The exposed immobile charge creates the E-field in the vicinity of the junction form a depletion region.

- The E-field created by the movement increases until all further movement stops.
- The continued movement of electrons and holes across the junction.
  - These immobile charges组成s in the p- and n-type regions create an electric field that works against
  - the n-region, while it creates an immobile, mobile charge in the p-region.

When an electron crosses the junction, it fills a hole leaving an immobile, positive charge behind in
the p-type material. Mobile holes drift by diffusion across the junction in the opposite direction.

In the n-type material, mobile electrons drift by diffusion across the junction.

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1. Briefly explain the physical phenomena depicted in the figure.

2. Draw and label the electric field on the close figure.

3. Mark the free charge particles in squares.

4. Mark the fixed charged particles in the p- and n-type materials in the circles.

The diagram depicts a p-n junction diode.
2. The figure depicts a p-n junction diode.

3. a. Draw a property table with the following variables in the dotted box to forward bias the diode.
   - $I_p = I_0 \left( \frac{V_p}{V_p + V_T - 1} \right)$
   - $V_p$
   - $I_p$

4. b. Write the Shockley diode equation.

5. c. Sketch and label the diode characteristic curve.