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**More**

**Knowledge Rich Curriculum Plan**

SCIENCE- More about Forces



| **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** |
| --- | --- | --- | --- | --- | --- | --- |
| ***Mass vs Weight*** | *Students will know that mass is a measure of the amount of matter an object or substance is comprised of and weight is the force needed to support the object or substance. Weight is calculated using the following equation; weight = mass x gravitational force. Students will know that astronauts weight changes as they take off in a rocket. Students will know that an astronaut orbiting the Earth is weightless.* | *Students need to know that mass is measured in kilograms (kg) and force is measured in Newtons (N).*  *Students will need to know that astronaut in space experience less gravity which makes the weightless.*  *Students need to know that gravity is a non-contact force that pulls objects towards its centre.* |  | ***Mass:***  *The amount of matter in an object*  ***Weight:***  *The force exerted on a mass by gravity*  ***Gravitational Force:***  *The universal force of attraction acting on all masses*  ***Comprised:***  *Made up of*  ***Matter:***  *Material substances* | *Retrieval questions*  *Simple exam questions*  *Homework quizzes*  *Summative assessment 1*  **What might we do to reduce your weight?**  **How might being on a different planet affect the weight of an astronaut?**  **How would you calculate the weight of an object?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/z6xjdp3*](https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/z6xjdp3) |
| ***Hidden Forces*** | *Students will know that a person’s hand uses force to support different sized weights, the larger the weight, the more force it will require. Students will know how that the size of the force exerted by a spring changes as it is compressed, the more it is compressed, the greater the force. Students will know that as gravity is increased, the normal force has also increased.* | * *Students need to know that the more weight an object has the more force will be required to oppose that weight.* * *Students will need to know that springs can be stretched and compressed. The larger the force the more a spring is stretched or compressed.* |  | ***Weight:***  *The force exerted on a mass by gravity*  ***Gravity:***  *The universal force of attraction acting on all masses*  ***Compression***  *The process of squashing*  ***Exerted:***  *Make a physical effort*  ***Normal:***  *An imaginary line drawn at 90 degrees to the surface of an object* | *Retrieval questions*  *Simple exam questions*  *Homework quizzes*  *Summative assessment 1*  **How might you change the length of a spring?**  **What forces would be applied in this scenario?**  **Why might the spring return to it’s original length when the pulling force is removed?**  **Why don’t you fall through the wall when you lean against it?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/z6xjdp3*](https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/z6xjdp3) |
| ***Levers*** | *Students will know that a bigger force applied and/or a longer lever gives a larger turning effect. Students will be able to predict sizes of different turning effects by comparing forces and lengths of levers.*  *Students will be bale to identify levers and pivots and be able to predict where to add masses to make a beam balanced.* | * *Students will need to know examples of levers such as a spanner. Levers can be used to create a twisting motion – turning force.*   *Students will need to know that when objects are balanced (seesaw) they are equal and remain stationary.* | *Enquire*  *Making predictions in relation to mass and length of lever to balance.* | ***Pivot:***  *The central point at which a mechanism turns*  ***Lever:***  *A rigid bar resting on a pivot used to move a heavy load*  ***Fulcrum:***  *The point at which a lever is placed and supported*  ***Predict:***  *Estimate that a thing will happen in the future*  ***Balance:***  *Split fairly* | *Retrieval questions*  *Simple exam questions*  *Homework quizzes*  *Summative assessment 1*  **How might three children play on a seesaw together at the same time?**  **What might be the purpose of a counterbalance on a crane?**  **Which two factors affect the size of a moment?**  **How could I balance a ruler that has two masses either side?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/z96g3j6*](https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/z96g3j6) |