Play the Game

Description
This activity uses pre-existing robotics competition challenges (e.g., FIRST LEGO League, VEX EDR, VEX IQ, VEX Robotics Competition).

Robotics competitions help students by engaging them in a time-bound activity, encouraging teamwork and having them follow rules similar to those outlined by a governing body. The benefits of completion include promoting collaborative work among students in diverse communities, taking pride in awards and encouraging innovation and problem-solving in an energized, public education forum.

The students’ primary objective is to attempt to complete one of the competition challenges listed below.

Lesson Outcomes
Students will be able to:

• Construct and operate a robot to perform the game challenge(s)
• Follow instructions to complete a complex task
• Solve technical problems
• Effectively communicate and work in a team
• Use appropriate terminology to describe the components in their electronic circuit

Assumptions
Students will have:

• Knowledge and understanding of basic construction techniques
• Formed teams and partnerships within the classroom
• Access to robotics platforms and necessary equipment

Estimated Time
3–4 hours

Recommended Number of Students
2–5 students per robot, per team (3 students per team is ideal); 2–5 teams
Facilities
A competition arena where the competition will take place (e.g., a large table in a cafeteria, gym or large classroom)

Each team takes their turn on the competition table.

Tools
All required tools are typically included with the kit you are using.

A basic tool kit that includes pliers, wrenches, files (to round off sharp corners)

Materials
You will need to purchase a game element kit supplied by the robotics competition organization (e.g., VEX Robotics or FIRST LEGO League) or you may choose to custom-design your own kit from the dollar store or the hardware store.

You will also need the necessary materials and equipment to construct your robot.

Resources
Search YouTube for official game videos.

You may also reference:

Vex Robotics
https://www.vexrobotics.com/

LEGO
https://www.lego.com/en-us/mindstorms/

Website forums for team-to-team or peer-to-peer online discussions:

VEX IQ Forum
http://www.vexiqforum.com/

VEX FORUM
https://www.vexforum.com/

FIRST Forums
https://forums.usfirst.org

Demonstration
Refer to the following game unveil videos as examples of competitions:

VEX IQ Challenge for 2016/2017
https://www.youtube.com/watch?v=0iIv1WOSJJs

VEX EDR Challenge for 2016/2017
https://www.youtube.com/watch?v=0t2zstQ84Tw

FIRST LEGO League Challenge for 2015
https://www.youtube.com/watch?v=akuN95EyXJk
Procedure
After you have purchased the game elements kit, follow the instructions to play the game with your teams.

Assessment
The evaluation of this lesson is based on the learning outcomes outlined above.

Prior to teachers using the evaluation grid it is recommended that students perform some form of peer-assessment and self-assessment.

<table>
<thead>
<tr>
<th>Outcome To Be Assessed</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td><strong>Outcome 1 Robot construction</strong></td>
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<tr>
<td>1.1 Robot is able to successfully compete in the challenge.</td>
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<td>1.2 Robot performs according to expectations.</td>
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<td><strong>Outcome 2 Follows instructions to complete a complex task</strong></td>
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<td>2.1 Able to understand and comply with the game’s parameters and rules.</td>
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<td><strong>Outcome 3 Tackles technical problems</strong></td>
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<td>3.1 Able to resolve errors when encountered.</td>
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<td>3.2 Able to approach challenges with perseverance.</td>
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<td><strong>Outcome 4 Teamwork</strong></td>
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<td>4.1 Division of work.</td>
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<td>4.2 Effort of each team member.</td>
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<td><strong>Outcome 5 Understanding Key Terminology</strong></td>
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<td>5.1 Demonstrates the use of Key Terminology.</td>
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<td>5.2 Applies terminology appropriately.</td>
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</table>

Total Points:

6  Completed successfully at the exceptional level     Exemplary
5  Completed successfully at higher than the expected level Accomplished
4  Completed successfully to the expected level         Emerging
3  Attempted successfully at the minimum level           Developing
2  Attempted – Unsuccessful – Close to Successful        Beginning
1  Attempted – Unsuccessful                             Basic
0  Not Attempted                                        N/A

Comments:
Extension Activities

Search YouTube for your chosen competition platform's unveil video for next year's game. It is a good idea to start planning and building robots as soon as possible.