Edexcel GCSE Physics

Topic 15.7P-15.17P - Fluids

Higher Flashcards

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What is meant by the term ‘fluid’?

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What is meant by the term ‘fluid’?

A liquid or a gas.

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In any fluid, at what angle do the forces due to pressure act on a given surface?

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In any fluid, at what angle do the forces due to pressure act on a given surface?

At right angles (normal to) the surface.

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State the equation used to calculate pressure. Give appropriate units.

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State the equation used to calculate pressure. Give appropriate units.

Pressure (Pa) = Force (N) / Area (m^2)

$$P = F / A$$

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Why does atmospheric pressure vary with the height above the earth's surface?

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Why does atmospheric pressure vary with the height above the earth's surface?

The number of air molecules decreases the higher you go. This means that the weight of air above a point decreases, meaning the pressure also decreases.

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True or False? The pressure in a fluid is determined by the fluid and the atmospheric pressure.

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True or False? The pressure in a fluid is determined by the fluid and the atmospheric pressure.

True

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What direction does pressure act in?

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What direction does pressure act in?

All directions.

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How does pressure in fluids increase with depth? (Higher)

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How does pressure in fluids increase with depth? (Higher)

As the depth increases the mass of the liquid above the point also increases. This means that the force produced by that mass also increases. Since the force has increased whilst the area has remained constant, the pressure will increase.

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Why does pressure in fluids increase with density? (Higher)

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Why does pressure in fluids increase with density? (Higher)

As density increases there are more particles in a given volume of the liquid, hence the weight of the liquid is increased. This means that the force of liquid above a certain point is larger. Since the force has increased, the pressure must also increase.

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What equation shows the magnitude of pressure in liquids at different depths? (Higher)

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What equation shows the magnitude of pressure in liquids at different depths? (Higher)

Pressure (Pa) = Column height (m) x density (kg/m³) x gravitational field strength (N/kg)

$$P = h\rho g$$

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Why are objects in a fluid subject to an upthrust? (Higher)

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Why are objects in a fluid subject to an upthrust? (Higher)

- When an object is submerged in fluid, it experiences a higher pressure below it than it does on top of it.
- This leads to an upwards force called upthrust.

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What is the magnitude of the upthrust felt by an object? (Higher)

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Why is the magnitude of the upthrust felt by an object? (Higher)

Upthrust is equal to the weight of fluid displaced by the object.

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How can you determine is an object will sink or float? (Higher)

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How can you determine if an object will sink or float? (Higher)

If the upthrust is greater than the weight of the object, it will float. If the weight is the greater force, it will sink.

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Explain why an object with a density more than that of water would never float. (Higher)

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Explain why an object with a density more than that of water would never float. (Higher)

Upthrust is equal to the weight of the displaced fluid. If the density of the object is high, there would not be enough volume displaced to produce an upthrust larger than the object's weight. This means that it will sink.

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