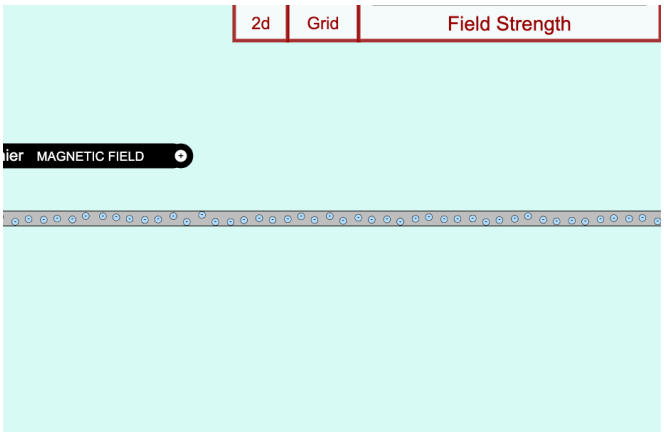
Finding Current from Magnetic Field of Wire

In this problem you are trying to determine the current flowing through a wire by measuring the magnetic field strength at a known distance from the wire.

Step 1: In the picture below draw the direction of 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. Use xs and •s to show where the magnetic field is pointing into the paper and out of the paper. Finally, write down the strength of your magnetic field.



Step 2: 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 current in the wire. Make sure you are careful to use the proper units. Show all your work. Put your answers in your program to make sure you did everything properly

Step 3: Notice that we were able to find the current in the wire without actually touching the wire. Why might this be a really useful thing to be able to do?