

## Defining Roles

### The Mentor as a Facilitator

As a Mentor, it is important to be involved, but it is equally important to make sure the process is directed and completed by students. Mentors differ in the amount of instruction they give their teams. Some give very little, and others give much more. While Mentors are often teachers, it is important that the role they play on an FTC® team be that of a facilitator.

- Teachers communicate knowledge they have learned on a given subject to one or more people
- Facilitators enable communication within a group so that everyone contributes knowledge and experience toward the solution.

Students will gain the most from the experience if they are the driving force behind the actual robot planning, building, and programming. The team must design and build the robot with only limited assistance from adult Mentors. This way, students may become problem solvers by finding solutions themselves.

Mentors	Students
<ul style="list-style-type: none"> <li>• Are facilitators</li> <li>• Are available to help the team complete its work</li> <li>• Provide direction that supports accomplishing tasks and team success</li> <li>• Help the team stay focused on the jobs that must be completed</li> <li>• Help the team communicate effectively and improve the way members work together</li> </ul> <p><b>Note:</b> Mentors must be directly involved when safety is a concern.</p>	<ul style="list-style-type: none"> <li>• Are project managers</li> <li>• Are directors</li> <li>• Drive the goals of the team</li> <li>• Are creators, innovators and problem solvers</li> <li>• Make final decisions about robot design and strategy.</li> </ul>

### 10 Steps to Being an Effective FTC Facilitator:

1. Be an Active Listener
  - Listen before speaking.
  - Listen for the contribution that the person is trying to make. Attempt to identify with what the person is saying. Be understanding. Be empathetic.
  - Evaluate what is being said.
  - Ensure there is an accurate understanding of what was said by paraphrasing.
  - Establish meaningful conversations with team members and never talk down to anyone.
2. Look for Verbal and Non-verbal Cues
  - These signals are important in communication and in knowing whether something is understood. Some signals that clarification or a new approach is needed include:
    - Raising or lowering of voice
    - Body positioning
    - Raising eyebrows
    - Shifting in one's seat
    - Rapid speech or tone of speech
  - When one of these cues is observed, stop to check for comprehension. The team may need a short break to relax and re-focus.
3. Listen and Ask
  - Resist doing most of the talking, even if the correct answer seems obvious.
  - When communication is one-way and the Mentor has all of the answers, the other team members will not feel valued.
  - Ask open-ended questions such as "What do you think?" or "How do you think we should approach this?"
  - Avoid questions requiring a simple yes or no answer.

- Be patient and provide “think time” in discussions.
  - Do not provide an immediate solution.
  - Encourage all team members to think for a few moments before making a suggestion. Some people require extra time to process information, and some people require extra time to put their thoughts into words, or to build up the courage to speak in a group.
  - Let students finish their thoughts completely. This can also be done one-on-one, if a student requires more time to explain his or her idea than the allotted discussion time allows.
- Take the time to make sure everyone understands
  - Encourage students to ask questions if something is not clear.
  - Always ask if there is anyone who does not understand, and provide clarification when necessary.
- Encourage students to politely question their Mentors and their teammates if they do not understand or agree.

**Note:** Have students paraphrase the point or final decision to check for comprehension. Students (and adults) often say they understand when further clarification is needed. Remember that concepts may not have been covered yet in school. Misinterpretation of explanations or decisions is also common and can cause frustration and mistakes if they are not addressed early on.

#### 4. Provide Positive, Objective, and Constructive Feedback

- Observe what the team members contribute and provide positive, objective, and constructive feedback to build confidence and help them improve.
- Help students understand that Mentors provide feedback to help the team improve. It is about actions or work, and is not a judgment of him/her as a person.
- Establish and practice effective communication between team members. Outline routines for feedback and ways to address concerns.
- Help students see the potential pitfalls in a particular approach to a problem.
- Help students understand that certain types of solutions may be dependent on more detailed knowledge. Direct them to appropriate resources for investigation.
- If students provide information concerning robot rules to the group, be sure they can pinpoint where they found it so accuracy can be checked.

#### 5. Be Sensitive

- If there is a problem, provide constructive criticism immediately following the behavior, if possible. Be sensitive to things that could embarrass an individual, such as commenting in public.
- Be aware that not all people are receptive to feedback. Some view it as criticism and may be hurt, or react defensively. The way the message is delivered will have an impact on the reaction.
- Be direct, treat all team members with respect, and deliver positive and constructive comments.
- For some individuals and some situations, it may be helpful to ask the team member if he or she would like to receive comments on his or her work. If he or she does, the session should be two-way, allowing him or her to ask questions and clarify the delivered message.

#### 6. Be Safe

- When there is a safety issue, give immediate feedback to team members, even at the risk of embarrassing them.
- Take them aside later and explain that the issue had to be addressed out of concern for that person's well-being and safety. It should be highlighted that speaking up is often required in order to prevent injury.

#### 7. Let the Students Lead

- Remember that FTC® offers students a chance to learn in a fun way. Students have frequent, daily opportunities at school to listen to teachers. This is their chance to lead.
- Make an effort to balance the amount of time students spend listening to a Mentor with the amount of time they spend doing something themselves. FTC should be hands-on and student-driven.

**Note:** For some learners, being a leader is challenging. It may take time for some students to learn to take the initiative and not ask for step-by-step directions.

#### 8. Encourage Innovation and Critical Thinking

- Reply to a question with another carefully considered question that will force team members to use their knowledge of science and hypothesize logical outcomes: “What would happen if . . .” or “How will that affect . . .”
- Remain flexible and open to new concepts and work to facilitate the student's articulation of what they want to do and their understanding of the technical aspects of their actions, as well as the potential effects on all other aspects of the team.
- If at first their understanding appears too narrow, provide students with potential alternatives of viewing a problem.

#### 9. Be Inclusive

- Do not scare away quiet members. Provide them with comfortable opportunities to share. They have a lot to offer and a lot to gain from the team.
- Have students work in pairs or alone to sketch out ideas with a short description. Do not make students present verbally to the group at first unless they wish to do so. Post the pictures for all to see, and perhaps it will open up discussion.

#### 10. Promote Routine Self-Evaluation and Evaluation of Team Goals

- Keep the team focused on their goals during the season and review the goals periodically, as well as after the competition.

### Student Responsibilities

Some team members will quickly reach a point where they can work independently, while other team members may need more direct support from an adult Mentor for a longer period of time. Do not judge how quickly they move from one phase to the next. Keep in mind that everyone is an individual, comes from a different background, learns at a different rate, and in different ways. Celebrate and facilitate each person's accomplishments, both large and small. All students on the team, regardless of their experience or skill level, should be working towards the same collective goals.

#### All students are expected to:

- Commit to the project.
- Work towards an improved understanding of science and technology.
- Understand the engineering principles and process.
- Be held accountable for their roles on the team.
- Take individual responsibility for their assigned tasks.
- Develop trust and respect for adult and student team members.
- Augment their skills.
- Learn to prioritize work effectively.
- Learn when to ask for help or clarification.
- Complete tasks with a high level of independence.

To keep students engaged and challenged throughout the process, it may be beneficial to move them into roles of greater responsibility, or to take on the role of Mentor to other team members, or other teams.

The peak of the mentoring process occurs when a team member develops the skills, both technical and people-oriented, necessary for he or she to widen the skill circle to include mentoring others.

## Transferring Ownership From Mentors to Students

During the mentoring processes, students and other team members learn and assume more responsibility. Members of the team grow in knowledge and understanding, and are able to teach and guide others on the team.

It is important to foster a safe learning environment for team members. Students should be encouraged to be creative and experimental. Mentors should emphasize that students should be comfortable with both the idea of success and of failure as an important part of the process of discovery and innovation.

In certain areas, the Mentor becomes a sustainer rather than a teacher. The role shifts and allows the students and others to initiate and complete tasks.

The four simple steps below describe this transition. In this process, the mentor gradually passes responsibility to the student. The Mentor begins the process by demonstrating a task while a student observes. The process is complete when the same student is able to perform the task independently as the mentor observes.

1. I Do, You Watch
2. I Do, You Help
3. You Do, I Help
4. You Do. I Watch

### When transferring ownership to the student:

- Be sure he or she is fully prepared and knows the subject well.
- Provide encouragement and make sure he or she is comfortable and wants the shift to a mentoring role.
- Inform the rest of the participants of what is happening regarding the shift. This will curb ideas that the new Mentor is assuming a role not assigned

## Preparing Students to Be Mentors

Through mentoring and facilitation, students learn how to complete various tasks. As a result, the student has a clear understanding of the skills and is able to answer any questions relevant to them. This process results in more time for the Mentor, now able to assume more of an observer role, and allows the student to work as a Mentor to other students.

This team evolution not only builds trust and respect, but can also help prevent Mentor burnout. As students who were team members move into the role of Mentor, it also encourages new team members or underclassmen that may be unsure of their capabilities to join, participate, and add new life to the team.

