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**Knowledge Rich Curriculum Plan**

SCIENCE- Floating and Sinking



| **Lesson/Learning Sequence**  | **Intended Knowledge:***Students will know that…* | **Prior Knowledge:***In order to know this, students need to already know that…* | **Working Scientifically** | **Tiered Vocabulary and Reading Activity** | **Assessment**  | **Support** |
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| ***Floating, Sinking and Density*** | *Students will know that some objects that are float, can be suspended in water or air, and some objects sink, that goes down below the surface. For example; a submarine under different circumstances can float or sink. Students will know that mass and volume of an object how well it floats. Students will know how to describe how the shape of an object affects how well it floats to be the more of the outside of an object that is touching the water the more buoyant it is. Students will know that the density of a liquid (or gas) determines how well objects float in it. The denser the object, the less it will float.*  | *Students will need to know and have experienced that ‘heavy’ items sink in water and ‘light’ objects float.**Students will need to know that floating and sinking can only happen in liquid and a gas.**Students will need to know that volume is how much there is of a substance.**Students will need to know that surface area is how much outer area the object has.* |  | ***Float***Resting or moving at the surface of a liquid without sinking***Sink****Go down beneath the surface of a liquid****Buoyant****The property of floating at the surface of a fluid* | *Retrieval questions**Simple exam questions**Homework quizzes**Summative assessment 3* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/topics/z4qtvcw/articles/zytqj6f*](https://www.bbc.co.uk/bitesize/topics/z4qtvcw/articles/zytqj6f) |
| ***Density Calculations*** | *Students will know that solids are very close together. They are tightly packed, giving solids high densities. Liquids are close together, that are randomly arranged and are still tightly packed together, giving liquids high densities. Students will know that particles in gases are very far apart, so gases have a very low density. Students will know that the equation for calculating density is; density = mass/volume. The units of used for mass and volume are usually g/cm^3. Students will know that the denser a substance is, the heavier it feels for its size.*  | * *Students will need to know how particles are arranged in solids, liquids and gases.*
* *Students need to know that mass is how much there is of a substance.*
 |  | ***Density****The number of particles contained within a certain volume.****Mass****The amount of matter in an object.****Volume****The amount of space that a 3D object takes up.* | *Retrieval questions**Simple exam questions**Homework quizzes**Summative assessment 3* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/guides/zc9q7ty/revision/2*](https://www.bbc.co.uk/bitesize/guides/zc9q7ty/revision/2) |
| ***Pressure in Fluids*** | *Students will know that liquids and gases are fluids. A fluid is able to change shape and flow from place to place. Students will know that fluids exert pressure on surfaces and this pressure is at 90o to those surfaces. Students will know that pressure increases as the depth increases. The pressure in a liquid is due to the weight of the column of water above*. *Students will know that the atmosphere exerts a pressure on you. Students will be able to explain why pressure at a particular depth is the same throughout a fluid, because the weight above will remain the same.*  | * *Students will know that liquids and gases can flow and take the shape of their container.*
* *Students will know that the more there is of a substance the heavier the substance will be.*
* *Students will know that 90˚is a right angle.*
 |  | ***Pressure****The force acting on an object per unit area, caused by particle collisions****Fluid****A substance that is able to flow when a force is applied.****Flow****To move steadily and continuously****Column****A vertical structure****Atmosphere****The mixture of gases that surrounds Earth* | *Retrieval questions**Simple exam questions**Homework quizzes**Summative assessment 3* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/guides/zssbgk7/revision/2*](https://www.bbc.co.uk/bitesize/guides/zssbgk7/revision/2) |
| ***Pressure Calculations*** | *Students will know that the equation for calculating is pressure = force/ area. Students will use the FIFA method, formula, insert, fine tune and answer to calculate the pressure, force and area.*  | * *Students will know that the unit of force is newtons (N) and area is measured in cm2 / m2*
* *Students will know how to calculate area of a square – length of side x length of side.. Rectangle – length x width x height. Circle - ℼr²*
 | *Enquire: Students will be able to rearrange equations to make another component the subject* | ***Pressure****The force acting on an object per unit area.****Force****A push or a pull that acts on an object as a result of it interacting with its surroundings.****Area****The amount of space taken up by a 2D shape or object.* | *Retrieval questions**Simple exam questions**Homework quizzes**Summative assessment 3* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/guides/zssbgk7/revision/1*](https://www.bbc.co.uk/bitesize/guides/zssbgk7/revision/1) |
| ***Convection*** | *Students will know that heat can be transferred from one place to another by convection. Convection occurs because liquids and gases expand when heated. This is because the particles in liquids and gases move faster when they are heated than they do when they are cold. The particles take up more volume. This is because the gap between particles widens, while the particles themselves stay the same size. Liquid or gas in hot areas is less dense than the liquid or gas in cold areas, so it rises into the cold areas. The denser cold liquid or gas falls into the warm areas. In this way, convection currents that transfer heat from place to place are set up. Examples of convection is hot air balloons rise and ocean currents.*  | * *Students will know that warm particles rise.*
* *Students will know that all substances are made of particles.*
* *Students will know the particle model of liquids and gases. Liquid particles can move but are still touching one another. Whereas gas particles are free to move in all direction in a random motion with lots of energy.*
 |  | ***Convection****The movement of particles, transferring energy from hot places to cold places.****Transfer****To move from one place to another.****Currents****A steady flow of a fluid****Expand****An increase in the volume of an object.* | *Retrieval questions**Simple exam questions**Homework quizzes**Summative assessment 3* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/guides/zttrd2p/revision/2*](https://www.bbc.co.uk/bitesize/guides/zttrd2p/revision/2) |