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1. Overview of STARBASE 2.0

The vision of DoD STARBASE is to raise the interest and improve the knowledge and skills of at-risk youth in science, technology, engineering, and mathematics, providing for a highly educated and skilled American workforce that can meet the advanced technological requirements of the Department of Defense.

STARBASE 2.0 Mission

STARBASE 2.0 combines STEM activities with a relationship-rich, school-based afterschool environment to provide the missing link for at-risk youth making the transition from elementary to middle and on to high school. It extends the positive impact of STARBASE through an afterschool STEM mentoring approach which solidifies students’ attachment to and engagement with school.

How STARBASE 2.0 Works

STARBASE 2.0 targets sixth to eighth graders. Club meetings will take place afterschool at schools selected by each STARBASE programs. Every meeting will be spearheaded by a lead STEM mentor from the community. Clubs meet a minimum of four hours per month at regularly scheduled times. These groups consist of one STEM mentor and 3-4 students working together.

Research has found that afterschool programs provide safe environments, support school goals, and improve student-teacher relationships. In addition, benefits of school-based afterschool programs are

» They are highly structured.

» They empower schools.

» They appeal to non-traditional mentors (e.g. those with busy schedules, such as yourselves).

STEM Mentoring

STEM Mentors are corporate professionals, college or graduate students, and / or teachers who work in the area of science, technology, engineering, or math. The purpose of the STEM mentor is to help increase middle school students knowledge, skills, and interest in STEM areas and to build relationships that support student self-efficacy.
Intended Outcomes

The unique combination of activities for students outlined here align with the following intended outcomes of the program:

» To increase STEM interest and knowledge
» To reduce high-risk behavior
» To increase engagement with school
» To increase awareness of jobs in STEM fields

How to Use this Guidebook

This guidebook is a resource to support STEM mentors and STARBASE STEM mentor coordinators in implementing the STARBASE 2.0 STEM mentoring program. Programs can meet the four hour requirement in a number of ways (e.g. twice per month for two hours; four times per month for one hour; once a month for four hours). You will also need to decide which projects you will work on and which activities to utilize for each meeting. The activities outlined in this guidebook are designed for maximum flexibility.

Program Curriculum

Regular meeting sessions are at the core of the program. These meeting times will be a specified length of time, and they will be filled with fun exercises and activities for the students. STEM mentors lead these exercises.

The framework for meetings is built around a tri-fold “journey” theme:

» STEM Navigation
» Team Exploration
» MAP It Activities

You may decide to do all three activities or just STEM Navigation (the STEM Activity).

STEM Navigation

The STARBASE 2.0 curriculum will provide the compass for navigating toward a fulfilling club experience for individuals and the group. STARBASE STEM mentor coordinators and STEM mentoring teams should agree ahead of time on three to five possible STEM projects for the team to work on through the year. Determine if you want to offer more than one choice that each STEM mentor would lead.

Projects may be in any of the STARBASE 2.0 curriculum areas (physics, chemistry sciences, technology, engineering, and mathematics operations and applications).
They can include competitions, global explorations (through use of the internet), and/or partnerships with other STEM-related organizations (e.g. NDEP, LEGO League Teams, etc.) See the resources on page 78 for project ideas, websites, and organizations.

**Team Exploration**

A great benefit of team mentoring is the combination of peer interaction and adult role models to learn about and practice leadership, teamwork, commitment, and inter-personal skills. This guidebook contains seventeen different team exploration activities that provide connections to the STEM Navigation group project and to students’ personal MAPs, explained below.

At the end of each team exploration activity, there is a “The Take-Away” section. The take-away provides discussion points to help answer the “so what?” question. Team members should be sitting down (unless otherwise indicated) during this discussion time to focus the conversation and drive the points home. While these team exploration activities are not mandatory, they offer an opportunity for students to work in teams and learn to work together in their STEM activities.

**MAP It!**

The Mentoring Action Plan (MAP) is a guided set of goal-setting activities to introduce participants to personal life-planning principles. MAPs use a simple 3-4-5 list-making technique to generate ideas, assess priorities, and establish milestones. Because the process is repeated throughout the program, students become comfortable making their own MAPs, and they will learn a goal-setting technique they can use throughout their lives.

Each “MAP It!” activity takes thirty minutes. Students and STEM mentors are encouraged to complete the MAP It! activities together, as it provides an opportunity for STEM mentors to break down barriers and role model leadership, trust, and planning skills.

Each participant will need a blank notebook to use as their MAP journal. The program may choose to provide these notebooks, or you can ask participants to bring their own. Participants are responsible for bringing their MAP notebooks with them to each meeting.

With each MAP It! activity, you will follow these similar steps:

1. Ask participants to open up their notebooks and draw two lines down a page to create three columns.

2. Ask participants to write three things in the left column, four things in the middle column, and five things in the right column. The specific things will be driven by the MAP activity. For example, the first MAP It! activity encourages participants...
to list subjects they like, things they are good at, and things they want to learn.

3. Participants will be given five minutes to complete their lists. You can allow up to ten minutes, but participants should be encouraged not to over-think the exercise. They should write what first comes to mind, not what they think they should write.

4. Participants will then break into small groups and take ten minutes to share and provide each other positive feedback. This act of sharing is important in building trust and communication within the group. Positive, non-judgemental feedback should be encouraged, focusing on the assets that each youth has identified through the list process. However, STEM mentors should be prepared that some students will not be comfortable sharing their ideas with the group. Sharing must be optional.

5. Participants will then use these lists to generate a “seven day goal” for the next week. Instructions for setting this goal will be included in each MAP activity. Participants will be instructed to write down in their MAP journal:
   - A seven-day goal
   - What they can do today to work toward achieving their goal
   - What they can do over the next week

6. The final step for each MAP It! activity is to talk about goals in small groups or one-on-one, as time allows. In these conversations, STEM mentors can provide guidance on how to create realistic steps to achieve these goals and take time to review accomplishments from previous weeks. Just as in Step 4, please note that sharing must be optional.

For a complete list of all the MAP It! activities, see page 57. By browsing the list, you may gain further ideas of how to create your own MAP It! activities.

*These MAP It! activities are not mandatory.

**Planning Your Meetings**

STARBASE STEM mentor coordinators and STEM mentors should work together to plan an agenda well in advance of each meeting. Select from STEM navigation options, team exploration activities, and MAP It! activities to create an exciting and streamlined blend for each month.

Before you start each meeting, make sure you leave enough time to organize your materials for the selected projects and activities for that day. You will also want to plan out the environment for each meeting. Every time you meet, try to create a warm, inviting, and safe environment.
Consider the following ideas:

- Have snacks and beverage available.
- Welcome each student by name and ask them to sign in.
- Ask students to select a call sign (what they want to be called at meetings) and make a name tag.
- Ask students to share one thing they learned from the last time you met.
- After each activity, ask each student to share something they liked and something they didn’t like about it.

» If you are interested in Team Exploration Activities, a list of all the activities can be found on page 31.

» If you are interested in Map It! Activities, a list of all the activities can be found on page 57.

Field Trips

Over the course of the year, the program aims to schedule three field trips (virtual or literal) to visit the workplace of the different STEM mentor participants. These are opportunities to expose students to potential careers and give them greater insight into the daily activities of their mentors. The field trips are a key method for achieving the outcome of “greater career awareness.”

Program Guidelines

There are several specific rules and guidelines that govern the STARBASE 2.0 program. These rules are important because they enhance the safety of mentees, they reduce liability for the STEM mentors, and they help in the development of healthy relationships.

Program rules start with issues of “confidentiality.” As a mentor, you are required to keep confidential the conversations that any student shares with you. Confidentiality is vital to encourage students to share and open up to their STEM mentors. Students will not open up if they believe others learn about their issues.

However, there are four exceptions to keeping confidentiality:

1. **Talking to program personnel.** You can talk to STARBASE staff about anything. They are there to support you.

2. **Talking to other mentors (But maintain a “group confidentiality”).** In general conversations, and in the Mentor Support Group meetings, you can talk about what’s going on with the students. Just know that whatever you hear about other mentees (for instance, if you happened to talk to mentors from...
other teams), should be held in “group confidentiality.” That is, you must keep confidential what you hear about other students as if they were your own.

[Concerning Reporting: By law, you are a mandated reporter if you are paid to work with children. As a STEM mentor, you do not fall into this category; however, the teachers in our group are mandated reporters. They are required to report specific situations to both the Program Coordinator and the Department of Children and Family Services. As a STEM mentor, you will be asked only to report to STARBASE staff.]

3. **Student’s potential harm or danger to self or others.** If you suspect that a student may be a harm or danger to self or others, you must report this immediately to STARBASE staff.

4. **Potential child abuse, neglect, or endangerment.** If you hear or suspect that any of your students, or other minors have been abused, neglected, or endangered, you must report to STARBASE staff immediately.

Good personal boundaries promote healthy relationships, and STARBASE 2.0 aims to teach students about the importance of relationships. Please keep the following in mind regarding your own personal boundaries with your student mentees.

» **No loaning money or gift-giving, celebrating birthdays, or providing parties.** There are many reasons to stay away from the areas outlined in this bullet point. This begins with playing favorites, and therefore making some students feel left out. Also, if you give students money and gifts, they immediately see you as something besides a mentor—and it diminishes the mentoring relationships. There may be a rare situation where it would be okay to provide something to students if it were given to all the students on all teams at your school. If you want to do this, please contact your STEM Mentor Coordinator to discuss.

» **Be careful about touching or hugging.** We don’t want to take the spontaneity out of the program, but be careful about hugging. Long frontal hugs bring up the most suspicion--even if nothing is going on. It’s much safer to give someone a quick side hug, and it’s easy to turn when someone approaches you from the front. In addition, be careful not to hold hands or have a student sit on your lap.

» **Self-disclosure is a boundary issue--don’t go deeply into your personal life.** Information about your personal life is also a boundary issue. It is mentioned in other areas of this guidebook, but it bears repeating. Don’t go too deeply into your own issues, as it takes the focus off of the students, and it can make them wonder about your stability.
2. Mentoring Basics

The word “mentor” is an old one. It was first found in the Odyssey, written by Homer. In it, Odysseus goes on a 10 year journey. Before he leaves, he places a wise and trusted friend named “Mentor” in charge of his son, Telemachus.

“Mentor” is from the Greek “mens,” for “mind.” The word itself offers some vital keys to remember how to mentor. People have interpreted the word “mentor” to mean those that help their mentees (or students) “make up their minds.”

An important key to successful mentorship is avoiding telling students what to do; instead, successful mentors help young people come to their own decisions or “make up their minds.” This helps to empower the mentee.

Expectations

Mentoring is about “relationship, relationship, relationship.” This is supported by a 1995 study by Public/Private Ventures. This organization interviewed mentees, their parents, and program staff, and they found that “successful mentors try to develop relationships of trust and respect.” They also found that “unsuccessful mentors push too hard, and expect too much.” They called this type of person a “prescriptive mentor” (they think they are the pill that can cure the kids they work with).

Dr. Michael Karcher, who co-edited a 600-page book on youth mentoring research, also brought it back to the importance of developing relationships. In fact, he says that the key to being a successful mentor is “to engage them [students] in casual conversations,” such as “hey, how’s going?” and “watch any good TV programs lately?” This type of positive communication helps students start to see adults as allies who are interested in what they are doing. This builds trust. And, when students learn to trust the adults in their lives, they will function at a higher level in every area, including school.

Mentors commonly have their own expectations of their students and themselves. Below is an overview of a few typical unrealistic expectations along with a possible way to adjust thinking.
CONSIDERING EXPECTATIONS

1. **Unrealistic:** The team will function smoothly from the start.
   
   **Realistic:** I don’t know how the team will function, so I will have to be patient.

2. **Unrealistic:** The students will make immediate, remarkable changes in their functioning and attitudes.
   
   **Realistic:** It is more likely any student changes will occur only after a long period of time. Therefore, I will do the best I can do and then step back (emotionally) to practice a “healthy detachment.”

3. **Unrealistic:** If there is not a quick change or an improvement in the functioning of the team and individual students, it will be a negative reflection on me.
   
   **Realistic:** Not seeing these hoped-for changes doesn’t mean I’m a bad mentor. Plus, mentoring is certainly not a contest, and it is not about me.

4. **Unrealistic:** I need to be a perfect mentor—never make a mistake.
   
   **Realistic:** I will make mistakes, including sometimes saying and doing the wrong thing. I must keep faith that students will know that I am coming from my heart and that I am trying to do the right thing. I hope they will forgive me when I make a mistake.

5. **Unrealistic:** The students I work with will thank me frequently for my time and efforts.
   
   **Realistic:** Many people this age don’t know how or are not comfortable with saying thank you (or they forget). So, I will serve these young people with the attitude that, “I am giving mentoring as a gift and will expect nothing from the students in return.”
Team Development

There is a progression of relationship dynamics with young people, and it often relates to the amount of time that everyone spends together. There are two ways to look at these relationships: group/team dynamic and one-to-one relationships.

Group/Team Dynamics

The stages of team development, outlined in the figure below, are further explained throughout this section from the perspectives of the student and the STEM mentor.

<table>
<thead>
<tr>
<th>5 STAGES OF TEAM DEVELOPMENT</th>
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<tbody>
<tr>
<td>» <strong>Forming</strong></td>
</tr>
<tr>
<td>• <em>Students</em>: Shy or hyper (signs of anxiety).</td>
</tr>
<tr>
<td>• <em>Mentors</em>: Focus on relationship and making a safe place.</td>
</tr>
<tr>
<td>» <strong>Storming</strong></td>
</tr>
<tr>
<td>• <em>Students</em>: Ideas and personalities compete for attention.</td>
</tr>
<tr>
<td>• <em>Mentors</em>: Build “togetherness,” monitor behaviors.</td>
</tr>
<tr>
<td>» <strong>Norming</strong></td>
</tr>
<tr>
<td>• <em>Students</em>: Relaxed routine; recognize own strengths.</td>
</tr>
<tr>
<td>• <em>Mentors</em>: Affirm strengths; watch for boredom.</td>
</tr>
<tr>
<td>» <strong>Performing</strong></td>
</tr>
<tr>
<td>• <em>Students</em>: Greater cooperation, motivation, and accomplish tasks together.</td>
</tr>
<tr>
<td>• <em>Mentors</em>: Allow decision-making; cheer accomplishments.</td>
</tr>
<tr>
<td>» <strong>Mourning</strong></td>
</tr>
<tr>
<td>• <em>Students</em>: Can involve feelings of separation and loss.</td>
</tr>
<tr>
<td>• <em>Mentors</em>: Remind students of time left; celebrate transformations.</td>
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</tbody>
</table>

**Forming**

» *Students*: Shy or hyper because they are anxious. This is when students are feeling the situation out, figuring out how they fit in with the team, and determining who the mentors are, etc. They could also act out or be hyperactive, and these are usually all signs of anxiety.
» **STEM Mentors: Focus on relationship and making your meetings a safe place.** The best thing for STEM mentors to do is to focus on relationships to try to make students feel comfortable. Particularly during sharing activities, it is important to make them feel this is a safe place.

### Storming

» **Students: Ideas and personalities compete for attention.** Students are starting to get a little more comfortable. They look around to try and figure out the hierarchy, and personalities often compete for control of the group.

» **STEM Mentors: Build “togetherness” and monitor behaviors.** Through exercises and personal relationships, during this stage, STEM mentors can try to build a sense of togetherness and team identity.

### Norming

» **Students: Relaxed routine and recognize their own strengths.** Students are settling in to the regular routine of the team meeting. Students also have a stronger sense of how they fit into the team. During this stage, students are building trust with their mentors.

» **STEM Mentors: Affirm strengths and watch for boredom.** STEM mentors need to maintain consistency of the team meeting. Using sharing activities, STEM mentors can directly affirm student strengths, as well as encourage students to affirm the strengths of other students on their team. STEM mentors need to ensure that all students are using their strengths to stay engaged with activities and projects. STEM mentors can also ensure that science and math activities and projects continue to be active and student-based.

### Performing

» **Students: Greater cooperation, motivation, and desire to accomplish tasks together.** The performing stage is where it usually all comes together. Students get excited about field trips and also about their STEM Navigation projects. They will experience a strong sense of achievement when they successfully complete their project.

» **STEM Mentors: Allow decision-making and cheer accomplishments.** Very often, STEM mentors can take a step back here. Be ready to jump in if there are any difficulties, but if the team is functioning well, you won’t have to interfere. Also during this stage, mentors can consistently praise the students for their accomplishments, both personal and collective. In this sense, STEM mentors can become cheerleaders.
Mourning

» **Students:** Can experience feelings of separation and loss. You might be surprised at how attached students can get with mentors and with each other in a school year. This closeness may be aided by the fact that many of them don’t have any other positive place they can come and feel accepted by others.

» **STEM Mentors:** Remind students of time left, and celebrate collective and individual transformations. Within individual relationships, this mourning stage is called closure. One way to prepare students is to remind them of the amount of time left in the program—this way, they will emotionally prepare themselves for the separation. Another great strategy is to compliment them, for example, “Over the last 25 weeks I’ve really seen a lot of positive changes in you...”

One-to-One Relationships

The stages of one-to-one have a lot of similarities to the team dynamic. The description of this relationship is important because it is often observed that some students tend to gravitate to certain mentors. This can happen with the few minutes before or after sessions, or even during the exercises, activities, and field trips. The stages of one-on-one relationships are often described as testing, trusting, and closure.

<table>
<thead>
<tr>
<th>STAGES OF ONE-TO-ONE RELATIONSHIPS</th>
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» **Testing**
  • **Students:** Fear of Opening Up
  • **Mentors:** Make Self Available

» **Trusting**
  • **Students:** Begin Opening Up
  • **Mentors:** Go Slow, Don’t Probe

» **Closure**
  • **Students:** Mourn Ending of Relationships
  • **Mentors:** State Time Remaining & Celebrate
Testing

» **Students: Fear of opening up.** Even though some students may seek you out, and they always do it for a reason, they may hold back in sharing until they get more comfortable with you.

» **STEM Mentors: Make self available.** If someone is seeking you out for a personal relationship, the first thing is to be aware that it is happening and, if possible, make yourself available. This could be for 5 or 10 minutes before or after a session or on field trips. You can also make a connection with them during session exercises.

Trusting

» **Students: Begin opening up.** Of course, when students trust you, they begin to tell you what’s going on in their lives. This could be something that is stressful or even something positive, like their hopes and dreams.

» **STEM Mentors: Go slow and don’t probe.** If students start to open up, don’t probe—just go slow. If they do start to share deep personal information, you can ask a few questions. Don’t think that you have to be a detective. And, of course, if it has to do with anything serious, contact the STEM mentor coordinator right away.

Closure

» **Students: Mourn ending of relationships.** This is very much like that group dynamic addressed above. If a student has made a personal connection with you, it will probably be more emotional for them than the mourning of the passing of their relationship with the group.

» **STEM Mentors: State time remaining and celebrate.** As with the strategy for the group dynamic, you can state the time left. “We’ve been together for 20 weeks. What have you liked so far. Anything you want to do or talk about in our remaining 10 weeks together?” Also, stating the enjoyment that you have experienced by being with them and by seeing them grow. This type of praise and acknowledgement could be a huge positive for them.

Do’s and Don’ts

One of the important things you can do as a STEM mentor is honor your commitment. Research shows that it is better to not engage a youth in mentoring at all than to commit to mentor them and not follow through (Jean Rhodes, *Stand by Me*). STEM mentors should only miss sessions in cases of emergencies.

In addition to being present, there are a few other Do’s and Don’ts listed at the top of the next page.
<table>
<thead>
<tr>
<th><strong>DO’S</strong></th>
<th><strong>DON’TS</strong></th>
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<tbody>
<tr>
<td>• Focus on relationship development</td>
<td>• Speak harshly to any student</td>
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<tr>
<td>• Participate fully in activities</td>
<td>• Be a parole officer or policeman</td>
</tr>
<tr>
<td>• Find what’s right with students</td>
<td>• Find what’s wrong with students</td>
</tr>
<tr>
<td>• Be positive and encouraging</td>
<td>• Show favoritism</td>
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<tr>
<td>• Be a good listener</td>
<td>• Try to be a substitute parent</td>
</tr>
<tr>
<td>• Respect a student’s right to make choices</td>
<td>• Make promises you can’t keep</td>
</tr>
<tr>
<td>• Have a good sense of humor</td>
<td>• Give unwanted advice</td>
</tr>
<tr>
<td>• Be flexible, patient &amp; consistent</td>
<td>• Force students to share</td>
</tr>
<tr>
<td>• Be open minded</td>
<td>• Try to fix or change students</td>
</tr>
<tr>
<td>• Be a good coach</td>
<td>• Be a cool peer</td>
</tr>
<tr>
<td>• Be a good role model</td>
<td>• Give students gifts or money</td>
</tr>
<tr>
<td>• Be someone who really cares</td>
<td>• Be a therapist</td>
</tr>
<tr>
<td></td>
<td>• Try to be a savior</td>
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<tr>
<td></td>
<td>• Feel you have to be perfect</td>
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</tbody>
</table>
3. Child and Youth Development

In order to effectively serve as a STEM mentor, a volunteer must develop an understanding of the youth they will be working with. Participants will be introduced to the basics of child and youth development in regards to the potentially “at-risk” or underprivileged youth.

Many of the children served in the STARBASE 2.0 programs live in high-poverty and high crime areas, and very often they live with one parent or even a relative. Child development experts tell us that traumatic and unstable circumstances can lead to delays in normal development. The ability to “trust” is the first and perhaps the most important element in development. This comes with nurturing caregivers and a safe and stable environment.

Many of our students do not trust others because of their many negative life experiences. This could come from having parents that are not able to consistently give them the love they need or from being around domestic violence, verbal abuse, and so forth. “Poverty,” in itself, can also be traumatic.

In STARBASE 2.0, we are potentially serving youth that are at-risk, and it is possible that their needs are not being met in other areas of their lives. In Reclaiming Youth at Risk, the authors point out that youth in high-risk situations have four basic needs: belonging, mastery, independence, and generosity.

Because STARBASE 2.0 STEM mentors and staff members will focus on these areas in order to try and fulfill the needs of our students, it is important to look at each of these needs individually. It is also important to note that when these needs are not met for a child, the most common responses are to act out or drop out.

**Belonging**

- Belonging is the need to be accepted and loved by others rather than be alienated.
- Youth want to gain the acceptance, attention, and affection of others.

*STEM Mentors’ focus.* The STEM mentor’s focus in helping fulfill “belonging” is to develop trusting relationships. These young people need to be able to trust others to feel that they belong, and the way to do that is to focus on relationship development. In fact, it could be that you, the STEM mentors in this program, will be the only adults in these students’ lives that they can open up to. Along with relationship development, it is essential to affirm what is right about these students, as they may not receive very much praise.
Programs’ focus. The STARBASE 2.0 curriculum has been previously outlined, but as a recap, the three components of the program framework are STEM Navigation, Team Exploration, and MAP It. The Team Exploration component is the key element to foster the need of belonging. However, every opportunity throughout the program to instill a sense of belonging is encouraged.

Mastery

- Mastery is the need to be good at something, rather than caught in a cycle of failure.
- Youth want to master their environment and achieve their goals.

STEM Mentor’s focus. STEM mentors identify the gifts and talents of students and also help them find out what they are drawn to, what they love. Mastery helps these young people feel like they are worthwhile.

Program’s focus. The program focuses on students’ mastery needs through the STEM Navigation, opening up opportunities to acquire knowledge and skills in STEM disciplines. The MAP It! activities teach an age-appropriate goal-setting technique that help students recognize their own achievements and facilitate the mentoring relationships.

Independence

- Independence is the need to gain control of one’s destiny, rather than be at the mercy of others.
- Youth want to control their world and gain the respect of others.

STEM Mentors’ focus. Mentors will assist students in exploring various careers and in discussing the importance of academics. MAP It! exercises instill goal-setting and life-planning skills.

Program’s focus. The curriculum will draw from all three areas to try to satisfy “independence needs,” but the main area is again, “shaping your future.” Career field trips (virtual or actual) also figure in to this area of need.
Generosity

» Generosity is the need to give to others, rather than to be always receiving.

» Youth need to be needed in the lives of others and want to be viewed as contributors.

STEM Mentors’ focus. STEM mentors will offer guidance on leadership, on teamwork, and on how students can work together to become a positive influence within the community.

Program’s focus. Through participation in the STEM Navigation group projects, students have an opportunity to contribute in a meaningful way. Small group interactions through Team Exploration and MAP It! activities reinforce the importance of reaching out to others.

Participant Profile

At the middle school age, most salient memories involve the social and emotional needs for status and acceptance. Good memories involve getting noticed or awarded in a positive way or taking a step toward independence. And, most negative memories involve getting noticed or pointed out in a negative way. Understanding more about the developmental traits of the middle school student participants will help STEM mentors ensure students are provided with positive STEM experiences and memories.

Cognitive Characteristics

» Demonstrate an increase in abstract thought.

» Like new challenges, but reasoning and decision-making skills are still undeveloped.

» Increasingly curious and imaginative.

Social Characteristics

» Demonstrate a desire for increased autonomy.

» Display signs of tension between reliance on family or peers to define self and make decisions.

» Exhibit heightened awareness of how they compare with their peers.

» Desire to be “in” and not “out.”
Emotional Characteristics

» Very self-conscious
» More likely to be anxious or depressed
» Often unpredictable

In order to connect with and retain middle-schoolers in a program requiring a substantial investment of time and energy, it is essential to understand who they are and what motivates them. Appealing to the needs of their developmental level makes this possible. Physical changes and development play an critical role in all aspects of the young person's characteristics at this age.

MIDDLE SCHOOL MOTIVATORS

<table>
<thead>
<tr>
<th>Cognitive</th>
<th>Social</th>
<th>Emotional</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Intellectual challenges</td>
<td>» Autonomy/choice</td>
<td>» Acceptance/safety</td>
</tr>
<tr>
<td>» Responsibilities / decision-making</td>
<td>» Status</td>
<td>» Reduced anxiety</td>
</tr>
<tr>
<td>» Imagination / curiosity</td>
<td>» Positive recognition</td>
<td>» Fear of failure</td>
</tr>
</tbody>
</table>
4. Facilitator Tips and Techniques

Facilitating group activities that account for multiple learning and communication styles can be challenging. However, better understanding behavioral management techniques can help prepare you for situations you might encounter. This section discusses these techniques along with actionable techniques that mentors can use to diffuse behavioral issues that may arise during club meetings.

Best Practices for Facilitating

*Divide up leadership of exercises, review curriculum, and decide on leadership based on strengths and interests.* Please note that teacher/mentors should not have to facilitate all the exercises, just because they have the expertise—leading of exercises should be divided equally between the STEM mentors.

*Review lessons in advance (one session) and check on materials.* This is a critical point. If you wait until the session time to review the lessons, it is unfair to the students when the STEM mentors are unprepared and distracted.

*Practice exercises and get feedback from others.* You will want to practice some of the exercises, especially the more complex ones. One way to do this is to read the instructions to a friend and ask for feedback. In particular, ask if they understand how to do the exercise.

*Adapt the curriculum if necessary (e.g., more/less complicated materials, shorter/longer activities).* Adapt exercises while keeping the objective in mind. It could be making it more or less complicated or shorter or longer. It could also be that you adapt the size of the breakout groups or the type of materials.

Running the Activity

» Read instructions, introduce name, theme, and purpose.

» Give clear directions, repeat if necessary. Look for “faces with question marks,” even if they don’t raise their hands.

» Participate with students (don’t just watch). Some STEM mentors have even been tempted to check their email on computers when students are working. This is a real turn off to our students.

» “Foster discovery”—subtly guide students. This means “don’t find the answers for them.” Instead, help them find the answers and solutions.
Facilitating Student Discussions

Facilitation is a learned art. STEM mentors tend to improve and get more comfortable over time. Here are a few key points to remember as you start out:

» Praise and affirm students. Remember that these students may not get praised often. So, in team discussion, as well as elsewhere, find what’s right with them, not what’s wrong. One strategy is to think about one positive thing about each mentee during each session, and share that praise with them.

» Never demand that students share. Especially at first, there are some students that are really afraid to talk in groups. Never demand that they share. If they decline, you can say something, like, “that’s okay, just jump in there later if you feel like it.”

» Don’t call out a student’s shyness. If someone is shy, don’t say, “Oh, you’re shy—you don’t have to share.” Calling out someone’s shyness can make them even more sensitive.

» Don’t probe into their personal life. Both in groups, and individually, don’t try to dig deeply into a student’s business. You might “open them up” and not know what to do afterwards.

» Don’t discuss students’ deep issues in group. If a student brings up a deeply sensitive issue in group, try to get them to wait and talk to you after group, and then follow up. Examples of sensitive subjects are: pregnancy, someone committed a crime, or abuse or neglect.

» Hold back on giving advice. This goes along with the definition of “mentor.” Work to “foster discovery.” Remember, mentoring is helping students to make up their minds. They have enough adults telling them what to do.

» Watch your own self-disclosure. If you go deeply into your own problems and issues, even to give a young person hope, 1) it takes the focus off of them, and 2) they may be wondering why such an unstable person is mentoring them.

» You don’t have to be perfect- facilitation is a learned art. Even if you say or do the wrong thing, if students see your heart is in the right place, they will forgive you.

Communication Skills

There are four communication tools that can help facilitate working with students: active listening, non-directive approach, open questions, and paraphrasing.

Active listening. Active listening simply means you put a great deal of effort into listening to what a student is trying to say. In fact, you almost strain. Those who do
this for a living, for example counselors, say they know they’ve been engaged in active listening because they expend energy—listening actively can be tiring.

*Non-directive approach.* The non-directive approach is just another reminder to not tell students what to do. It is disempowering to these young people to always be directed. Remember, mentoring is about helping students to make up their minds, not making their minds up for them. A non-directive strategy would be to ask questions, which leads us to the next tool.

*Open questions.* These are questions that cannot be answered with a yes or no. Yes or no answers are conversation-enders. For example, instead of saying, “Do you think you could do better in this exercise if we did it again?,” a mentor could say, “Give me a few ideas how you might be able to do this exercise better...”

*Paraphrasing (reflective listening).* Paraphrasing is also known as reflective listening because you reflect back what the student has just said to you. This is a great act of respect because it sends a signal to the young person that you are truly trying to understand them. Examples of paraphrasing lead-ins include: “It sounds like what you are saying is...” and “Correct me if I’m wrong, but it seems like you are feeling...”

**Handling Difficult Students**

Sometimes students will get disruptive in groups. To combat these issues, consider the following tools. Of course, your STEM Mentor Coordinator is always available to help if these situations arise.

» *Formalize rules with a team exercise.* Team Exploration Activity #4 (see page 37), “Team Commitment Forms,” provides an opportunity for students to formalize their own rules. This is a good strategy because most students will be more receptive to abide by rules that they and their cohorts have come up with. You may choose to conduct this activity at the start of your program.

» *Review the Rules (Catch All: “No Disruptive Behavior”).* The first thing you can do, with an individual or with the entire group, is to review the rules. In addition to the rules the students create for themselves, make sure that they are told up front that they can’t be disruptive in the groups. “No disruptive behavior” is a catch-all phrase that you can reiterate.

» *Plea for fairness and respect.* As simple as this seems, some students will respond to a plea for fairness.

» *Make a plan with co-mentors.* Work with your co-mentors to make a plan to take disruptive students aside. Students can be taken aside before, during, or after sessions.
» Contact the mentor coordinator. If you have tried some of these strategies and they haven’t worked, or if disruptions have been serious or frequent, let your STEM mentor coordinator know, right away.

**Mentor Debriefs and Activity Logs**

Debriefing sessions will be held directly after each team meeting. This time is for you to get feedback and to provide support to your fellow mentors.

These 30 minute sessions will typically include

- Summary of Club Meeting
- Student Concerns
- Curriculum Issues and Ongoing Training on Specific Subjects
- Preparation for Next Week’s Session
- Updates
- School Information, Field Trips, Events, Etc.

These debriefing sessions have proven themselves so essential to the success of our program that attendance is mandatory.

In addition, you will be asked to complete a STEM Mentor Activity Log after each club meeting. An example of a STARBASE 2.0 STEM Mentor Activity Log is provided on page 27.

**Possible Month-to-Month Expectations**

**Month One**

For the first month, most of your STARBASE 2.0 students will be attending because they either attended STARBASE last year or they heard about STARBASE 2.0 from a friend. In other words, they are excited to do STEM projects. In the first month, you will want to introduce the project(s) early on, giving students a reason to come back for more the next time. By the end of month one, all team members should know their assignments on the project(s) and their role on the team.

If you have any questions regarding planning or implementation of your STEM Navigation projects, talk to your STEM mentor coordinator.

**Month Two**

In month two, you will be settling into your project work and beginning to apply real-time lessons about teamwork and communication. As a team, both students and STEM mentor team members should share how they have made progress on
their seven-day goals and celebrate even the smallest achievements with warm encouragement and positive reinforcement.

No matter what project or projects your STARBASE 2.0 team selects, by this time you will be well underway, with roles assigned and students and STEM mentors engaged in specific assignments. If you have new members joining the club this month, take the extra time necessary to get them up to speed with the project(s) goals, the team norms, and their specific assignments.

**Month Three**

You may begin to experience some bumps along the way in month three, as the team plays out the natural “storming” part of relationship building. As the team encounters challenges, the Team Exploration and Map It! activities can reinforce team identity, communication skills, and the importance of relationships and role models.

You may want to revisit the Team Commitment Form and the group values you agreed on early in the club’s meetings and continue to find opportunities to reinforce your team’s identity. Because your project work is well underway and you have worked to establish a team identity, the group should be closed to new members at this time.

If you are working on a project that is in partnership with another group or as part of a national competition, at this stage you will want to ensure that you are on track with the requirements of that other organization.

Work with your STEM mentor coordinator to find interesting ways to communicate with parents about the individual and group achievements of their children. If you have been taking pictures of group projects and activities throughout, you might find a way to use these pictures in a newsletter to families.

**Month Four**

Cooperation, teamwork, and communication will be critical to the advancement of project goals at this time. Team Exploration activities emphasize these elements as well as provide additional opportunity for career awareness and learning more about each STEM mentor. The MAP It! exercises tie these aspects together by providing a safe setting to share with each other and explore personal interests.

You are just passing the midway point now for your projects. Take the time with your groups to assess your progress as a team and as individual contributors. You may consider providing team members the option of switching assignments to try out new roles and learn new skills. Take the time as a mentoring team to fully debrief the informal matches that have taken place and determine if groups should be reformed based on these alignments.
Month Five

In the fifth month, you will be in the final stages of your projects and getting ready to showcase your achievements. At this point, the emphasis is on looking at assets and opportunities outside of the individual and even outside of the group.

As you enter the final stretch of your projects, focus on the finish line! You may need to take on the role of cheerleader, coach, and facilitator to support the team in completing their projects. Keep in mind the objectives of STARBASE 2.0: to increase STEM interest and knowledge, reduce high-risk behavior, increase engagement with school, and increase career awareness.

Month Six

In the final month, you will be finishing up your projects and concluding your program for the year. The focus should be on celebrating both individual and group achievements and encouraging students's newfound excitement for STEM disciplines.

Review one-on-one, in small groups, and in the large group how far everyone has come in the short time since the program started. Reinforce the goal-setting techniques and skills they have learned that they can use in the future.

In your mentoring relationships, this will be a time of mourning (ending) but also of morning (beginning). The program is ending, and the opportunity to explore new skills, knowledge, and relationships is just beginning.

STEM mentors may find it beneficial to hold group discussions regarding the sense of loss or disappointment in the program ending. Allow the teams to express this sadness, and provide time and guidance to the groups as they discuss the skills and knowledge they have gained that will help them in the future. This is also a good time to let them know they can come back next September to start the STARBASE 2.0 experience over again with new projects.

It is highly recommended that, in this month, you hold a final celebration in which you can showcase your project(s) to parents, teachers, and the rest of the school. This is a great opportunity to thank parents and other supporters of the program, give them a tangible picture of what their children have been doing in the club, and recruit students and other volunteers for next year.
STARBASE 2.0 STEM Mentor Activity Log

STEM Mentor Name: ____________________________________________________________

Entry Period:

Date of meeting: ___________________________ Length: ___________________________

Was the STEM mentor able to attend all scheduled meetings during the entry period?

☐ Yes  ☐ No

If no, please explain: _________________________________________________________

________________________________________

Below, please estimate the amount of time, in 15 minute increments, that you spent working or discussing the following items with your mentoring team during the entry period.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time Allotment</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEM Navigation</td>
<td></td>
</tr>
<tr>
<td>Team Exploration</td>
<td></td>
</tr>
<tr>
<td>MAPs</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

<table>
<thead>
<tr>
<th>Time Allotment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academics</td>
</tr>
<tr>
<td>Careers</td>
</tr>
<tr>
<td>Behavior</td>
</tr>
<tr>
<td>Attendance</td>
</tr>
</tbody>
</table>

Are there any other topics, not mentioned here, that you discussed with your mentoring team (please indicate time allotment)?

________________________________________

Who completed this form?  ☐ STEM Mentor  ☐ Staff

Signature: ___________________________ Date: ____ / ____ / __________
5. STEM Navigation

The STEM Navigation is the core component of the STARBASE 2.0 program. You will spend a majority of your time with students working on these projects, and as explained above, you will participate in choosing the project your program will work with. Offered here are three examples of how these large-scale projects might be organized week-by-week.

Lego Mindstorm Robotics Example

Meeting Schedule: Once a week for 1 hour
Project: Build and program a robot to complete a series of tasks.

<table>
<thead>
<tr>
<th>Week #</th>
<th>STEM Navigation Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduce Lego Mindstorm. (Time permitting, students can organize the pieces, or pieces can be organized before the meeting.)</td>
</tr>
<tr>
<td>2</td>
<td>Build Pages 8-12</td>
</tr>
<tr>
<td>3</td>
<td>Build Pages 13-22</td>
</tr>
<tr>
<td>4</td>
<td>Show the Students the Lego Computer Program</td>
</tr>
<tr>
<td>5</td>
<td>Let the Students practice with the Lego Computer Program</td>
</tr>
<tr>
<td>6</td>
<td>Computer Program the robots to let students discover the different ways of programming the functions rather than on the robot itself to increase the functions limit.</td>
</tr>
<tr>
<td>7</td>
<td>Build Pages 24-27 and then have students program using new piece of robot.</td>
</tr>
<tr>
<td>8</td>
<td>Build Pages 28-31 and then have students program using new piece of robot.</td>
</tr>
<tr>
<td>9</td>
<td>Build Pages 32-39 and then have students program using new piece of robot.</td>
</tr>
<tr>
<td>10</td>
<td>Build Pages 40-45 and then have students program using new piece of robot.</td>
</tr>
<tr>
<td>11</td>
<td>Guest Speaker</td>
</tr>
<tr>
<td>12</td>
<td>Build Pages 46-49 and then have students program using new piece of robot.</td>
</tr>
<tr>
<td>13</td>
<td>Build Pages 50-61 and then have students program using new piece of robot.</td>
</tr>
<tr>
<td>14</td>
<td>Build Pages 62-68 and then have students program using new piece of robot.</td>
</tr>
<tr>
<td>16</td>
<td>Practice for the STEM Navigation Exhibit</td>
</tr>
</tbody>
</table>
PTC - ProEngineer Flashlight

**Meeting Schedule:** Once a week or once every other week for 4 hours

**Project:** This is a project that has the students design and manufacture a flashlight. The project provides students with an understanding of the product development process employed in many of today’s leading design and manufacturing companies around the world.

<table>
<thead>
<tr>
<th>Week #</th>
<th>STEM Navigation Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduce Computer, Mouse, Icons (tools to be used). Draw circles, give dimensions and extrude.</td>
</tr>
<tr>
<td>2</td>
<td>Task # 5 – Build Button</td>
</tr>
<tr>
<td>3</td>
<td>Tour</td>
</tr>
<tr>
<td>4</td>
<td>Task 6 &amp; 7 - Begin Top</td>
</tr>
<tr>
<td>5</td>
<td>Task 8 &amp; 9 - Shell Top, Build Nozzle</td>
</tr>
<tr>
<td>6</td>
<td>Task 10 &amp; 11 - Button Guide, Snap Clips</td>
</tr>
<tr>
<td>7</td>
<td>Task 12, 14, &amp; 15 - Add Name, Begin Base Building</td>
</tr>
<tr>
<td>8</td>
<td>Task 16 &amp; 17 - Create Nozzle, Create Quarter Groove</td>
</tr>
<tr>
<td>9</td>
<td>Tour - 3D Printer at TANG</td>
</tr>
<tr>
<td>10</td>
<td>Task 18 &amp; 19 - Create LED Mount, Create LED Hole</td>
</tr>
<tr>
<td>11</td>
<td>Task 20 &amp; 21 - Create Battery Mount, Add Snap Clip Post</td>
</tr>
<tr>
<td>12</td>
<td>Task 22 &amp; 23 - Create Fins, Add Logo</td>
</tr>
<tr>
<td>13</td>
<td>Exploring CAD</td>
</tr>
<tr>
<td>14</td>
<td>Exploring CAD</td>
</tr>
</tbody>
</table>
## Scalextric4Schools

**Meeting Schedule:** Twice a month for 2 hours  
**Project:** Design, market, and race a slot car.

<table>
<thead>
<tr>
<th>Week #</th>
<th>STEM Navigation Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Scalextric and Creo Elements/Pro (Pages 5-12)</td>
</tr>
<tr>
<td>2</td>
<td>Create Generic Car Body Part 1 (Pages 13-28)</td>
</tr>
<tr>
<td>3</td>
<td>Create Generic Car Body Part 2 (Pages 29-42)</td>
</tr>
<tr>
<td>4</td>
<td>Create Mold of Generic Car Body (Pages 43-55)</td>
</tr>
<tr>
<td>5</td>
<td>Analysis and Testing of Generic Car (Pages 57-68)</td>
</tr>
<tr>
<td></td>
<td>Math and Science Part 1 (<a href="#">Design Reference Guide</a> - Pages 6-16)</td>
</tr>
<tr>
<td>6</td>
<td>Testing Generic Car on the Track (Page 69)</td>
</tr>
<tr>
<td></td>
<td>Math and Science Part 2 (<a href="#">Design and Reference Guide</a> - Pages 6-16)</td>
</tr>
<tr>
<td></td>
<td>Teams Sketch Re-design Car (Pages 70-71)</td>
</tr>
<tr>
<td>7</td>
<td>Re-design Car Body and Update Mold (Pages 72-83 and Pages 93-95)</td>
</tr>
<tr>
<td></td>
<td>Introduce Scalextric Design Engineer (<a href="#">Design Reference Guide</a> - Pages 20-25)</td>
</tr>
<tr>
<td>8</td>
<td>Data Analysis of Re-design Car (Pages 84-92)</td>
</tr>
<tr>
<td></td>
<td>Begin Marketing Poster</td>
</tr>
<tr>
<td>9</td>
<td>Test Re-design Car on the Track and Compare Results</td>
</tr>
<tr>
<td></td>
<td>Finish Marketing Poster and Begin PowerPoint Presentation</td>
</tr>
<tr>
<td>10</td>
<td>Finish PowerPoint Presentation and Practice Presenting</td>
</tr>
<tr>
<td>11</td>
<td>STEM Speaker / STEM Tour</td>
</tr>
<tr>
<td>12</td>
<td>Practice Presentations and Record Official Lap Times</td>
</tr>
<tr>
<td>13</td>
<td>Present Car, Poster, and PowerPoint to Panel of Judges</td>
</tr>
<tr>
<td>14</td>
<td>Race Day! Awards Ceremony with Family and Friends</td>
</tr>
</tbody>
</table>
6. Team Exploration Activities

1. Balloon Ice Breaker (15-20 minutes)
2. A Tangled Web (15-30 minutes)
3. Fifty Things to Do (30 minutes)
4. Team Commitment Forms (30 minutes)
5. Career Exploration Field Trip (45-90 minutes)
6. Similarity/Diversity Wheel (30 minutes)
7. Minefield (45-60 minutes)
8. One Body (30 minutes)
9. Group Invention Game (30 minutes)
10. The Gifts We Share (30 minutes)
11. A Tangled Web Revisited (30 minutes)
12. Getting to Know You Better (20-30 minutes)
13. Who Am I (20-30 minutes)
14. Keep Communicating (15-20 minutes)*
15. Helium Stick (15-30 minutes)
16. Puzzle Me This (15-20 minutes)*
17. The Cube (20-30 minutes)

*Has corresponding MAP It! activity.
1. **Balloon Ice Breaker**

   **Time:** 15-20 minutes  
   **Objective:** Students and STEM mentors learn each other’s names and begin to feel comfortable with each other.  
   **Materials:** One large balloon

   1. Have everyone stand in a circle, then bump the balloon to someone and say, “Let’s see how long we can keep this off the ground.” Most groups will be able to keep it up indefinitely. Make some small talk while this is going on.

   2. Next, ask everyone to introduce himself while keeping the balloon in the air. Keep it simple: their name, their call sign, and their grade.

   3. Once everyone has had the chance to introduce themselves, ask all participants to keep the balloon going, but now with their hands behind their backs, keeping the balloon aloft with their heads, feet, shoulders, etc.

   4. Introduce the next level of complexity by randomly eliminating members. The people called out get to come back in as soon as the next person is called out, but if someone who isn’t supposed to touch the balloon touches it, they are eliminated.

   5. There are a number of variations on this activity. For example, you can have someone who is eliminated call out the names.

**The Take-Away:**

Getting to know each other is fun and sometimes a little crazy. And, it is important! To work together as a team, we need to be able to know each other by name and be comfortable with each other.
2. A Tangled Web

1. Gather students and STEM mentors in a circle on the floor. Hold a large ball of yarn. Start by telling the students something about yourself. Then, roll the ball of yarn to someone without letting go of the end of the yarn.

2. The person who gets the ball of yarn tells their name and their grade or favorite food. Then, they roll the yarn to someone else in the group, holding onto the strand of yarn.

3. Soon the team has a giant web. After everyone has had their turn, everyone should stand up, continuing to hold the yarn.

The Take-Away:

While standing, talk about how this activity relates to the idea of teamwork – for example, we all need to work together and not let others down. To drive home your point about teamwork, have one student drop their strand of yarn. This will demonstrate to students how the web weakens if the team isn’t working together.

Time: 15-30 minutes

Objective: Students learn something new about each other and begin to explore the importance of teamwork.

Materials: One large ball of yarn
3. Fifty Things to Do

Time: 30 minutes

Objective: As a result of this session, students will be able to explain the importance of setting SMART goals.

Materials: “Fifty Things to Do” essay (attached)

1. Read to group or hand out printed copies of “50 Things to Do” essay.

2. Ask students what they noticed about the different things on the author’s list of things to do. Answers may include that her goals covered many areas (academic, travel, service, family.)

3. Ask students some of the challenges the author identified, and how she approached those challenges.

4. Introduce the concept of SMART goals.

   S Specific
   A general goal would be, “Get in shape.”
   A specific goal would say, “Workout 3 days a week.”

   M Measurable
   Ask questions such as…How much? How many?
   How will I know when it is accomplished?

   A Attainable
   When you identify goals that are most important to you, you begin to figure out ways you can make them come true.

   R Realistic
   To be realistic, a goal must represent an objective toward which you are both willing and able to work.

   T Time-bound
   Set a date for completion.

The Take-Away:

Goal setting is an important skill to develop in order to grow, discover, and experience all that life has to offer.
“Fifty Things To Do”  
by Wendy Swallow William  

A few weeks ago I followed a friend into an art-supply store. I found him picking out tubes of water-color paint, which surprised me because he is not an artist.

“I signed up for a water color class, and it starts next week,” he said sheepishly. “I don’t really have time for it, but was on my list of 50 things to do before I die, so I went for it.”

This sounded interesting. “What else is on the list?” I asked.

“All kinds of things,” he said. “Every few months I look at the list and decide what to focus on next. Before I had the list, I moaned a lot about what I was missing in my life. Now, I just do stuff.”

“Can I see your list sometime?” I asked.

“I don’t know,” he said. “It reveals a lot about me. Write your own list, and you will see what I mean.”

So, that night I did just that, and he was right. The list revealed a whole lot about what was important to me. It also revealed how hopelessly behind I am at getting to the things I really want.

Just writing the list helped me sort through priorities. I filled up the first 20 blanks quickly, but then began thinking carefully. Eventually, I added items I’ve thought about for years, dreams I’ve carried with me since I was young, and things that resonated when I first heard about them. When, I reviewed the list later, some entries surprised me.

First, I want to travel much more, particularly now that my children are older and can go with me to see the world. There are ten trips I would like to make with my boys - from biking through Denmark to camping in the Canadian Rockies.
I also was surprised to find some things on the list that need to be done soon. If I’m going to learn to Rollerblade for instance, I’d better start before I turn 50.

Some items I thought I can put off until I’m older. I would love to grow flowers, to really garden, but while I am raising the kids, I don’t have time for roses.

I would love to do volunteer work in the hospital nursery someday, rocking crying infants and giving them their first baths. I would like to work with teenagers, leading youth groups, or helping at the local school. If I’m going to do these, I may need to reconsider running the bake sale for the school fair each year.

A few of the items are intimidating because they mean a serious commitment of some sort. I would like to publish a novel before I die, and I would like to get a Ph.D. in English literature. I also would like to learn to draw and play the piano with a string quartet. If I’m going to accomplish these things, I need to start writing every day and polishing my piano skills.

I may not make it through the list. Some things may just be out of reach, such as New Zealand, and others ultimately may not work with the rest of my life, such as owning a horse. Yet, I see that I already built the frame work for many of those pipe dreams, and that if I make them goals today, there’s no reason I can’t find a way to taste at least part of that reality tomorrow.

Like my friend, I now have an alternative to complaining. When I’m bored with my life, I take out my list. Maybe I’ll send off for travel brochures or take my pencils out in the backyard and doodle for an hour, trying to sketch trees that look like trees.

I have no idea how the boys and I will go to Africa, but if it’s important enough, we’ll find a way. I might become a nature writer and get sent on assignment, or maybe we just save our money till we have enough.

I have a cousin who accomplished an amazing string of interesting things. She told me the key was preparing so that life could work in mysterious ways. “If you want your ship to come in, you must build a dock,” she said.

Thanks to my list, I’m working on some big docks.
Team Exploration Activity

4. Team Commitment Forms

Time: 30 minutes
Objective: Students will begin to establish a team and identify and define the rules for their team.
Materials: A flip chart, whiteboard, or chalkboard; markers; team commitment forms (attached)

1. Move chairs into a large circle. Ask the students, “What are some of the things we would need to do to be the best team possible?” Encourage them to brainstorm many ideas.

2. Capture their comments on a flip chart, whiteboard, or chalkboard. Examples might include respect for each other, timeliness, etc.

3. Keep going until there are at least ten things on the board.

4. Have them select the top five rules for their team by voting on each sequential pair and moving the winning vote to the top, until you have given selected.

5. Write these rules on the team commitment form.

6. Ask the students how they feel about the five rules. Ask them what it means to make a commitment to those rules.

7. Have each member sign the team commitment form.

The Take-Away:

Working together as a team requires a common set of expectations. With these rules that we agreed to, we are making a commitment to each other and to our team.
Team Exploration Activity

Team Commitment Form

Team Name: ____________________________________________________________

Team Rules
We have agreed to the following rules that will help us to be the best team we can be:

1. ___________________________________________________________________

2. ___________________________________________________________________

3. ___________________________________________________________________

4. ___________________________________________________________________

5. ___________________________________________________________________

Team Members
We agree to participate in STARBASE 2.0 and to honor our commitment to attend all activities and support our team members.

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

Signature  Date  Signature  Date
Team Exploration Activity

5. Career Exploration Field Trip*

Time: 45-90 minutes (depending on whether the trip requires transportation or is done virtually.)

Objective: Students will learn more about one of their STEM mentors and expand their awareness or career options in the STEM professions.

You may choose to conduct this activity as a literal or virtual field trip, depending on time, resources, and transportation options. If a regular field trip is planned, make sure you follow proper protocol for your school regarding permission slips, transportation, etc.

Select one STEM mentor to give a guided tour of their work. The more hands-on and interactive the demonstration, the more interesting and engaging it will be for the students. If the group ends up going to the actual place of work, the STEM mentor should show where they do most of their work (office space, desk, lab, classroom, farm, shop, etc.) and give a demonstration of what their work entails. This can be done virtually by having the STEM mentor attend the meeting dressed as they would to work and bringing in their tools of the trade and demonstrating how they are used. The STEM mentor may also consider introducing students to colleagues through a PowerPoint presentation, video, or web-cam.

If the STEM mentor leading the field trip this month is a science or math teacher that works in the school (i.e: the students see them at work often and are familiar with some of what they do), they may want to show an aspect of their work that the students wouldn’t normally be exposed to, such as preparing for a lab experiment, cleaning up the classroom, or grading papers.

The Take-Away:

At the end of the activity, have a discussion with the group about what they learned, what about the demonstration/field trip interested them, and how they might apply what they learned in their group project or in their personal MAPs.

*This activity can be repeated, each time focusing on a different STEM mentor’s career.
1. Have the group move chairs to form a circle. Draw a large copy of the Similarity/Diversity Wheel (attached) on a poster board or flip chart paper.

2. Have the group find five ways in which all members of the team are similar. The qualities that the team searches for should not be overly obvious, such as, “We are all human beings.” Ask them to probe for important facts that may not be readily apparent to an outsider looking in on the team, such as, “We all like Astronomy.” It is most important that the list of similarities reflect something that is true of every team member.

3. Once all the similarities have been identified, as the group to being exploring ways in which each individual is unique. You might lead the discussion by offering something that you believe is unique about you, such as, “I scuba dive.” If no other member can make this same statement, write your name on one of the spokes of the wheel along with the phrase “scuba diver.” In a similar way, go around the circle until each team member adds his or her unique contribution.

4. Ask one person to summarize for the group the similarities and differences seen on the wheel.

**The Take-Away:**

Discuss the following questions with the group:

- Was it more difficult to identify the similarities or unique qualities?
- Why are similarities important for a team?
- Why are differences important for a team?
Team Exploration Activity

Similarity/Diversity Wheel

One way we are each unique on this team:

Five ways we are all similar on this team:

1.
2.
3.
4.
5.
Team Exploration Activity

7. Minefield

**Time:** 45-60 minutes

**Objective:** Students and STEM mentors will build trust in each other in a fun, interactive way that nurtures good communication skills and sets the groundwork for productive teamwork throughout the year.

**Materials:** Markers or lengths of rope to indicate the boundaries (e.g. 50 yard rectangular field); bowling pins or many soft objects, such as larger balls, items to be used as “mines”; blindfolds

1. To set up, select an appropriate area. Go outside, if possible. However, this activity can be done inside, even in rooms with fixed furniture (which can become objects to be avoided). Distribute “mines” (e.g. balls or other objects such as bowling pins, cones, foam noodles, etc.)

2. Have participants operate in pairs, one taking on the role of “follower” and the other as “coach.” The follower is blindfolded (or keeps their eyes closed) and cannot talk. The coach can see and talk, but cannot enter the field or touch the other person. It can help participants if you suggest that they each develop a unique communication system. When participants swap roles, give participants some review and planning time to refine their communication method.

3. Allow participants to swap over and even have several attempts, until each party develops a sense of skill and competence in guiding their partner throughout the “minefield.” The activity can be conducted one pair at a time or with all pairs at once. Conducting the activity with multiple pairs at one time can help to create a more demanding exercise due to the extra noise/confusion.

4. Explain to participants the following points:
   - The challenge is for each blind-folded person to walk from one side of the field to the other, avoiding the “mines” by listening to the verbal instructions of their partners.
   - You will have a short period (e.g. 3 minutes) or planning time to decide on your communication commands, and then begin the activity.
   - The penalty for hitting a “mine” is to start back at the beginning.

5. Conduct the activity.
7. **Minefield (Cont.)**

6. Break for a few minutes to regroup.

7. Tell the pairs to switch roles – they will have three minutes to discuss communication strategies again. Then, start the activity.

8. Once the activity is complete, ask each pair the following questions:
   - On a scale of 1-10, how much did you trust your partner at the start?
   - On a scale of 1-10, how much did you trust your partner at the end?
   - What is the difference between going alone and being guided by another?
   - What ingredients are needed when trusting and working with someone else?
   - What did your partner do/say to help you feel safe and secure?
   - What could your partner have done to help make you feel more safe/secure?
   - What communication strategies worked best?
   - How important was effective communication?
   - Were you ever so frustrated you wanted to quit? How did you keep going?

**The Take-Away:**

There are three components that help to make this activity a success. Those three components are also vital in a mentoring relationship. Ask team members what they think those components are. Prompt for trust, communication, and commitment.
8. One Body

Time: 30 minutes

Objective: Team members will appreciate each individual’s contributions to the team.

Materials: A large sheet or paper, a black marker, colored markers or crayons

1. Lay out the sheet of paper on the ground.
2. Trace a different body part from each person to create one complete body.
3. After a group body has been created, allow the group to color in the body and create one person.
4. Talk about the following questions:
   - How was each person able to contribute to the body?
   - What do you like about being part of the group?
   - What don’t you like about it?
   - How can others in the group help you?

The Take-Away:

Every person brings their own unique contribution to the group. Because of each special element, the things a group can make together can be very creative and unique as well.
9. Group Invention Game

**Time:** 30 minutes

**Objective:** Students and STEM mentors will practice using their imaginations and teamwork skills.

1. Divide participants into groups of five.
2. Create a list of objects that a group can “create” using only their bodies (e.g. orange juicer, marshmallow making machine, robot, helicopter, shower, etc.). Each invention must include everyone in the group. It may be moving or still.
3. Let each group pick from that list of objects which machine they will invent.
4. Give all the groups fifteen to twenty minutes to complete their machines. Encourage them to brainstorm for a few minutes the best way to develop their machine. Creativity is the key!
5. Once the time is up, get each group to show how their machine works.
6. Give silly “awards” to the most inventive or noisiest or most bizarre.
7. After the game is over, ask the group these questions:
   - Did everyone feel included? How or how not?
   - How did you decide which invention to make in your group?
   - What are some good ways to make decisions in a group?

**The Take-Away:**

The process of inventing and discovery can be great fun, and it requires teamwork and creativity. Decision-making is an important skill in working as a team.
10. The Gifts We Share

**Time:** 30 minutes

**Objective:** Students and STEM mentors will express appreciation for each other and identify positive attributes in each other and themselves.

**Materials:** A pen and paper for each participant.

1. Distribute a pen and piece of paper to each participant. Instruct participants to draw an outline of a gift on the paper and to write their names at the top of the page.

2. Discuss the gifts that we give each other. We think of tangible things as gifts, but the gifts we give each other in STARBASE 2.0 are different. Gifts can include having a sense of humor, a special talent, listening carefully, and expressing our feelings in a healthy manner.

3. Participants then pass their papers one person to their left and record the “gift” that person represents.

4. Once everyone has written something down, pass the papers to the next person.

5. At the end, everyone has a list of positive comments about themselves.

**The Take-Away:**

Recognizing and acknowledging positive things in others and ourselves is an important part of ongoing relationships and personal well-being. As we move beyond this experience of STARBASE 2.0, we can take these gifts with us.
Team Exploration Activity

11. A Tangled Web Revisited

Time: 30 minutes

Objective: Students will appreciate the positive lessons learned in the club and visualize how they take those lessons with them.

Materials: A large ball of yarn, scissors

1. Gather students and STEM mentors in a circle on the floor. Hold a large ball of yarn. Start by telling team members something you learned about yourself, something you are proud of, or something you’ll remember as a result of STARBASE 2.0. Then, roll the ball of yarn to someone else without letting go of the end of the yarn.

2. The person who gets the ball of yarn tells something they learned, are proud of, or will remember. Then, they roll the yarn to someone else until everyone else has had a turn.

3. Soon, you will have created a giant web. Go around as many times as you like. Once everyone has had at least one turn, summarize some of the goals the group has met.

4. Cut the web apart and discuss how each person has contributed to the group. Each participant will have a piece of yarn to take with them and remind themselves of the positive lessons they learned in STARBASE 2.0.

The Take-Away:

After this closing session, we will no longer be working together as a team, but the lessons we learned and the friendships we made will go with us wherever we go.
12. Getting to Know You Better

**Time:** 20-30 minutes

**Objective:** As a result of this activity, students will build greater levels of comfort and cohesiveness as a team by getting to know each other better.

**Materials:** List of questions for STEM mentor to read.

1. Have the group get into their mentoring teams.
2. The STEM mentor will ask his/her group four of the following questions.
3. Each person will have a turn to share his/her opinion.

**“Getting to Know You” Questions:**

- What is your favorite food? Least favorite food? The best meal you ever had?
- What is the funniest thing that happened to you this week?
- What is your favorite place in your neighborhood? Scariest place?
- What is your most prized possession? Why?
- Who is your favorite relative? Why?
- What is your favorite subject in school?
- What do you like to do on school vacation days?
- What was your best Halloween costume?
- What is your favorite type of music? Group/singer?
- If you were an animal, what would you be?
- What is the worst storm you were ever in?
- What is your favorite thing to cook?
- What do you do on a snow day?
- What is your middle name? Do you like it?
- What is your favorite sport to play? To watch?

You could extend this activity by graphing the different answers to questions. Share with the entire group some of your interesting findings about your team members.

**The Take-Away:**

By sharing parts of ourselves, we allow team members to see our personality. When team members know each other better, their levels of comfort and trust can increase, making it easier to accomplish challenges.
Team Exploration Activity

13. Who I Am

Time: 20-30 minutes

Objective: After completing this activity, students will know each other better and, as a result, increase their comfort levels when working together.

Materials: Checklist (handout attached) and writing utensil for each student.

1. Pass out a checklist to each person.
2. Have them check off five things that would describe themselves.
3. When everyone is finished, collect the papers, assemble into a circle, and take turns reading what was checked on each sheet. Each person will have a chance to read one of the sheets.
4. The group is to guess who each paper belongs to.

The Take-Away:

When team members know each other better, their levels of comfort and trust can increase. They are less like strangers and more like colleagues and friends. A greater level of comfort among team members can help foster open communication for problem-solving.
Team Exploration Activity

I am someone who...

☐ Cries at movies
☐ Can speak a foreign language
☐ Sings in the shower
☐ Likes to dance
☐ Takes dance lessons
☐ Is good at math
☐ Slurps my soup
☐ Talks to plants
☐ Listens to music full-blast
☐ Eats dessert first
☐ Daydreams a lot
☐ Sends or makes cards for friends
☐ Like thunderstorms
☐ Likes to walk in the rain
☐ Hates flying in a plane
☐ Loves flying in a plane
☐ Loves science and doing experiments
☐ Likes to play practical jokes
☐ Loves to do crossword puzzles and word searches
☐ Likes to play soccer
☐ Has grandparents who live in this town
☐ Would like to skydive
☐ Has a pen pal
☐ Knows martial arts (Karate, Judo, etc.)
☐ Plays the guitar
☐ Is in band

☐ Loves popcorn at movies
☐ Sleeps as late as possible
☐ Closes my eyes at horror movies
☐ Makes a “to-do” list every day
☐ Likes to read the comics before the front page of the paper
☐ Cheats at games
☐ Wants to go to college
☐ Has a teddy bear in my bedroom room
☐ Took a vacation out of town last summer
☐ Has seen mountains
☐ Has seen the ocean
☐ Has been in a science fair
Team Exploration Activity

14. Keep Communicating

<table>
<thead>
<tr>
<th>Time:</th>
<th>15-20 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective:</td>
<td>As a result of this activity, students will have a gained practice with working together to solve a problem.</td>
</tr>
<tr>
<td>Materials:</td>
<td>Two-inch PVC pipe cut in 18-inch sections, tennis balls, two buckets. (Can also substitute flexible pipe insulation and marbles for PVC pipe and tennis balls)</td>
</tr>
</tbody>
</table>

The goal is for participants to move the balls from one end of the room to the other (or outside area, hallway, etc.) to the bucket at the other end, and then back.

Movement rules:
1. Each member of the team must handle the ball.
2. The ball must never stop moving in the tube. If it starts, the team must start over.
3. The ball must never fall out of the tube. If it falls, the team must start over.

Teams will need to strategize movement techniques, communicate, and function well together to complete this task.

Note: This activity has a corresponding MAP It! exercise entitled “Communicating Well with Others.”

The Take-Away:

Team members must communicate to work well together. It is important that each member understand the ultimate goal and help the team work toward that goal.
15. Helium Stick

Time: 15-30 minutes

Objective: After completing this activity, students will have a better understanding of how to communicate to overcome an unexpected challenge.

Materials: “Helium Stick”—a long, lightweight rod

Background: This is a deceptively simple but powerful exercise for learning how to work together and communicate in groups. The stick does not contain helium. The secret (which the facilitator must keep to him/herself until the end) is that the collective upward pressure created by everyone’s fingers tends to be greater than the weight of the stick. As a result, the more a group tries, the more the stick tends to “float” upwards.

1. Line up in two rows which face each other.
2. Introduce the Helium Stick—a long, thin, lightweight rod. Ask participants to point their index fingers and hold their arms out.
3. Lay the Helium Stick down on their fingers. Get the group to adjust their finger heights until the Helium Stick is horizontal and everyone’s index fingers are touching the stick.
4. Explain that the challenge is to lower the Helium Stick to the ground.
5. The catch: Each person’s fingers must be in contact with the Helium Stick at all times. Pinching or grabbing the pole in not allowed—it must rest on top of fingers.
6. Reiterate to the group that if anyone’s finger is caught not touching the Helium Stick, the task will be restarted. Let the task begin…
7. Warning: Particularly in the early stages, the Helium Stick has a habit of mysteriously floating up rather than coming down. A bit of clever humoring can help—act surprised and ask what are they doing raising the Helium Stick instead of lowering it!
8. Participants may be confused initially about the paradoxical behavior of the Helium Stick.
15. Helium Stick (cont.)

9. Facilitators may need to be particularly vigilant about extra fingers not touching the pole. Also, make sure participants lower the pole all the way onto the ground.

10. Eventually the group needs to calm down, concentrate, and very slowly and patiently lower the Helium Stick, which is easier said than done.

The Take-Away:

When groups face an unexpected challenge or things do not go the way they had planned, people can be tempted to just give up after a couple tries. Groups need to have patience and be willing to start again to accomplish a goal.
16. Puzzle Me This

**Time:** 15-20 minutes

**Objective:** As a result of this activity, students will have gained practice with working together to solve a problem. The activity also spotlights the strengths a visual learner brings to the team.

**Materials:** Interlocking floor mats (available at [www.commercialmatsandrubber.com](http://www.commercialmatsandrubber.com)): a set of 16 mats (4 of each of the 4 colors), one side plain, the other with a picture (4 sets of 4 with the same picture on each set of pieces—one red, one green, one blue, one yellow). The pictures can be of anything; tie them into your STEM activity.

The goal is for participants to complete the puzzle using communication and teamwork.

1. Using the plain side, the participants are to put the pieces together to form a square. No more than one piece of each color should be in each column of 4, row of 4, or diagonal of 4 mats.

2. Increase the difficulty by having the participants turn the mats over and complete the task without having a picture repeat in one row, column, or diagonal.

3. To further increase the difficulty, blindfold half of the group moving the pieces and have the other half talk them through the task.

*Note:* This activity has a corresponding MAP It! exercise entitled “Teaching Others.”

**The Take-Away:**

A team is strongest when it uses the strengths of its members to work toward a goal.
Team Exploration Activity

17. The Cube

**Time:** 20-30 minutes

**Objective:** A team is strongest when it uses the strengths of its members to work toward a goal.

**Materials:** Eight PVC connectors, 12 PVC tubing segments, small kitchen timer, extra masking tape to repair the boundaries if needed

*Note: If you have more than four people, use the second square and have two groups going at once.*

1. Read the following to students: You are a team of expert astronauts working on an EVA (Extra Vehicle Activity). Your mission is to repair a damaged structure located just outside the shuttle. You have eight (8) minutes to complete your mission. Before you begin, you will need to examine the picture of the structure you are to repair (see image below). Next, you will need to design a plan to repair the structure and then complete the repairs.

2. Explain to the students that there are certain difficulties astronauts face while working in space, and during this activity they will face several challenges too. The following are their limitations:

   a. They may not leave the corners of the square.

   b. They can use only the parts given to them. In other words, they may not pass the parts around.

   c. They may only use one hand. The students may choose which hand they want to use.

   d. The structure may not touch the ground.

   e. They have eight minutes to complete The Cube.

3. Show the students the picture of The Cube, so they can see what it should look like when completed. Give the students 2-3 minutes to come up with a plan. After the time is up, have one student stand in each of the four corners of the square on the floor. When they are ready, start the timer and have them begin to build The Cube.
17. The Cube (cont.)

4. When the students have completed The Cube, or when time has run out, sit them down and have a discussion about what happened.

When complete, the cube should look like this:

![Image of a completed cube]

The Take-Away:

A team must identify a problem and plan accordingly by gathering information and then enacting the plan. If it doesn’t work, a team must be prepared to start over. A team must foster open communication and patience among all members to complete a task. A challenge is not always solved or completed, and team members must learn from their mistakes to perform more cohesively in the future.
### 7. MAP It! Activities & Topics

<table>
<thead>
<tr>
<th></th>
<th>School</th>
<th>3 Subjects I like</th>
<th>4 things I’m good at</th>
<th>5 things I want to learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Responsibility</td>
<td>3 things I achieved in the past three weeks</td>
<td>4 barriers I overcame in the last 4 months</td>
<td>5 things I want to do in the next 5 years</td>
</tr>
<tr>
<td>3</td>
<td>Career</td>
<td>3 careers I’m interested in</td>
<td>4 people who can help me learn more about those careers</td>
<td>5 skills or traits that someone in those careers would have</td>
</tr>
<tr>
<td>4</td>
<td>Character Traits</td>
<td>3 things I admire in other people</td>
<td>4 positive traits in myself</td>
<td>5 ways I want others to describe me</td>
</tr>
<tr>
<td>5</td>
<td>Relationships</td>
<td>3 people who are important to me</td>
<td>4 people I want to know better</td>
<td>5 ways I can improve my relationships</td>
</tr>
<tr>
<td>6</td>
<td>Role Models</td>
<td>3 people I admire</td>
<td>4 things I admire about them</td>
<td>5 ways I can be more like them</td>
</tr>
<tr>
<td>7</td>
<td>Reading</td>
<td>3 books I like</td>
<td>4 things I like about them</td>
<td>5 books I would like to read</td>
</tr>
<tr>
<td>8</td>
<td>Hobbies</td>
<td>3 hobbies I am good at</td>
<td>4 hobbies I really enjoy</td>
<td>5 fun things I would like to try</td>
</tr>
<tr>
<td>9</td>
<td>Culture</td>
<td>3 places I’ve been</td>
<td>4 things I like about those places</td>
<td>5 ways I can learn more about those places</td>
</tr>
<tr>
<td>10</td>
<td>Neighborhood</td>
<td>3 people who care about me in my neighborhood</td>
<td>4 good things about my neighborhood</td>
<td>5 ways we could make our neighborhood better</td>
</tr>
<tr>
<td>11</td>
<td>Service</td>
<td>3 ways I’ve volunteered this month</td>
<td>4 things I’m good at that I can share</td>
<td>5 new ways I can serve</td>
</tr>
<tr>
<td>12</td>
<td>Positive Choices</td>
<td>3 ways I can say no to negative peer pressure</td>
<td>4 people who help me make good choices</td>
<td>5 good choices I can make this week</td>
</tr>
<tr>
<td>13</td>
<td>Fun</td>
<td>3 ways I have fun</td>
<td>4 things that make me laugh</td>
<td>5 fun things I want to do this school year</td>
</tr>
<tr>
<td>14</td>
<td>Friends</td>
<td>3 of my best friends are</td>
<td>4 traits I admire in my friends</td>
<td>5 ways to be a good friend</td>
</tr>
<tr>
<td>15</td>
<td>Happiness &amp; Joy</td>
<td>3 things that may me happy</td>
<td>4 ways others make me happy</td>
<td>5 things I can do to bring joy to others</td>
</tr>
<tr>
<td>16</td>
<td>Commitment</td>
<td>3 things I am committed to</td>
<td>4 ways others show a commitment to me</td>
<td>5 things I would like to be committed to</td>
</tr>
<tr>
<td>17</td>
<td>Communicating with Others</td>
<td>3 people with whom I communicate easily</td>
<td>4 tasks I’ve attempted for which I needed others’ help</td>
<td>5 things I can do to help myself communicate with others</td>
</tr>
<tr>
<td>18</td>
<td>Teaching Others</td>
<td>3 things I find difficult</td>
<td>4 things I think are easy</td>
<td>5 things I can teach others</td>
</tr>
<tr>
<td>19</td>
<td>Living Drug Free</td>
<td>3 negative things about drugs</td>
<td>4 positive adults I can go to with questions about drugs</td>
<td>5 positive things I can do in my free time instead of drugs</td>
</tr>
<tr>
<td>20</td>
<td>Living without Violence</td>
<td>3 ways to avoid violence</td>
<td>4 positive adults I can go to with a question or talk to about an experience with violence</td>
<td>5 ways to positively release anger and aggression</td>
</tr>
</tbody>
</table>
1. School

The MAP It activities follow the same 3-4-5 list technique, followed by a seven-day plan. To introduce the first MAP, hand out blank spiral ring notebooks to each student (or if you’ve told them to bring them ahead of time, ask them to take them out), and explain that these are their MAP journals. They will be responsible for bringing them to each meeting. Tell them to open their MAP journal and draw two lines down the page to create three columns.

**Column headers:**

<table>
<thead>
<tr>
<th>3 subjects I like</th>
<th>4 things I’m good at</th>
<th>5 things I want to learn</th>
</tr>
</thead>
</table>

Give participants (students and STEM mentors) five minutes to complete their lists. In the large group, have each student and STEM mentor share what they wrote down. This sharing activity should be voluntary; however, students should be encouraged to share their ideas. Also, encourage participants to make a note of others in the group who are good at things they want to learn.

Ask participants to pick one thing off of their list of “5 Things I want to Learn.” Tell them to set a goal for the next seven days that relates to that one thing. For example, if they want to learn about astronomy, they could set a goal to read an article about the planets.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors provide guidance on how to create realistic steps for achievement.
MAP It! Activity

2. Responsibility

This MAP It! activity ties back to Team Exploration Activity: “Fifty Things to Do.” Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

Column headers:

| 3 things I have achieved in the last 3 months | 4 barriers I’ve overcome in the last 4 weeks | 5 things I want to do in the next 5 years |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Ask participants to pick one thing off of their list of “5 things I want to do” and to set a goal for the next seven days that relates to that one thing.

Participants should write down in their MAP journals:

» My seven-day goal?
» What can I do today to work toward achieving my goal?
» What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors provide guidance on how to create realistic steps for achievement.
3. Career

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 careers I’m interested in | 4 people who can help me learn more about those careers | 5 skills or traits that someone in those careers would have |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct each member of the group to pick one thing from their lists and to set a goal for the next seven days that relates to that one thing. In this case, a goal could be about learning more about a particular career (column 1), connecting with an individual (column 2), or gaining new skills (column 3). Talk with the group about how knowledge, networks (who you know), and skills can all help a person to achieve their goals.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.
4. Character Traits

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

Column headers:

| 3 things I admire in other people | 4 positive traits I see in myself | 5 ways I want others to describe me |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct everyone to pick one thing from the third column (five ways I want others describe me), and to set a goal for the next seven days that relates to that one thing. As a group, discuss how although we may have certain tendencies and personalities, we can take responsibility for being the kind of person we want to be. Provide examples of specific short-term goals. For example, if someone wants to be described as “generous,” they can set a seven-day goal of volunteering to mow the lawn for their elderly neighbor.

Participants should write down in their MAP journals:

» My seven-day goal?
» What can I do today to work toward achieving my goal?
» What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

Have a discussion about how character traits relate to the STEM group project and to your goals. Ideas should include the concept that teambuilding, problem-solving, and creativity, among other traits are important to achieving personal and group goals.
5. Relationships

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 people who are important to me | 4 people I want to know better | 5 ways I can improve my relationships |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct each participant to pick one thing from the second or third column and to set a goal for the next seven days that relates to that one thing.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

Have a discussion with the larger group about how relationship goals relate to the STEM group project and to the other goals you have set in their MAPs. Talk about how getting along with others, conflict resolution, trust, and communication, among other relational skills, are important to achieving personal and group goals.
6. Role Models

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 people I admire | 4 things I admire about them | 5 ways I can be more like them |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct the group to each pick one thing from one of their lists and to set a goal for the next seven days that relates to that one thing.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

In the larger group, ask, “Why is it important to identify role models in your life?” Prompt for: helps you identify priorities, they can help with other goals, etc.
7. Reading

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 books I like | 4 things I like about them | 5 books I’d like to read |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct the group to pick one thing from one of their lists and set a goal for the next seven days that relates to that one thing. If they had trouble selecting five books they would like to read, you could have them regroup with others who have similar ideas listed under “4 things I like about them.”

For instance, all the team members who wrote down “scary” or “magical” in that column could sit together and tell each other about the three books they like. You also might suggest that a seven-day goal could be to ask a librarian (or parents, friends, teachers) for suggestions of books that are similar to column one or have characteristics of the second column.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

In the large group, talk about how reading books they like prepares them to be life-long learners and provides a way to explore new worlds.
8. Hobbies

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 hobbies (sports, crafts, music, etc) I’m good at | 4 fun things I would like to get better at | 5 new things I would like to try |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct the group to each pick one thing from one of their lists and to set a goal for the next seven days that relates to that one thing.

**Participants should write down in their MAP journals:**

» My seven-day goal?
» What can I do today to work toward achieving my goal?
» What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

Ask the group, “why are hobbies important to your STEM/career goals?” Talk about how hobbies can point to some previously overlooked opportunities. See [http://www.thefunworks.org/](http://www.thefunworks.org/) to explore STEM careers in surprising places (e.g. sports doctor, acoustical engineer, cosmetics chemist).
9. Culture

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 places I’ve been | 4 things I liked about those places | 5 ways I can learn more about those places |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct the group to each pick one thing from the third column, or pick a place they would like to visit. Set a goal for the next seven days that relates to that place or thing.

**Participants should write down in their MAP journals:**

» My seven-day goal?

» What can I do today to work toward achieving my goal?

» What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

In the larger group, discuss how cultural exploration aids in long-term goals and group projects. Talk about how appreciating diversity helps in teamwork, life-long learning, etc.
10. Neighborhood

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 people who care about me in my neighborhood | 4 good things about my neighborhood | 5 ways we could make our neighborhood better |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct the group to each pick one thing from one of their lists and to set a goal for the next seven days that relates to that one thing.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

In the larger group, ask, “How does your neighborhood goal relate to our project and your other goals?”
11. Service

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 ways I have volunteered this month | 4 things I am good at that I can share | 5 new ways to serve |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct the group to each pick one thing from one of their lists and to set a goal for the next seven days that relates to that one thing.

**Participants should write down in their MAP journals:**

» My seven-day goal?

» What can I do today to work toward achieving my goal?

» What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.
12. Positive Choices

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 ways I can say “no” to peer pressure | 4 people who help me make good choices | 5 good choices that I can make this week |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct the group to each pick one thing from one of their lists and to set a goal for the next seven days that relates to that one thing.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.
13. Fun

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

- 3 ways I have fun
- 4 things that make me laugh
- 5 fun things I want to do this school year

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct everyone to pick one thing from the third column (“5 things I want to do this school year”) and to set a goal for the next seven days that relates to that one thing. As a group, discuss how to have safe and positive fun. Provide examples of specific short-term goals. For example, if someone wants to learn a new skateboard trick, they should break the task down into “baby steps” and start practicing the skills necessary to complete the trick.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

Have a discussion about how having fun relates to the STEM project and to your goals. Ideas should include teambuilding, problem-solving, creativity, and having fun while you work, among others.
14. Friends

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 of my best friends are | 4 traits I admire in my friends | 5 ways to be a good friend |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct everyone to pick one thing from the third column ("5 ways to be a good friend") and to set a goal for the next seven days that relates to that one thing. As a group, discuss how to be a good friend. Provide examples of specific short-term goals. For example, if someone wants to be described as “kind,” he or she can set a goal of inviting a new student to join him or her at lunch.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

Have a discussion about how being a good friend relates to the STEM project and to the students’ goals. Ideas should include teambuilding, problem-solving, and creativity, among other things.
15. Happiness & Joy

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 things that make me happy | 4 ways others make me happy | 5 things I can do to bring joy to others |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct everyone to pick one thing from the third column (5 things I can do to bring joy to others) and to set a goal for the next seven days that relates to that one thing. As a group, discuss ways students can help others and bring them joy. Provide examples of specific short-term goals. For example, if a student has a grandparent who lives alone, he or she could visit the grandparent to talk or play a board game together.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

Have a discussion about how bringing joy to others relates to the STEM project and to your goals. Ideas can include that by bringing happiness to others, we can create a more positive environment in which to work as a team.
16. Commitment

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

Column headers:

| 3 things I am committed to | 4 ways others show commitment to me | 5 things I would like to be committed to |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other with positive feedback. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Instruct everyone to pick one thing from the third column (5 things I would like to be committed to) and to set a goal for the next seven days that relates to that one thing. As a group, discuss ways students can demonstrate and make commitments. Provide examples of specific short-term goals. For example, if a student wants to improve his or her soccer skills, he or she could commit to practicing on his or her own, at home, for half an hour every day (or every other day).

Participants should write down in their MAP journals:

» My seven-day goal?
» What can I do today to work toward achieving my goal?
» What can I do over the next week?

Leave time to talk about goals in small groups or, as time allows, one-on-one. STEM mentors should provide guidance on how to create realistic steps/milestones for achievement.

Have a discussion about how commitment relates to the STEM project and to your goals. Ideas should include that it takes commitment and dedication to reach goals, and that committing to coming to each STARBASE 2.0 meeting helps strengthen your team and build trust over time.
17. Communicating with Others

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

Column headers:

- 3 people who I communicate easily with
- 4 tasks I have attempted where I needed others’ help
- 5 things I can do to help me communicate with others

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other positive feedback. As a group, discuss the components of strong communication. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Ask them to pick one thing off of their list of “5 things I can do to help me communicate with others” and to set a goal for the next seven days that relates to that one thing.

Participants should write down in their MAP journals:

» My seven-day goal?
» What can I do today to work toward achieving my goal?
» What can I do over the next week?

This exercise will likely generate many goals that aren’t necessarily attainable within a week. Leave time to talk about goals in small groups or one-on-one, as time allows.

Discuss how communication relates to the STEM project and to your goals. Ideas include that strong communication can help team members listen to and hear each other and feel more comfortable contributing to the process of achieving a goal.
18. Teaching Others

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

- **3 things I find difficult**
- **4 things I think are easy**
- **5 things I can teach others**

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other positive feedback. As a group, discuss the components of strong communication. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Ask them to pick one thing off of their list of “5 things I can teach to others” and to set a goal for the next seven days that relates to that one thing.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

This exercise will likely generate many goals that aren’t necessarily attainable within a week. Leave time to talk about goals in small groups or one-on-one, as time allows.

Discuss how teaching others relates to the STEM project and to your goals. Explain that by listening to each other and respecting other people’s experience, team members can share knowledge that helps everyone achieve more as a group.
19. Living Drug Free

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

| 3 negative things about drugs | 4 positive adults I can go to with questions about drugs | 5 positive things I can do in my free time instead of drugs |

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other positive feedback. As a group, discuss the components of strong communication. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Ask them to pick one thing off of their list of “5 positive things I can do in my free time instead of drugs” and to set a goal for the next seven days that relates to that one thing. Encourage students to make definite plans—from reading a comic book, to watching a movie, to playing basketball—for what to do with their free time.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or one-on-one, as time allows.

Discuss how finding positive hobbies relates to the STEM project and to your goals. Ideas for discussion include that drugs severely limit a person’s options for the future, and that positive hobbies can lead to lifelong interests or help guide career goals.
20. Living without Violence

Ask participants to start a new page in their MAP journals and draw two lines down the page to create three columns with the following headers.

**Column headers:**

<table>
<thead>
<tr>
<th>3 ways to avoid violence</th>
<th>4 positive adults I can go to with a question or talk to about an experience with violence</th>
<th>5 ways to positively release anger and aggression</th>
</tr>
</thead>
</table>

Give participants five minutes to make their lists, then another ten minutes to share in their small groups and provide each other positive feedback. As a group, discuss the components of strong communication. Encourage participants to share as much (or as little) as they want. Participants can add to this list at any time.

Ask them to pick one thing off of their list of “5 ways to positively release anger and aggression” and to set a goal for the next seven days that relates to that one thing. Encourage students to think “outside the box”—e.g., go running, hit a punching bag at a gym, write a poem or in a journal, paint.

**Participants should write down in their MAP journals:**

- My seven-day goal?
- What can I do today to work toward achieving my goal?
- What can I do over the next week?

Leave time to talk about goals in small groups or one-on-one, as time allows.

Discuss how avoiding violence relates to the STEM project and to your goals. Ideas for discussion should include the benefits of finding someone to trust to talk to about a violent experience, and why it’s important to be able to express anger in a healthy way.
Resources

eCYBERMISSION: https://www.ecybermission.com/

A free, web-based science, math, and technology competition for students in grades six through nine. The competition promotes self-discovery and enables all students to recognize the real-life applications of science, math, and technology.

FIRST LEGO League (FLL) : http://www.firstlegoleague.org/

An exciting global robotics program that ignites enthusiasm for discovery, science, and technology in kids ages nine to fourteen.

FIRST Robotics Competition (FRC): http://www.usfirst.org/roboticsprograms/frc

A competition that challenges teams of young people and their mentors to solve a common problem in a six-week time frame using a standard “kit of parts” and common set of rules.

The Fun Works: http://thefunworks.edc.org

This is website where young people can explore ways their favorite activities might translate into STEM careers. Designed for middle-school students, particularly those who are underrepresented in STEM education and careers--girls, minorities, and students with disabilities--the site features sports, games, music, and art sections.

National Defense Education Program (NDEP): http://www.ndep.us/

A program investing science, engineering, and math education from middle and high school through college and post graduation. NDEP’s mission is to support a new generation of scientists and engineers who will apply their talents in our nation’s defense laboratories.

The Real World Design Challenge (RWDC):
http://www.realworlddesignchallenge.org/

An annual event that provides students with opportunities to apply the lessons of the classroom to the technical problems that are being faced in the workplace. Students will utilize professional quality computer-aided design software to develop their solutions and will also generate presentations that convincingly demonstrate the value of their solutions.

ThinkQuest: http://www.thinkquest.org/en/

A learning platform where teachers and students create learning projects, participate in website competition, and browse a library of student projects.