



## MECHANICAL SYSTEMS

1. Connect the mechanical components below to their pictures:



Wheel    Axle    Bearing    Pulley    Motor pulley    Drive belt



2. What is the purpose of the bearings?

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

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

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

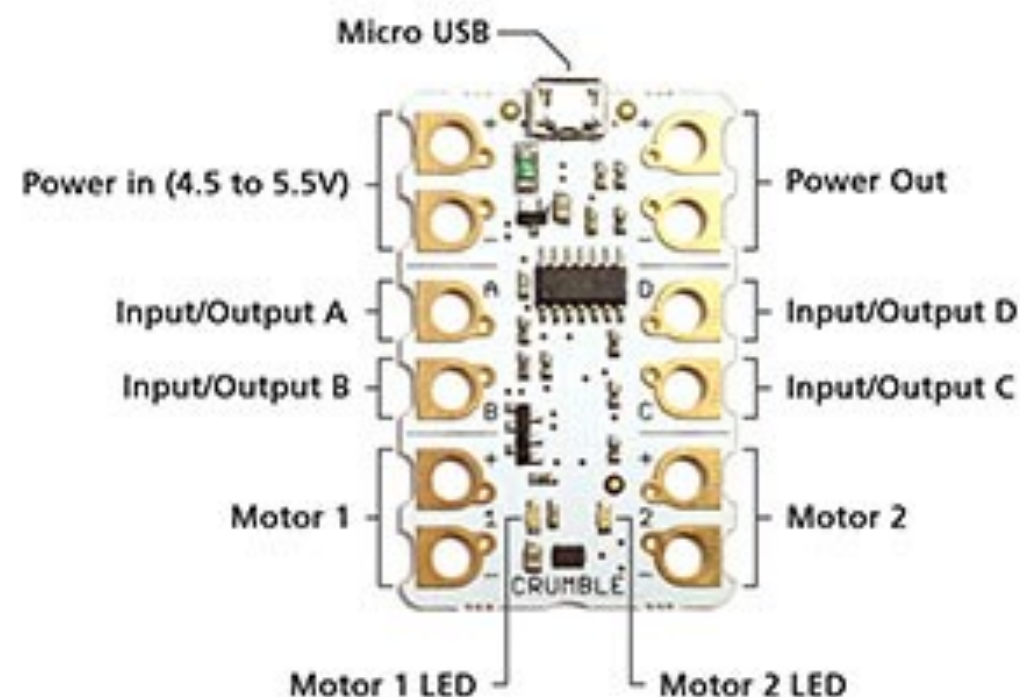
6. Why do the pulleys and rear wheels need to attach firmly to the rear axles?



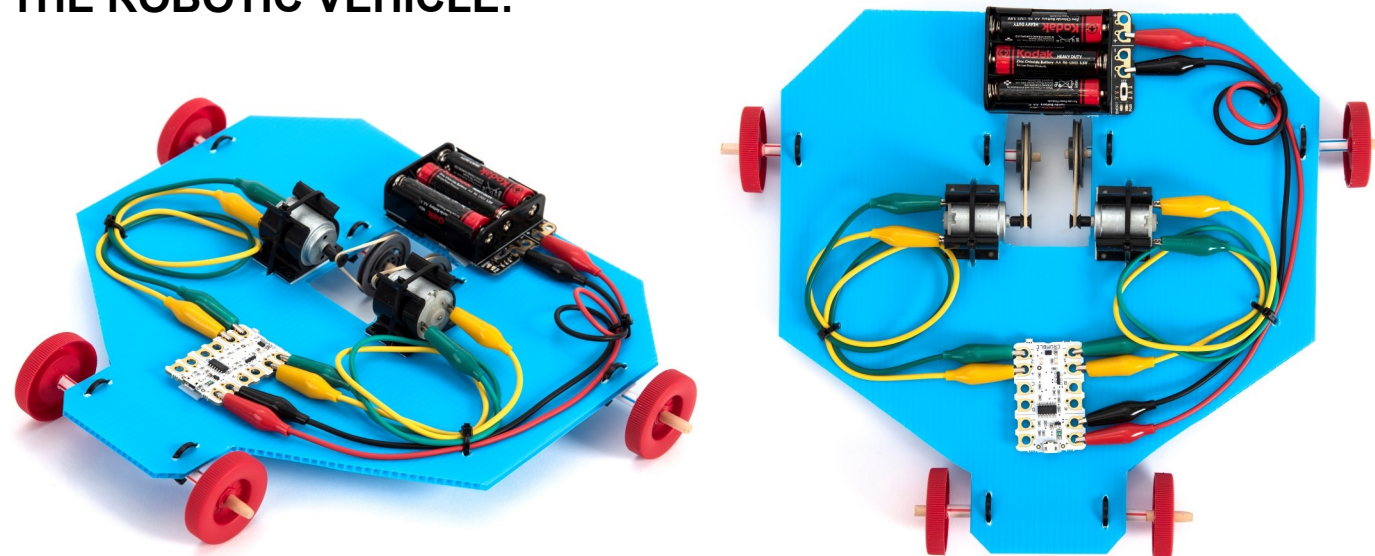
## CRUMBLE ROBOTIC VEHICLE WORKSHEET

NAMES: .....

THE CRUMBLE CONTROLLER:



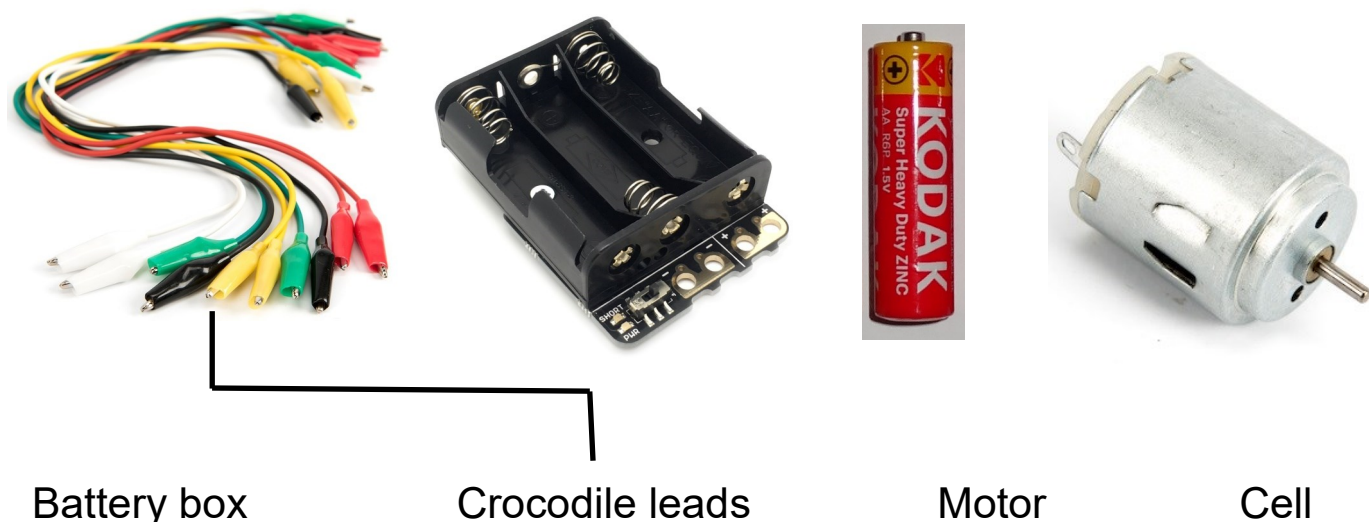
THE ROBOTIC VEHICLE:



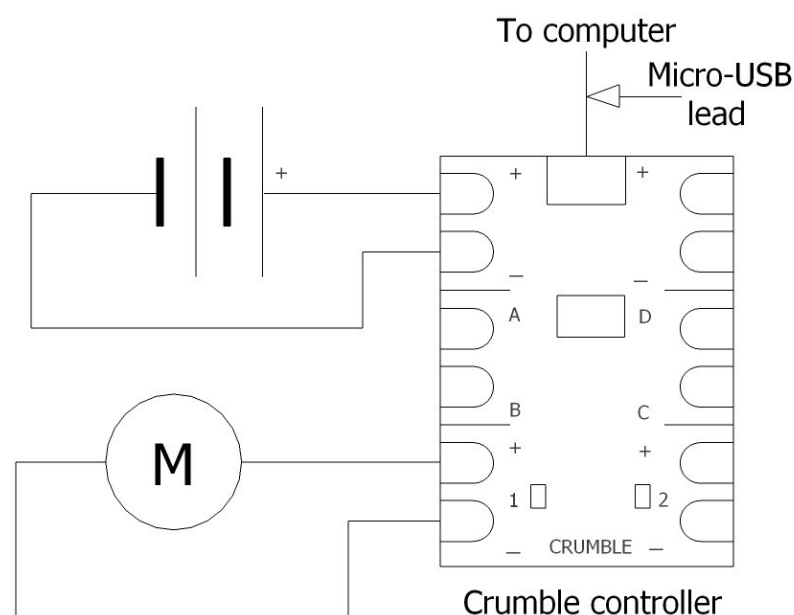


## ELECTRICITY

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)

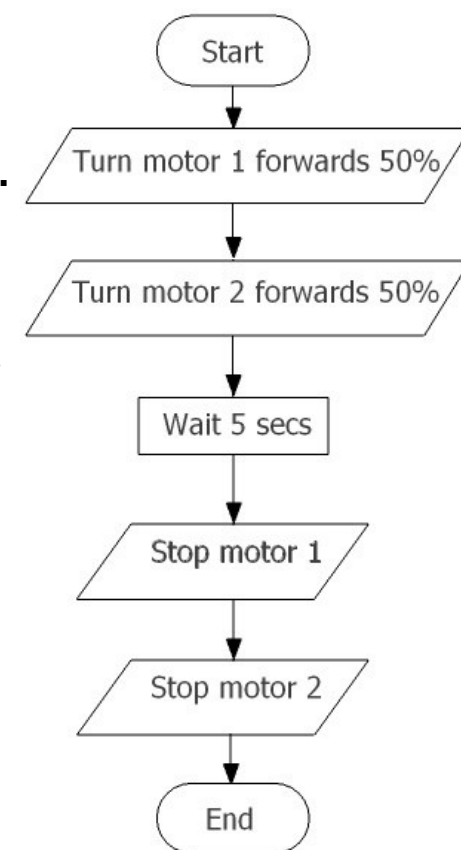


3. Add the second motor to the diagram and show how it connects to the Crumble controller. (Slide 5)



## 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.

