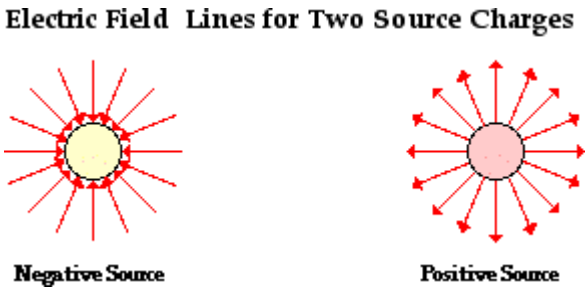
represented by a vector arrow. For any given location, the arrows point in the direction of the electric field and their length is proportional to the strength of the electric field at that location. Such vector arrows are shown in the diagram below. Note that the lengths of the arrows are longer when closer to the source charge and shorter when further from the source charge.

A more useful means of visually representing the vector nature of an electric field is through the use of electric field lines of force. Rather than draw countless vector arrows in the space surrounding a source charge, it is perhaps more useful to draw a pattern of several lines that extend between *infinity* and the source charge. These pattern of lines, sometimes referred to as **electric field lines**, point in the direction that a positive test charge would accelerate if placed upon the line. As such, the lines are directed away from positively charged source charges and toward negatively charged source charges. To communicate information about the direction of the field, each line must include an arrowhead that points in the appropriate direction. An electric field line pattern could include an infinite number of lines. Because drawing such large quantities of lines tends to decrease the readability of the patterns, the number of lines is usually limited. The presence of a few lines around a charge is typically sufficient to convey the nature of the electric field in the space surrounding the lines.



Rules for Drawing Electric Field Patterns

There are a variety of conventions and rules to drawing such patterns of electric field lines. The conventions are simply established in order that electric field line patterns