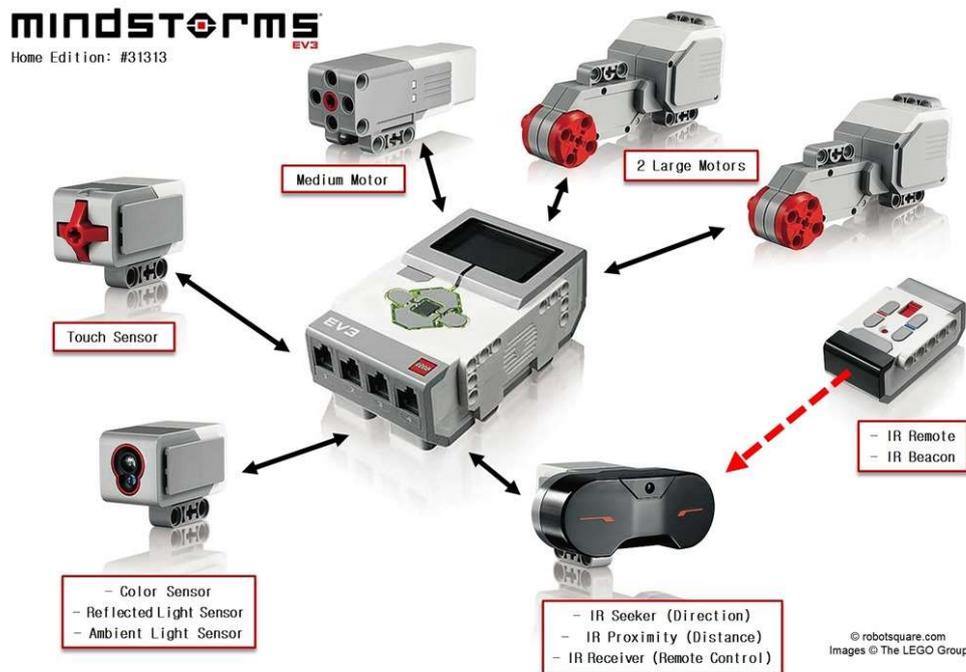


## Lego Mindstorms EV3 Lesson Plan

**Getting Started:** We will need to build a basic robot using the Lego Mindstorms kit. Download the latest version of Lego Mindstorms software and link the programming device (laptop/iPad etc) to the robot via Bluetooth or USB. Ensure the firmware on the Mindstorms brick is the latest version.

Robots need three main components. They need:

1. a way to understand the world around them (sensors),
2. a way to collect the information from the sensors, decide what to do with that information and tell the robot how to act on it (microprocessor),
3. a way to move (motors).

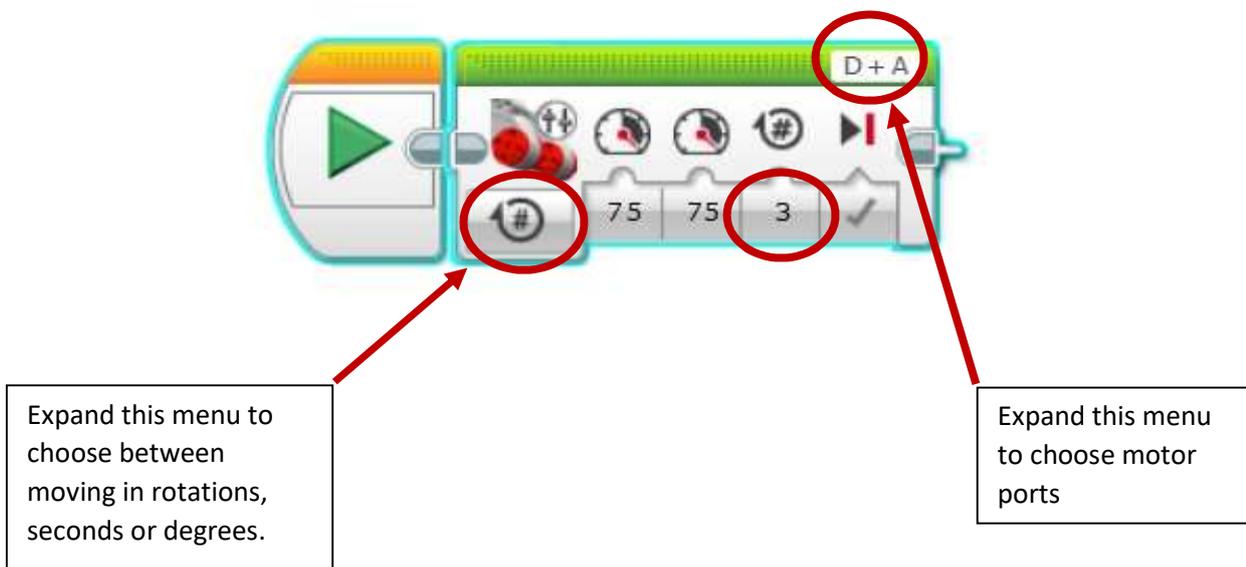


**Fig 1: Main components of EV3 robot**

**Ports:** There are 8 ports on the EV3 brick. Ports labelled A-D are on the top and the motors are plugged into these via the cables supplied. Ports 1-4 along the bottom are for the sensors. When we program the robots we use the labels A-D and 1-4 in the program to determine which motor or sensor receives instruction.

**Create your first program:**

1. Open the software and choose the “New Program” option.
2. Name your program at this stage so that you will recognise it on the EV3 brick later.
3. Find the green motors tab at the end of the screen and pull the “Move tank” block into the program.
4. Ensure the settings on the block match the diagram in Fig. 2.
5. Use the download button to send the program to the robot.
6. Find your program on the brick and run it.
7. Your robot should move forward by 3 rotations of the wheels.



**Fig 2: Move Forward Program**

**Activities:**

1. Change the settings to program the robot to move forward 6 rotations
2. Change the settings to program the robot to move forward 5 seconds
3. Change the settings to program the robot to move forward 720 degrees (note: 360 degrees = 1 rotation)
4. Can you make the robot move backwards?
5. Can you make the robot move around in a complete square? The robot should finish in the position that it started!