# Acoustics - Knowledge Organiser

## GLOSSARY

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


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|---|---|---|
| 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