Mission Briefing Booklet

SMART City Challenge ~ GEARBOTS Coding Challenge

Skills Canada BC Provincial Competition ~ Abbotsford BC ~ April 5th 2017

Thanks to the following event supporters:

Mission Briefing

SMART City Challenge – April 2017

Description of the challenge:

1. Missions from the ALPHA BASE

☐ **A1 - ALPHA BASE Primary Mission A: Taking money out of the ATM to pay for gas**
Your robotic device must travel from the ALPHA BASE to the ATM in the GAS STATION ZONE, collect the MONEY BLOCK, move the MONEY BLOCK to the GAS STATION DROP ZONE and return back to the ALPHA BASE.

☐ **A2 - ALPHA BASE Primary Mission B: Refueling your robot at the gas station**
Your robotic device must travel from the ALPHA BASE to the GAS STATION ZONE, stop with one wheel completely inside the 720^0 (degree) circle, complete a 720^0 (degree) one wheel turn inside the circle to refuel your robot and return back to the ALPHA BASE.

☐ **A3 - ALPHA BASE Primary Mission C: Taking crash victim to the hospital**
Your robotic device must travel from the ALPHA BASE to the CAR CRASH ZONE, collect the CRASH VICTIM BLOCK, and move the CRASH VICTIM BLOCK to the HOSPITAL DROP ZONE and return back to the ALPHA BASE.

☐ **A4 - ALPHA BASE Primary Mission D: Putting out the forest fire**
Your robotic device must travel from the ALPHA BASE to the POLICE & FIRE STATION ZONE, collect the WATER CONTAINER, and move the WATER CONTAINER to the FOREST FIRE DROP ZONE and return back to the ALPHA BASE.

☐ **A5 - ALPHA BASE Primary Mission E: Complete the computer code**
Your robotic device must travel from the ALPHA BASE to the LIGHTHOUSE LABS ZONE, move the CODE BLOCK in A5-1 to the other CODE BLOCK DROP ZONE A5-2 and return back to the ALPHA BASE.

☐ **A6 - ALPHA BASE Primary Mission F: Crash scene investigation of the car crash**
Your robotic device must travel from the ALPHA BASE to the POLICE & FIRE STATION ZONE, collect the CRASH SCENE INVESTIGATION SUPPLIES BLOCKS, and move the CRASH SCENE INVESTIGATION SUPPLIES BLOCKS to the CAR CRASH DROP ZONE and return back to the ALPHA BASE.

☐ **A7 - ALPHA BASE Primary Mission G: Rock to construction site**
Your robotic device must travel from the ALPHA BASE to the ROCK QUARRY ZONE, collect the ROCK BLOCKS, and move the ROCK BLOCKS to the CONSTRUCTION SITE DROP ZONE and return back to the ALPHA BASE.

Extension Mission: Can only attempt this Extension Mission once **ALL** Primary Missions from the ALPHA BASE have been successfully completed / evaluated by the judges.

☐ **A8 - ALPHA BASE Extension Mission H: Pay tuition for coding bootcamp course**
Your robotic device must travel from the ALPHA BASE, pick-up/collect the RED/BLUE BALL representing the TUITION PAYMENT from one of the squares in the BANK ZONE, deliver the RED/BLUE BALL to the basket at the LIGHTHOUSE LABS DROP ZONE, and return back to the ALPHA BASE.

2. Missions from the BETA BASE

☐ **B1 - BETA BASE Primary Mission I: Fixing traffic lights**
Your robotic device must travel from the BETA BASE to HARDWARE STORE ZONE, collect the LIGHT BLOCK, move the LIGHT BLOCK to the FIX TRAFFIC LIGHT DROP ZONE and return back to the BETA BASE.

☐ **B2 - BETA BASE Primary Mission J: Close the window**
Your robotic device must travel from the BETA BASE to the HOUSE ZONE, close the OPEN WINDOW and return back to the BETA BASE.

☐ **B3 - BETA BASE Primary Mission K: Take term paper to BCIT campus**
Your robotic device must travel from the BETA BASE to the HOUSE ZONE, collect the TERM PAPER BLOCK, move the TERM PAPER BLOCK to the BCIT CAMPUS DROP ZONE and return back to the BETA BASE.

☐ **B4 - BETA BASE Primary Mission L: Collecting the recycling**
Your robotic device must travel from the BETA BASE to the area the has the recycling boxes, collect all of the RECYCLING BLOCKS, move the RECYCLING BLOCKS to the CITY WORKS YARD DROP ZONE and return back to the BETA BASE.

☐ **B5 - BETA BASE Primary Mission M: Tree planting**
Your robotic device must travel from the BETA BASE to the CITY WORKS YARD ZONE, collect all of the TREE BLOCKS, move the TREE BLOCKS to the TREE PLANTING DROP ZONE and return back to the BETA BASE.

☐ **B6 - BETA BASE Primary Mission N: Regional park road garbage collection* / line follower**
*** NOTE: [must use light sensor programming to follow the line & collect blocks / only one light/colour sensor]**
Your robotic device must travel from the BETA BASE to the FRASER VALLEY REGIONAL PARK ZONE, following the line path along the road (minimum one direction) of the FRASER VALLEY REGIONAL PARK ZONE [using a light/colour sensor] while touching and collecting the GARBAGE BLOCKS from and to the arrows, move the GARBAGE BLOCKS to the CITY WORKS YARD DROP ZONE and return back to the BETA BASE.

☐ **B7 - BETA BASE Primary Mission O: Fishing in Abbotsford Lake**
Your robotic device must travel from the BETA BASE to the ABBOTSFORD LAKE ZONE, collect the FISH BLOCKS from the lake, move the FISH BLOCKS to the HOUSE ZONE and return back to the BETA BASE.

Extension Mission: Can only attempt this Extension Mission once **ALL** Primary Missions from the BETA BASE have been successfully completed / evaluated by the judges.

☐ **B8 - BETA BASE Extension Mission P: Catching the bus**
Your robotic device must travel from the BETA BASE, pick-up/collect/push the structure representing the PERSON from the BUS STOP ZONE, deliver the PERSON BLOCK to the BCIT CAMPUS DROP ZONE, and return back to the BETA BASE.

General breakdown of the point system:

Starting a Mission:
- 10 points awarded for starting inside appropriate base

Moving Blocks: (small and large)
- each designate small block moved or touched during the mission earns 5 points
- each designate large block moved or touched during the mission earns 20 points
- each designate beam moved or touched during the mission earns 10 points

Target Boundaries:
- each block within designated boundary zone but not touching "No Touch Zone" will count
- 5 points for each of the small blocks and 20 points for the large block

Line Following:
- following line from the start/stop arrows
- total points awarded 70 points (line follower in only one direction is counted)
- must use light sensor / colour sensor programming

Ending a Mission:
- Between 30 – 50 points awarded for both main drive wheels crossing the boundary of the designated base

Extension Missions:
- the balls/tower/structure/object is worth between 50 and 100 points. Collect full points if the balls/tower/structure/object is successfully left upright/dropped into the container/zone and the robot returns successfully back to the appropriate base.
- only 25 to 50 points are awarded if the balls/tower/structure/object does not stay in/upright in the container/zone
- NO points are deducted if the balls/ tower falls over and touches a NO TOUCH ZONE

Point Deductions:
- at any point in a mission, 5 points (for each touch) will be deducted for any part of the robotic device (except wires) touching or crossing over the vertical plane any part of a NO TOUCH ZONE
- blocks that touch the NO TOUCH ZONES will be not counted and are considered frozen
- Robot can touch but not go across the yellow / black dashed area on the regional park zone
- 10 points are assessed when retrieving the robot to restart the mission for each attempt - This will be referred to as a RESTART by the team and zone judge
- running time will continue until the mission has been completed.

Terminating the Mission:
- touching the robot to correct its course voids (terminates) the mission
- if the mission has been terminated, the score and time will not count (no points awarded). The mission is considered scrubbed and cannot be attempted again.