

# Acoustics - Knowledge Organiser

## GLOSSARY

<b>Absorption Coefficient (a)</b>	A measurement of how effective a material is at absorbing sound
<b>Constructive Interference</b>	The increase in amplitude across specific frequencies that occurs when two waves interact
<b>Destructive Interference</b>	The decrease in amplitude across specific frequencies that occurs when two waves interact

## ACOUSTICS

- The study of acoustics allows for the understanding of how sound interacts in a space
- Different materials have different levels of absorption, measured by their **absorption coefficient (a)**
  - If  $a = 1$ , all sound would be completely **absorbed** by the material
  - If  $a = 0$ , all sound would be completely **reflected** by the material
- The **more reflective** the materials in a room are, the **longer the reverb time ( $RT_{60}$ )**

## REFLECTION, ABSORPTION AND DIFFUSION

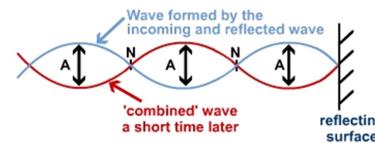
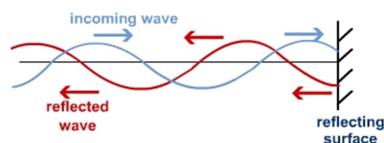


When a wave is **reflected**, some of it will **bounce off** the material's surface

When a wave is **absorbed**, some of its **energy is absorbed** by the material

When a wave is **diffused**, it is **scattered** from angled surfaces and reflected over a wide area

## STANDING WAVES



- Some reflections can cause either an increase or decrease in amplitude for certain frequencies
- An increase in amplitude is caused by the incoming and reflected wave being in phase and exhibiting constructive interference
- A decrease in amplitude is caused by the incoming and reflected wave being out of phase and exhibiting destructive interference
- Acoustic treatment is used in rooms to help lessen the effect of standing waves