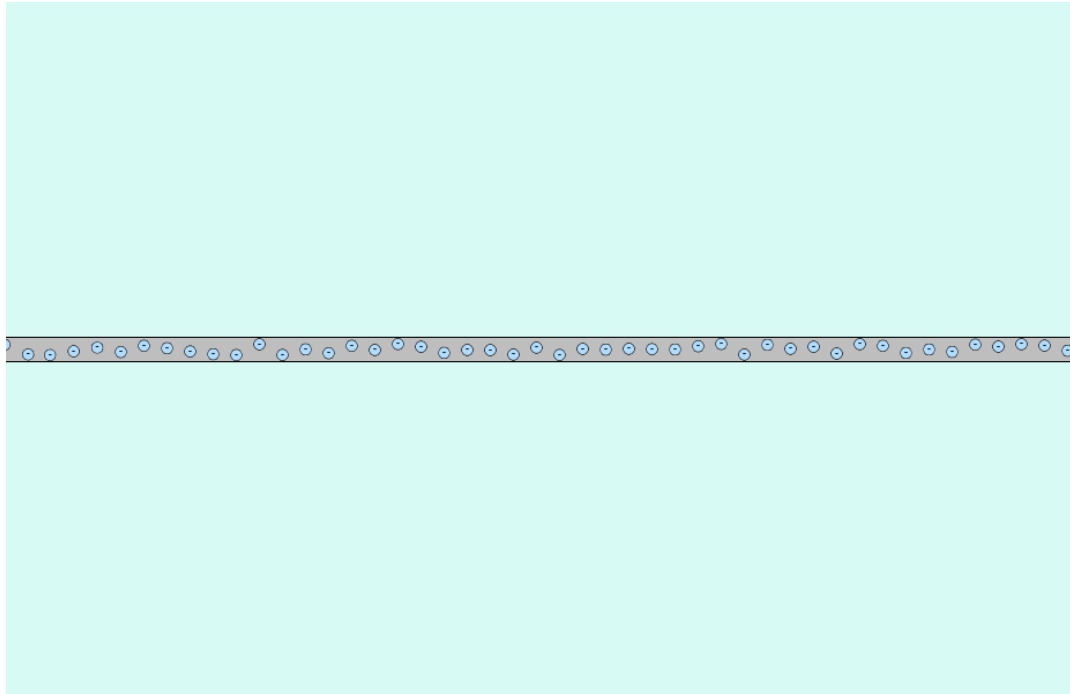# Magnetic Field of a Wire

In this problem you are trying to determine the strength and direction of a magnetic field at a known distance from the wire.

Step 1: In the picture below draw the direction and magnitude of the current flow. In the program you are seeing the movement of electrons through the wire. If your teacher works with conventional current, make sure your current arrows point in the opposite way of the electron flow. Also label the distance from the center of the wire to the center of the magnetic field sensor.

Step 2: Based on the way the electrons are moving through the wire, determine the direction of the magnetic field both above and below the wire. Draw a series of xs in the location where the field is moving into the paper and •s where the magnetic field is coming out of the paper. In the program you will be entering the direction of the field at the location of the sensor.

Step 3: Write down the formula that connects the magnetic field strength to the current in the wire and the distance from the wire. Then use the formula to find the magnitude of the magnetic field at the location of your sensor. Make sure you are careful to use the proper units. Show all your work. Convert your final magnetic field to µT. Put your answers in your program to make sure you did everything properly