Subject:Combined Science/ Separate Science

Medium term plan KS4-

Unit planning and evaluation sheet:

Year group : 10	Subject: Topic P2: Forces
Prior learning- linked to National curriculum	From their work in Key Stage 3 Science, learners will have a basic knowledge of the mathematical relationship between speed, distance and time. They should also be able to represent this information in a distance-time graph and have an understanding of the relative motion of objects. Learners should have an understanding of contact and non-contact forces influencing the motion of an object. They should be aware of newtons and that this is the measure of force. The three laws themselves will be new to the learners. Learners are expected to be able to use force arrows and have an understanding of balanced and unbalanced forces. Learners should have an understanding of forces acting to deform objects and to restrict motion. They should already be familiar with Hooke's law and the idea that when work is done by a force it results in an energy transfer and leads to energy being stored by an object. Learners are expected to know that there is a force due to gravity and that gravitational field strength differs on other planets and stars. **Links to KS3 Subject content** Motion: • Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time) • The representation of a journey on a distance-time graph • Relative motion: trains and cars passing one another. Newton's Laws • Forces as pushes or pulls, arising from the interaction between two objects • Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces • Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) • Change depending on direction of force and size Forces in action • Moment as the turning effect of a force • Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water

	• Force measured in Newton, measurements of stretch or compression as force is changing • Force-extension linear relation; Hooke's law as a special case
Covid gaps	Most pupils will have covered the prior learning in KS3 but there will likely be gaps due to online learning and absences. Pupils may have gaps in practical skills as they were taught outside of science in year 7
Rationale	Having looked at the nature of matter which makes up objects, we move on to consider the effects of forces. The interaction between objects leads to actions which can be seen by the observer, these actions are caused by forces between the objects in question. Some of the interactions involve contact between the objects, others involve no contact. We will also consider the importance of the direction in which forces act to allow understanding of the importance of vector quantities when trying to predict the action. Newton's laws of motion essentially define the means by which motion changes and the relationship between these changes in motion with force and mass. Pupils will have covered forces in KS3. This modules extents their knowledge from Ks3. Forces acting on an object can result in a change of shape or motion. Having looked at the nature of matter, we can now introduce the idea of fields and forces causing changes. This develops the idea that force interactions between objects can take place even if they are not in contact. Learners should be familiar with forces associated with deforming objects, with stretching and compressing (springs).
Vocabulary:	**Keywords** *P2 Forces Glossary* *P2 Forces glossary higher.docx*
SEND	Include SENDSational 6 Introducing SENDsational 6
Cultural Capital:	LInks to inertia and braking help with knowledge of road safety. History of Hooke and Newton
Key assessments- name the assessments	Long answer question End of module quiz. It is 40 marks using past paper questions. The last 6 marks are higher paper content the rest are foundation.
Homework	Homework set on educake. Module split into subsections and pupils given 20 questions to complete each week. The expectation is they repeat the quiz until they achieve at least 80%. Homework guide available.