

## (Science Ostriches) - (Physics)

<b>Key Stage/Year</b>	Key Stage 3 / Year 7
<b>Approximate Number of Lessons and Term</b>	22 Lessons (plus revision lesson and assessment lesson and feedback lesson)
<b>Qualification/Exam (if applicable)</b>	N/A

<b>Consideration of prior learning</b>	Students in this class are our nurture group and so may struggle to access the curriculum in a regular pattern. Although older than Year 7, this has been chosen due to considerable gaps in knowledge and lack of engagement.
<b>How will learners' knowledge, skills and understanding be checked at the start of the unit?</b>	Q&A group discussion on key concepts from Key Stage 2. Revision of what a force is (push or pull) and examples of when forces are useful or bad.

<b>How will learners' knowledge, skills and understanding be checked at the end of the unit?</b>	End of topic or assessment. Either traditional or some students struggle with accessing tests and so a project or mind map or poster may be used instead where students illustrate key concepts that they have learnt.
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Learning Outcome	Approx. No. of Lessons	Potential Activities	Behaviour/Safety/Personal Development/SMSC Opportunities
name forces and classify them as contact or non-contact forces	2	Get out examples of objects that use different forces such magnets for non contact forces and balls to push or newton metres to pull	
recall how to measure forces and masses and their units		Use of Newton metres to measure the force required to pull different objects.	Beware of the maximum weight of the newton metre.
describe how the extension of a spring depends on the force applied	2	Hooke's Law experiment.	Safety goggles to be worn due to risk of spring coming off apparatus and weights dropping onto laps.
recall the effects of friction	2	Look at useful or non-useful ways that friction is used such as using a bike.	
explain some ways in which friction can be changed		Look at examples to reduce friction such as making a surface smoother or lubricating an object.	
identify situation in which friction is helpful or not helpful		Look at useful or non-useful ways that friction is used such as using a bike.	
calculate pressure and recall its units	2	Experiment to calculate the pressure of a person by measuring their weight and drawing around their foot on squared paper to calculate their surface area. Simple equation of Pressure = Force / Area.	One student has an eating disorder - an alternative may be needed such as a pawprint of a pet.
identify balanced and unbalanced forces	2	Identify forces acting on a moving and non-moving object such as a plane at rest/moving at constant speed and then a plane speeding up/slowing down	
explain the effects of balanced			

and unbalanced forces		or changing shape or direction. PHet Simulation will be useful for this.	
explain what causes sounds and how to make louder sounds	2	Playing with musical instruments and looking at what happens when you pluck the string harder for instance.	Handle instruments carefully so that they are not dented or damaged. Be careful of students with noise sensitivity.
explain the link between frequency and pitch		Phet Simulation of a signal generator - look at how the wavelength gets shorter or longer and relate that to the frequency and the pitch.	
describe how sounds move through materials	2	Investigate the bell jar experiment - look at YouTube clips if equipment is not available. Link it to sound needing molecules to travel and that solids allow sound to travel more quickly than gases.	Check for signs of cracks before use, perform a demo behind a plastic screen.
explain why sounds get fainter from their source			
describe what line graphs and scatter graphs show	2	Look at different examples of pre drawn scatter graphs and line graphs and identify the independent / dependent variable and the relationship.	
identify relationships using scatter graphs			
describe the parts of the ear and the ear and their functions	2	Use the model of the ear. Online simulations and augmented reality can also be used via the google chromebooks.	
describe some uses of ultrasound	2	Look at how it is used in cleaning jewellery and detecting cracks in metals.	
compare longitudinal and transverse waves	2	Use a slinky spring - emphasis that matter is not transmitted, only energy and that it always returns to its original place. Look at examples of transverse and longitudinal waves.	Slinky spring must be held at all times and done on the floor in case someone lets go.

**Possible Adaptations for Higher and Lower Achievers**

For higher achievers - use of equations can be introduced and different units. Look at what a pascal is. Wave equations could also be used and the units of frequency and wavelength introduced. Hooke's Law equation can also be introduced.