BASIC ELECTRONICS

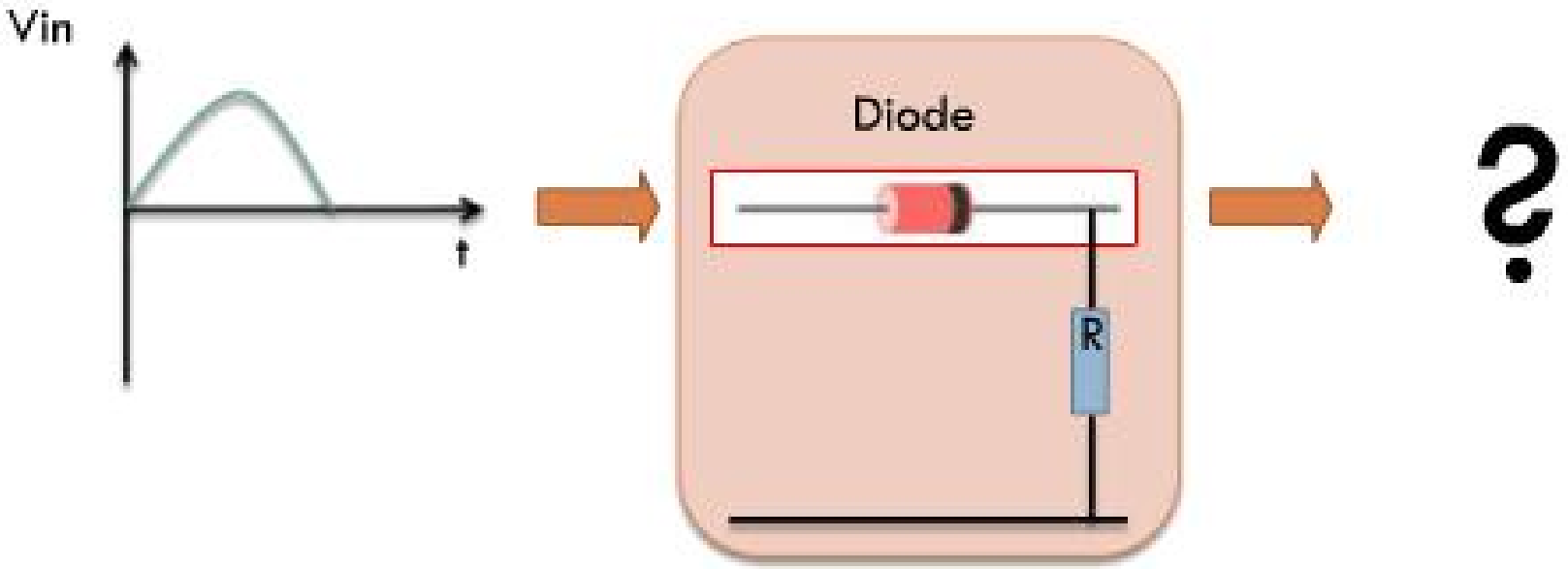
Half wave Rectifiers

Objectives

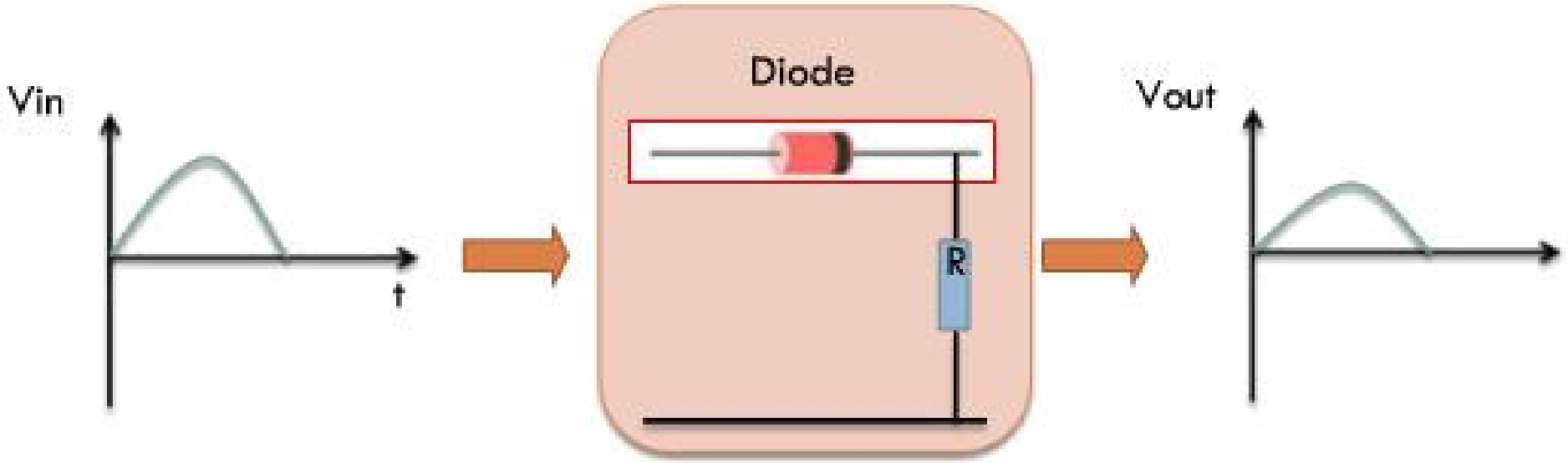
At the end of the module the student would be able to

- Understand Rectification
- Explain Half Wave Rectification

Exploratory Circuit

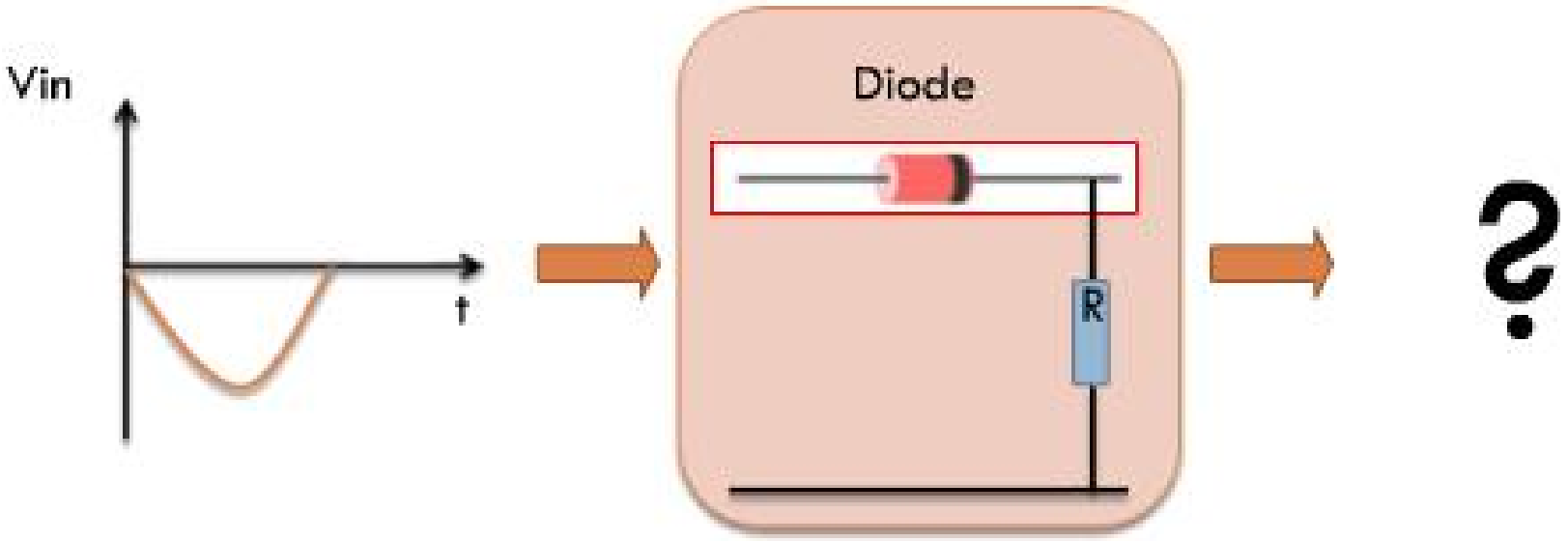


Exploratory Circuit

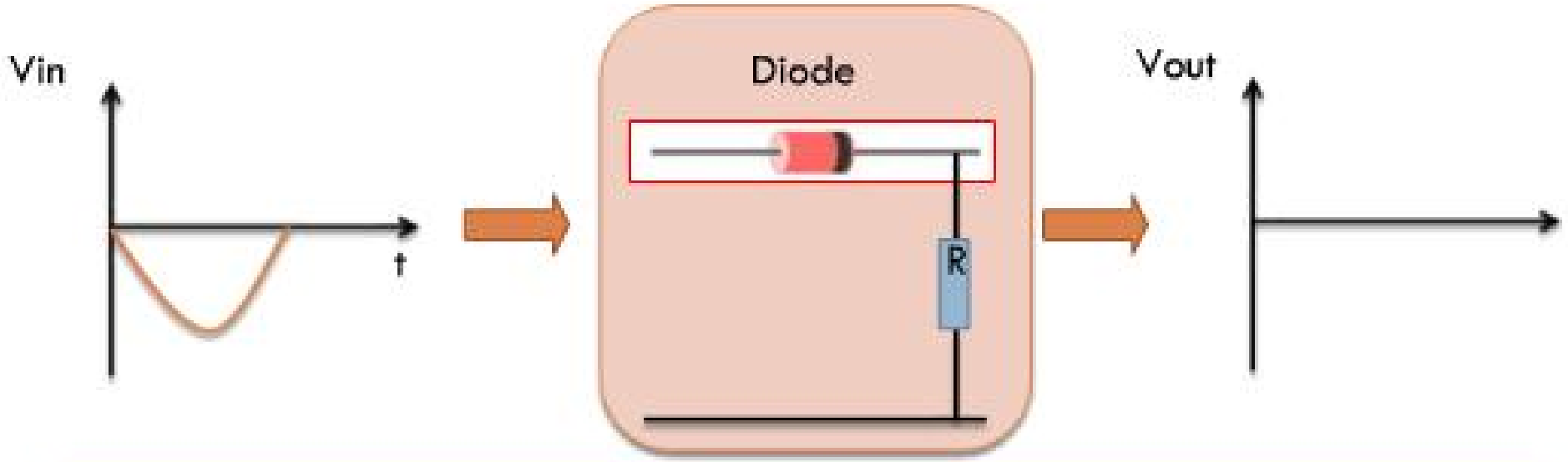


Diode is forward biased, acts as a short circuit, passes the waveform through.

Exploratory Circuit

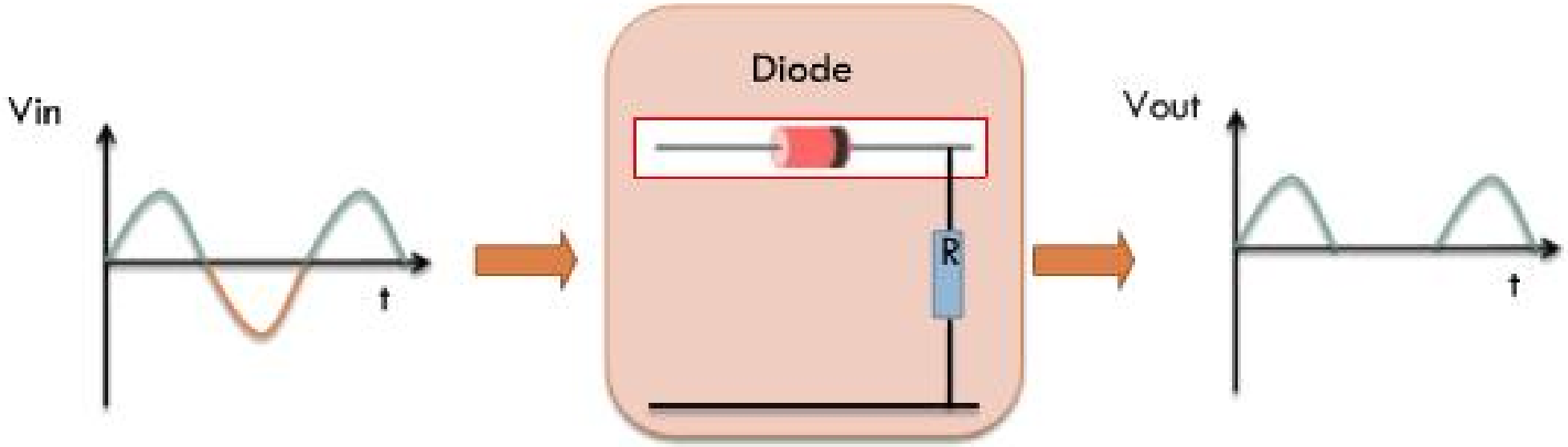


Exploratory Circuit



Diode is reverse biased, acts as a open circuit, does not pass the waveform through.

Putting them together



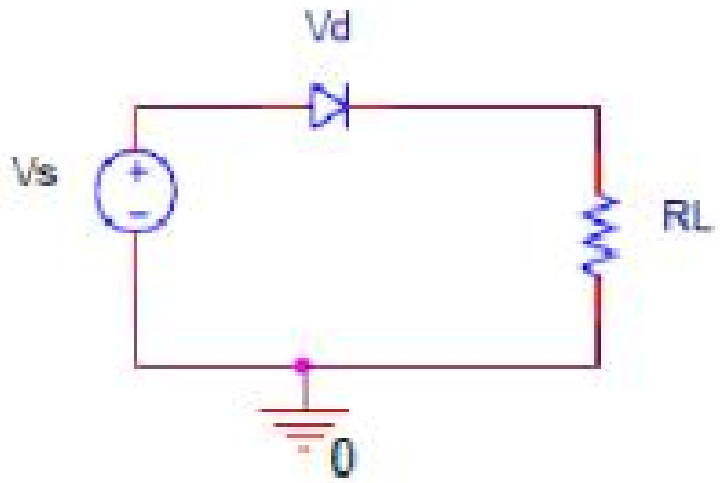
On the positive cycle the diode is forward biased and on the negative cycle the diode is reverse biased. By using a diode we have converted an AC source into a pulsating DC source. In summary we have 'rectified' the AC signal.

Rectification

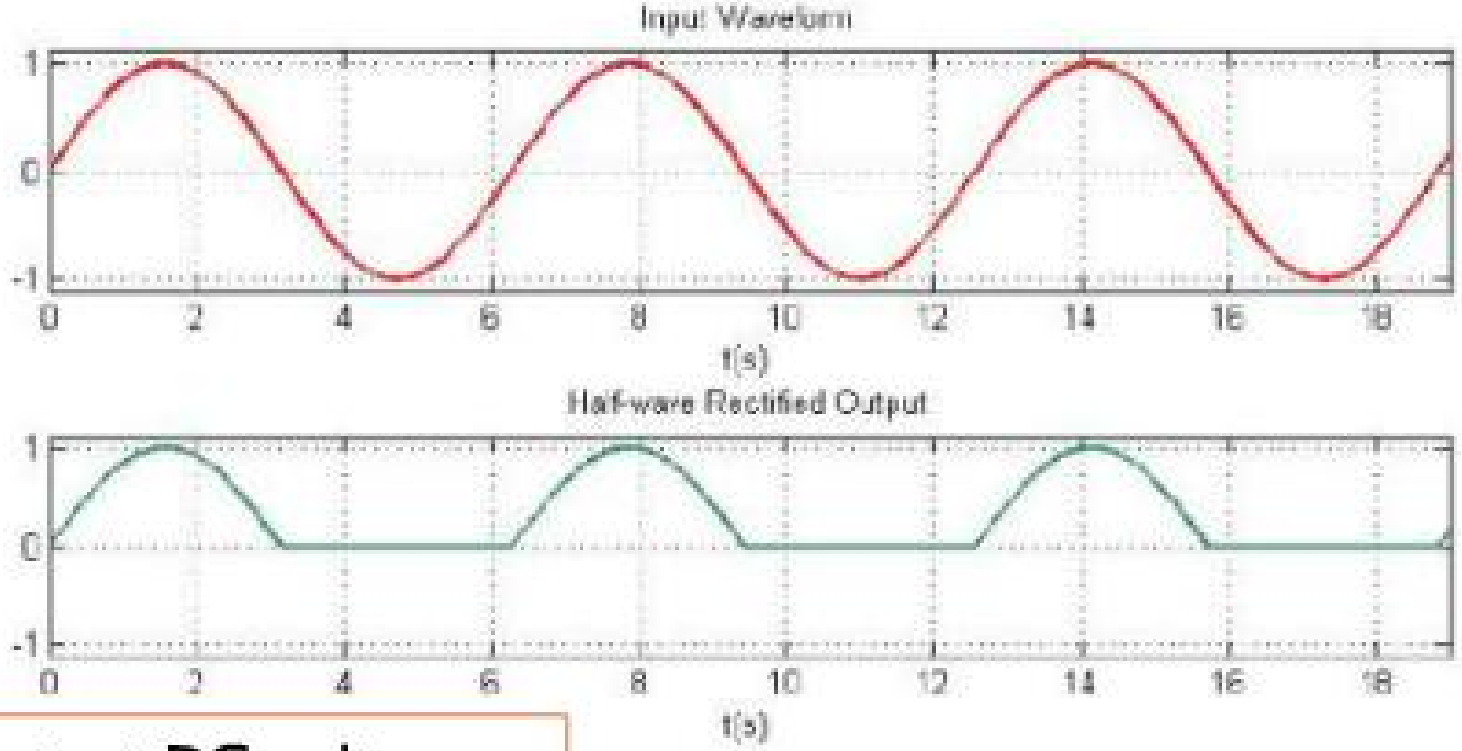
A **rectifier** is a device that converts alternating current (AC) to direct current (DC), a process known as **rectification. Rectifiers are essentially of two types – a half wave rectifier and a full wave rectifier.**

Half Wave Rectification

The simplest kind of rectifier circuit is the *half-wave* rectifier. The half-wave rectifier is a circuit that allows only part of an input signal to pass. The circuit is simply the combination of a single diode in series with a resistor, where the resistor is acting as a load.



Half Wave Rectifiers – Waveforms



The output DC voltage of a half wave rectifier can be calculated with the following two ideal equations.

$$V_{peak} = V_{rms}\sqrt{2} \qquad V_{dc} = \frac{V_{peak}}{\pi}$$