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| ***Topic Content I must know. Can I ...?*** | ☺ | 😐 | ☹ |
| **Forces 1: Forces in balance** | | | |
| Write down what displacement is. |  |  |  |
| Write down what a vector quantity is. |  |  |  |
| Write down what a scalar quantity is. |  |  |  |
| Describe how to represent a vector quantity. |  |  |  |
| Write down what forces can do. |  |  |  |
| Write down the unit of force. |  |  |  |
| Write down what a contact force is. |  |  |  |
| Describe the forces being exerted when two objects interact. |  |  |  |
| Describe what a resultant force is. |  |  |  |
| Describe what happens if the resultant force on an object is zero. |  |  |  |
| Describe what happens if the resultant force on an object is greater than zero. |  |  |  |
| Calculate the resultant force when an object is acted by two forces acting along the same line. |  |  |  |
| State what a free-body force diagram is. |  |  |  |
| State what the moment of a force measures. |  |  |  |
| Calculate the moment of a force. |  |  |  |
| Describe how the moment of a force can be increased. |  |  |  |
| Describe why levers are force multipliers. |  |  |  |
| Describe how levers act as force multipliers. |  |  |  |
| Explain how you can tell if a lever is a force multiplier. |  |  |  |
| Describe what gears do. |  |  |  |
| Explain how gears can give a bigger turning effect. |  |  |  |
| State what the centre of mass of an object is. |  |  |  |
| State where the centre of mass of a metre ruler is. |  |  |  |
| Find the centre of mass of an object suspended from a fixed point. |  |  |  |
| Find the centre of mass of a symmetrical object. |  |  |  |
| Use your knowledge of forces and moments to explain why objects at rest don’t turn. |  |  |  |
| Identify the forces that can turn an object about a fixed point. |  |  |  |
| Identify whether a turning force that can turn an object turns it clockwise or anticlockwise. |  |  |  |
| Calculate the size of a force (or its perpendicular distance from a pivot) acting on an object that is balanced. |  |  |  |
| State what a parallelogram of forces is. |  |  |  |
| State what a parallelogram of forces is used for. |  |  |  |
| Write down what is needed to draw a scale diagram of a parallelogram of forces. |  |  |  |
| Use a parallelogram of forces to find the resultant of two forces. |  |  |  |
| Describe what resolving a force means. |  |  |  |
| Describe how to resolve a force into two components. |  |  |  |
| Define equilibrium. |  |  |  |
| Explain why an object at rest is in equilibrium. |  |  |  |

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| **Forces 1: Equations I need to know.** | | | |
| **moment (*M*) = force (*F*) x perpendicular distance\* (*d*)**  (N m) (N) (m)  **\*from the line of action of the force to the pivot.** |  |  |  |
| **Forces 1: Equations I am given and need to use.** | | | |
| **None! Lucky you!** |  |  |  |

**Homework and Independent Study**

HW: Assessed past-paper questions.

Kerboodle online task(s).

Revision: For topic test at end of the topic (PP-style questions, ~40 mins)

IS: Textbook spread questions on each topic, to self-assess.

Use of online resources including BBC Bitesize, physicandmathstutor.com, Seneca Learning and Kerboodle textbook. Especially check the “Appendices” for Maths and Science skills.

YouTube channels – Free Science Lessons, Primrose Kitten.

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| **Forces 1: Key words I need to know** | | | |
| **Displacement:** *distance in a given direction.* |  |  |  |
| **Force:** *a force (in newtons, N) can change the motion of an object.* |  |  |  |
| **Friction:** *the force opposing the relative motion of two solid surfaces in contact.* |  |  |  |
| **Load:** *the weight of an object raised by a device used to lift the object, or the force applied by a device when it is used to shift an object.* |  |  |  |
| **Magnitude:** *the size or amount of a physical quantity.* |  |  |  |
| **Moment:** *the turning effect of a force.* |  |  |  |
| **Newton’s first law of motion:** *if the resultant force on an object is zero, the object stays at rest if it is stationary, or it keeps moving with the same speed in the same direction.* |  |  |  |
| **Newton’s third law:** *when two objects interact with each other, they exert equal and opposite forces on each other.* |  |  |  |
| **Parallelogram of forces:** *a geometrical method used to find the resultant of two forces that do that do not act along the same line.* |  |  |  |
| **Principle of moments:** *for an object in equilibrium, the sum of all the clockwise moments about any point = the sum of all the anti-clockwise moments about that point.* |  |  |  |
| **Resultant force:** *a single force that has the same effect as all the forces acting on the object.* |  |  |  |
| **Scalars:** *a physical quantity, such as mass or energy that has magnitude only (unlike a vector which has magnitude and direction).* |  |  |  |
| **Vector:** *a vector is a physical, such as displacement or velocity that has a magnitude and a direction (unlike a scalar which has magnitude only).* |  |  |  |