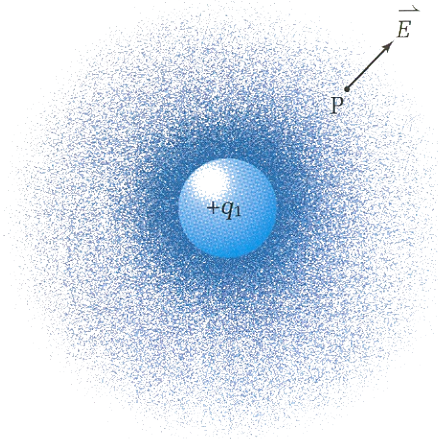


Defining Field Intensity

-diagram illustrates the generation of an electric field by a single charge, q_1
-the density of the shading indicates the strength of the field



-a second charge, q_2 , is placed in the field at P
-the field interacts with the charge and experiences a force, (attractive or repulsive)
-the charge placed at P is often called a "test charge", it's magnitude is so small that it doesn't influence the field around q_1
-by convention, the direction of the vector representing field, is the direction a *positive* charge would move.

DEFINITION OF ELECTRIC FIELD INTENSITY

The electric field intensity at a point is the quotient of the electric force on a charge and the magnitude of the charge located at the point.

$$\vec{E} = \frac{\vec{F}_Q}{q}$$

Quantity

electric field intensity

Symbol

\vec{E}

SI unit

$\frac{N}{C}$ (newtons per coulomb)

electric force

\vec{F}_Q

N (newtons)

electric charge

q

C (coulombs)

Unit Analysis

$$\frac{\text{newtons}}{\text{coulomb}} = \frac{N}{C}$$

Note: Electric field intensity has not been given a unique unit.

DEFINITION OF GRAVITATIONAL FIELD INTENSITY

The gravitational field intensity at a point is the quotient of the gravitational force and the magnitude of the test mass.

$$\vec{g} = \frac{\vec{F}_g}{m}$$

Quantity	Symbol	SI unit
gravitational field intensity	\vec{g}	$\frac{\text{N}}{\text{kg}}$ (newtons per kilogram)
gravitational force	\vec{F}_g	N (newtons)
mass	m	kg (kilograms)