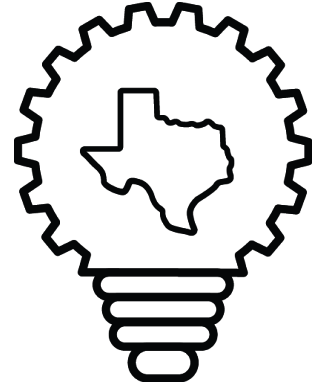


TAME Club Leader Guide: Best Practices



TAME Clubs across the Lonestar State empower educators to inspire and prepare the future engineers of Texas.

Clubs are typically led by teachers, librarians, administrators, parents, or community partners. They can be in public schools, private schools, home schools, scout troops, libraries, college campuses, and anywhere that students can meet regularly to explore engineering.

Thank you for Leading a TAME Club!

TAME Staff are inspired on a daily basis by the efforts of educators, parents, volunteers, grassroots organizers, corporate partners, and communities that go above and beyond to support students. We know your time is valuable and work hard to streamline our programs for you.

TAME is like an engineering design challenge spanning decades and adapting to new opportunities to change and improve. We welcome feedback with enthusiasm at programs@tame.org, knowing that it will take the whole TAME Family to build a future where Texas students can dream big.

Contents of this Guide

- Engineering inclusion since 1976: TAME’s Mission
- The flexibility of the TAME Club program
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Engineering inclusion since 1976:

TAME's Mission, Values, and Vision

TAME is a nonprofit that inspires & equips students from underrepresented groups to become future engineers.

Mission – TAME creates equitable experiences for students from underrepresented groups to explore futures in engineering by fostering their sense of belonging and equipping them with knowledge, skills, and intergenerational support through statewide programming at no cost to students.

Values – Equity, Inspiration, Impact, Community, Empathy, Leadership

Vision – TAME envisions a Texas where students realize their full potential, build community in engineering, and create inclusive solutions that reflect and celebrate our diverse world.

What do TAME Clubs do? Is there a format we have to follow? How often do we have to meet?

The TAME Club program is flexible. We understand that there is no “one-size-fits-all” format that will work for students in different communities around Texas. That’s why TAME does not require clubs to meet a certain number of times or use a particular format.

Some TAME Clubs meet several times a month, some meet a few times a semester. Because many students ride the bus and aren't able to stay after school, some clubs meet during lunch or homeroom, or even count class time toward the club meetings.

Club Leaders do not need to report back to TAME about their meetings, although we love to hear about fun and interesting projects and often feature photos on TAME's Facebook, Twitter, and Instagram to inspire other clubs. Many of our best practices come from our TAME Club Hall of Fame, available at the bottom of our [Club Resources & Activities page](#) at tame.org.

Timing your TAME Club meetings

When do TAME Clubs meet?

- before or after school
- during homeroom or lunch
- during class
- on the weekend

How often do TAME Clubs meet?

- once a week
- multiple times a month
- once a month
- a few times a semester

TAME Toolkits

TAME Club Toolkits will include curriculum for club meetings along with supplies, t-shirts for Club Leaders and students, student engineering workbooks, stickers.

Funding for your TAME Club

While you can organize many activities with typical classroom supplies on hand, extra funding can help cover snacks, field trips to local colleges, and other engineering fun.

If you're seeking additional funding, a good place to start would be a free trial on [Instrumentl](#) to search for small grants. TAME Clubs have also had some success with the local grants available through [Walmart](#), and [Target](#).

Suggested TAME Club guidelines for students

- **Everyone has a voice at the table.** Someday you will work with people who are different from you. They will be different from you in age, gender, race or ethnicity, height, hometown, and more. An Engineering Club is a great place to practice listening to voices you're not used to hearing. If someone in the group isn't speaking up, ask what they think. More voices at the table means more ideas to solve problems and maybe even change the world.
- **You're not going to get things right on the first try.** Scientists and engineers "fail" all the time, go back to the drawing board, and try again until they get the product they want. The more "oops" moments you collect, the more often you'll see success.
- **You don't have to tackle any problem alone.** In the engineering world, we have to work with each other to share ideas, draw on different strengths, learn from mistakes, and present our concepts. Why reinvent the wheel by yourself when you can build on other inventors' work and skip to the fun part where you redesign the whole car?
- **The goal is fun, not grades.** Even at Competitions, the goal is to explore and celebrate engineering. Good grades and awards are secondary to having fun and finding out what inspires you.

Recruiting new club members: Hidden in Plain Sight

TAME believes that engineering professionals play a critical role in creating solutions for people and our planet. TAME Clubs welcome any students who want to pursue their interest in engineering, including students in home-schooling networks, community groups, and more. Simultaneously, TAME knows that only 18% of bachelor's degrees in engineering and computer science are earned by women, and only 12% of the engineering workforce are made up of African American and Latino workers.¹ We believe that the more diverse perspectives and lived experiences are present in the engineering design process, the more inclusive a solution will be in your TAME Club and beyond. To this end, we invite you to support [TAME's mission](#) to promote equitable experiences for students from underrepresented groups to explore futures in engineering (also referred to as Focus Student Groups).

Focus Students

TAME's Focus Student Groups include these identities underrepresented in engineering:

- Black/African American
- Hispanic/Latinx
- Indigenous/Native American
- female

Ways to invite students to your TAME Club

As a TAME Club Leader, you play a critical role in the students' experience and their engineering journey. If you need ideas for recruiting students into your Club, check out [our blog](#) that includes TAME Club Leaders recommendations and tricks that have worked for them.

You also play a critical role in helping us reach students from our Focus Student Groups. Whether you share similar backgrounds or not we believe that with intentionality and the adoption of culturally responsive practices, you can support all students explore their passion in engineering. Please read the [Framework for the SciGirls Strategies](#) for background information and suggestions on how you may center students' lived experience and passions to drive the community building in your TAME Club. We also have a great repertoire of resources on Pinterest, starting with our [STEM Ed Equity Resources board](#) to tons of other [lesson plans and resources](#).

To help you start your recruitment efforts, here are some quick invitations and conversation starters to have with students:

Individual Conversations

- *What is your favorite tool in the whole wide world? Do you know who invented it? Come join our TAME Club to explore the history of that tool and the process they used to develop it, and practice the same process yourself!*

¹ <https://www.nsf.gov/statistics/2018/nsb20181/assets/nsb20181.pdf> & <https://www.ecs.org/wp-content/uploads/2015-Solving-the-Diversity-DilemmaFINAL-6.2015.pdf>

- *What do you think an engineer does? Is that something that interests you? Engineers create solutions for people and the planet. In our Club, we will explore the different types of engineering careers, visit with engineers, and practice the engineering design process that can be applicable to anything like writing a report or creating hurricane protection structures. But most importantly, we all get to shape our group's community! Come check us out!*

Posters and Voice Announcements

- *Calling all dreamers! Is there a problem you want to solve? Then, come join our TAME Club, where we'll learn to apply the engineering design challenges to all kinds of situations and come up with solutions TOGETHER.*

When recruiting students, especially students from different backgrounds to your own, please focus on highlighting the opportunities that will emerge when we all bring our expertise and passions. Do not under any circumstance recruit students and invite them to join based on their expressed and/or perceived identity. The key to making everyone feel welcomed and nurtured in a group is when we are invited to bring our passions and share our expertise.

We are happy to support you through your recruitment efforts. Reach out to on our Slack community.

Who's not in the room? Who won't seek out an Engineering Club without your help?

Many students hear about an Engineering Club and know immediately that they want to join. They might already consider themselves “a math person” or know that they have a knack for chemistry. However, in order to reach more students and fulfill TAME's mission, TAME strongly urges Club Leaders to actively recruit students who might not end up in a TAME Club on their own.

Who isn't in the club yet? Who doubts whether they belong in engineering? Some questions to ask:

- What **creative, artistic students** haven't yet learned what an engineer is, and how desperately engineering needs creative minds to solve problems and envision new futures?
- What **young writers or debate enthusiasts** don't yet know that scientists with good communication skills can help make science accessible, interesting—and maybe even poetic?
- What **sociable, outgoing students** would thrive on an Engineering Design Challenge Team, helping all the different members of the team connect and feel heard?
- What **passionate volunteers** might light up when they learn that engineering fields usually focus on helping people, improving lives, and solving the problems facing the future of humanity?
- What **adventurous, athletic students** haven't considered that a career in engineering could take them outdoors, into different habitats and environments all over the world—or even beyond it, into the next generation of space explorers?

Perhaps the first person to walk on Mars is currently walking the hallways at your school but has never thought of themselves as an engineering person. They may never walk into your TAME Club unless you actively encourage them to join.

“We try to intentionally create these communities of diverse students, diverse teachers. Diversity is an incredibly important part of an effective team. When you have a diversity of opinion, a diversity of experiences, the end product that you create is so much bigger than what any one person could create by themselves.” – Savita Raj, Executive Director of TAME, 2010-2019

Recruitment criteria

See our tips on recruiting from other successful Club Leaders: [21 Ideas for Recruiting Diverse Students into Engineering Clubs](#).

A TAME Club must have at least 8 students in grades 6 – 12 and:

- 60% of student members must be from TAME Focus Student groups that are underrepresented in engineering (Black/African American, Hispanic/Latinx, Indigenous/Native American, or female)
- OR be at a Title I school

Title I Schools have 40% or more students who are eligible for free or reduced price meals. Not sure if you're at a Title I school? Look up your school by zip code in the National Center for Education Statistics [here](#).

TAME Educator Workshop

Want more strategies to help? To generate understanding for the need to challenge engineering stereotypes and develop soft skills in engineering students, TAME created a unique program with original subject matter called [Hidden in Plain Sight: Discovering Engineering Potential](#).

This workshop makes the connection between the need for breaking stereotypes and how that creates inclusion for underrepresented groups. It provides teachers with tools to nurture non-stereotypical engineering students and methods to create a classroom atmosphere which encourages these students to explore and become engaged in engineering learning.

“It really made me think about how some of my kids might feel in different situations and how I might structure my classroom/lessons to create a “safer” learning environment.” Dawn R., Middle school science teacher, Fort Stockton, TX

Engineering Competitions

TAME's annual [Engineering Competitions](#) bring together thousands of high-performing TAME Club students in grades 6-12 from across the state to test their skills through collaborative engineering challenges. The competitions celebrate creativity, collaboration, and encourage the development of a peer and mentor network.

All Competitions are free—but you need to register and sign up!

The [Student Registration](#) deadline for students in grades 6-12 who want to participate in Engineering Competitions is in mid-October, so get your registration in soon.

Once the dates for Regional Competitions have been announced, the TAME State Office will reach out to Club Leaders to confirm which students are planning to attend. Students who sign up to attend will be added to Design Challenge Teams and receive free t-shirts at the event.

An engineer for an afternoon

At the Regional Competitions that take place around the state in January or February, students also compete in an Engineering Design Challenge on a team with students from other schools at the event. Team assignments are strategically balanced by race, gender, age, and geography to bring diverse voices to the table and give each student a fair chance to step into the role of a real engineer for an afternoon.

Competition Signups help keep Competitions free for all

Some students aren't sure if they want to compete, and prefer to just have fun with friends at the club level. **If there's a chance a student may want to participate, have them register in the fall!** While all registered students in grades 6-12 are eligible to compete, only students who sign up and confirm participation will be invited to attend the Regional Competition. If a student does not complete the Student Registration form, or does not sign up to confirm they will attend, organizers will not have supplies or team assignments for them and **they will not be able to participate.** However, they are welcome to stay active in the TAME Club year round and register for the next Competition season in the fall.

When a student signs up to attend, we make sure we have the right supplies and food available for that student. If we know ahead of time they cannot attend, we can invest that money in other meaningful ways. Please help us use our donors' money responsibly and keep our programs free for all students.

Celebrate with your students

We require that TAME Club Leaders accompany their students to Regionals or find an alternate chaperone. If your students are selected for the State Competition, we will need your assistance in coordinating their participation. At the State Competition, TAME covers all costs, including transportation, food and lodging, and great giveaways and prizes.

Suggested TAME Club meeting recipes & activity ideas

Many Club Leaders ask us for advice on how to structure meetings, schedules, and activities. Here are some optional “recipes” or examples to help you envision some of the ways that your TAME Club can help foster exploration and build a supportive network for your students.

Simple Engineering Activity (1 hour meeting, all ages)

Setup supplies & table space before the meeting (5 minutes)

Welcome students with name tags, snacks, icebreaker activity, etc. (10 minutes)

Engineering challenge with 4-5 people to a team (30 minutes)

Discussion: What worked, what would you do differently next time? (10 minutes)

Clean up, wrap up, and vote on the next TAME Club challenge (5 minutes)

Simple Science, Tech, or Math Activity (1 hour meeting, all ages)

Setup supplies & table space before the meeting (5 minutes)

Welcome students with name tags, snacks, icebreaker activity, etc. (10 minutes)

Plan and execute a science experiment, coding project, or math activity (30 minutes)

Discussion: What worked, what would you do differently next time? (10 minutes)

Clean up, wrap up, and vote on the next TAME Club challenge (5 minutes)

Practice Engineering Design Challenge (2-3 hour meeting, grades 6-12)

Setup supplies & table space before the meeting (10 minutes)

Welcome students with name tags, snacks, icebreaker activity, etc. (10 minutes)

Practice an official Engineering Design Challenge from a past TAME Competition with 5-6 people to a team (60 minutes)

Discussion: What worked, what would you do differently next time? What ideas did you like from other team designs and why? (20 minutes)

Optional: Round Two of the same Engineering Design Challenge, redesigning prototypes after discussion and feedback (60 minutes)

Clean up, wrap up, and vote on the next TAME Club challenge (5 minutes)

Past Engineering Design Challenges:

- [Channel Crossing Challenge](#), *from the 2019 Divisional STEM Competitions*
- [Wind Turbine](#), *from the 2017 State STEM Competition*
- [Wrap A Fuselage](#), *from the 2016 State STEM Competition*
- [Jet Powered Blimp](#), *from the 2015 State Math and Science Competition*
- [Stunt Plane](#), *from the 2014 State Math and Science Competition*
- [Mars Rover](#), *from the 2013 State Math and Science Competition*
- [Aggie Crane Challenge](#), *from the 2012 State Math and Science Competition*

Tutoring & Engineering Video/Discussion (1 hour meeting, all ages)

Clear table space before the meeting (5 minutes)

Welcome students with name tags, snacks, icebreaker activity, etc. (10 minutes)

Tutoring sessions with peers and/or teachers (25-30 minutes)

Engineering Video: select and watch a video from [TED Ed](#), [The Kid Should See This](#), etc. (5-10 minutes)

Discussion about engineering concepts / role models in the video (10 minutes)

Clean up, wrap up, and vote on the next TAME Club challenge (5 minutes)

Guest Speaker (1-2 hour meeting, all ages)

We recommend inviting a local engineering professional or a former club member who is now in college. **HINT: this is a great opportunity to welcome the whole school to attend & recruit students.**

Welcome guest and setup space before the meeting (5 minutes)

Welcome students with name tags, snacks, icebreaker activity, etc. (10 minutes)

Guest presentation / conversation (20-40 minutes)

Encourage the guest to bring props, photos, or any other type of visual aid that will provide students with a better understanding of their career/college experience. Encourage them to keep things light, conversational, and positive overall—it's okay to talk about struggles, too. Honesty is important, and so is inspiring students to consider new career paths. We recommend [the Role Model training from Techbridge Girls](#).

Some questions to ask:

- What school subjects help you most in your job?
- Did you always know what you wanted to be? How did you choose your career?
- What education/training would students need to follow in your footsteps?
- What problems do you solve with your job? Who do you help with your work?
- What are some situations where you had to be creative in your job?
- If your job didn't exist, how would the world be different?
- What tools do you use? Who do you work with?
- What is the best part of your job?
- Does your employer offer paid internships, tours of the facility, or volunteer opportunities? If so, what are your tips for students interested in applying?
- What do you wish you had known when you were a student? What advice can you give?

Questions from students (15 minutes)

Host a Competition for Younger Students (3-6 hr meeting, grades 6-12)

Work with students to plan the schedule and challenge in advance. Connect with a local TAME Club or school with students younger than those in your club and arrange time to meet for an Engineering Design Challenge.

Students setup supplies & table space before the meeting (10 minutes)

Welcome both groups of students with name tags, snacks, icebreaker activity, etc. (10 minutes)

Practice an official Engineering Design Challenge from a past TAME Competition with 5-6 people to a team and older students acting as judges (60 minutes)

Student-Led Discussion: What worked, what would you do differently next time? What ideas did you like from other team designs and why? (20 minutes)

Optional: Round Two of the same Engineering Design Challenge, redesigning prototypes after discussion and feedback (60 minutes)

Clean up, wrap up, and vote on the next TAME Club activity (5 minutes)

Engineering Leadership Discussion (1-2 hours, grades 6-12)

We recommend this activity after your students have had a chance to get to know each other. Host a discussion session where students can talk about their experience in engineering classes, activities, and events like competitions. Ask students to draw a scientist or an engineer, then use that as a jumping off point to talk about stereotypes.

- How many students drew a “mad scientist” in a labcoat? What other stereotypes appear?
- What messages are these stereotypes sending about who gets to be a scientist, or what skills it takes to be an engineer?
- Can you imagine a scientist who is social and outgoing?
- Can you picture an engineer who is creative and artistic?
- How old do you have to be, in order to be a good scientist?
- Can an artist or photographer be good with numbers and formulas?
- Can an engineering major also play college basketball?
- Do you have to look, act, or think a certain way to change the world?

Studies show that engineering professionals generate more innovative and effective ideas in diverse teams. How can your TAME Club recruit more students who might not yet see themselves as a science or math person, or who may not yet know much about engineering? What new kinds of creative voices or artistic talents can you bring to the team? How can they inspire and mentor younger students? Talk about ways club members can lead by example and encourage others by setting small engineering leadership goals such as:

- to raise their hand a certain number of times in their STEM classes during a week
- ask questions to see if other people at school or in the community might want the help of an engineering club to solve a problem or design and build something new
- bring a friend to a TAME Club meeting
- see how many club members they can recruit to attend the TAME Competition
- when the club goes to the Competition, each member makes a point to meet and talk to one student from another school to get ideas for other club activities

STEAM Art Project & Contest Day (1 hr meeting, all ages)

Organize a STEAM (Science, Tech, Engineering, Art, and Math) art project day to help students submit artwork for the [annual T-Shirt Design Contest](#). Coordinate with an art teacher to talk about the many ways art, design, and STEM overlap and depend on each other for creative pursuits across many disciplines. Consider asking the school theater department about props, smoke, steam, or lighting effects, and other tech-related ways to bring a stage production to life with your students’ engineering skills.

College & Scholarship Workshop (1 hr meeting, grades 11-12)

Invite 12th graders to fill out TAME Scholarship Application during the club meeting, and offer constructive feedback on their essays. Remind students they need to take ACT or SAT to get into college, and help them brainstorm ways to sign up for and prepare for those tests. It's a great opportunity to welcome the school counselor or career counselor to give a talk to the students about applying for colleges—don't forget to include 11th graders who might be interested in the conversation.

Daytime Nature Walk (1-3 hours, all ages)

Scope out a safe place to bring students on a nature walk to study concepts like biology, geology, and ecology. Nearby [State Parks](#) may offer guided tours, handouts, maps, and scavenger hunt activities for spotting native wildlife. Apps like [LeafSnap](#), [Project BudBurst](#), [iNaturalist](#), [eBird](#), and [Project Noah](#) can make your students citizen scientists as they help photograph and document insects, birds, trees, and native plants. We recommend encouraging all students to wear the same color t-shirt and nametags, as well as sunscreen, bug spray, hats, comfortable walking shoes, and long pants to protect the skin. Consider accessibility and students' mobility needs when choosing a location, so all students can take part. Research what jobs are available in this area to help students get excited and see the possibilities of a future in this area.

Nighttime Star Party (1-2 hours, all ages)

Do you know anyone who owns a telescope, spotting scope, or binoculars? Students can plan a star party to observe stars, meteor showers, planets like Mars and Venus, or celestial events like lunar eclipses. Apps like NASA's [Meteor Counter](#) can make your students citizen scientists as they document the timing, direction, and brightness of meteors. To see the most stars, you may want to wait for a clear night with a new moon, and meet in a place away from city lights like streetlights. Consider accessibility and students' mobility needs when choosing a location, so all students can take part. Research jobs in this area to help students get excited and see the possibilities of a future in astronomy, aerodynamics, or space exploration.

Community Volunteering Trip (half day to full day, grades 6-12)

Encourage students to brainstorm ways that they could give back to their school or community, such as planting trees, running a recycling drive, a park cleanup day, or building something like a Little Free Library. TAME Clubs have connected with [Elequa](#), a TAME partner in southwest Texas that offers online curriculum and \$50 open source water testing kits for free so students can

check the chemistry of local waterways and run other experiments and challenges (makewater.org). Consider accessibility and students' mobility needs when choosing a location for your volunteering experience, so all students can take part. Discuss related job opportunities to help students get excited and see the possibilities of a future in this area.

Discussion: Science Fiction & Engineering Ethics (1–2 hours, grades 6–12)

Host a discussion session where students can use their favorite sci-fi films, shows, books, and comics to [consider the human impact of progress in engineering fields](#). What are the social and ethical impacts of the technology they or their fellow students will someday invent?

This is an exercise with multiple benefits, as it encourages students to visualize themselves in a career where they make a lasting impact on humankind—and it asks them to consider what sort of impact they want to have.

Film / fiction examples and TED-Ed lessons for discussion starting points:

- Nebula Award nominated short story “[Today I am Paul](#)” by Martin Shoemaker, grades 6+; pair with TED-Ed lesson, [Can Machines Read Your Emotions?](#)
- Film *Big Hero 6*, grades 2+; TED-Ed lesson [The Turing test: Can a computer pass for a human?](#); [STEM activities](#) from Disney
- Film & book *The Martian*, grades 6+; TED-Ed lessons, [Could we actually live on Mars?](#) and [Could human civilization spread across the whole galaxy?](#)
- Film *Interstellar*, grades 6+; [educator's guide](#) and [TED-Ed lessons](#)
- Film *Black Panther*, grades 9+; [Afrofuturism](#) and representation in STEM; TED-Ed lessons, [Why should you read sci-fi superstar Octavia E. Butler?](#) and [How fiction can change reality](#)
- Film & book *Hidden Figures*, grades 6+; TED-Ed lessons, [Why do people get so anxious about math?](#); [The exceptional life of Benjamin Banneker](#); and [Eyes on the stars](#), on Ronald E. McNair, the second African American in space

College, Museum, or Career Day Field Trip (full day, grades 6–12)

Visit a local college, museum, or engineering employer. Consider accessibility and students' mobility needs when choosing a location, so all students can take part. We recommend all students wear the same color t-shirt and nametags. Bring the list of questions from the “Guest Speaker” meeting recipe to help students get excited and see the possibilities of a future in this area.

Looking for more ideas? See more at
tame.org/clubs