virginia.org/sciencehistorymuseums/>
 - j. Vermont Science and Nature Museums (VT): <https://www.visit-vermont.com/state/science-and-nature/>
 - k. Eight DC Museums You Have to Visit If You're a Science and Nature Nerd: <https://www.washingtonian.com/2016/12/27/travel-guide-dc-science-museums/>
9. Start a Food diary program: <https://thehomeschoolscientist.com/food-journal-printable-kids/>.
10. Provide Nutrition Education for Kids: <https://www.actionforhealthykids.org/activity/nutrition-education/> or <https://www.nutrition.gov/topics/nutrition-age/children/kids-corner>
11. Sponsor hands-on STEM experiments or exercises from NASA as workshops: NASA: <https://www.nasa.gov/stem-at-home-for-students-5-8.html>
12. Enroll young girls in a BCG Workshop: <https://www.blackgirlscore.com/programsevents.html>
13. Start a NSBE Jr. Chapter using the National STEMREADY Guide:
14. Enroll students in a NSBE Jr. Summer Engineering Experience for Kids (SEEK) Camp: <https://www.nsbe.org/seek.aspx>.
15. Plan and conduct activities referenced in the National STEMREADY Virtual Programming Guide for Traditional STEM Programs.

16. Plan and conduct activities referenced in the National STEMREADY Virtual Programming Guide for WildSTEM.
17. Read a book to students or purchase a book for students that inspires interest in Science: https://www.harpercollins.com/9780062946041/libby-loves-science/?utm_source=facebook&utm_medium=paidsocial&utm_term=sponsoredpost&utm_campaign=libbylovesscience.
18. Collaborate with your chapter's Services To Youth (STY) and National Trends and Services Facets to provide young girls you mentor a list of Women in STEM. Purchase copies of the following book for students your chapter mentors: https://www.amazon.com/Black-Women-Science-History-Book/dp/1641527072/ref=pd_sbs_14_4/147-5608667-3983918?encoding=UTF8&pd_rd_i=1641527072&pd_rd_r=edba9735-9872-48cf-a9aa-aed77b70c622&pd_rd_w=nh6dy&pd_rd_wg=WjTk0&pf_rd_p=d28ef93e-22cf-4527-b60a-90c984b5663d&pf_rd_r=VRS18W8J4RYMS5Q521F4&psc=1&refRID=VRS18W8J4RYMS5Q521F4

5.3.4 Foundational Grades 9-12

1. Participate in NSBE Jr.'s Try Math-A-Lon: <https://www.nsbe.org/NSBE-Jr/Programs/TMAL.aspx#.Xv58tXdfw2w>.
2. Participate in NSBE Jr.'s Explorer Technical Innovation Competition (TIC): <https://www.nsbe.org/NSBE-Jr/Programs/NSBE-Jr-Explorer.aspx#.Xv59FHdfw2w>.
3. Provide mentors for a math and/or science program: <https://www.nationalacademies.org/our-work/the-science-of-effective-mentoring-in-stemm>.
4. Use Food training tools to provide nutrition education to students: <https://www.fns.usda.gov/tn/training-tools-cacfp>.
5. View a webinar that provides interactive approaches used by the Maryland State Department of Education and the Texas Department of Agriculture to actively engage participants during in-person trainings (Train-the-Trainer): <https://www.fns.usda.gov/tn/webinar-interactive-person-training>; from Cincinnati <https://closingthehealthgap.org/what-we-do/wellness-series/nutrition-train-the-trainer/>.
6. Use resources to help teens take charge of their health: https://www.dropbox.com/sh/y9sanrynmtf1v94/AAAsc3fXvpM8PZY1DmROJuLHa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/STEM%20Resources/STEM%20to%20STEAM%20and%20HHS%20Healthy%20Eating?dl=0&preview=C3-Take+Charge+of+Your+Health+for+Teenagers.pdf&subfolder_nav_tracking=1
7. Sponsor hands-on STEM experiments or exercises as workshops while social distancing: <https://phys.org/news/2020-05-experimental-science-inatime-ofsocial-distancing.html>.
8. Make students aware of great small colleges for STEM Degrees: <https://www.bestdegreeprograms.org/top-schools/great-small-colleges-for-stem-degrees/>.
9. Virtual robotics STEM camp: <https://www.valleycentral.com/news/virtual-robotics-stem-camp-for-elementary-students/>.
10. Enroll students in a STEM summer camp: <https://www.houmatoday.com/news/20200603/fletcher-partners-with-nasa-chevron-and-shell-to-launch-virtual-stem-camps>.
11. Plan and conduct activities referenced in the National STEMREADY Virtual Programming Guide for Traditional STEM Programs: To be provided in the March 2021 update.
12. Plan and conduct activities referenced in the National STEMREADY Virtual Programming Guide for National WildSTEM: To be provided in the March 2021 update.

-
13. Provide a workshop that highlights Link Framework development for 9-12
<https://k12cs.org/framework-statements-by-grade-band/#jump-9-12>
 14. Provide a workshop highlighting Six Science Content Standards for 9-12 grade-level clusters
PDF <https://www.nap.edu/read/4962/chapter/8>.

5.3.5 Foundational College Students

1. Partner with your chapter's HBCU Committee to provide mentors for students enrolled in a science, technology, engineering or mathematics program at a Historically Black College or University (HBCU). See Item 1 in Section 5.2.4 Beginner College Students for instructions.
2. Start a STEM Entrepreneurship program on a local college campus under the Eastern Area's Mentoring Framework initiative. To obtain information on how to start a STEM Entrepreneurship program, send an email to monicalewis81@gmail.com.
3. Understand the importance of STEM mentors for college students:
<https://www.liberalartscolleges.com/how-important-are-mentors-to-college-students/>.
4. Start a Peer Mentoring program: <https://canadacollege.edu/stemcenter/peer-mentors.php>.
5. Review Five Effective Strategies for Mentoring Undergraduates:
<http://www.cur.org/assets/1/7/333Spring13Pital1-15.pdf>.
6. Read about STEM recognitions during social reform:
<https://news.harvard.edu/gazette/story/2020/06/for-a-day-harvard-science-shuts-down-to-strike4blacklives/>.
7. Understand the role of mentoring: <https://www.nap.edu/read/24622/chapter/7#138>.
8. Use resources to encourage healthy eating for college students:
https://www.dropbox.com/sh/y9sanrynmtf1v94/AAAsc3fXvpM8PZY1DmROJuLHa/National%20Programs/Services%20to%20Youth/National%20STEM%20Initiative/STEM%20Resources/STEM%20to%20STEAM%20and%20HHS%20Healthy%20Eating?dl=0&preview=C4-Healthy+Eating+for+College+Students.pdf&subfolder_nav_tracking=1.

5.4 Advanced

5.4.1 Advanced All Grades

1. Use STEM data provided by the National Science Foundation (NSF) to customize workshops presentations or to make targeted improvements to your chapter's STEM programming:
<https://www.nsf.gov/nsb/sei/edTool/>.
2. Take advantage of NSF STEM Programming to obtain funding or to improve your chapter's STEM programming: https://www.nsf.gov/funding/education.jsp?fund_type=4.
3. Establish joint programming utilizing existing Lockheed Martin STEM programs to supplement your existing STEM programming: <https://www.lockheedmartin.com/en-us/who-we-are/communities/stem-education.html>.
4. Leverage Department of Energy resources to strengthen your chapter's existing STEM programming: <https://www.energy.gov/diversity/services/stem-education>.
5. Order free STEM Reference supplements by age group from NIH to equip your STEM program curriculum: <https://science.education.nih.gov/>.
6. Apply for a Corporate Sponsorship with one of the following prospective Corporate donors:

-
- a. Lockheed Martin: <https://www.lockheedmartin.com/en-us/who-we-are/communities/applying-for-contributions.html>
 - b. Merck: <https://www.msdresponsibility.com/philanthropy/>
 - c. Additional prospective Corporate donors to be provided by March 2021 for the Version 2 update.
 7. Reach out to the Eastern Area STEM Committee to obtain template grant proposal text that can be used to aid your chapter in requesting a STEM grant by sending an email entitled “Request for EASTEM Corporate Sponsorship Template” to EASTEMLINKSAMADO@gmail.com.
 8. Refer to a guide to write a STEM grant: <https://www.dreambox.com/blog/writing-winning-stem-grant-guide>.
 9. Read up on the Top 10 Tips to Building a Successful STEM Grant Proposal: <https://edventures.com/blogs/stempower/top-10-tips-to-building-a-successful-stem-grant-proposal>.
 10. Review Resources for Proposal Writing. There are a number of resources to help in proposal development and writing as well as finding funding resources. Here a few you may want to start with:
 - a. Short Course in Proposal Writing: The Foundation Center Free online course that defines components of a proposal including statement of need, project description, the budget and the executive summary. <http://foundationcenter.org/getstarted/tutorials/shortcourse/index.html>
 - b. A Guide to Proposal Writing National Science Foundation Guide development by the National Science Foundation to provide guidance to proposers. Provides guidelines for getting started and writing proposals. <http://www.nsf.gov/pubs/1998/nsf9891/nsf9891.htm>
 - c. Scholastic's Grant Writing Seminar Scholastic Free online seminar course for educators that includes information on developing a needs statement, the budget, project description and sample proposals. <http://teacher.scholastic.com/professional/grants/scholgrantseminar.htm>
 - d. Grant Writing Guide Vernier Guide for educators interested in grant writing. The guide includes formulating an idea, finding funding sources, writing the proposal, and following up with the grant. <http://www.vernier.com/grants/index.html>
 - e. "The Fundamentals of Funding: How to Identify, Write, and Submit Grants for School and Program Initiatives" Edutopia Webinar hosted by Edutopia in August 2007. Video archive and PowerPoint slides are available. <http://www.edutopia.org/webinar-august>
 11. Research funding sources to get an idea of what is required for a successful proposal. Funding sources can be found online through a number of websites. The following is only a sampling of STEM related grant opportunities you may want to start researching:
 - a. American Institute and Astronautics Classroom Grants As an AIAA Educator Associate, you can apply to earn up to \$200 for your science and math programs. <http://www.aiaa.org/content.cfm?pageid=216>.
 - b. Beckman Coulter Foundation. The Foundation serves as the philanthropic arm of Beckman Coulter, by funding programs which are focused around science, science education and healthcare-related research that improves patient health and the quality of life. <http://www.beckmancoulterfoundation.org/index.asp>.
 - c. Broadcom Foundation Broadcom Foundation accepts online applications from qualifying entities in communities where Broadcom has a significant presence and where Broadcom employees live and work. Broadcom Foundation funds on the

-
- following: (1) STEM Education, (2) Health, and (3) Human Services.
<http://www.broadcomfoundation.org/apply/>.
- d. Intel Corporation Schools of Distinction Grant Every year, Intel honors U.S. schools demonstrating excellence in math and science education through innovative teaching and learning environments. To be considered as an Intel School of Distinction, schools must develop an environment and curricula that meet or exceed benchmarks put forth by national mathematics and science content standards.
<http://www.intel.com/about/corporateresponsibility/education/soda/index.htm>.
 - e. International Technology and Engineering Educators Association The grant is for a technology and engineering teacher at any grade level (K-12). Its purpose is to recognize and encourage the integration of a quality technology and engineering education program within the school curriculum.
<http://www.iteea.org/Awards/granthearlihy.htm>.
 - f. Lockheed Martin Lockheed Martin dedicates 50% of its support to STEM education programs and activities.
<http://www.lockheedmartin.com/aboutus/community/philanthropy/funding.html>.
 - g. National Girls Collaborative Project Mini-Grants. Mini-grants are awarded to girl-serving science, technology, engineering, and mathematics (STEM) focused programs to support collaboration, address gaps and overlaps in service, and share promising practices. <http://www.ngcproject.org/mini-grant/index.cfm>.
 - h. National Council of Teachers of Mathematics provides list of grants and awards provided by the Mathematics Education Trust.
<http://www.nctm.org/resources/content.aspx?id=198>.
 - i. National Science Teachers Association Provides list of science education and teaching awards and recognitions given by the National Science Teachers Association
<http://www.nsta.org/about/awards.aspx>.
 - j. Northrup Grumman Grant guidelines and application for grants.
<http://www.northropgrumman.com/corporate-responsibility/corporate-citizenship/foundation-grantguidelines.html>.
 - k. Toshiba America Foundation. The Toshiba America Foundation offers grants up to \$1,000 to K-5 teachers and contributes to science & math education by investing in teacher designed projects for 6-12 students. <http://www.toshiba.com/taf/>.
 - l. Toyota TAPESTRY Grant Program. Toyota TAPESTRY recognizes outstanding educators who are making a difference by demonstrating excellence and creativity in science teaching. <http://tapestry.nsta.org/>.
 - m. Vernier Technology Grant. The Vernier/NSTA Technology Awards promote the innovative use of data-collection technology using a computer, graphing calculator, or other handheld in the science classroom. <http://www.vernier.com/30years/index2.html>.
 - n. MOST Network. In Maryland, there are many opportunities to seek funding and sponsorship to support out of school time programs from private foundations, public funding at the local, state and federal level, and business.
http://mdoutofschooltime.org/resources/funding_opportunities#http://www.mdcommunityfoundations.org/.
 - o. Philanthropy Delaware displays list of grants and awards provided by granting organizations in DE: <https://philanthropydelaware.org/Grants>
 - p. STEMfinity displays a list of STEM Education grants awards by state:
<https://www.stemfinity.com/STEM-Education-Grants>.

5.4.2 Advanced Grades K-5

To be provided by March 2021 for the Version 2 update.

5.4.3 Advanced Grades 6-8

1. Participate in NSBE Jr.'s Ten80 Student Racing Challenge: <https://www.nsbe.org/NSBE-Jr/Programs/Ten80-STEM-Initiative.aspx#.Xv57uHdFw2w>.
2. Establish joint programming utilizing existing FAA STEM programs to supplement your chapter's existing STEM programming: https://www.faa.gov/education/programs/middle/joint_programs/.
3. Provide a workshop on how electric cars convert electricity into motion using YouTube videos from General Motors: <https://www.youtube.com/watch?v=7fpClaOOH-g>.
Provided by the National STEMREADY Committee.

5.4.4 Advanced Grades 9-12

1. Participate in the NSBE Jr.'s KidWind Challenge: <https://www.nsbe.org/NSBE-Jr/Programs/KidWind-Challenge.aspx#.Xuf7vTHsY2w>.
2. Participate in NSBE Jr.'s Ten80 Student Racing Challenge: <https://www.nsbe.org/NSBE-Jr/Programs/Ten80-STEM-Initiative.aspx#.Xv57uHdFw2w>.
3. Participate in NSBE Jr.'s VEX Robotics Competition: <https://www.nsbe.org/NSBE-Jr/Programs/VEX-Robotics.aspx#.Xv59andFw2w>.
4. Participate in NSBE Jr.'s KidWind Challenge: <https://www.nsbe.org/NSBE-Jr/Programs/KidWind-Challenge.aspx#.Xv59sndFw2w>.
5. Participate in NSBE Jr.'s VEX IQ Robotics Competition: <https://www.nsbe.org/NSBE-Jr/Programs/VEX-IQ.aspx#.Xv5-CXdFw2w>.
6. Future City Competition: <https://www.nsbe.org/NSBE-Jr/Programs/Future-City.aspx#.Xv5-uHdFw2w>.
7. Collaborate with your chapter's Health and Human Services Facet to conduct a workshop on Reducing the Carbon Footprint: https://www.teachengineering.org/lessons/view/cub_footprint_lesson1. Encourage the HHS Facet to supplement the lesson with a presentation on healthy foods that can be eaten to help reduce the carbon footprint, which can be derived from the following article: <https://www.healthline.com/nutrition/how-to-reduce-carbon-footprint>.
8. Encourage high school students you mentor to enroll in NASA programs: <https://www.nasa.gov/langley/education/students#.Xv8ivwYSEhA.link>.
9. Establish joint programming utilizing existing FAA STEM programs to supplement your chapter's existing STEM programming: https://www.faa.gov/education/programs/highschool/joint_programs/.
10. Establish joint programming utilizing existing Northrop Grumman STEM programs to supplement your chapter's existing STEM programming: <https://www.northropgrumman.com/corporate-responsibility/corporate-citizenship/hip-high-school-involvement-partnership-mentoring-program/>.

-
11. Access the National Institutes of Health (NIH) Training and Education website for STEM and career educational opportunities:
https://www.training.nih.gov/virtual_nih_activities_for_trainees_outside_the_nih.
 12. Highlight 124 phenomenal women who work in various STEM fields:
<https://www.ifthenshecan.org/ambassadors/>. Provided by the National STEMREADY Committee.

5.4.5 Advanced College Students

1. Starting in the Fall of 2021, work with students on campuses of local colleges to participate in quarterly Eastern Area Green STEM Table Talks on the campus of local colleges. Green STEM Table Talks topics will include leadership development, community engagement and collective impact. To obtain information on how to plan and conduct quarterly Green STEM Table Talks, send an email entitled “Eastern Area Green STEM Table Talks” to monicalewis81@gmail.com.
2. Introduce college students you mentor to NASA programs:
<https://www.nasa.gov/langley/education/students#.Xv8ivwYSEhA.link>.
3. Access the NIH Training and Education website for STEM and career educational opportunities:
https://www.training.nih.gov/virtual_nih_activities_for_trainees_outside_the_nih.

5.5 Expert

5.5.1 Expert All Grades

An update will be provided by March 2021 for the Version 2 update.

1. Train your STEM Program instructors using You Tube videos hosted by the University of Pittsburgh school of Education:
https://www.youtube.com/watch?v=YON_Nx9O5Us&feature=youtu.be.
2. Expand your existing STEM Program by including 3-D Printing and Design:
<https://www.youtube.com/watch?v=4IG27xnh0oA&feature=youtu.be>.
3. Find a method to fund your STEM Program supplies by researching over 700 Grant opportunities: <https://blog.stem-supplies.com/700-grant-opportunities-to-fund-your-stem-classroom/>.

5.5.2 Expert Grades K-5

To be provided by March 2021 for the Version 2 update.

5.5.3 Expert Grades 6-8

To be provided by March 2021 for the Version 2 update.

5.5.4 Expert Grades 9-12

An update will be provided by March 2021 for the Version 2 update.

1. Collaborate with the Health and Human Services Facet of your chapter to expose high school students you mentor to the Top 5 STEM Careers in the Healthcare field:
<https://jobs.northwell.edu/blog/2019/04/11/5-stem-healthcare-careers-for-students/>
2. Collaborate with the Health and Human Services Facet of your chapter to expose high school students you mentor to the Top 5 STEM Careers in the field of medicine:
<https://www.stemjobs.com/5-top-stem-medicine-careers/>.
3. Collaborate with the National Trends and Services Facet or Legislative Affairs committee of your chapter to expose high school students you mentor to the Top 5 STEM Careers in the field of law: <https://www.stemjobs.com/5-top-stem-law-careers/>
4. Collaborate with the National Trends and Services Facet committee of your chapter to expose high school students you mentor to Blue STEM Careers:
<https://www.blackengineer.com/news/redefining-blue-collar-science-technology-engineering-and-math/> or <https://www.stemjobs.com/new-collar-careers-of-the-future/>.

5.5.5 Expert College Students




To be provided by March 2021 for the Version 2 update.

Eastern Area STEM Initiative Committee Members

The Eastern Area STEM Initiative Committee works tirelessly to provide a robust entrée of STEMulating programming from which your chapter can select based upon your chapter's STEM Maturity Level as prescribed by the Eastern Area STEM Roadmap and as assessed by the Eastern Area STEM Assessment Tool. The table included in this section provides the list of Eastern Area STEM Initiative Committee Members, their assigned area of focus and contact information. We are accessible and available to serve and assist you.

If you have questions that you need answered about how to begin implementation of STEMulating programming in your chapter or about your chapter's current STEM programming, do not hesitate to contact the Eastern Area STEM Initiative Committee. Also, if you have innovative and/or successful programming, we want to hear about your STEM programming triumphs, learnings, and successes. Please send us your chapter's STEM programming write-ups containing no more than 175 words along with pictures and related picture captions. Please email your chapter's STEM programming write-ups, pictures and picture caption to EALINKSSTEM@gmail.com by the 15th of each month. The Eastern Area STEM Initiative Committee also seeks to feature presenters on our monthly Area webinars.

Eastern Area STEM Initiative Committee Member and Role	Contact Information	Area(s) of Responsibilities
 <p>Stacey G. Mangham, Chair Patuxent River (MD) Chapter</p>	<p>EALinksSTEM@gmail.com (240) 778-4043</p>	<ul style="list-style-type: none"> •EA STEM Roadmap •Black Girls Code Partnership •Lead, Black Girls Code – Washington, DC City Team •Lead, Eastern Area STEM Assessment •Lead, Kids Love STEM •Lead, Putting the “A” in STEAM: Collaboration with The Arts Facet •Listserv •Webinars •Input to Friendship’s Chain, Coordinator •Eastern Area STEM Toolkit
 <p>Link Cheri Amado, Co-Chair Milford (CT) Chapter</p>	<p>EALinksSTEMAmado@gmail.com (203) 449-6786</p>	<ul style="list-style-type: none"> •Eastern Area STEM Corporate Sponsorship Package •Tracking Chapter Participation/Roll Call •Chapter Survey Results •Lead, Eastern Area Participation in WildSTEM •Listserv •Webinars •Input to Friendship’s Chain

Eastern Area STEM Initiative Committee Member and Role	Contact Information	Area(s) of Responsibilities
 Link Chenita Daughtry Middlesex County (MA) Chapter	chenitadaughtry@gmail.com (617)270-6956	<ul style="list-style-type: none"> •Lead, Eastern Area Participation in NSBE Jr. •Putting the “A” in STEAM: Collaboration with The Arts Facet •Input to Friendship’s Chain
 Link Colena Johnson-Kemp Montgomery County (PA) Chapter	Colena.johnson@icloud.com (215)360-2662	<ul style="list-style-type: none"> •Coordinator, Eastern Area STEM Toolkit •Black Girls Code – New York City (NY) City Team •Input to Friendship’s Chain
 Link Monica Lewis Freeman Washington (DC) Chapter	Monicalewis81@gmail.com (202)253-4069	<ul style="list-style-type: none"> •Lead, Eastern Area STEM Mentoring Framework: Collaboration with the STY Mentoring and HBCU Committees •Input to Friendship’s Chain

Eastern Area STEM Initiative Committee Member and Role	Contact Information	Area(s) of Responsibilities
 <p>Link Tashanna Myers Greater Springfield (MA) Chapter</p>	<p>tashannamyers@aol.com (914)522-1116</p>	<ul style="list-style-type: none"> •Lead, Black Girls Code – Boston (MA) City Team •Input to Friendship's Chain
 <p>Link Pamela A. Walker Norfolk (VA) Chapter</p>	<p>Pawalker1@charter.net and EALinksSTYVideoVignettes@gmail.com (for Video Vignette Submissions) (757)408-3595</p>	<ul style="list-style-type: none"> •Lead, Eastern Area STEM Video Vignettes •Lead, Eastern Area STY Video Vignettes •Coordinator, STEM Support to Liberia (Collaboration with the ITS Facet) •Input to Friendship's Chain

Appendix A

The Assessment Framework contained in this section is adapted from Assessment and Planning Tool for STEM, California Afterschool Network, <https://www.afterschoolnetwork.org/post/assessment-and-planning-tool-stem-expanded-learning-programs>. This section to be updated by March 2021 in Version 2.

A.1 Is your Program Ready?

If you are not currently doing any STEM programming at your program, except what comes up in program workshop discussions, is your program ready? Answer the questions below to see where you stand. Circle the response that most closely matches your program.

SA = Strongly Agree, **A** = Agree, **D** = Disagree, **SD** = Strongly Disagree.

These questions are meant for your own reflection. Please feel free to skip any that are truly not applicable to your program, and to use your own best judgment for the guidance that follows.

Safety and Structure:				
We provide a safe environment for the children and youth in our program. Our program follows a generally predictable routine. Children and youth in our program generally get along. Our volunteers are not constantly handling behavior problems such that they can't get through lessons.	SA	A	D	SD

Materials, Space and Storage:				
Our STEM Volunteer Leaders are ready to smoothly facilitate activities with multiple materials (more than just paper and pencils/pens).	SA	A	D	SD
We have regular access to a large, secure storage area (closet or large cabinet or dedicated program room) for specialized STEM materials such as kits, supplies.	SA	A	D	SD
We have a budget for specialized STEM materials.	SA	A	D	SD
We have access to a sink.*	SA	A	D	SD
We have access to multiple computers.*	SA	A	D	SD
We have access to outdoor space.*	SA	A	D	SD
We can make a mess as long as we clean it up afterwards.*	SA	A	D	SD
We can move furniture out of the way.*	SA	A	D	SD
We can set up work stations (e.g. group tables or cluster desks together).*	SA	A	D	SD
* These materials/spaces may not be needed for all STEM activities. However, we list these common materials/spaces to prompt you to think through what you might need, depending on the types of STEM activities you choose to initiate.				

Staffing and Supervision:				
Nearly all of our STEM volunteers have been volunteering since the program year began (or several months).	SA	A	D	SD
Our volunteers have strong, positive relationships with the youth in this program.	SA	A	D	SD
We have at least one reliable and communicative chapter member who is willing to lead STEM activities.	SA	A	D	SD
For ongoing monthly or weekly programs, I have 1-2 hours a monthly/weekly to support a staff member to implement STEM (planning, ordering and managing materials, providing support for complicated activities, and/or providing support and feedback).	SA	A	D	SD
We have volunteer meetings with the whole team at least once a quarter.	SA	A	D	SD

STEM Team and Partnerships:				
We have a relationship with an Instructional Coach, such as a current or retired teacher OR a STEM Professional, who can help us provide high quality instruction and activities (does not need to be a STEM teacher).	SA	A	D	SD
We have access to a local science museum or science specialist with whom we can consult.	SA	A	D	SD
Activities and Lesson Plans:				
We have structured enrichment and recreation activities.	SA	A	D	SD
Our program leaders regularly develop lesson plans.	SA	A	D	SD
Our program leaders feel confident about developing new activities for our participants.	SA	A	D	SD
Program Assessment and Improvement:				
We regularly (at least once per year) assess the quality of our program.	SA	A	D	SD
We regularly (at least once per year) develop a program improvement plan.	SA	A	D	SD
Totals				
Count the times you circled each rating and enter it here:				
Add the number of times you circled Strongly Agree and Agree:				

- If you circled Strongly Agree or Agree 18 times or more, you are probably ready to initiate STEM. Proceed to Section A.4: Initiating Your STEM Program.
- If you circled Strongly Agree or Agree between 10 and 17 times, you may still be ready to initiate STEM. Review those items where you marked Disagree or Strongly Disagree and work to improve those as you plan your STEM programming. Proceed to Section A.3: Getting Your Program Ready. Then, proceed to Section A.4: Initiating Your STEM Program.
- If you answered Strongly Agree or Agree 10 times or less, you may need to strengthen your overall programming and access to facilities first, before beginning to plan your STEM programming. Proceed to Section A.3: Getting Your Program Ready.

A.2 Initiating your STEM Program: Making a Plan

A.2.1 Form your STEM Team

Implementing STEM in programming for the Eastern Area of The Links, Incorporated can be challenging. To meet that challenge, chapters should form STEM program teams that meet regularly, share ideas, and troubleshoot problems as they arise. At the heart of the STEM team are the STEM Program Leaders who will regularly facilitate the STEM activities. Identify your Program Leaders who are already experienced facilitators and/or have an interest in STEM. The STEM program team should also include:

- **Site Coordinator:** The person who will back up the STEM Program Leaders for every scheduled workshop or program. This person may also be responsible for developing and maintaining school and community partnerships.
- **Program Advocate/STEM Liaison:** The person who can advocate for STEM – and the money, time, and other resources required – at the chapter level. This person may also be responsible for developing and maintaining school and community partnerships.
- **Instructional Coach:** A teacher, retired teacher, or experienced after school worker who can support STEM Program Leaders in classroom management and instructional strategies.
- **STEM Content Coach:** This person may be the same as the Instructional Coach. A STEM educator, museum staff, or industry representative who can help STEM Program Leaders understand STEM content and connect them to trusted resources.

A.2.2 Develop Two to Four STEM Program Goals

These should be overarching goals that draw on school or community goals or existing data on the needs and interests of your youth and staff. Access existing lesson plans or curricula. While you eventually may want to write your own lesson plans or curricula, it is acceptable to start with what someone else has already written. An Internet search will yield many existing curricula, but here is a short list of sites to investigate:

- Power of Discovery (http://powerofdiscovery.org/curriculum_activity).
- www.InformalScience.org

-
- HowToSmile.org for science and math activities.
 - Kidzscience (http://www.lawrencehallofscience.org/programs_for_schools/programs/afterschool_kidzscience).
 - PBS's Fetch hands-on science (<http://www.pbs.org/parents/fetch/index.html>)
 - Your local science or kids museum, amusement park, nature center, District office or University to see if they have available curricula.

Tip: Start Small

A.2.3 Budget for STEM

When completing your budget, consider the following:

- Budget for materials. Even if you have not yet picked curricula, include a generous supplies budget in your annual budget. While there is no way to be exact, doubling your existing supplies budget may provide a rough estimate of what you will need.
- Budget time to check in with STEM Program Leaders at least monthly. Because STEM activities often bring unique challenges, STEM Program Leaders will need additional support.
- Budget additional planning time for STEM Program Leaders. They may need at least one hour to plan each lesson.

A.2.4 Identify space, order materials

Once you have picked curricula and/or lesson plans, review all space and materials that you will need and begin to plan for them right away.

A.2.5 Create a Program Plan

If your program has an existing program plan template, use that. Otherwise, use the plan template provided by the National STEMREADY Committee.

A.3 Getting Your STEM Program Ready

Programs may not be ready to implement STEM because basic safety and structure is not in place, the program does not (yet) have a stable set of volunteers or a regular time for volunteers to meet, there is not a strong system in place for creating activities such as lesson plans, or because there is no approach in place for assessing program implementation and quality and making improvements based on that assessment.

A.3.1 Safety and Structure:

If your program feels unsafe or is chaotic, you will need to create safety and structure before turning to other strategies to get ready. There are too many resources for improving the safety, structure, and routine of your program to list them here. You may wish to start with your program partners, or school site for resources to help you build a consistent, safe program.

A.3.2 Materials, Space and Storage:

STEM activities often require unique – and specialized – supplies, materials, and spaces. Although using a few materials may sound simple, working with materials beyond paper and pencil can be more challenging than expected. To set your program and your volunteers up for success, consider the following:

- Encourage your volunteers to practice activities with multiple materials. Have them practice with materials heavy activities such as an arts and crafts activity or complex academic game.
- Work with your chapter or program site early on to identify a secure place to store and organize materials.
- Work with your chapter or program site early on to identify a range of spaces (indoor, outdoor, access to water, access to computers) that you might need.

A.3.3 Volunteers and Partner Resources:

If you are having trouble finding the right volunteers, the following are excellent resources specific to after-school programs. They also provide best practices for volunteer coordination:

- NSBE: www.nsbe.org
- NASA: www.nasa.org

A.3.4 STEM Team and Partnerships:

To build a strong STEM learning experience, after-school programs often must rely on partnerships with school day staff and local community resources who can help strengthen instruction and develop or review content. As you get ready to initiate STEM, consider:

- Develop relationships with school day staff who are interested in supporting the after-school program and/or STEM efforts.
- Arrange school-day meetings with school leadership, if possible, especially with school leaders responsible for STEM.
- Identify local STEM resources such as local STEM industries, science and technology museums, nature centers and the STEM departments at local colleges and universities. Be prepared to reach out to them to ask for resources and ideas. See Section 5.0 of this document for potential partners, resources and ideas.

A.3.5 Activities and Lesson Plans:

If volunteers still struggle to deliver a structured activity, the Internet contains many lesson planning and youth activity resources. Below is a very short list of places to start:

- Afterschool Exchange:
http://www.thirteen.org/edonline/afterschool/activities/tips_dev_act.html
- Edutopia (<http://www.edutopia.org>) – especially their After-School Learning page
- Pinterest (<https://www.pinterest.com>) has many educational activity ideas
- You for Youth: <https://www.y4y.ed.gov/>

A.3.6 Program Assessment and Improvement Resources:

Program assessment and improvement are key to providing high quality STEM programming. As you get ready to initiate STEM, build a program improvement culture. There are many program assessment tools available. Use “A Crosswalk Between The Quality Standards for Expanded Learning and Program Quality Assessment Tools” to find an assessment that works for your program:

<http://www.cde.ca.gov/ls/ba/cp/documents/qualitycrosswalk.pdf>.