Team Attributes (TA)

REQUIRED TEAM ATTRIBUTE (TA) QUESTION:

CONNECT:

REQUIRED	1	Team must describe, display, or document a team plan that covers **all of the following**: A. The team's goals for the development of team member skills, and B. The steps the team has taken or will take to reach those goals
ENCOURAGED	2	Provide examples of developing in person or virtual connections with individuals in the engineering, science, or technology community.
ENCOURAGED	3	Provide examples of how it actively engages with the engineering community.

REACH:

REQUIRED	1	Team must discuss, describe, display, or document their outreach objectives and how their outreach activities support the FIRST community.
REQUIRED	2	Team must discuss, describe, display, or document their successful recruitment of new teams, or coaches, or mentors and/or volunteers who are not otherwise active within the *FIRST* community.
ENCOURAGED	3	Is an ambassador for FIRST programs in a way that makes FIRST loud.
ENCOURAGED	4	Has a creative and evolving approach to outreach materials that market their team and *FIRST*.

SUSTAIN:

REQUIRED	1	Team must discuss, describe, display, or document their plan(s) which includes **at least one** of the following: A. finances and financial sustainability plan, B. season project planning, and/or C. team sustainability plans and/or objectives.
REQUIRED	2	Team must discuss, describe, display or document how a team tracks their progress towards their plan(s) listed above.
ENCOURAGED	3	Team has clear team roles for all members of the team and a process for developing leadership
ENCOURAGED	4	Team can discuss, describe, display, or document how they manage the team's constraints and/or risks

Make notes on reverse side

MACHINE, INNOVATION, AND CREATIVITY (MCI)

REQUIRED MACHINE, INNOVATION, AND CREATIVITY (MCI) QUESTION:

INNOVATE:

REQUIRED	1	Team must describe, display, or document examples of the team's engineering content that illustrate how the team arrived at their design solution.
REQUIRED	2	ROBOT or ROBOT MECHANISM is creative and unique in its design.
REQUIRED	3	The innovative element must be stable, robust, and contribute positively to the team's game objectives most of the time.
ENCOURAGED	4	Designs often come with risks, the team should discuss, describe, display or document how they mitigated that risk

CONTROL:

REQUIRED	1	Team must submit a PORTFOLIO. The PORTFOLIO must include **all of the following**: A. hardware and/or software control COMPONENTS on the ROBOT, B. which challenges each COMPONENT or system is intended to solve, and C. how does each COMPONENT or system work
REQUIRED	2	Team must use one or more hardware or software solutions to improve ROBOT functionality by using external feedback and control.
ENCOURAGED	3	The control solution(s) should work consistently during most MATCHES.
ENCOURAGED	4	Team could describe, display, or document how the solution should consider reliability either through demonstrated effectiveness or identification of how the solution could be improved
ENCOURAGED	5	Use of the engineering process to develop the control solutions (sensors, hardware and/or algorithms) used on the ROBOT includes lessons learned.

DESIGN:

REQUIRED	1	A team must be able to describe or demonstrate how their ROBOT is elegant, efficient (simple/executable), and practical to maintain.
REQUIRED	2	The entire machine design, or the detailed process used to develop the design, is worthy of this recognition, and not just a single COMPONENT.
ENCOURAGED	3	The ROBOT distinguishes itself from others by its aesthetic and functional design.
ENCOURAGED	4	The basis for the design is well considered (that is inspiration, function, etc.).
ENCOURAGED	5	Design is effective and consistent with team's game plan and/or strategy.

Make notes on reverse side

Think Award

❑ **Team submitted a PORTFOLIO**
(Required for this award)

Team Number: _____

Team Name: _____

Judge's Name: _____

THINK:

REQUIRED	1	Team must submit a PORTFOLIO. The PORTFOLIO must include engineering content which includes **at least one** of the following: A. evidence of use of the engineering process, B. lessons learned and implemented related to the design of their ROBOT C. trade off analysis /cost benefit analysis, and/or D. mathematical analysis used to make design decisions.
ENCOURAGED	2	Team PORTFOLIO may include information about resources which includes any number of the following examples: A. how the team learns from team mentors, and/or a development plan for team members to learn new skills, B. how the team recruited new people into *FIRST*, and/or C. how the team identified goals and tracked progress towards their goals throughout the season.
ENCOURAGED	3	Team PORTFOLIO may include information about resources which includes any number of the following examples: A. how the team learns from team mentors, and/or a development plan for team members to learn new skills, B. how the team recruited new people into *FIRST*, and/or C. how the team identified goals and tracked progress towards their goals throughout the season.

Questions

(Not required to ask of the teams but items to ask yourself as you review the team's portfolio):

- Did the team describe the engineering process(es) used in designing their robot?
- Did the team document how their robot improved throughout the season?
- How did the team decide what aspects needed to be improved - did they use data or any analysis?

Notes: