5. (a) Let i be the current in the circuit and take it to be positive if it is to the left in R_1. We use Kirchhoff's loop rule: $\mathcal{E}_1 - iR_2 - iR_1 - \mathcal{E}_2 = 0$. We solve for i:

$$i = \frac{\mathcal{E}_1 - \mathcal{E}_2}{R_1 + R_2} = \frac{12\,\mathrm{V} - 6.0\,\mathrm{V}}{4.0\,\Omega + 8.0\,\Omega} = 0.50\ \mathrm{A}\ .$$

A positive value is obtained, so the current is counterclockwise around the circuit.

(b) If i is the current in a resistor R, then the power dissipated by that resistor is given by $P = i^2R$. For R_1, $P_1 = (0.50\,\mathrm{A})^2(4.0\,\Omega) = 1.0\,\mathrm{W}$ and for R_2, $P_2 = (0.50\,\mathrm{A})^2(8.0\,\Omega) = 2.0\,\mathrm{W}$.

(c) If i is the current in a battery with emf $\mathcal{E}$, then the battery supplies energy at the rate $P = i\mathcal{E}$ provided the current and emf are in the same direction. The battery absorbs energy at the rate $P = i\mathcal{E}$ if the current and emf are in opposite directions. For $\mathcal{E}_1$, $P_1 = (0.50\,\mathrm{A})(12\,\mathrm{V}) = 6.0\,\mathrm{W}$ and for $\mathcal{E}_2$, $P_2 = (0.50\,\mathrm{A})(6.0\,\mathrm{V}) = 3.0\,\mathrm{W}$. In battery 1 the current is in the same direction as the emf. Therefore, this battery supplies energy to the circuit; the battery is discharging. The current in battery 2 is opposite the direction of the emf, so this battery absorbs energy from the circuit. It is charging.