Science Faculty | Directed Improvement Sheet

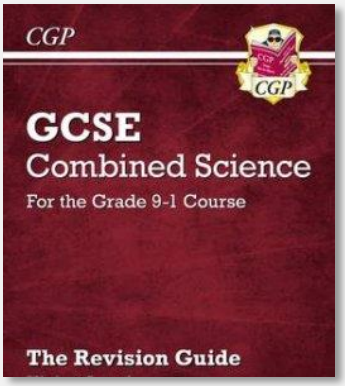
Year 9

Compare a range of sources of energy in terms of: sustainability, reliability and impacts.

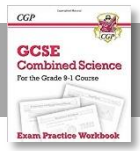
Step 1 What do I need to know?

- Compare renewable and non-renewable energy sources.

Step 2 How do I find out about it?

Revision Guide Page		Web Links
		Bitesize Sustainability Renewable and non-renewable sources of energy YouTube Energy Sources
Higher	**Pg. 161-162**	
Foundation	**Pg. 175-179**	

Step 3 What can I do to help me learn it?



Complete the relevant questions in your CGP Science Workbook	Higher	Pages 168- 171
	Foundation	Pages 156-159

TASK 1- Create a table of advantages and disadvantages of 8 different energy sources.

TASK 2- Describe what impacts energy sources have on the environment using keywords such as:

- Aquatic life
- Climate change
- Carbon dioxide emissions
- Deforestation
- Greenhouse gases
- Landscape

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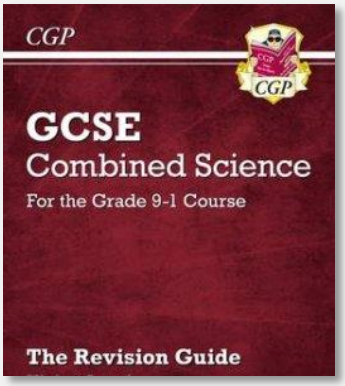
Year 9

Explain how energy can be stored as elastic potential energy

Step 1 What do I need to know?

- Recall and rearrange the elastic potential energy equation
- Recall the units of different variables used in the elastic potential energy equation.
- Elastic potential energy is stored in the object that is being stretched or squashed.
- Calculate the energy stored in a stretched spring
- Explain why the equation only works as long as the elastic limit (the limit of proportionality) is not exceeded.
- Use the equations for GPE, Ke and Ee in multistep calculations.

Revision Guide Page		Web Links
		Bitesize http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa/forces/forceselasticityrev1.shtml YouTube https://www.youtube.com/watch?v=Qw_9kX9PARc
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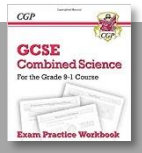
Triple (Physics)	Pg. 11-12	

Step 3 What can I do to help me learn it?



Complete the relevant questions in your CGP Science Workbook		
	Higher	Pages 175-176
	Foundation	Pages 148-150

TASK 1- Recall the EPE equation and rearrange it using an equation triangle.

TASK 2 – Explain what is meant by "directly proportional" and explain what happens when the elastic limit of a spring is exceeded.

TASK 3 – Try these equations that link the two equations. See your teacher to find out the answers.

1. The tape on a finishing line stretches 3m when winner crosses the line. The tape has a spring constant of 5N/m. Hoe much elastic potential energy is stored in the tape?
2. A finishing tape is stretched from 8m to 12m, the tape has a spring constant of 5N/m. How much elastic potential energy is stored in the tape?

3. A finishing tape is stretched 2m as the athlete crosses the line. The tape has a spring constant of 5N/m. The athlete has a mass of 65kg, assuming all the kinetic energy was converted to elastic potential energy, calculate the speed of the athlete as they cross the line.

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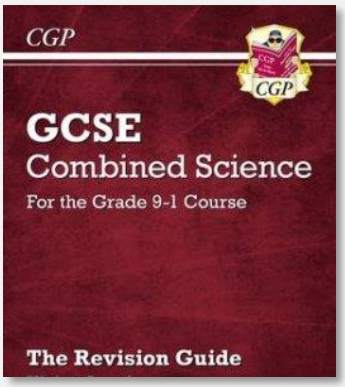
Year 9

Explain how energy is stored as gravitational potential or kinetic energy

Step 1 What do I need to know?

- Recall and rearrange the GPE and Kinetic energy equations
- Recall the units of different variables used in the GPE and kinetic energy equations.
- Calculate the force of gravity on other planets. On Earth it is 9.8N/Kg.
- Suggest why not all energy is transferred to kinetic energy when an object is dropped from a known height.
- Compare the energy transferred from a falling object to its kinetic energy gained.

Revision Guide Page		Web Links
		Bitesize https://www.bbc.com/education/guides/zskp7p3/revision/2 https://www.bbc.com/education/guides/zskp7p3/revision/5 YouTube https://www.youtube.com/watch?v=p8ElhKTpoO0 https://www.youtube.com/watch?v=-zy9eWzmGe4
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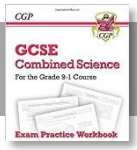
Triple (Physics)	Pg. 12	

Step 3 What can I do to help me learn it?



Complete the relevant questions in your CGP Science Workbook	Higher	Pages 176
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TASK 1- Recall the equation for GPE and kinetic energy. Rearrange by putting both equations into triangles.

TASK 2- Explain why not all energy is transferred from GPE to Kinetic energy from falling objects. Think about wasted energy.

TASK 3 – Try these equations that link the two equations. See your teacher to find out the answers.

1. A man of mass 80kg jumped a height of 2m. What was the change in gravitational potential energy?
2. A runner has mass of 80 kg and travels at 3m/s. Calculate her kinetic energy.
3. A high jumper of mass 55kg falls 2.5m, assuming all the gravitational potential energy is converted to kinetic energy what is the speed of the athlete when they land on the mat?

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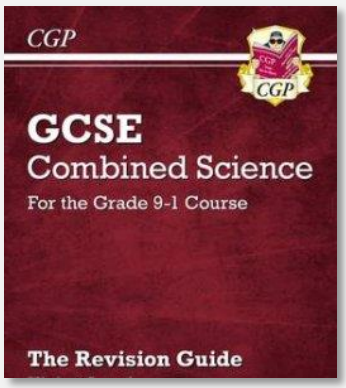
Year 9

Explain how the specific heat capacity of an object can be found

Step 1 What do I need to know?

- Recall that the specific heat capacity of a substance is the amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius.
- Recall and rearrange the specific heat capacity energy equation.
- Suggest equipment and actions to carry out a practical to investigate specific heat capacity.
- Use the equation to explain why some objects
- Link electrical power and energy to calculate SHC of objects

Revision Guide Page		Web Links
		Bitesize http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/heatingandcooling/buildingsrev3.shtml YouTube https://www.youtube.com/watch?v=Hs5x0-IU2F4
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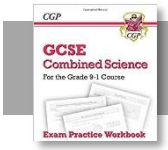
Step 3 What can I do to help me learn it?



Complete the relevant questions in your CGP Science Workbook	Higher	Pages 177
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TASK 1- Recall the specific heat capacity equation and rearrange it using an equation triangle.

TASK 2 – Use the specific heat capacity equation to explain why some objects require more energy to increase the temperature than others.

TASK 3 – Try these equations that link the two equations. See your teacher to find out the answers.

1. How much energy must be transferred to raise the temperature of 2 kg of water from 20°C to 30°C?
2. How much energy is needed to increase the temperature of 500g of lead from 20°C to 30°C? The specific heat capacity of lead is 128 J/Kg°C.
3. The temperature of a 1 Kg block of aluminium rises by 9°C, to do this 8190J of thermal energy is transferred to the aluminium. What is the specific heat capacity of aluminium?