Electric Field Lines
Electric Field lines

Imagine a small +ve charge is in space far from any other charge.

If we bring another small +ve charge close to it, the two like charges will repel each other.

How do we expect the +ve charge to behave as it interacts with the test charge?
a) +ve point charge in space(+q)

-lines are drawn coming out of the charge.
-arrows are the same length indicating that the magnitude of the force is the same in all directions.
b) -ve point charge in space(-q)

-lines drawn going into the charge
arrow length indicate the magnitude of the force.
Direction of an Electric Field

The electric field direction is always directed away from positive source charges and towards negative source charges.
c) 2 equal and opposite charges

-begin at the positive and terminate at the negative
-do not stop or start in between the charges.
-direction at any given point is given by a tangent line at that point

"electric dipole" - two point charges that are equal and opposite in charge (+q, -q)
e) electric field lines for two equal +ve charges
f) electric field lines for two equal -ve charges
Electric Field Line Patterns for Objects with Unequal Amounts of Charge
Uniform Electric Field

-an electric field that has a constant magnitude and direction.
-can be generated between two oppositely charged parallel plate.
-near the edges the field lines curve indicating that the field is no longer uniform here (Edge effect)
Summary

• field lines are a model of the behaviour of the field
• field lines point away from the +ve charge
• field lines point toward from the -ve charge
• the stronger the field the more lines we draw
• the number of lines is proportional to the field strength
• Force lines begin at a positive charge and terminate at a negative charge (Sometimes those charges are at infinity and the lines are drawn without showing the end of the lines.)
• point charges will generate a non-uniform field
• parallel plates will generate a uniform electric field in the space between the plates.
Assignment:

Read pages 7-11

Complete questions on page 24,25 and 32

as well as q. 1-8 on page 29