2018 OVERVIEW Rules, Deadlines and Rubrics

OXFORD INVITATIONAL YOUTH
ROBOTICS
CHALLENGE

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Challenge Overview:

For the 2018 OIYRC Robotic Challenge, teams will design and fabricate a "sorting" robot. You will be supplied with a 1.5" x 3.5" x 24" guide board, a sorting box, and nine letters which spell "Execulink" (one of this year's OIYRC platinum sponsors). The supplied letters will differ by colour and mass.

The judge will randomly choose one of the nine (9) unique letters and give it to the robot operator. The robot operator will place the chosen letter into the robot and press a start button to initiate the robotic operation. The robot will autonomously determine the object's colour (i.e., green, red, yellow, blue, or black) and mass (i.e., heavy or light) and place it into its correct location to spell the word "Execulink". This random process will be repeated until all nine (9) letters are correctly placed into their correct location within the sorting bin.

Skillful design and programming will ensure the robot can *efficiently* complete the repetitive task on its own without the assistance of the team members

Teams, Deadlines: submitted to jane@workforcedevelopment.ca

- Teams may represent a school, a club or youth group.
- Teams will have at least four (4) youth members.
- Teams with more than 4 members must select only a maximum of 5 members to attend the event challenge on **November 20, 2018**
- Submit team name and participating student names by **October 19, 2018**.
- Send a team photo (JPG format) and photo release forms by **October 19, 2018**.
- Submit a final video and written report by **November 14, 2018**.
- Teachers and adult mentors (upon availability) may only act in an advisory role.
- A team field trip to a sponsor manufacturing facility or mentor facility is strongly encouraged (upon availability).

Each team MUST be at the challenge with a functioning robot in order to keep the Mindstorm EV3 kit.

The kits are generously provided by our sponsors. Each team will be provided with the name of their sponsor. Teams are expected to learn about their sponsor and proudly exhibit their sponsor's name on their display.

Teams may be provided with a mentor (upon availability) to advise and assist the team throughout the process. These mentors volunteer their time to provide mentoring. Mentors may also provide opportunities for plant tours to view robots in an industrial environment.
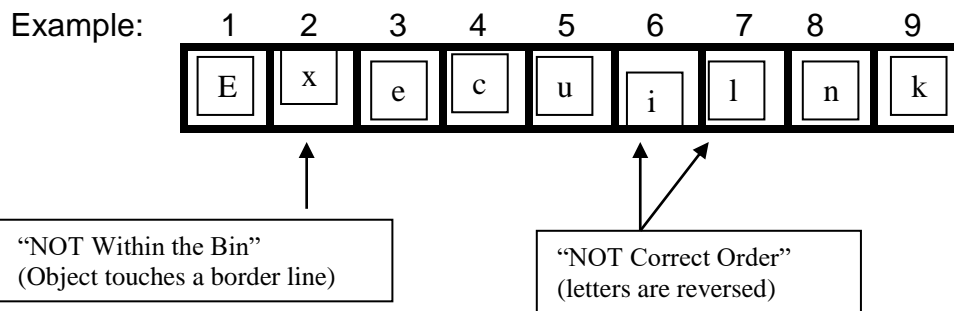
All questions regarding the video, written report: jane@workforcedevelopment.ca

All questions regarding technical support (i.e., the robot and/or the challenge) should be directed to Glenn Raake at graake@ldcsb.ca

Challenge Rules:

1. Only the Lego Mindstorms EV3 Kit provided may be used to build the robot. Uses of extra materials or parts are not allowed in the robot.

2. No use of glue, tape wire, etc. is allowed to be used in the project. No parts may be cut, drilled or otherwise modified.

3. The objects will be manually loaded into the robot. A Cycle Start button must be incorporated into the robot design which will be manually pressed to indicate the part has been loaded and is ready to sort.

4. All letters must be loaded into the robot using the exact same procedure. When the robot operator is placing the letter into the robot, he/she may NOT manipulate the object in any way which will assist the robot in determining the object's mass; the robot must determine if the object is "heavy" or "light" on its own. For example, the robot operator may not strategically orient the "heavy" letters in a unique position, angle, or location which is different than the orientation of the "light" letters. In this example, the <u>operator</u> is determining the mass of the object not the robot.

5. The objects are considered "correctly sorted" if they are placed in their correct corresponding box AND as long as it is NOT touching any row or column border line. The judge will have final ruling on any such instance.

Example:

1	2	3	4	5	6	7	8	9
E	x	e	c	u	i	l	n	k

"NOT Within the Bin"
(Object touches a border line)

"NOT Correct Order"
(letters are reversed)

6. The robot cannot come into contact with the 1.5" x 3.5" x 24" guide board.

7. If the operator must assist the robot through a cycle, that cycle will not be counted. Thus, the object will be removed from the scoring tally. The remaining objects to be sorted can be cycled.

8. No part of the robot may remain in contact with the object once it is placed. If robot contact is present, no points will be allotted for the placement.

9. The entire assembly process should be autonomous except for the loading of the objects and pressing the "Cycle Start" button.

10. **Operation Scoring Calculation:** Points for successfully delivered objects will be as follows:
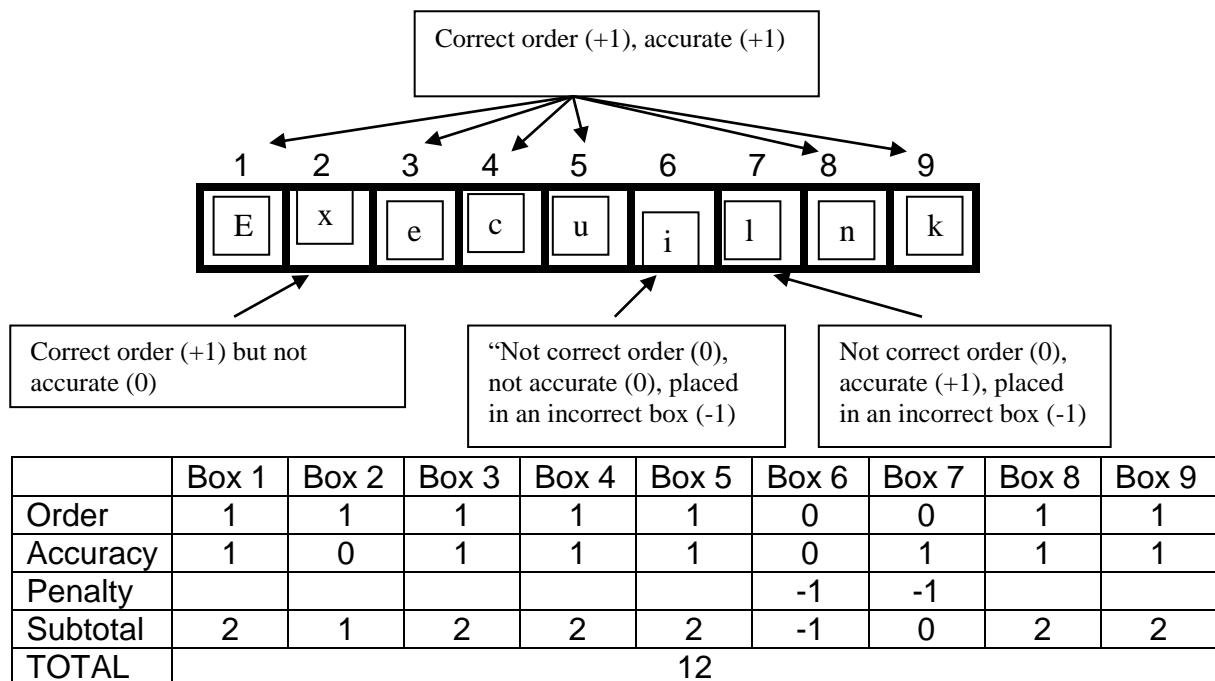
+1 Point for Order. Each object is placed in the correct box (e.g., "E" is box #1, "x" is box #2, "e" is box #3, "c" is box #4, "u" is box #5, etc.) even if it is touching a border line
+1 Point for Accuracy. Each object is placed within a box and not touching a border line (even if the incorrect letter is the box.)
-**1 Point penalty** for each object placed in an incorrect box.

Thus, each object correctly placed into its corresponding box will score two points. A maximum score of 18 points can be achieved.

SAMPLE SCORING:

Correct order (+1), accurate (+1)

1 2 3 4 5 6 7 8 9

E x e c u i l n k

Correct order (+1) but not accurate (0)

"Not correct order (0), not accurate (0), placed in an incorrect box (-1)

Not correct order (0), accurate (+1), placed in an incorrect box (-1)

	Box 1	Box 2	Box 3	Box 4	Box 5	Box 6	Box 7	Box 8	Box 9
Order	1	1	1	1	1	0	0	1	1
Accuracy	1	0	1	1	1	0	1	1	1
Penalty						-1	-1		
Subtotal	2	1	2	2	2	-1	0	2	2
TOTAL					12				

11. The 1.5" x 3.5" x 24" guide board must be placed on the table on its narrow edge. The sorting boxes must be centered on the 24" and located alongside the 1.5 x 3.5 x 24 board exactly 6" away. The sorting boxes may be taped down to the desk using clear tape.

See diagram:

12. Additional operational points (maximum of 2) may be awarded for a supplementary feature incorporated into the robot design (e.g., sorted objects are counted by the EV3 on its screen or by sound, and a light indicates it is ready to receive another object, etc.) These 1-2 points are at the discretion of the judges.

13. The sorting process will be timed; the robot will be judged for its time efficiency. The team with the highest score will be awarded Platinum Level achievement. In the event of a tied score, the most efficient robot (i.e., with the fastest time to complete the task) will be awarded Platinum Level.

14. The team must document their project from start to finish in a written report and presentation. In addition, they must submit a final maximum 10 minute video outlining the struggles and achievements encountered in the process. The final functioning robot should be shown completing the task. Refer to the written report, video, and presentation rubrics provided for judging criteria. Instructions for submitting the written report and the final video are provided in the information packaged included in the Lego kit. The written report and final video must be submitted by **November 14, 2018**.

15. Each team must be present at Goff Hall for the challenge on **November 20, 2018** and have contact with their mentor (upon availability). Any team that misses the event will be required to return the Lego Mindstorms EV3 Kit in its entirety.

16. **Overall Scoring Calculation:** The final overall score will be as follows:

Challenge Component	Possible Score
Operation	/50
Presentation	/30
Video	/10
Written Report	/10
Final Score	**/100**

OPERATION RUBRIC:

Bronze Level	Silver Level	Gold Level
Total points awarded for sorted objects (1-8 points) _____Points	Total points awarded for sorted objects (9-13 points) _____Points	Total points awarded for sorted objects (14-18 points) _____Points
Time taken to assemble all products without human assistance **Time:** _____	Time taken to assemble all products without human assistance **Time:** _____	Time taken to assemble all products without human assistance **Time:** _____
Additional supplementary robot feature #1 (e.g., counter) _____ (Brief Description) Additional supplementary robot feature #2 (e.g., ready light) _____ (Brief Description) _____**Points (Max 2)**	Additional supplementary robot feature #1 (e.g., counter) _____ (Brief Description) Additional supplementary robot feature #2 (e.g., ready light) _____ (Brief Description) _____**Points (Max 2)**	Additional supplementary robot feature #1 (e.g., counter) _____ (Brief Description) Additional supplementary robot feature #2 (e.g., ready light) _____ (Brief Description) _____**Points (Max 2)**
Total Score _____ **(Maximum 10)**	**Total Score** _____ **(Maximum 15)**	**Total Score** _____ **(Maximum 20)**

Instructions to Judges:
Write **Team Name** at top of sheet
1. Evaluate robot operation using criteria stated above.
2. <u>Time</u> the operation using a stop watch, record the time on the sheet.
3. Circle **(Bronze)** or **(Silver)** or **(Gold)** at top of page
4. Use the following equation to <u>calculate</u> the Operation Final Score below

      Operation Final Score = (Above Total Score) $\div$ **20** $\times$ **50**

5. <u>Write </u>any special remarks below:
6. <u>Thank Team for effort, move to next table</u>
7.

Operation Final Score = ___ / 50

PRESENTATION RUBRIC:

	Bronze Level	Silver Level	Gold Level
Oral Presentation	Default level. Presentation is made but lacks preparation and direction. Important details are missing Time runs over 5 minute limit.	Well prepared presentation is well organized and includes: -introduction of team members -sponsor info and mentor info (upon availability) -clear explanation of robot operation	Presentation is polished and smooth. Three or more team members participate in the presentation.
/20	2 4 6 8 10	12 14 16	17 18 19 20
Robot Display	Robot kit is present in its entirety. Table is organized with minimal information or display	Display is well designed with poster and graphics. Sponsor name and logo is identified	As in silver level plus photos used to 'tell the story' behind the project
/10	1 2 3 4 5	6 7 8	9 10

Instructions to Judges:

1. Write **Team Name** at top of sheet
2. Evaluate team report against the stated criteria
3. Underline each achieved criteria
4. Identify the resulting scoring level
5. Circle **B** (Bronze) or **S** (Silver) or **G** (Gold) at top of page
6. Calculate Presentation Final Score.
7. Write any special remarks below:
8. Thank Team for effort, move to next table

Presentation Final Score =   ___ /30

VIDEO RUBRIC:

|	Bronze Level	Silver Level	Gold Level
Video Submission	Video includes two of the following: -complete team -operation of robot -simple to follow -no gimmicks -only necessary info -under ten minutes	Video is clear and includes four of the following: -complete team -operation of robot -simple to follow -no gimmicks -only necessary info -under ten minutes	Video is clear and includes all of the following: -complete team -operation of robot -simple to follow -no gimmicks -only necessary info -under ten minutes
/10	1 2 3 4 5	6 7 8	9 10

Instructions to Judges:
1. Write **Team Name** at top of sheet
2. Evaluate team report against the stated criteria
3. Underline each achieved criteria
4. Identify the resulting scoring level
5. Circle **B** (Bronze) or **S** (Silver) or **G** (Gold) at top of page
6. Calculate Video Final Score
7. Write any special remarks below:

Video Final Score = _____ /10

WRITTEN REPORT RUBRIC:

	Bronze Level	**Silver Level**	**Gold Level**
Written Report	Basic written report only	Detailed written report Including: -mentor profile (upon availability) -sponsor information -concept diagrams -program script	As in silver level with superior report detail and professional formatting. Report is well organized and attractive.
/10	1 2 3 4 5	6 7 8	9 10

Instructions to Judges:
1.   Write **Team Name** at top of sheet
2.   Evaluate team report against the stated criteria
3.   Underline each achieved criteria
4.   Identify the resulting scoring level
5.   Circle **B** (Bronze) or **S** (Silver) or **G** (Gold) at top of page
6.   Calculate Written Report Final Score
7.   Write any special remarks below

# Written Report Final Score =   ___ /10

## Instructions on submitting your video to our YouTube account for judging:

1. <u>Name your video with your school name and team name</u>. Save it.
2. Click here: http://www.youtube.com/user/OxfordRoboticsChalle
3. See upper right screen, click "Sign In"; then
4. You may be asked to use an existing Google account. CAUTION: do not use any other account. **Click "Add An Account**" to use the "Oxford Robotics" Account
5. If your screen says "Oxford Robotics" Click on the right ">" to enter Sign in with the email account oxfordroboticscompetition@gmail.com
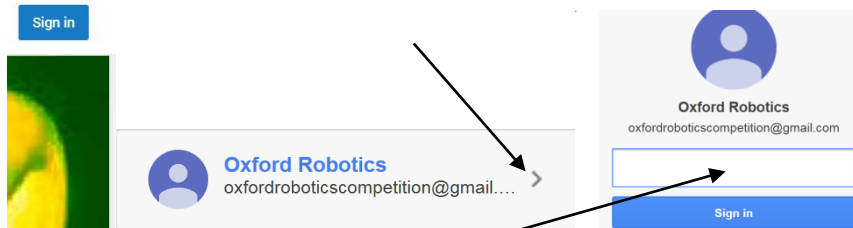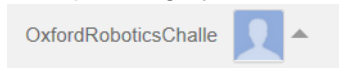

6. Password is: 2roboticsoxford#2 (Please don't share)
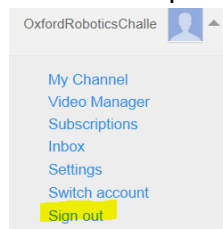7. Click on "upload" at the top. REMEMBER to allow enough time for upload.
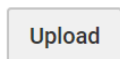
8. Please remember to make your video public.
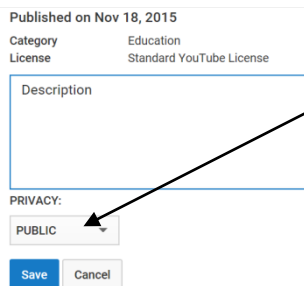
9. Remember to log out when upload is completed. Screens may look different depending on the operating system. Click on:

10. From the drop down list, click "sign out":

11. If you have questions uploading to YouTube please contact us by email for assistance at jane@workforcedevelopment.ca