

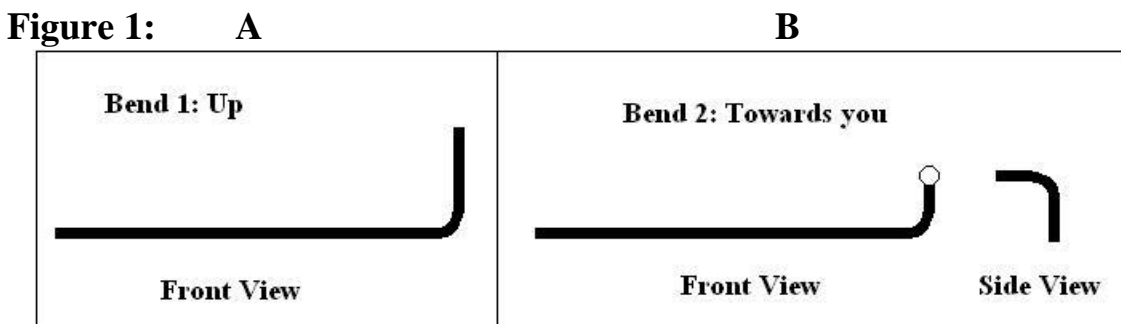
# *Building Your Own Speed Control Car*

## 1. Wheels (Student 1)

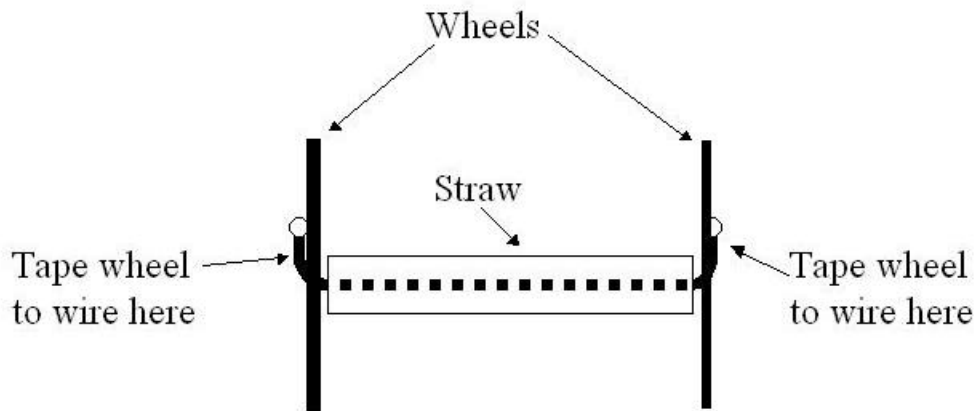
- a. Pick out the wheels your group wants to use from the choices listed on your design worksheet (small, medium, or large).
- b. Using a pencil or pen, make marks as close to the center of the wheels as possible. You may find a ruler or other measuring tool useful for this task.
- c. Borrow a thumbtack from your teacher. Poke a hole in each wheel at the center using a thumbtack. Return the thumbtack to the teacher when you are finished.

## 2. Axle (Student 2)

- a. Cut off the end of a straw so that the straw is 5” long.
- b. Slide a 7” long piece of wire through the straw so that the same amount of extra wire shows on either end of the straw.
- c. Bend one end of the wire twice where it exits the straw, as shown in Figure 1. First, bend the wire up where it exits the straw. Second, bend the wire towards you halfway between the straw and the end of the wire.
- d. Repeat the two bends on the other side of the straw.
- e. **With the help of student 1:** Slide your wheels past the bends in your wire, so that they sit flat against the bent portion. They should look something like the picture in Figure 2.
- f. Tape the wheels to the bent portions of the wire.
- g. Adjust the wires with the wheels attached until the wires roll straight.



**Figure 2:**



### **3. Car Body (Student 3):**

- a. Cut your car body from cardboard using the template of your choice. Cut along the dark lines (not the dashed lines).
- b. Attach two popsicle sticks to the car at the location shown on your template.
- c. Tape the straw with your wheels to the front of the car.

### **4. Operating the Car**

- a. Select a motor unit that you think will work best with your car. Record the name of that motor unit.
- b. The motor unit uses two pieces of cardboard stacked together. Slide the popsicle sticks on your car body between the two pieces of cardboard to connect it to the motor unit.
- c. To start the motor, connect the red wire to the center hook of the potentiometer.
- d. Turn the knob of your potentiometer to full power, and begin testing.

### **If your car does not move, some things to check (*Trouble Shooting*):**

1. Is the motor wire loose?
2. Is any part of the car dragging on the ground?
3. Do your wheels spin easily in the axle?

4. Does the axle go through the center of each wheel?
5. Can you turn up the motor speed?