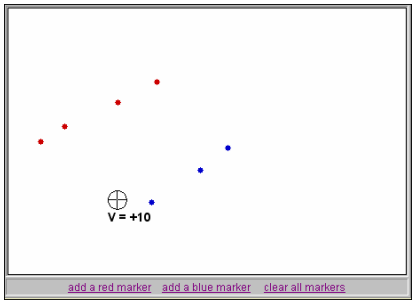
Worksheet for Exploration 25.3: Electric Potential around Conductors



In this animation you can measure electric potential using a probe. You can click-drag to measure position and electric potential **(position is given in meters and electric potential is given in volts)**. Clicking an *add marker* link will add a dot at the current position of the probe. There are two hidden conductors in the animation.

a. How do you know when the cursor moves over a conductor?

b. Make a sketch of the animation. Begin by labeling the position of the hidden conductors on your drawing. As you find the edges of the conductors, you can use the markers to outline them (use one color of marker for the first conductor you find and the other color for the second conductor you find).

c. How could **one** battery be connected to the two conductors to produce the above system? What would the voltage of the battery need to be? (Hint: Remember that the zero point of potential energy is arbitrary. Does either pole of the battery have to be at 0 V? Why or why not?)

Battery Potential =_____

d. Draw the battery in your sketch of the conductors from part (a). (Above)

e. A conductor is an equipotential surface. Why? (really the entire volume is equipotential).

f. Sketch a representative number of equipotential contour lines for this system. Pick a specific voltage and then move the cursor around to find the loop of constant voltage. This maps out one equipotential contour line. As you map out other contour lines, remember that the change in voltage from one contour to the next is constant. Choose values wisely. You probably do not want to map out equipotential surfaces for voltage changes of 0.1 V.

g. Where is the electric field the strongest? Where is it the weakest?
   i. What is happening to the equipotential lines at or near thes locations?