

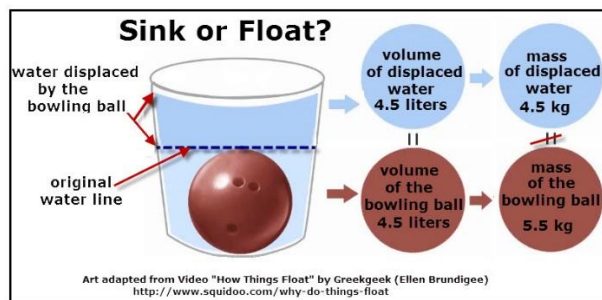
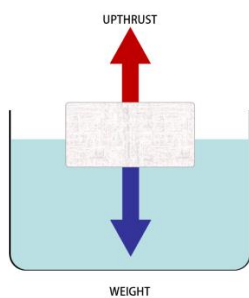
**Lesson Title**

**Upthrust**

**Key Notes and tasks; (Black are notes, red are tasks)**

- An object experiences an upward force, called upthrust, if it is partially or wholly submerged in a fluid. They may also recall that whether an object floats or sinks in a particular fluid depends on whether its overall density is less or greater than that of the fluid.
- The greater pressure at greater depth means that there is a larger force on the bottom surface of the object than on the top surface. This gives an overall upward force on the object due to the fluid surrounding it.
- The upthrust is equal to the weight of fluid displaced by the object.
- **This is Archimedes' Principle.**

**Copy the diagrams**



- For an object to be able to float, it must therefore be able to displace a volume of fluid with a weight equal to its own. Since an object can only displace a volume up to its own volume, to be able to float the object must have a density equal to or less than that of the fluid. An object with a greater density than the fluid will sink because it can never displace a sufficient volume of fluid to have a weight equal to its own.
- Objects with a lower density than the fluid can displace sufficient fluid without being wholly immersed in the fluid.
- The less dense an object is, the higher it will float because only a small part of its volume is needed to displace fluid equal to its own weight.
- It is important for students to appreciate that the ideas in this lesson about floating and sinking apply not just to water, or to liquids, but to all fluids, including gases.
- Some objects that sink when placed in water (e.g. a potato) will float if the water is replaced with saltwater.
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**Watch the Youtube video clip of people floating in the Dead Sea (e.g. <https://www.youtube.com/watch?v=VhkijRtMOo>)**

**Sample exam practice**

Exam board	AQA
Specification	Current – Physics
Paper and Question(s)	<b>Complete the Practice Questions on page 173 of the textbook.</b>
Useful links	Page 172-173 of the textbook