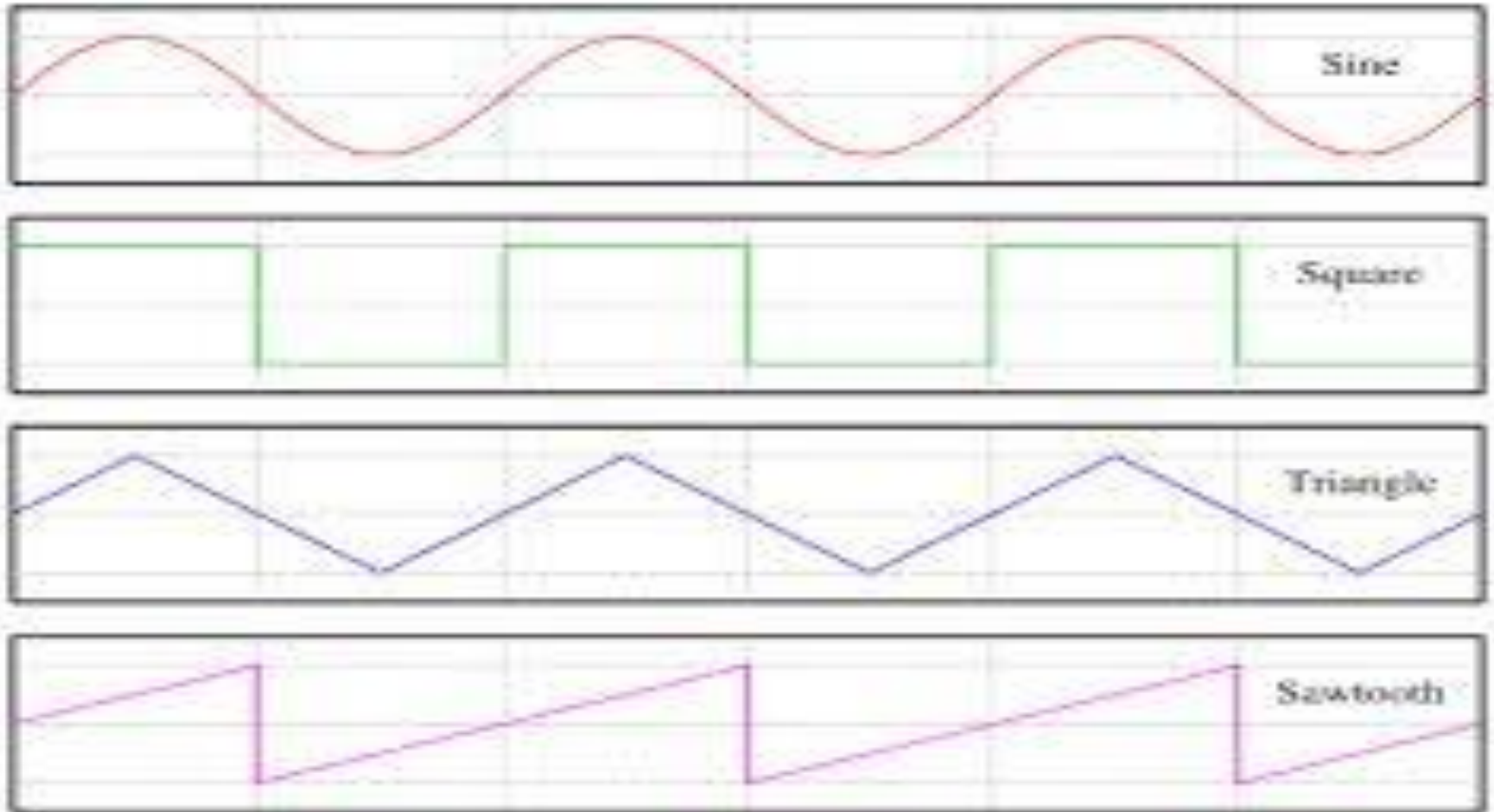


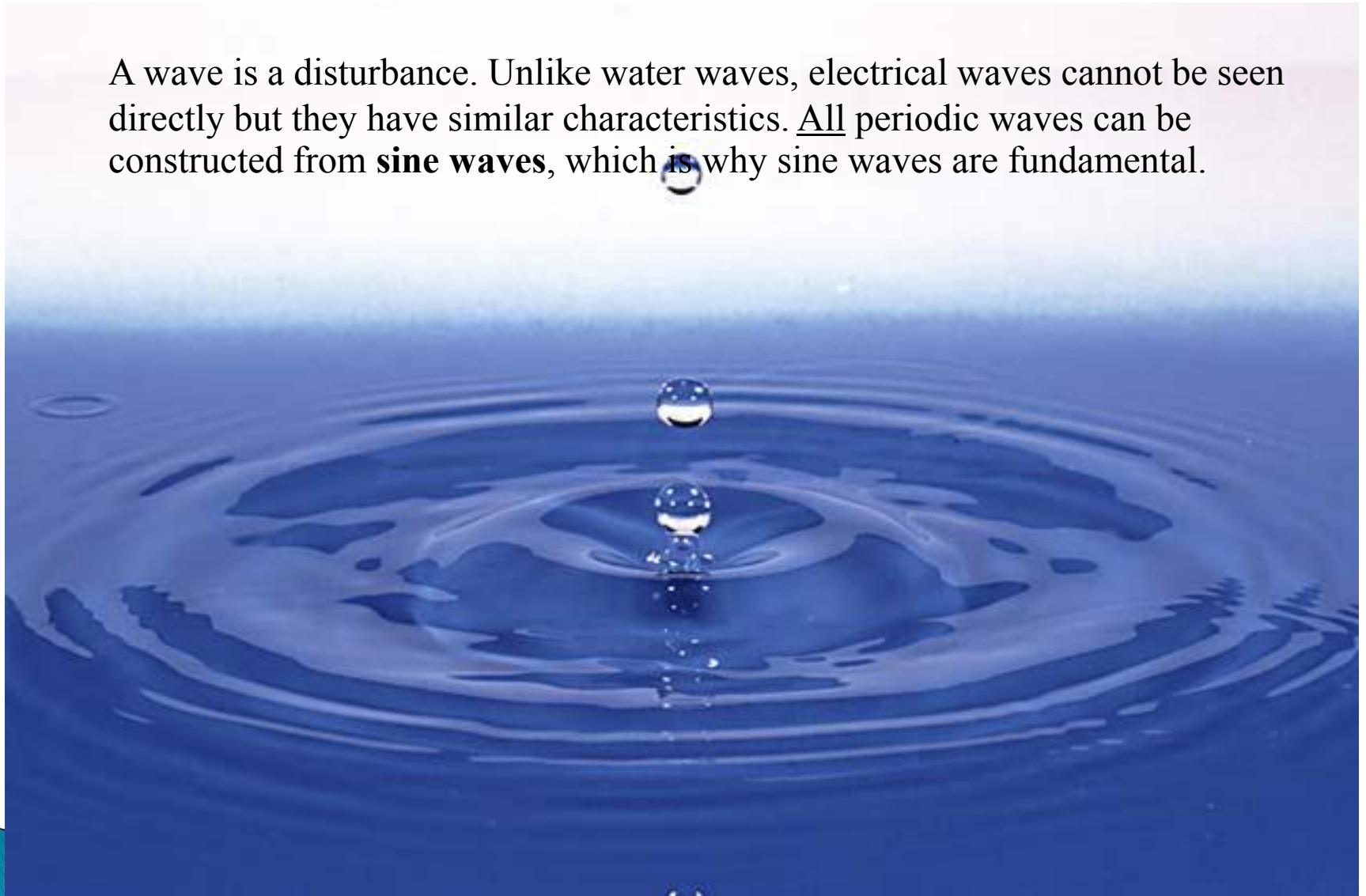
# Waveforms

- ▶ **Electrical Waveforms** are basically visual representations of the variation of a voltage or current over time. In plain English this means that if we plotted these voltage or current variations on a piece of graph paper against a base (x-axis) of time, ( t ) the resulting plot or drawing would represent the shape of a **Waveform** as shown.

# Waveforms



A wave is a disturbance. Unlike water waves, electrical waves cannot be seen directly but they have similar characteristics. All periodic waves can be constructed from **sine waves**, which is why sine waves are fundamental.



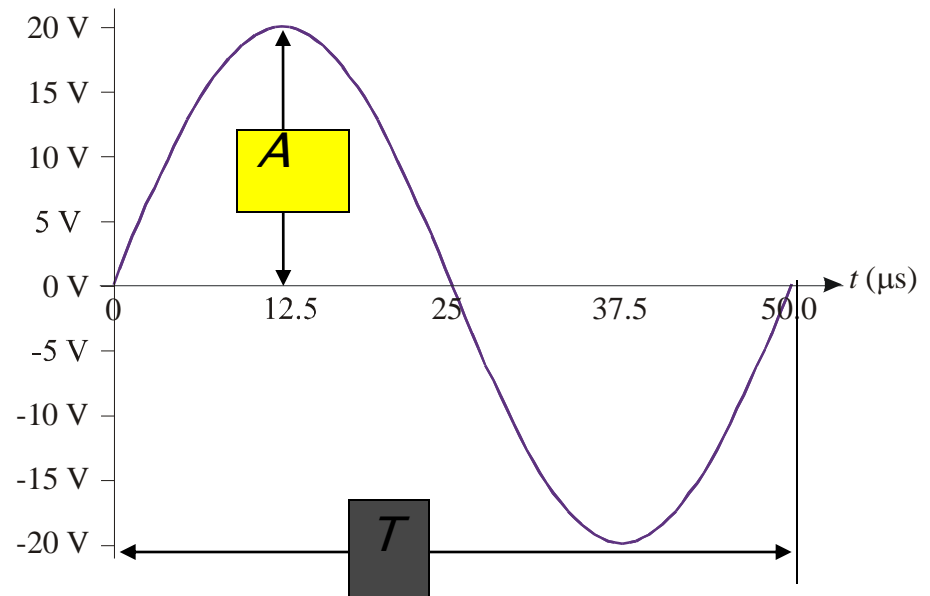
# Sine waves

Sine waves are characterized by the amplitude and period. The **amplitude** is the maximum value of a voltage or current; the **period** is the time interval for one complete cycle.

The amplitude ( $A$ )  
of this sine wave is

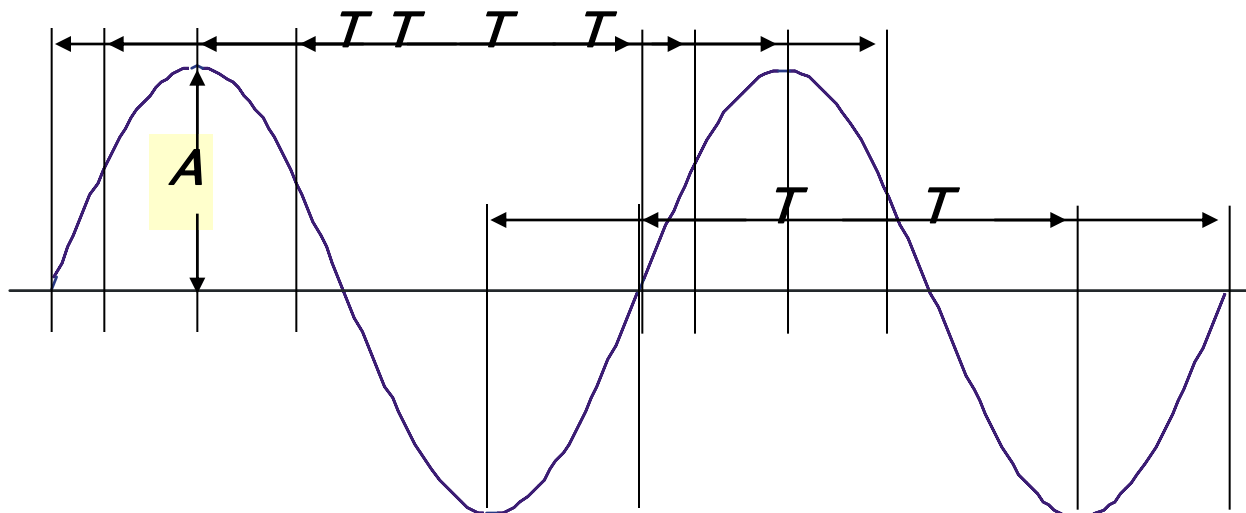
**20 V**

The period is **50.0  $\mu\text{s}$**



# Sine waves

The period of a sine wave can be measured between any two corresponding points on the waveform.



By contrast, the amplitude of a sine wave is only measured from the center to the maximum point.

# Frequency

Frequency ( $f$ ) is the number of cycles that a sine wave completes in one second.

Frequency is measured in **hertz (Hz)**.

If 3 cycles of a wave occur in one second, the frequency is

3.0 Hz

