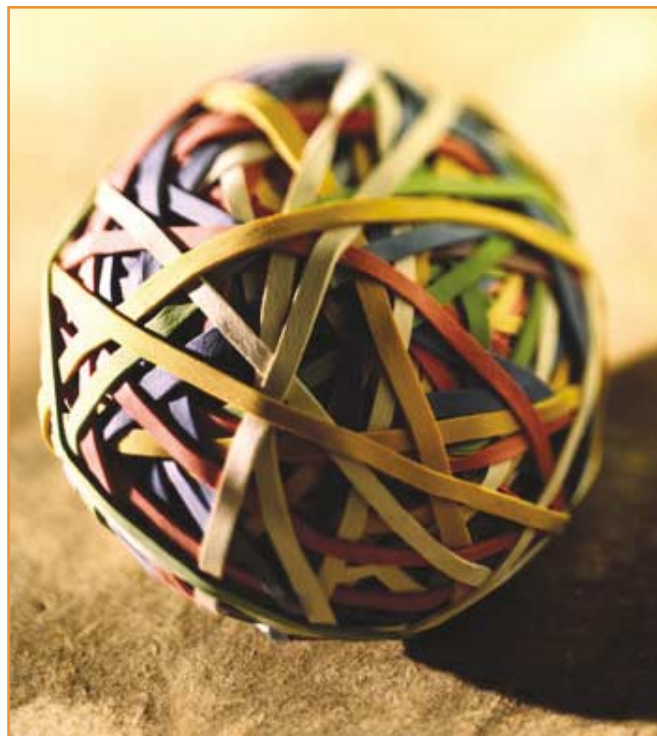
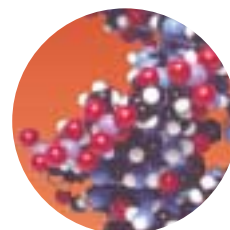


Teach Assist Resource Worksheets

Series 16 of 16



"Extension of elastic bands"



Teach Assist Resources

TeachAssist resources are written with the practical needs of science teachers in mind. Each resource covers a practical activity that is integral to the QCA schemes of work to provide quick and easy preparation for practical classes.

Please feel free to photocopy the sheets to suit your needs.

Each TeachAssist resource contains:

- Student worksheet with practical instructions and activities.
- Technicians' equipment list for a class of 30 students.
- Reference to allow trouble-free ordering of materials and resources.

A summary table links each resource to the National Curriculum programme of study which allows TeachAssist practical activities to be quickly included into lesson plans and schemes of work.

If you require other booklets in the series, please telephone the Griffin Education sales team or send your request to the following address:-

Griffin Education
Bishop Meadow Road
Loughborough
Leicestershire LE11 5RG

STUDENT WORKSHEET



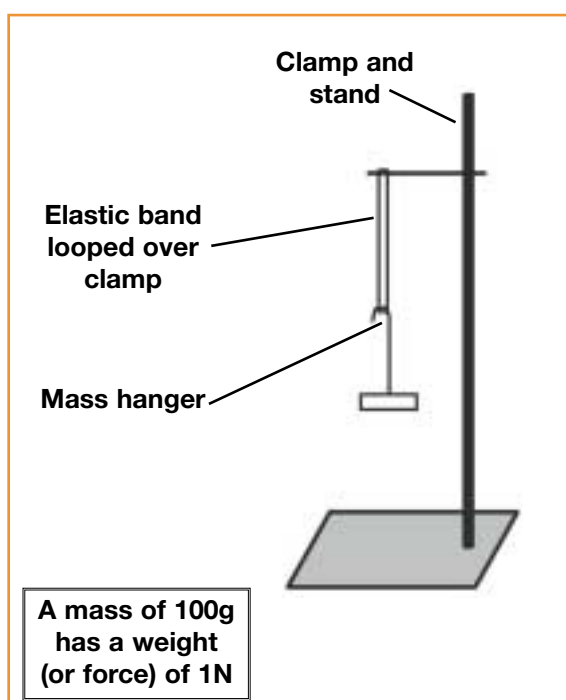
Important information:

Follow all the safety instructions that your teacher gives you.
 Do not add more weight than your teacher has told you to.
 Position the stand so that any falling weights land on the bench and not your foot!
 Wear safety glasses at all times.

How stretchy?

This experiment looks at how an elastic band stretches when a pulling force is applied to it.

1. Use a pen to mark your elastic band 1cm from each end.
2. Lie the elastic band flat out and measure between the two marks. This gives you the starting length.
3. Set up the equipment as shown in the diagram. Make sure the elastic band will not fall off.
4. Hook the mass hanger to the elastic band and measure the distance between the two marks. This gives you the length with the mass of the hanger added.
5. Add weights one at a time. For each mass, record the length of the elastic band between the two points. Use a table like the one below.
6. Stop when you have reached the maximum mass that your teacher has told you to add.



Mass added (g)	Force applied (N)	Length between marks (cm)	Extension (cm)
Start	0		

- What happens to the elastic band when you add weights to it?
- The extension of the elastic band is the increase from its starting length. How can you calculate this for each mass?
- Plot a line graph of your results. Put the extension (vertical axis) against the force added (horizontal axis).
- What would happen if you kept adding more and more weights?

You can try the same experiment with a spring to see how it reacts when weights are added.

TECHNICIANS' EQUIPMENT LIST

QCA Unit 7K: Forces and their effects

Date:	Room	Time/Period:
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Equipment Class of 30 pupils, working in pairs.	Quantity	Check	Out	Back
Elastic bands	15			
Springs	15			
Masses and mass hangers (appropriate to elastic bands and springs being used)	15			
25cm rules	15			
Retort stand and clamp	15			
Safety glasses	30			

Important Information:



- The activity contains procedures that can be hazardous. It should not be performed unless an appropriate risk assessment has been made.
- It is important to establish the elastic limit for the springs used and the 'safe' range for the extension of the elastic bands before the practical.
- The main hazard is sudden failure of the rubber bands or springs. Limit students to weights below the elastic limit of springs / elastic bands.
- Ensure students position stands so that any falling weights do not pose a danger.
- Students should share data as a class set or students should repeat measurements to ensure an appreciation of variability of the data.
- The graph for the spring is linear up to the elastic limit of spring and non-linear above this. Graph for elastic band is non-linear.
- As an extension activity, students could use their graphs to estimate the mass of various objects.

ORDER REQUISITION

Equipment	Griffin Catalogue No.	Page	Unit cost (£)	No.	Cost (£)
Springs	Various	27			
Mass hanger, 50g choose as appropriate for spring or elastic band being used (pack of 3)	MAS-754-506B	13	7.00		
Masses, 20g choose as appropriate for spring or elastic band being used. (pack of 3)	MAS-750-050T	13	3.65		
30cm rules (pack of 10)	RUL-040-C	489	8.40		
Safety glasses	FB55125	492	2.25		
Total cost					
VAT					
Order total					

Complete the order form above and place your order with Griffin Education in your usual way. Prices are correct at time of print, please contact the Griffin Sales office or check on the Griffin Education website for the latest prices.

By phone: 01509 233344
By post: Griffin Education
 Bishop Meadow Road
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By fax: 01509 231893
By email: griffin@fisher.co.uk
On-line: www.griffineducation.co.uk

SUMMARY TABLE

QCA unit	KS3 NC programme	Y7 TeachAssist	Activity	Relevant experience from Key stage 2
7A: Cells	Sc1.2f Sc2.1a	1	How to use a microscope and prepare an onion epidermis slide	Use of hand lenses and basic microscopes. Plants and animals, including internal body organs and plant structures
7C: Environments and feeding relationships	Sc1.2g	2	Using a data logger to monitor environmental conditions	Some use of data loggers How organisms are suited to their environment
	Sc1.1a,c,d Sc1.2h,k,o	3	Wood lice in choice chambers	Asking questions and designing a fair test How organisms are suited to their environment
	Sc2.5b,e	4	Organisms and food chains in leaf litter	How organisms are suited to their environment Food chains as a feeding relationship
7E: Acids and alkalis	Sc3.3d	5	Finding the pH using universal indicator solution	Little or no previous coverage of pH
	Sc1.2g Sc3.3e	6	Using a data logger to monitor changes in pH when an acid is added to an alkali	Some use of data loggers Identification of patterns and trends
	Sc3.3e	7	Investigating the neutralisation of acids with antacid tablets	Use of tables and line graphs to represent data Mixing materials can lead to a change
7F: Simple chemical reactions	Sc3.3a	8	Reactions of metals with acids	Describing how materials change when mixed or heated and how irreversible changes produce new materials
7H: Solutions	Sc1.2a Sc3.1h	9	Purifying salt from rock salt	Use of dissolving, filtering and evaporation to separate mixtures
	Sc3.1h	10	Simple distillation	Knowledge of evaporation as a separation technique
	Sc3.1h	11	Paper chromatography of ink	Separation of colours in food colourings such as sugar-coated sweets
7I: Energy resources	Sc1.2f	12	Using the Bunsen burner	Possible use of methylated spirit burners or candle-burners
	Sc4.1c Sc4.5a,e	13	Demonstrating solar energy: solar cells and absorption of heat energy by different surfaces	Little or no previous coverage of energy
	Sc4.5a	14	Finding the energy content of foods	Little or no previous coverage of energy
7J: Electrical circuits	Sc4.1a	15	Current in series and parallel circuits	Construction of series circuits from circuit diagrams
7K: Forces and their effects	Sc1.2f,g,j,k Sc4.2b	16	Extension of springs and elastic bands	Push and pull in springs Testing elastic band catapults. Some may have extended bands with masses Measurement of forces and weight