CCS Rockin’ Robots 2019

Getting Started

✘ Decide your team members.
  ✘ Each team consists of 2-4 students maximum.
  ✘ Each school can bring a max of eight teams (fall).
  ✘ Think about creating an application.

✘ Decide when you will be meeting.
  ✘ Talk with your principal and decide if your robotics club will be meeting during school hours or after school.

✘ Locate equipment.
  ✘ We will be using the Lego Mindstorms EV3 as hardware, and the Lego Mindstorms EV3 for Chromebooks for software.
  ✘ We will also be using Spheros for part of the fall competition.
Sample Application

https://docs.google.com/document/d/1hnmJ8CZXb8YEpclMnITyjUlqxwEMOiVwIu-Mz7-mZ34/edit?usp=sharing

Robotics Team Application

Parent/Guardian Complete this Section:

Student Name: __________________________ Grade: _____ Teacher: __________

Student DOB: ______________ Parent/Guardian Names: ________________________

Complete Address: ____________________________

Phone #: (please list multiple if n
g armed)

__________________________________________

Email Address: _____________________________

Are you available to volunteer at club meetings during the week or at a competition if necessary?

__________________________

Parent Signature: __________________________ Date: __________

__________________________________________

Student Complete this Section:

Your Full Name: __________________________ Age: _______ Grade: _______

Answer All Questions Below: (feel free to use additional paper if needed -- write your full name on each sheet)

1. List three of your favorite hobbies: ________________________________________

2. What is your favorite subject in school and why? ________________________________

3. List at least two examples of robotics used in your community:

4. Attach a one page report about why you want to be a part of the Robotics Team
   (report header should include your full name, grade, and teacher)
Robotic Team Participation Agreement

Student Name (Print):___________________________
Parent/Guardian Signature:_________________________
Student and Parent/Guardian please review and initial/date the membership requirements below confirming that you will abide by them if selected to be a member of the BCES Robotics Team.

<table>
<thead>
<tr>
<th>Grades</th>
<th>Student Initials</th>
<th>Parent Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student must maintain report card grades no lower than a C for the entire current school year and maintain satisfactory conduct grades (this include specials classes)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Student Initials</th>
<th>Parent Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student must have no disciplinary referrals for the current academic year. Students must have good behavior during all team meetings.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attendance</th>
<th>Student Initials</th>
<th>Parent Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance is required to all team meetings and competitions. There will be at least two competitions, one in the fall and one in the spring. If a conflict arises, please notify the coach.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Student Initials</th>
<th>Parent Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student must consistently exhibit a positive scholarly attitude and always put forth his/her best effort. Students will not criticize others on the team for their ideas. Students will have the utmost respect and good sportsmanship.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teamwork</th>
<th>Student Initials</th>
<th>Parent Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student agrees to work as a part of the team, remembering what is best for the team may outweigh what is best for an individual member. Students will do all the work and understand that adults do not give them the answers. All will be as cooperative and helpful as possible.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transportation</th>
<th>Student Initials</th>
<th>Parent Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent must coordinate student’s transportation to and from team functions.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please give this recommendation to one of your current teachers and ASK NICELY for them to complete the form. Teachers, please put in Mrs. Eddings box by Friday, May 24. Please be honest. Do NOT give the recommendation back to the student. Thanks!!!

Please circle the number to indicate your recommendations for the student above (1 being the lowest score and 5 being the best possible score)

<table>
<thead>
<tr>
<th>How trustworthy is this student?</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>How mature is this student?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Is this student a hard-worker?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Does this student help others?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>How well does this student follow directions?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Please list any “extra” activities this student participates in. (ex. Chorus, K Kids, etc.)

__________________________________________________________________________

Why do you recommend this student for the Robotics Team?
__________________________________________________________________________
__________________________________________________________________________

Teacher Signature:___________________________
Teacher Name:___________________________
Date:___________________________
Building the Robot

Before you begin programming, you must first build the basic robot.

Follow the instructions with the EV3 Lego kit for the base, touch sensor, color sensor, and ultrasonic sensor.
Building Instructions

Building Instructions Link

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# Programming Skills to Practice

At the fall competition, teams should be able to complete both the basic and advanced programming skills.

<table>
<thead>
<tr>
<th>Basic Skills</th>
<th>Advanced Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move forward</td>
<td>Follow a black line</td>
</tr>
<tr>
<td>Reverse</td>
<td>Detect color</td>
</tr>
<tr>
<td>Turn right and left 90 degrees</td>
<td>Detect an object using a touch sensor</td>
</tr>
<tr>
<td>Make a curve turn</td>
<td>Detect an object’s distance by using ultrasonic sensor</td>
</tr>
<tr>
<td></td>
<td>Using the ultrasonic sensor, detect an object and stop and/or change direction</td>
</tr>
</tbody>
</table>

**Make sure students know how to connect the robot by Bluetooth**
So Where Do We Start with Lessons on Programming?

- www.ev3lessons.com
- Touch Sensor
- Color Sensor
- Ultrasonic Sensor
- Motor Blocks Overview

This is one example of what happens in practice:

2. Go straight and stop on the boat for 5 seconds.
3. Turn right.
4. Go between the blocks.
5. Stop at the cargo truck
6. Turn backwards with one tire.
7. Back up to the blocks.
8. Turn left.
9. Stop in the 3rd circle (near turtle head)
How Does a Typical Meeting Look Like for us?
Other tips for creating a successful team practice
Fall 2019 Competition
This year, we will have three different parts to the competition.

- one part will be programming the EV3 robots
- one part will be programming the Sphero
- one part will be engineering a solution to a Sphero problem and driving the Sphero to accomplish the mission.

Each team will complete two missions per board.

- Teams will consist of 2-4 students. ($15 per team.)
- Items used to measure are allowed at the board.
- Students can bring one sheet with programming notes on it if needed.
- Coaches are not allowed in the playing field.
Teams will have 25 minutes to complete missions for as many points as possible. (We will give a 5 minute warning)

Each student will have a job for the round and will rotate jobs between rounds.

Teams may bring one attachment that can be easily added to or removed from the EV3 base robot to be able to grab/carry something from one place to another. No motor is allowed.

The missions will be given at the competition.
Time and Scoring

✘ All team members must be at their board by the time the round begins. We will start the round at the scheduled time and end the round at the scheduled time, even if the team is not there.

✘ All bricks must be clear before you start programming in the round. Judges will check before round begins.

✘ All chromebook programming must be clear before you may start programming in the round.

✘ When the round is over there will be NO MORE SCORING - you must have the judges score everything BEFORE the final time is up. The judge will only score programming during the round.

✘ **The front of the wheels must be behind the starting line when the robot starts the challenge**
Time and Scoring

✘ There will be two challenges per round. The number of rounds will depend on how many teams will compete.

✘ Each line the robot touches results in one point lost. They may restart the challenge as many times as time allows for a higher score.

✘ Once the team has completed Challenge 1 and has started Challenge 2, then they may NOT go back to Challenge 1.

✘ Challenge cards must be given back to judges at the end of the round.
Student Jobs for Competition

✗ **Computer engineer** - Programs the robot. All team members can give assistance, but only the computer engineer touches the computer.

✗ **Systems Analyst** - Moves the robot on the board as needed. The only one who touches the robot during the round.

✗ **Navigator** - Reads the Challenge Card to the team, measures for the team with rulers as needed, helps to navigate through the challenge.

✗ **Timekeeper** - keeps track of time and communicates with the judge, assists the Navigator as well.
Each School Should Bring

✗ Chromebook for each team
✗ EV3 for each team
✗ Color sensor pointed down
✗ Touch sensor pointed out
✗ Ultrasonic sensor pointed out
✗ Attachment for EV3 (no motors)
✗ Measuring device for each team
✗ Download cord for each team. (Bluetooth is allowed)
✗ Charging cords needed for the day
✗ One page printed cheat sheet per team if needed
This year’s theme is...
Any questions about the fall competition?
Sumo-Bot Competition


For our Sumo-Bot competition, two robots attempt to push each other out of an arena using sensors, clever programming, and innovative design.

The arena for the contest is a 4-foot diameter circle, and the time given for each round is 3 minutes.

Your goal is to create a sumo-bot that can push its opponent out of the arena before being pushed out of the arena by the competing sumo-bot.
Sumo-Bot Competition

✘ All robots may only be constructed with unmodified LEGO construction components.
✘ They must be completely autonomous.
✘ Maximum width: 10 inches (32 studs)
✘ Maximum length: 10 inches (32 studs)
✘ Weight: 1 kilograph (2.2 pounds)
✘ Maximum height: no limit
Sumo-Bot Competition

- 3 minute time frame
- 5 second delay before starting
- Robot must travel either forward or back completely out of the box before turning around
- The Appalachian State University rules will be followed
- ASU website states there will be changes for 2020 competition. When those are available, we will share.
- We have a county competition ($12 per team) and you can also compete at ASU ($20 per team)
How do we help students get ready for this competition?
You are invited to
CCS Fall Robotics
Competition

Date      First 2 weeks of December ???
Time      School Day ???
Location   Hickory Metro Center ???
Contact
stephanie_eddings@catawbaschools.net
lara_arrigoni@catawbaschools.net
You are invited to CCS Sumo Fest

Saturday (Last Sat March - 2 weeks before ASU)

Time ? (Mornings)

Location ? (Tarlton Center CVCC)

Contact

blaire_miller@catawbaschools.net
THANKS!

Any questions?
You can find me at

✘ Blaire_Miller@catawbaschools.net
✘ Stephanie_Eddings@catawbaschools.net
✘ Lara_Arrigoni@catawbaschools.net

Extra resources

\[ \pi, \sqrt{2}, E = mc^2, H_2O \]
SlidesCarnival icons are editable shapes.

This means that you can:

- Resize them without losing quality.
- Change fill color and opacity.

Isn't that nice? :)