

UNIT 3

FIRST[®] Tech Challenge Game

UNIT OVERVIEW

UNIT NUMBER: 3

DURATION: 10 hours

SUMMARY

In order to solve a problem, one must first understand it. For building a competing robot, the problem is defined by the *FIRST[®]* Tech Challenge game. In this unit the students will research and learn about the *FIRST* Tech Challenge game and begin the early stages of the design process with preliminary planning and strategizing.

INSTRUCTIONS

1. Watch the *FIRST* Tech Challenge release video and present this unit's driving question.
2. Discuss Knows and Need-to-Knows.
3. Divide students into groups and have them research the game manuals (found [here](#)).
4. Groups will present their findings and related quiz questions.
5. Prepare a quiz using the student-created questions.
Give students the quiz.



ASSESSMENTS:

1. Group Presentation of Game Manual section with rubric
2. Quiz over rules (3 questions from each group)
3. Weekly Engineering Notebook

TOOLS & MATERIALS

No tools or materials needed for this unit.

STANDARDS ADDRESSED:

Full course standards alignments can be found [here](#).

ENTRY EVENT

Watch the Challenge Kickoff Video!



DRIVING QUESTION

What do we as engineers need to know about this year's *FIRST* Tech Challenge game in order to design an effective robot?



HINT:

Driving questions are a Project-Based Learning mechanism designed to foster inquiry in students. The idea is to present students with an engaging and open-ended problem or challenge that will cause them to begin asking questions. Your job as the teacher is to then facilitate the students' process of finding the answers. See this [page](#) for more information on Driving Questions.

KNOWS

**HINT:**

Knows and Need-to-Knows are another Project-Based Learning mechanism. Once the entry event and driving question have been presented, the students should have questions. There are things about the project they already know, and there are undoubtedly many things about the project they will need to know or learn in order to complete it. Ask the students questions (or even better, let them ask questions) to help them think through what they currently know and what they will need to know.

As a class, make a list of what the students currently know related to the project. Ask questions such as:

1. What do we know about the driving question?
2. What do we know about *FIRST*® Tech Challenge?
3. What do we know about building a robot?
4. What do we know about programming?
5. What do we know about this year's game?
6. And more!

NEED-TO-KNOWS

Now make a list of what students need to know to complete the project. Ask questions such as:

1. What do we *not* know about the driving question?
2. What do we *not* know about *FIRST* Tech Challenge?
3. What do we *not* know about building a robot?
4. What do we *not* know about programming?
5. What do we *not* know about this year's game?
6. And more!

This list will help as the students design and build the robot. Have them think about how they can learn the things on this list. Where can they go? What resources can they access? Who can they talk to?

GAME RESEARCH

1. Divide students into groups of 3.
2. Assign each group a different section of the game manual. The sections of the game manual include:
 1. The Tournament
 2. The Robot
 3. Robot Inspection
 4. Judging & Award Criteria
 5. The Game
3. Have groups research their section of the game manual.

4. Groups will prepare a 5 minute presentation answering the driving question in relation to their section of the manual. The presentation should:
 1. Go beyond a verbatim reading of the rules.
 2. Analyze the rules and the implications they will have on the robot design.
 3. Discuss possible complications and strategies. For example:
 1. Propose a scoring strategy
 2. What does the robot need to accomplish?
 3. How can the robot be designed to accomplish the tasks?
 4. What interesting things have teams done in the past?
 5. Are any of the rules vague? If so, what freedom or constraint does that place upon the robot design?
 4. Create 3 quiz questions based on your section of the manual. These will be combined from all groups and given to the class for a grade.
5. View the presentation rubric.

GAME MANUAL PRESENTATION

Prepare a 5 minute presentation answering the driving question in relation to your section of the manual. The presentation should:

1. Go beyond a verbatim reading of the rules.
 2. Analyze the rules and the implications they will have on the robot design.
 3. Discuss possible complications and strategies. For example:
 1. Propose a scoring strategy
 2. What does the robot need to accomplish?
 3. How can the robot be designed to accomplish the tasks?
 4. What interesting things have teams done in the past?
 5. Are any of the rules vague? If so, what freedom or constraint does that place upon the robot design?
 4. Create 3 quiz questions based on your section of the manual. These will be combined from all groups and given to the class for a grade.
 5. Printable version available
https://my.pblworks.org/resource/document/6_8_presentation_rubric_non_ccss.
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