

Physics

Presentation guide

CC = Statement of the competence for a core competence

E = Elements of the competence for a specific statement of competence

P = Performance criteria for competency; associated with a specific element of the competence

Core Competence CC.3

Explain the principles of physics as they pertain to respiratory therapy

E.1 Explain the Physical Behaviour of Gases and related principles and laws

- P1.1 Atmospheric composition and its gases
- P1.2 Kinetic Energy
- P1.3 Avogadro's Law
- P1.4 Boyle's Law
- P1.5 Charles' Law
- P1.6 Gay-Lussac's Law
- P1.7 Combined gas Law
- P1.8 Ideal Gas Law
- P1.9 Pressure: units of measure and conversion factors
- P1.10 Volume: units of measure and conversion factors

E.2 Explain the States of Matter and Physical Changes of State

- P2.1 Melting Point and Boiling Point
- P2.2 Critical Temperature, Critical Pressure and Filling Density
- P2.3 Evaporation, Surface Area and Contact Time
- P2.4 Vapour and Vapour Pressure
- P2.5 Latent Heat of Vaporisation (Fusion)
- P2.6 Humidity, Absolute Humidity, Relative Humidity and Humidity Deficit
- P2.7 Condensation and Dew Point
- P2.8 STPD, ATPS and BTPS

E.3 Explain the Physical Characteristics of Liquids and Behaviour of Liquids

- P3.1 Viscosity and Density
- P3.2 Pascal's Principle
- P3.3 Cohesion and Adhesion

E.4 Explain Surface Tension

- P4.1 Laplace's Law
- P4.2 Capillary Action

E.5 Explain Gas Diffusion

- P5.1 Dalton's Law of Partial Pressures
- P5.2 Graham's Law
- P5.3 Henry's Law
- P5.4 Solubility co-efficient
- P5.5 Surface Area and Contact Time
- P5.6 Fick's Law of Diffusion

E.6 Explain Fluid Dynamics, Gas Flow and Gas Mixing/Entrainment

- P6.1 - Poiseuille's Law, Laminar Flow, Resistance and Ohm's Law
- P6.2 - Reynold's Number and Turbulent Flow
- P6.3 – Viscosity and Density
- P6.4 - Bernoulli principle
- P6.5 - Venturi Effect (Jet)
- P6.6 – Coanda Effect

E.7 Explain the Characteristics of Aerosols and Behaviour of Aerosols

- P7.1 Stoke's Law of Sedimentation
- P7.2 Stability and Particle Size
- P7.3 Gravitational Forces
- P7.4 Inertial Impaction
- P7.3 Penetration
- P7.4 Retention
- P7.5 Deposition
- P7.6 Clearance

E.8 Explain Thermal Regulation and Heat Loss

- P8.1 Conduction
- P8.2 Convection
- P8.3 Evaporation
- P8.4 Radiation

E.9 Explain other specific Physical Principles

- P9.1 Beer's Law and Light Absorption
- P9.2 Doppler Effect
- P9.3 Hooke's Law, Elasticity and Compliance
- P9.4 Ohm's Law, Resistance and Conductance (in terms of electron flow)