



Senior Robotics – Grade 8 + 9

Welcome to your Conquesta Olympiad. When you have decided which of the answers is correct, scratch out the letter in the matching square on your answer sheet. Example:- If the answer to question 4 is c, then scratch out the letter c in the square containing c next to the number 4 (see example 1 below). If you've made a mistake and b should have been the answer, neatly cross out the mistake and then scratch out b (see example 2 below).

Example 1:- 4. a b ~~c~~ d

Example 2:- 4. a ~~b~~ ~~c~~ d

As this paper has been printed in greyscale, the colours of the panels on the icons have been indicated in italics, with arrows pointing to the relevant panels.

BUILDING – CHASSIS, INVENTORY, BEAMS, PARTS

1. This component is used as a

- (a) beam.
- (b) wheel spacer.
- (c) bushing.
- (d) axle.



2. This is a/an

- (a) angular beam.
- (b) connector.
- (c) straight beam.
- (d) axle.



3. A colour sensor recognises three conditions, namely, colour, ambient light and intensity.

- (a) reflected light
- (b) real light
- (c) radar light
- (d) reflected load

4. The output ports of an EV3 brain are used to connect to the brain using wires.

- (a) motors
- (b) gears
- (c) beams
- (d) colour sensors

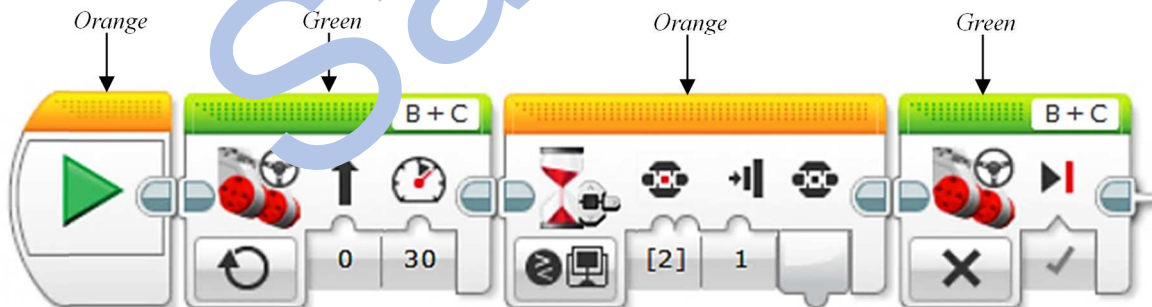
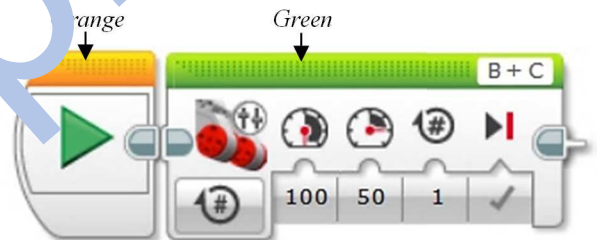
5. To download a program onto the EV3 brick, you can use a USB cable or

- (a) a beam.
- (b) a Bluetooth connection.
- (c) an axle.
- (d) a bushing.

PROGRAMMING – MOVE WAIT START (function)

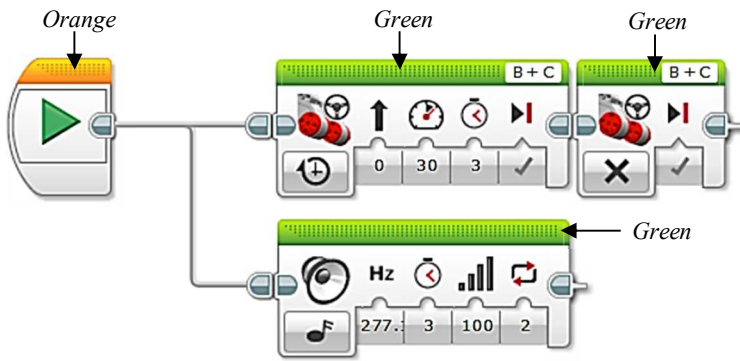
6. In the MOVE TANK icon on the right, the power settings of the motors indicate that Motor B

- (a) will first rotate at 100 power, and then Motor C will rotate at 50 power.
- (b) and Motor C cannot move at different power settings.
- (c) and Motor C will rotate backwards.
- (d) will rotate at the power of 100, and Motor C will rotate at the power of 50 at the same time.



7. The combinations of a MOVE STEERING, a WAIT and another MOVE STEERING icon, will ensure that the robot will

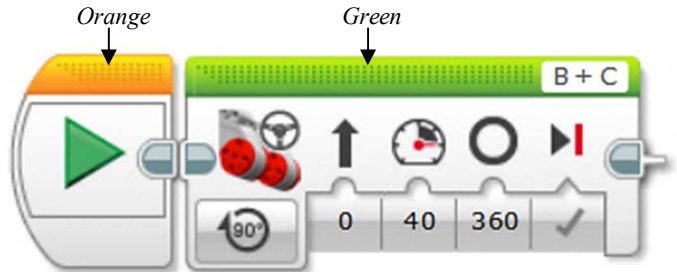
- (a) wait until the brick button is pressed, and then move forward at 30% power and then stop.
- (b) wait until the brick button is pressed, and then move forward for 30 degrees and then stop.
- (c) move forward for 30 degrees, wait until the central brick button is pressed, and then the motors will stop.
- (d) move forward at 30% power until the central brick button is pressed, and then the motors will stop.



8. The two programming icons indicate that the sound will
- (a) play on repeat mode for 3 seconds. The motors will run for 3 seconds and then stop.
 - (b) play only whilst the motors run for 3 seconds and then stop.
 - (c) continue to play until completion, irrespective of the motors running.
 - (d) play once and then stop, irrespective of the motors running.

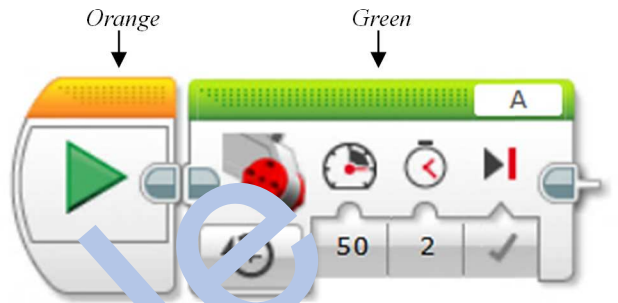
9. The motor controlled by this icon will MOVE for

- (a) 1 rotation.
- (b) 40 rotations.
- (c) 0 rotations.
- (d) 360 rotations.



10. The braking option selected on this icon will

- (a) allow the motors to spin freely until the motors stop eventually.
- (b) stop the motors immediately and locks the motors.
- (c) allow the motors to stop when it is safe.
- (d) stops the motors after momentum has been calculated.



BUILDING – PASSIVE ATTACHMENT

PROGRAMMING – PASSIVE ATTACHMENT

11. The robot must push a tennis ball 30 cm. The recommended passive attachment is a

- (a) plough.
- (b) delivery box.
- (c) bumper.
- (d) fishhook.

A bumper (like the picture on the right) may be used to push something. However, to push something out of the way (i.e. clear the surface in front of the moving robot) may require a different kind of attachment.



12. The recommended attachment will be a

- (a) delivery box.
- (b) simple hook.
- (c) plough.
- (d) grabber.

13. When moving the robot that has a passive attachment (e.g. a hook), it is recommended that the robot must approach the object

- (a) with great speed.
- (b) smoothly and steadily.
- (c) always at a 90-degree angle.
- (d) with a very loud noise.

14. When the robot is delivering an object with a passive dump attachment, it is recommended that the robot must be programmed to

- (a) reverse very slowly to ensure that the object is dumped.
- (b) pause for at least a second before reversing in order for momentum to assist in the dumping of the object.
- (c) make a warning noise before reversing to ensure the object is dumped.
- (d) turn 180 degrees after the object has been dumped.

BUILDING – SENSOR TOUCH

15. The touch sensor may be in one of the following phases, namely

- (a) on or off.
- (b) near or far.
- (c) stop or go.
- (d) released, pressed or bumped.

16. To make sure that the robot will stop when it collides with an obstacle in its path, you could use either of two sensors, namely

- (a) touch and ultrasonic
- (b) colour and touch
- (c) sound and light
- (d) light and colour

