

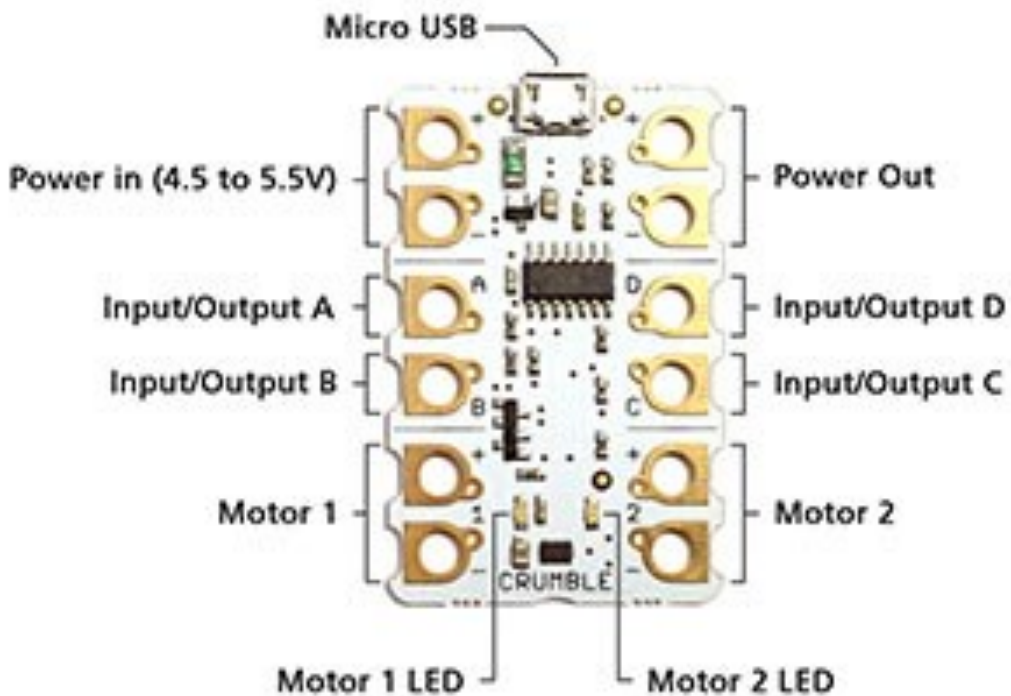


CRUMBLE ROBOTIC VEHICLE WORKSHEET

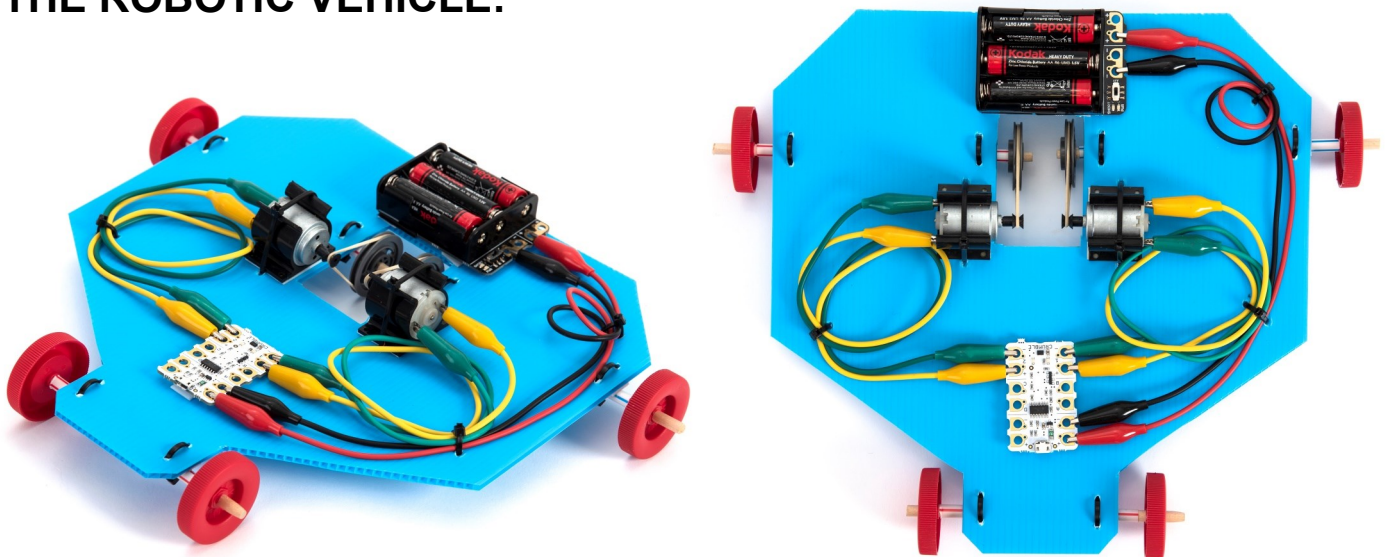
NAMES:

.....

THE CRUMBLE CONTROLLER:



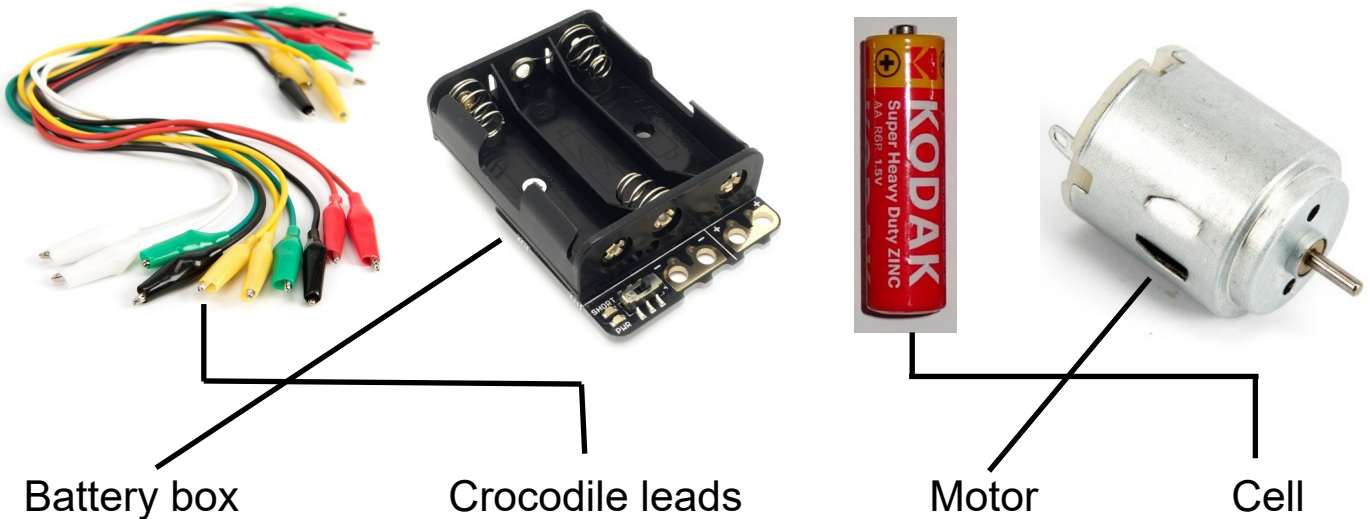
THE ROBOTIC VEHICLE:



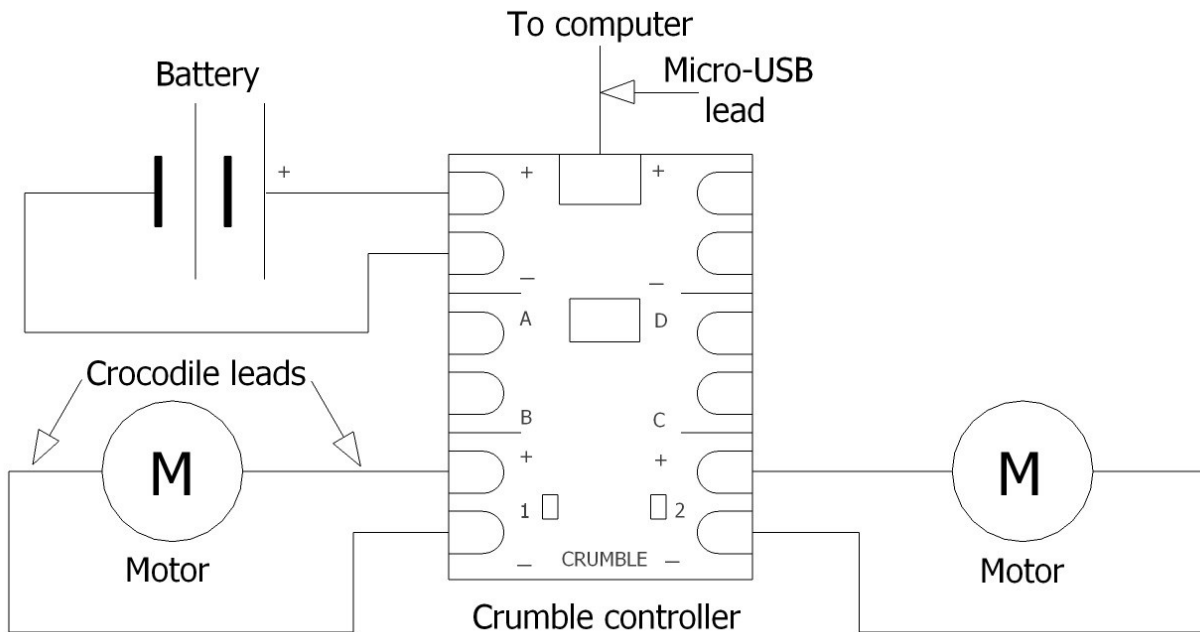


ELECTRICITY

1. Connect these electrical components to their names. The first one is done for you. (Slide 3)



2. Here is a circuit diagram to show you how to connect the battery and one motor to the Crumble controller. Label the motor, the battery and the crocodile leads. (Slide 4)

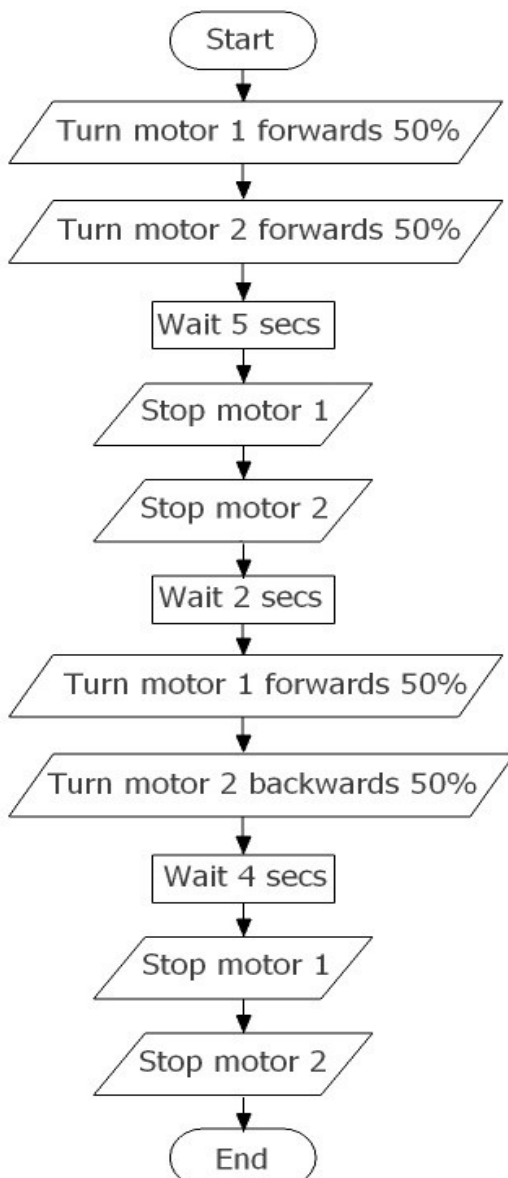
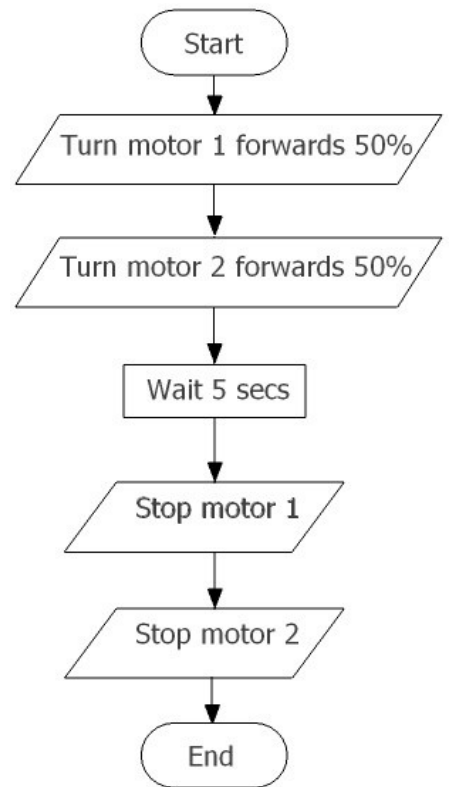


3. Add the second motor to the diagram and show how it connects to the Crumble controller. (Slide 5)



PROGRAMMING

1. On the right is a flow chart showing the logic for you to program both motors to run at 50% power for 5 secs and then stop. Construct a program to do this. (Slide 5)
2. Construct a flowchart below to program your motors to run forwards at 50% power for 5 secs, stop for 2 secs, run one forwards and one backwards at 50% power for 4 secs, then stop both motors.



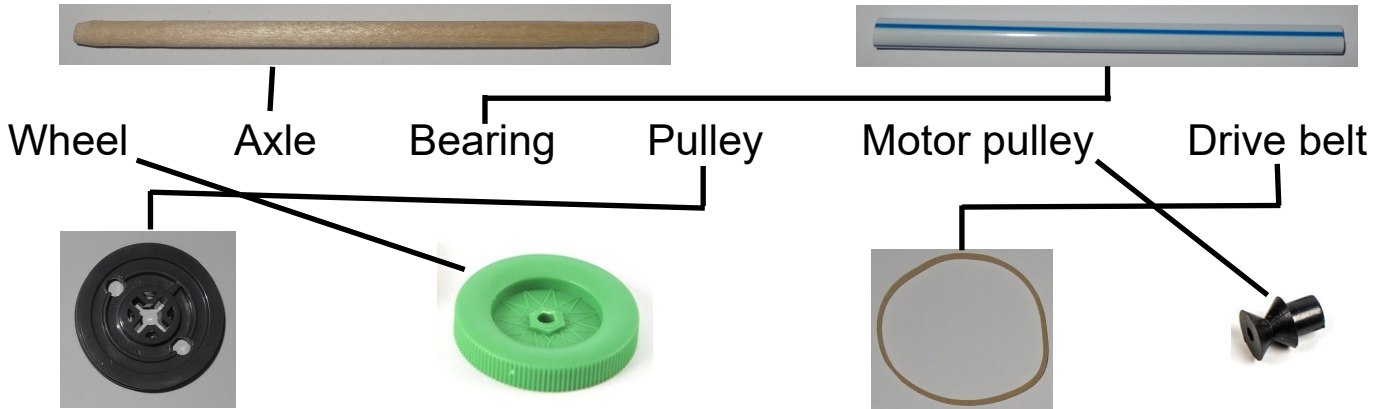
3. Below is a program meant to carry out the sequence described in step 2. It has four bugs (errors). Circle the four bugs.





MECHANICAL SYSTEMS

1. Connect the mechanical components below to their pictures:



2. **What is the purpose of the bearings?**

The bearings supports the axles, retaining them in position whilst keeping the friction down to allow them to rotate.

3. **What would happen if you had high friction between the axles and the bearings?**

This would act to reduce the speed at which the axles rotate, slowing the vehicle down. If the friction was too high the vehicle wouldn't move at all.

4. **Should the drive belts be made of high or low friction material? Why?**

The drive belts should be made of high friction material. They need to grip the pulleys in order to transmit the forces from one to the other.

5. **What is the purpose of the vee shape on the pulleys?**

The vee shape on the pulleys helps prevent the drive belt slipping off when running. It also helps improve the traction between belt and pulley.

6. **Why do the pulleys and rear wheels need to attach firmly to the rear axles?**

If either the pulley or the wheel slips on the axle then the motion is not transmitted, reducing the performance of the vehicle.