



Senior Robotics – Grades 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

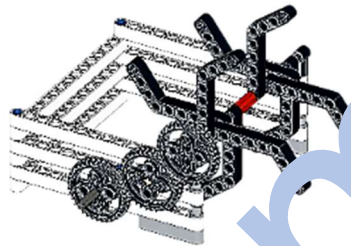
As this paper has been printed in greyscale, the colours of the panels on the icons have been indicated in italics, with arrows pointing to the relevant panels.

BUILDING CHASSIS, INVENTORY, BEAMS, PARTS

1. **A / An** is used to connect a sensor to the brain / hub of the robot.
(a) connector (b) axle (c) wheel (d) wire

BUILDING PASSIVE ATTACHMENT

2. **This attachment is called a**
(a) plough
(b) trigger
(c) sweeper
(d) carabineer



BUILDING SENSOR TOUCH

3. **The touch sensor must be mounted facing, to ensure that the robot stops when it reverses into a wall.**
(a) upwards
(b) backwards
(c) sideways
(d) the top

BUILDING ULTRASONIC

4. **To ensure that the robot follows a wall, the ultrasonic sensor must be attached at the of the robot.**
(a) front (b) back
(c) side (d) top

BUILDING COLOUR SENSORS

5. **For the colour sensor to follow the line, it must be attached to the robot**
(a) as close as possible to the ground.
(b) on the side of the robot.
(c) on top of the robot.
(d) in the centre at the front of the robot.

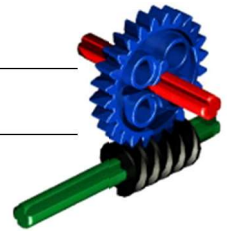


BUILDING GEARS

6. **To ensure that rotational motion is converted to longitudinal, a gear is used.**
(a) worm (b) spur
(c) rack and pinion (d) knob

PROGRAMMING GEARS

7. **When programming gears for strength, the programming will need to**
(a) gear down (b) gear up
(c) stay the same (d) pause



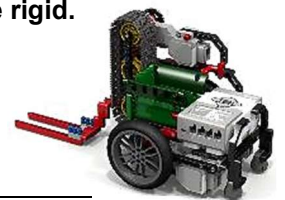
8. **If you need to program a robot to move faster, and attach a smaller gear and then a larger gear, the of the robot must be adjusted.**
(a) rotations (b) power
(c) speed (d) seconds

BUILDING POWERED ATTACHMENTS

9. **A powered attachment must**
(a) not be attached to a motor.
(b) only be attached to a small motor.
(c) be attached to a motor, no matter the size.
(d) only be attached to a large motor.

PROGRAMMING POWERED ATTACHMENTS

10. **When using a grabber, the motors must be programmed in**
(a) seconds (b) rotations (c) counts (d) degrees
11. **When gears are used in a powered attachment, the of the gears must be rigid.**
(a) meshing
(b) attachment
(c) rotation
(d) synchronization

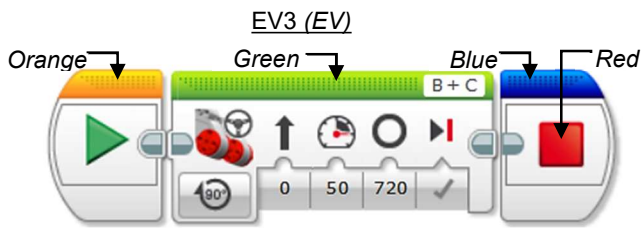


PROGRAMMING PASSIVE ATTACHMENT

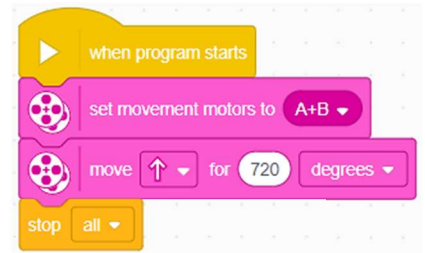
12. **A passive attachment is**
(a) always attached to motor A.
(b) always attached to motor B.
(c) always attached to motor C.
(d) not attached to a motor.

As schools are moving from EV3 Lab programming (icon-based) to EV3 Classroom / Spike Prime (scratch-based), the team has included diagrams for both coding options.

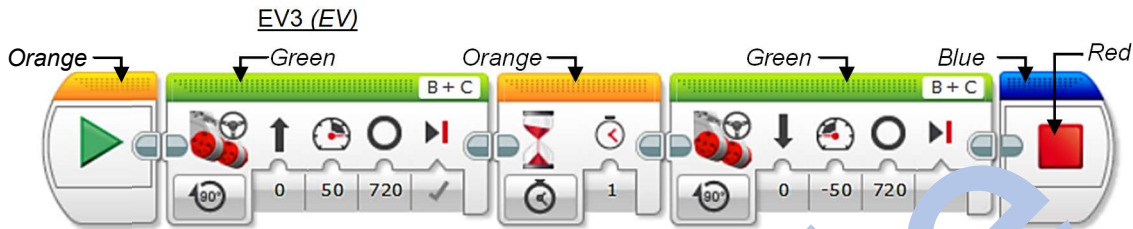
PROGRAMMING MOVE, WAIT, START, SOUND



Spike Prime (SP)



13. The robot will move forward with rotations of the wheels.
 (a) 0 (b) 50 (c) 720 (d) 2



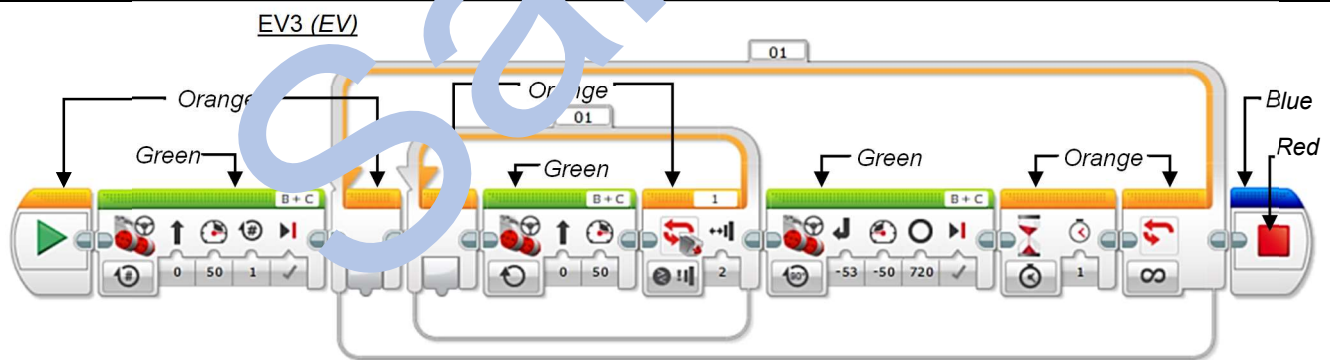
Spike Prime (SP)



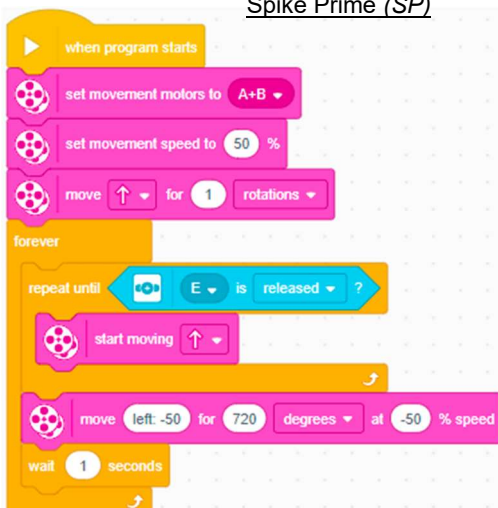
A trigger passive attachment is used to deliver a rubber ball into a bucket.

14. The robot moves and then reverses to ensure that the
 (a) bucket is not pushed.
 (b) ball is delivered.
 (c) carabiner closes.
 (d) ball remains on the attachment.

PROGRAMMING TOUCH & LOOP



Spike Prime (SP)



15. The touch sensor (EV) / force sensor (SP) can be programmed to react to the states of
 (a) bump, press and release.
 (b) push and pull.
 (c) bump and stop.
 (d) release and go.

16. In this code, the robot will move forward and reverse at a wall
 (a) for 1 second.
 (b) until it gets out of the maze.
 (c) forever.
 (d) until the colour sensor sees red.

