GEMS Winchester School Dubai

Year 10 Progress Test Revision

Year 10 Progress Test revision

English

Topic / Skill:
Reading: Narrative Non-Narrative
Notes / revision links
• Retrieval (extracting key information from the text read) • Inference (drawing conclusion on the basis of text read) • Authors technique (knowing the purpose, audience and context of writing) • Complex Inference (knowing how choice of words, leads to a particular meaning) TE: Pls choose Reading Option Booklet Year 9 from the first link below for Year 10. Challenge your child to answer Level (4-6). http://www.satspapers.org/KS3%20test%20papers.htm From the below link practice test (10-15) Reading Comprehension Passages. https://www.majortests.com/sat/reading-comprehension.php
Sample Questions
Q17 The writer uses the words 'figure' and 'spectre' in paragraphs one and two. What mood does this create for the reader? Choose **one** word. intrigue humour horror anxiety hope
Model Answers
Horror

Year 10 Progress Test revision

Topic / Skill:
Spelling Punctuation and Grammar
Notes / revision links
Spelling patterns and rules set out in KS 1 and 2 Apostrophes, Inverted Quotes, Commas, Semicolons, Colons, Brackets, Capitals & Full stops. Tenses, Subject Verb Agreement, Countable, Conjunctions, Prepositions, Transition words (Connectors) SPaG Practise Resources
Sample Questions
Matching: 1____ simile — A. inanimate objects taking on human characteristics 2____ metaphor — B. words that imitate a sound 3____ alliteration — C. comparing 2 unlike things using like or as 4____hyperbole — D. an exaggeration 5____ onomatopoeia — E. a description emphasizing one or more of the 5 senses 6____ personification — F. comparing 2 unlike things 7____ idiom — G. several words in a row whose first consonant sound is repeated 8____ imagery — H. a saying, that if taken literally, makes no sense 9____oxymoron — I. opposite words put together to form a unique meaning
Model Answers
1c, 2f, 3g, 4d, 5b, 6a, 7h, 8e, 9i

Year 10 Progress Test revision

Maths

Topic / Skill:
Numbers: Working with fractions
Notes / revision links
https://corbettmaths.com/tag/fractions/ https://corbettmaths.com/2018/04/04/adding-fractions/ https://corbettmaths.com/2019/09/02/multiplying-fractions-practice-questions/
Sample Questions

Which of the following fractions is less than $\frac{3}{8}$?

Possible Answers:

- $\frac{4}{7}$
- $\frac{1}{2}$
- $\frac{6}{16}$
- $\frac{5}{13}$
- $\frac{1}{3}$

Model Answers

Correct answer:

$\frac{1}{3}$

Year 10 Progress Test revision

Topic / Skill:
Numbers: Conversion of numbers to Standard form and vice versa, Operations with standard form
Notes / revision links
https://corbettmaths.com/2019/08/29/standard-form-practice-questions/ https://corbettmaths.com/wp-content/uploads/2013/02/standard-form-pdf.pdf
Sample Questions
1. Write 800,000 in standard form. 2. Earthworms can eat up to 5×10^3 bacteria in one minute. If an earthworm ate constantly, what is the maximum number of bacteria it could eat in 24 hours? Write your answer in standard form.
Model Answers
1. 800,000 can be written as $8 \times 100,000$. $100,000 = 10 \times 10 \times 10 \times 10 \times 10 = 10^5$ So, $800,000 = 8 \times 10^5$ 2. $5 \times 10^3 \times 60 \times 24$ $= 7.2 \times 10^6$

Year 10 Progress Test revision

Topic / Skill:
Algebra: Simplifying algebraic expressions, simplifying algebraic expressions with brackets
Notes / revision links
https://corbettmaths.com/tag/simplifying-expressions/ https://corbettmaths.com/2019/08/22/expanding-brackets-practice-questions/ https://corbettmaths.com/2019/08/22/multiplying-terms-practice-questions/
Sample Questions
1. Determine which of the following expressions are equivalent to $(x + 2y)(x – y)$. a. $x^2 + 2xy – 2y^2$ b. $x^2 + xy – 2y^2$ c. $x^2 – xy – 2y^2$ d. $x^2 + xy + 2y^2$ e. $x^2 – 2y^2 + xy$ f. $xy + x^2 – 2y^2$
Model Answers
1. Ans: b, e, f

Topic / Skill:
• **Numbers** : Compound Percentages
Notes / revision links
https://corbettmaths.com/2019/09/02/compound-interest-practice-questions/ https://corbettmaths.com/wp-content/uploads/2013/02/compound-interest-pdf1.pdf https://revisionmaths.com/gcse-maths/ratio-proportion-and-rates-change/simple-and-compound-interest
Sample Questions
1. The value of a painting in 2010 was £12000. Its value rose by 40% in 2011, but then fell by 20% in 2012 and fell again by 20% in 2013. (a) Calculate the value of the painting in 2011. Answer: £_____ [2] (b) Calculate the value of the painting in 2013. Answer: £_____ [2]
Model Answers
1.(a) 16800 (b) 10752

Year 10 Progress Test revision

Topic / Skill:
Algebra: Solving Equations, Solving equations with powers and roots
Notes / revision links
https://corbettmaths.com/2019/08/28/solving-equations-practice-questions/ https://corbettmaths.com/wp-content/uploads/2019/11/Equations-indices-roots-1.pdf
Sample Questions
1. Solve $3(2x-6)=2(5x+3)$ 2. Solve the equation $\frac{x^2}{5}=31.25$
Model Answers
1. $3(2x-6)=2(5x+3)$ $6x-18=10x+6$ $(-6)\quad 6x-18=10x+6$ $(-6x)\quad 6x-24=10x$ $(\div 4)\quad -24=4x$ $-6=x$ 2. $\frac{x^2}{5}=31.25$ $x^2=156.25$ $x=\sqrt{156.25}$ $x=\pm 12.5$

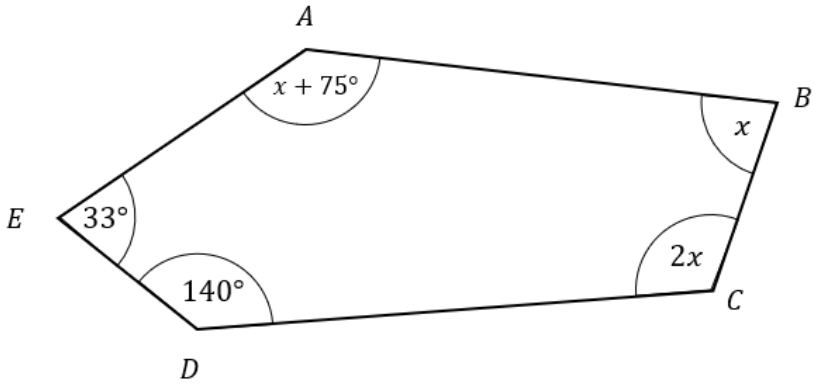
Year 10 Progress Test revision

Topic / Skill:
Shape and Space 1: Triangles, Quadrilaterals, Polygons
Notes / revision links
https://corbettmaths.com/2019/09/19/angles-in-polygons-textbook-exercise/ https://corbettmaths.com/wp-content/uploads/2013/02/angles-in-polygons-pdf2.pdf http://mrbartonmaths.com/topics/angles/angles-in-triangles-and-polygons/worksheets.html
Sample Questions

1.

$ABCDE$ is a pentagon.

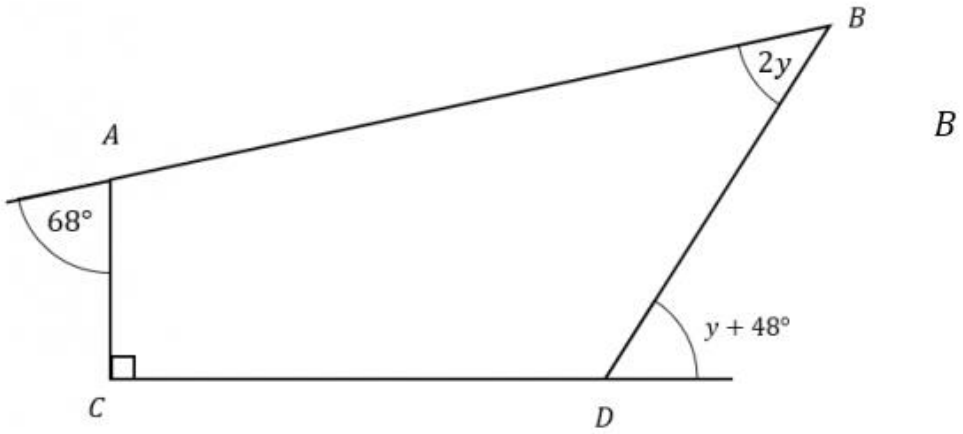
Work out the size of x.



2.

$ABCD$ is a quadrilateral.

Work out the size of y.



B

Year 10 Progress Test revision

Model Answers

1.

This shape has 5 sides, so its interior angles must add up to

$$180 \times (5-2) = 540^\circ.$$

We can't find this solution with one calculation as we did previously, but we can express the statement "the interior angles add up to 540" as an equation. This looks like

$$33 + 140 + 2x + x + (x + 75) = 540$$

$$4x + 248 = 540.$$

$$x = 292 \div 4 = 73^\circ$$

2.

This shape has 4 sides, so its interior angles add up to

$$180 \times (4-2) = 360^\circ.$$

We don't have any way of expression two of the interior angles at the moment, but we do have their associated exterior angles, and we know that interior plus exterior equals 180. So, we get

$$\text{interior angle CDB} = 180 - (y + 48) = 132 - y$$

Furthermore, we get

$$\text{interior angle CAB} = 180 - 68 = 112$$

Now we have figures/expressions for each interior angle, so we write the sum of them equal to 360 in equation form:

$$112 + 90 + 2y + (132 - y) = 360$$

Solving the equation, y=26

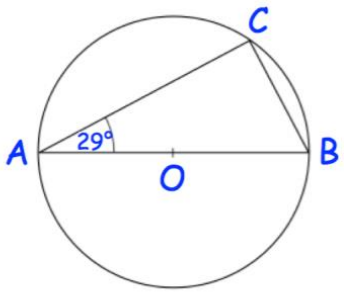
Year 10 Progress Test revision

Topic / Skill:
Shape and Space: Circle theorems

Notes / revision links
https://corbettmaths.com/2018/04/04/circle-theorems-2/ https://corbettmaths.com/2019/09/19/circle-theorems-textbook-exercise/ http://mrbartonmaths.com/topics/angles/circle-theorems/worksheets.html

Sample Questions

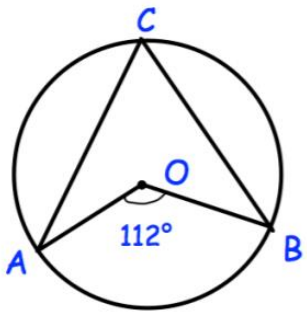
(a) In the diagram below, O is the centre of the circle and A, B and C are points on the circumference.



Angle A = 29°

Work out the size of angle B.

(b) A, B and C are three points on the circumference of another circle.
O is the centre of the circle.



Angle AOB = 112°

Work out the size of angle ACB.

Model Answers

(a) 81
(b)56

Year 10 Progress Test revision

Topic / Skill:
Graph 1: Gradient of a straight line, Equation of straight line
Notes / revision links
https://corbettmaths.com/2019/08/29/equation-of-a-line-practice-questions/ https://corbettmaths.com/2019/09/26/equation-of-a-line-textbook-exercise/ https://corbettmaths.files.wordpress.com/2013/02/equation-of-a-line-pdf.pdf
Sample Questions
1. Find the equation of the line that passes through the point (-2 , 5) and has a slope of -4. 2. Find an equation of the line that passes through the point (-2 , 1) and is perpendicular to the line $x + 2y = -2$.
Model Answers
1. • Substitute y_1 , x_1 and m in the point slope form of a line $y - y_1 = m(x - x_1)$ $y - 5 = -4(x - (-2))$ $y = -4x - 3$ 2. $y = 2x + 5$

Year 10 Progress Test revision

Topic / Skill:
Sets: Set notation, Venn diagram
Notes / revision links
https://corbettmaths.com/2019/09/09/venn-diagrams-practice-questions/ https://corbettmaths.com/2016/08/07/venn-diagrams/ https://www.tutor2u.net/maths/reference/venn-diagrams-and-set-notation-revision-videos
Sample Questions
There are 400 students in a class. 50 of them take German and 150 take Latin. Some students take two languages. There are 230 students who take no language whatsoever. How many students are there who take at least one language?
Model Answers
170

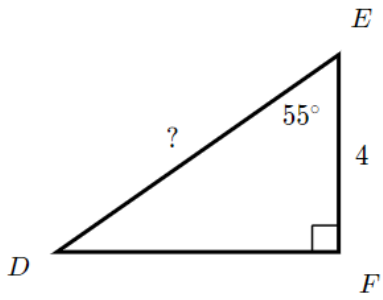
Topic / Skill:
Numbers: Upper and lower bounds
Notes / revision links
https://corbettmaths.com/2013/05/28/lower-and-upper-bounds/ https://corbettmaths.com/lower-and-upper-bounds-corbettmaths/
Sample Questions
What is the upper bound and lower bound of 390 grams, measured to the nearest 10 grams?
Model Answers
The degree of accuracy is nearest 10 g. $10\text{ g} \div 2 = 5\text{ g}$ Upper bound = $390 + 5 = 395\text{ g}$ Lower bound = $390 - 5 = 385\text{ g}$

Year 10 Progress Test revision

Topic / Skill:
Algebra: Solving simultaneous Equations
Notes / revision links
https://corbettmaths.com/2019/09/05/simultaneous-equations-practice-questions/ http://mrbartonmaths.com/topics/solving-equations/solving-simultaneous-equations/videos.html
Sample Questions
Solve the simultaneous equations $y = 2x + 4$ and $y = x + 1$
Model Answers
X= -3, y= -2

Topic / Skill:
Algebra: Change of Subject of formulae
Notes / revision links
https://corbettmaths.com/2018/04/04/changing-the-subject/ https://corbettmaths.com/2019/09/18/changing-the-subject-textbook-exercise/
Sample Questions
Make x the subject $y = xz + s$ $\frac{x + 3}{c} = h$ $x^3 - 4 = 5y$
Model Answers
$y = \frac{w}{a}$ $y = a - p$ $y = \sqrt[3]{x}$

Year 10 Progress Test revision

Topic / Skill:
Trigonometry: Sine, cos and tan ratio, calculating missing sides or angles
Notes / revision links
https://corbettmaths.com/2013/03/30/trigonometry-missing-sides/ https://corbettmaths.com/2013/03/30/trigonometry-missing-angles/ https://corbettmaths.com/wp-content/uploads/2018/12/Trigonometry-pdf.pdf
Sample Questions
Given $\triangle DEF$, find DE. *Round your answer to the nearest hundredth.* 
Model Answers
$ED \approx 6.97$

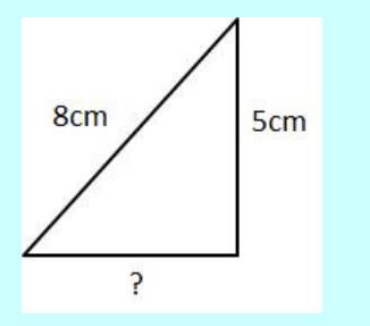
Topic / Skill:
Data handling: Averages for discrete data
Notes / revision links
https://corbettmaths.com/2019/08/28/mean-mode-median-range-practice-questions/ https://corbettmaths.com/2019/08/28/estimated-mean-practice-questions/ https://corbettmaths.com/wp-content/uploads/2013/02/averages-and-range-pdf2.pdf
Sample Questions
Compute the mean of the first 6 odd, natural numbers.
Model Answers
$\bar{x} = \frac{1+3+5+7+9+11}{6}$ $= \frac{36}{6}$ $= 6$

Year 10 Progress Test revision

Topic / Skill:
Data handling: Quartiles
Notes / revision links
https://corbettmaths.com/tag/quartile/ https://corbettmaths.com/wp-content/uploads/2015/03/linear-interpolation.pdf
Sample Questions
Compute Q_1 and Q_3 for the data relating to the marks of 8 students in an examination given below 25, 48, 32, 52, 21, 64, 29, 57
Model Answers
$Q_1 = 26$ $Q_3 = 55.75$

Topic / Skill:
Numbers: Inequalities
Notes / revision links
https://corbettmaths.com/2019/08/29/inequalities-practice-questions/ https://corbettmaths.com/2019/09/26/inequalities-textbook-exercise/ https://corbettmaths.com/wp-content/uploads/2019/04/Solving-Inequalities.pdf
Sample Questions
Solve $\frac{x-3}{2} < -5$
Model Answers
$x < -7$

Year 10 Progress Test revision

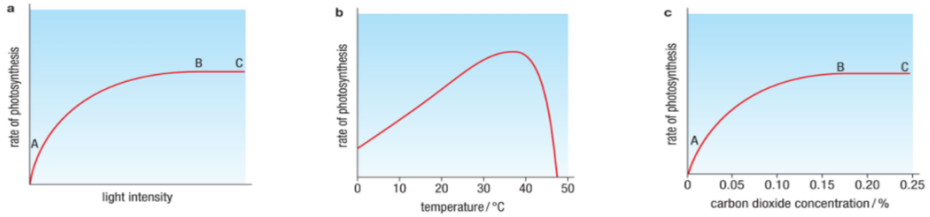
Topic / Skill:
Shape and Space: Pythagoras theorem
Notes / revision links
https://corbettmaths.com/2019/09/02/pythagoras-practice-questions/ https://corbettmaths.com/2019/10/04/pythagoras-textbook-exercise/ https://corbettmaths.com/wp-content/uploads/2013/02/pythagoras-pdf2.pdf
Sample Questions
Find the missing side 
Model Answers
$?^2 = 8^2 - 5^2 = 64 - 25 = 39$ $? = \sqrt{39} = 6.25\text{cm}$ to 2dp.

Topic / Skill:
Number: Ratio
Notes / revision links
https://corbettmaths.com/2019/09/02/ratio-practice-questions/ https://corbettmaths.com/2019/10/07/ratio-problem-solving-textbook-exercise/ https://corbettmaths.com/2019/10/07/ratio-sharing-the-total-textbook-exercise/
Sample Questions
A rectangle field has an area of 300 square meters and a perimeter of 80 meters. Whal the ratio of the length to the width of this field?
Model Answers
4:1

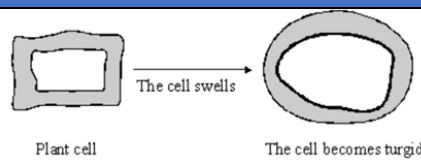
Science

Topic / Skill:
Biology: Construct and interpret a variety of food chains, identifying producers, predators and prey
Notes / revision links
https://www.bbc.co.uk/bitesize/guides/zq4wjxs/revision/1
Sample Questions
1. Which is the secondary consumer in this food chain: grass -> grasshopper -> frog -> hawk? 2. What is a habitat? 3. What do the arrows in a food chain show?
Model Answers
1. The secondary consumers in this food chain are frogs. 2. A habitat is the place where an organism lives. 3. The arrows in a food chain show the transfer of energy. It is a common mistake to think they show what eats what.

Year 10 Progress Test revision

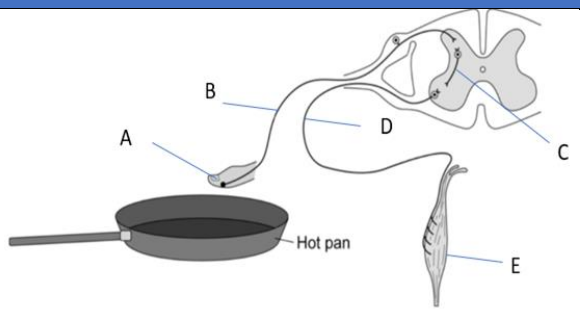
Topic / Skill:
Biology: Photosynthesis and factors affecting the rate of photosynthesis
Notes / revision links
https://www.bbc.co.uk/bitesize/guides/zq4wjxs/revision/1 https://www.bbc.co.uk/bitesize/guides/zg8nrwx/revision/1
Sample Questions
Look at graph a 1.Explain what is happening between points **A and B** on the graph 2.Explain what is happening between points **B and C** on the graph 3.Now look at graph b. Explain why it is a **different shape** to the other two graphs shown. 
Model Answers
• 1. As light intensity increases, so does the rate of photosynthesis. This tells us that light intensity is a **limiting factor.** • 2. An increase in light intensity has no effect on the rate of photosynthesis, so it is no longer a limiting factor, something else probably is. • 3. Temperature acts as a normal limiting factor to begin with; increase in temperature increases the rate of photosynthesis. But above a certain temperature, the **enzymes** in the cells are destroyed so no photosynthesis can take place.

Year 10 Progress Test revision

Topic / Skill:
Biology: Osmosis and effect of osmosis on plant and animal cells
Notes / revision links
https://www.bbc.co.uk/bitesize/guides/zq4wjxs/revision/1 https://www.bbc.co.uk/bitesize/guides/zs63tv4/revision/4
Sample Questions
 1.The diagrams show what happens to the shape of a plant cell placed in distilled water. a. Explain why the cell **swells** and becomes **turgid.** Name the process involved. b. When **animal** cells are put in water, they swell up, and then burst. When **plant** cells are put in water, they swell up, but do **not** burst. How does the structure of plant cells prevent them from bursting? c. Describe the change which will occur if a piece of peeled potato is placed in a **concentrated sugar solution** and explain **why** this change occurs.
Model Answers
1. (a) water (molecules) enter(s) (the cell) ***or*** *water (molecules) pass(es) through the (semi-permeable) cell membrane* by osmosis (b) (plant cells) have (cell) wall *accept animal cells have no (cell) wall* (c) (the piece of) potato shrinks ***or*** *loses its turgor* ***or*** *becomes flabby* ***or*** *becomes flaccid* ***or*** *plasmolysis occur* ***or*** *cytoplasm pulls away from the cell wall* (because) concentration of sugar ***or*** *because concentration of water* (solution) is greater than concentration inside the cell / vacuole *inside the cell / vacuole is greater than concentration (of water) outside* water is drawn out of the cell

Year 10 Progress Test revision

Topic / Skill:
Biology: Nervous coordination in Humans
Notes / revision links
https://www.bbc.co.uk/bitesize/guides/zq4wjxs/revision/1 https://www.bbc.co.uk/bitesize/guides/zprxy4j/revision/1 https://www.bbc.co.uk/bitesize/guides/z2374qt/revision/2
Sample Questions

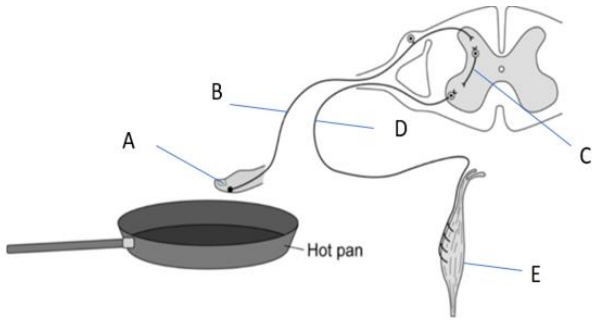


Q1. The diagram shows a reflex arc with parts labelled **A, B, C, D & E**. The **arrows** show the direction of the nerve impulse. Complete the diagram by **labelling** each part of the reflex arc.

Q2. The nerve pathway from hand to the spinal cord and back to the effector is **1.2 metres long**. The time it takes for the impulse to reach the effector is **0.02 seconds**. Calculate the **speed** of the impulse.

Q3. Explain why some actions, such as breathing and swallowing, are reflex actions, whilst others, such as speaking and eating, are under your conscious control.

Model Answers

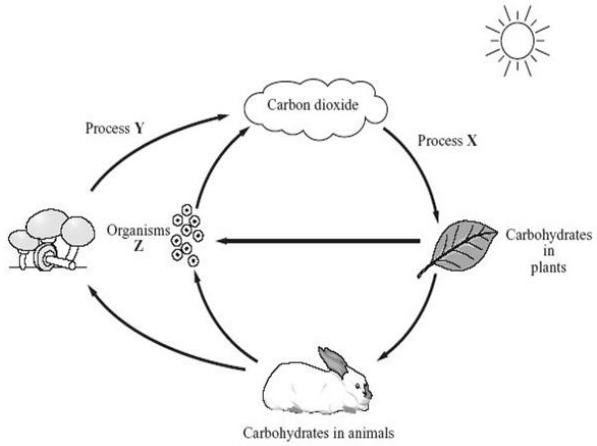


Q2. 1.2/0.02 = 60m/s

Q3. Reflex actions to operate automatically, even when you are asleep, so cannot rely on conscious though processes, unlike speaking and eating, which you choose when to do.

Year 10 Progress Test revision

Topic / Skill:
Biology: Carbon cycle – Ecology
Notes / revision links
https://www.bbc.co.uk/bitesize/guides/zq4wjxs/revision/1 https://www.bbc.co.uk/bitesize/topics/zxxhh39
Sample Questions



In a stable community, the processes which remove materials are balanced by processes which return materials. These materials are constantly cycled within the community

Name:

(i) process **X** .....

(ii) process **Y** .....

(iii) the group of organisms **Z** which bring about decay.

.....

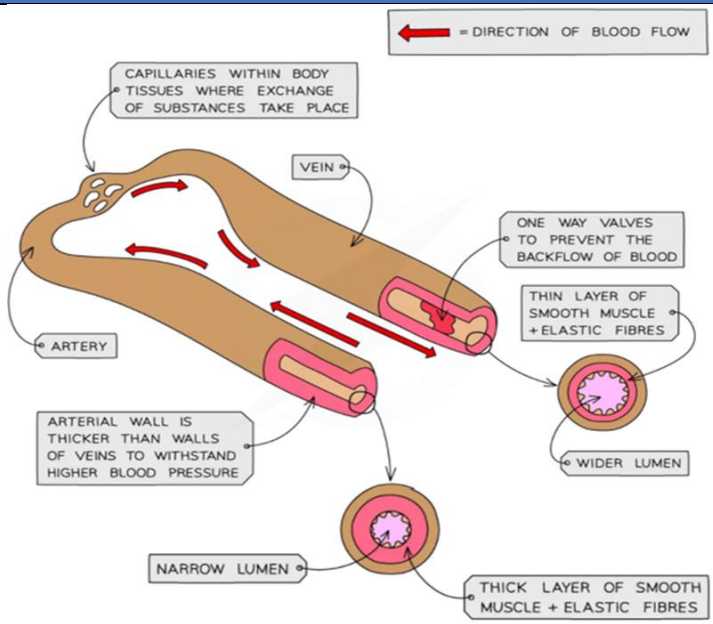
Model Answers

(i)Photosynthesis

(ii) respiration
'anaerobic' is neutral

(iii) microorganisms
accept microbes, bacteria, fungi, decomposers or any named microorganism

Year 10 Progress Test revision

Topic / Skill:
Biology: Blood vessels – Human circulation
Notes / revision links
https://www.bbc.co.uk/bitesize/guides/zq4wjxs/revision/1 https://www.bbc.co.uk/bitesize/guides/zqnsrwx/revision/2
Sample Questions
Figure 1 represents cross-sectional areas through the three main types of blood vessel. a)Identify which blood vessel in **Figure 1** represents an artery, vein and capillary b)Write the **functions** of arteries, veins and capillaries c)Explain the ways in which arteries, veins and capillaries are **adapted** for their function 
Model Answers
   P – VEIN Q – ARTERY R – CAPILLARY Adaptations and functions elaborated in this picture

Year 10 Progress Test revision

Topic / Skill:

Biology:
Respiration – Investigation based questions

Notes / revision links

https://www.bbc.co.uk/bitesize/guides/zq4wjxs/revision/1

Sample Questions

Some students investigated the process of cellular respiration. They set up three vacuum flasks. One contained live, soaked peas. One contained dry peas. One contained peas which had been soaked and then boiled. They took daily observations of the temperature in each flask for a week. The results are shown in the table.

Day	Room temperature (°C)	Temperature in flask A containing live, soaked peas (°C)	Temperature in flask B containing dry peas (°C)	Temperature in flask C containing soaked, boiled peas (°C)
1	20.0	20.0	20.0	20.0
2	20.0	20.5	20.0	20.0
3	20.0	21.0	20.0	20.0
4	20.0	21.5	20.0	20.0
5	20.0	22.0	20.0	20.0
6	20.0	22.2	20.0	20.5
7	20.0	22.5	20.0	21.0

a Plot a graph to show these results.

b Explain the results in flask A containing the live, soaked peas.

c Why were the results in flask B the same as the room temperature readings?

d Why was the room temperature in the lab recorded every day?

e Look at the results for flask C.

i Why is the temperature at 20 °C for the first five days?

ii After five days the temperature increases. Suggest **two** possible explanations for the temperature increase.

Model Answers

a. Award marks for standard of graphs, axes etc.

b. As the peas start to grow, they began to respire aerobically. As a result, a small amount of heat energy is produced so the temperature increased.

c. Because the seeds were dry and not growing, so there was no respiration or heat produced.

d. As a control level.

e. (i) any reasonable explanation, eg., the important thing about flask C is that the peas are dead so the temperature for the first five days remains at 20 degree Celsius as they are not respiring.

(ii) peas had gone mouldy and mould respiring so temperature goes up. Anomaly, eg., sun on thermometer, poor reading etc.

Year 10 Progress Test revision

Topic / Skill:

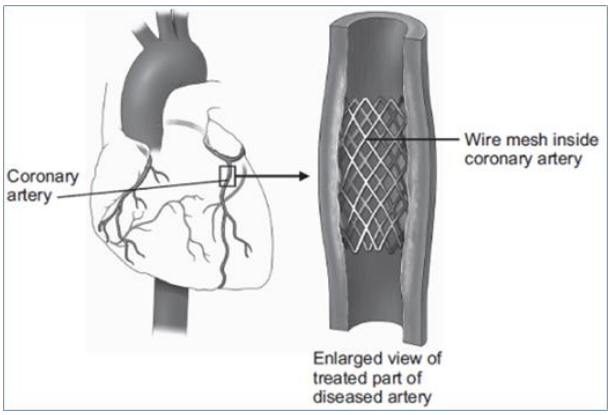
Biology:
CHD & Treatment - Circulation

Notes / revision links

https://www.bbc.co.uk/bitesize/guides/zq4wjxs/revision/1
https://www.bbc.co.uk/bitesize/guides/zqnsrwx/revision/2

Sample Questions

Q1. Name the treatment shown in **Diagram 2**.
Q2. Explain how the treatment works.
Q3. What is the **other** treatment for CHD?
Explain how this treatment works in **detail**
Q4. Explain why a **valve** that does not close properly causes major problems in the heart? How can we treat it?



Model Answers

Q1. Stents
Q2.

Inserting a stent into a blocked artery is a relatively simple surgical procedure

- Stents are very effective at reducing the risk of a heart attack as they widen the lumen to increase blood flow to the coronary arteries, and the procedure is relatively simple
- Stents also last a long time, which is a positive, however, there is a risk of blood clots (thrombosis) occurring around

Q3.

Treating CHD: Statins

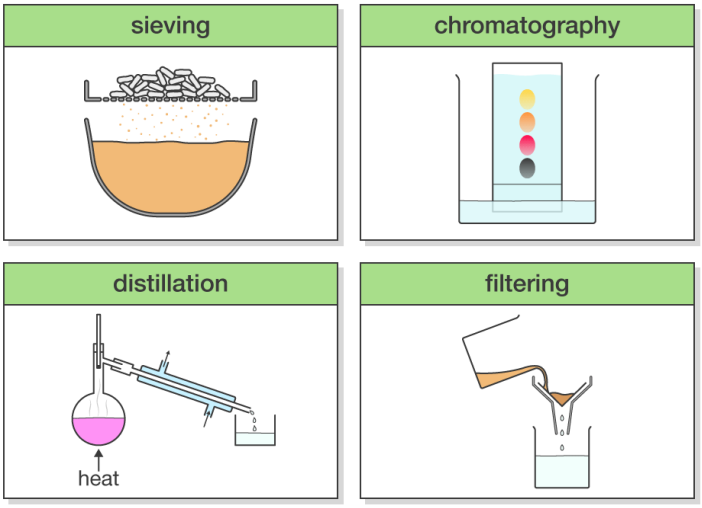
- Statins are drugs that are widely used to reduce the levels of fatty deposits (cholesterol) in the blood
- They block an enzyme in the liver which is needed to make cholesterol
- This slows down the rate of fatty material building up in the blood, reducing the risk of CHD occurring

Q4. Valves prevent the backflow of blood in the heart. If a valve does not close properly blood can flow backwards, which means that the full amount of blood does not leave the heart and the blood coming into a heart chamber mixes with the blood that hasn't left, so the heart cannot pump as effectively as it should.

Year 10 Progress Test revision

Topic / Skill:
Chemistry - Separation techniques and paper chromatography
Notes / revision links
1.https://www.bbc.co.uk/bitesize/guides/zb2f3k7/revision/1 2.https://www.savemyexams.co.uk/igcse-chemistry-edexcel-new/revision-notes/elements-compounds-mixtures/separation-techniques/
Sample Questions

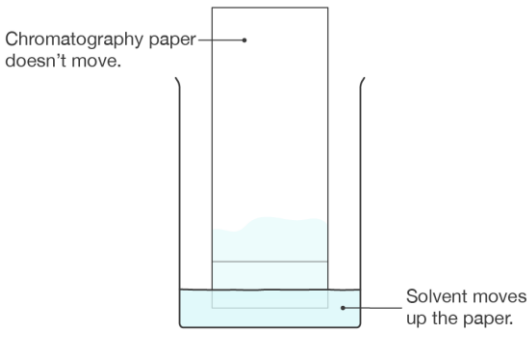
Q1.



Which separation technique is used to separate a mixture of liquids based on their boiling points?

- sieving
- chromatography
- distillation
- Filtration

Q2.

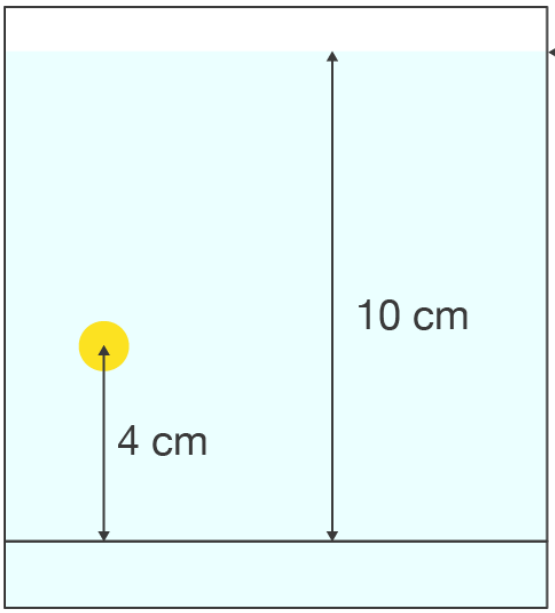


Chromatography involves a stationary phase and a mobile phase. In paper chromatography, what is the mobile phase?

- the piece of chromatography paper
- the solvent

Year 10 Progress Test revision

Q3.



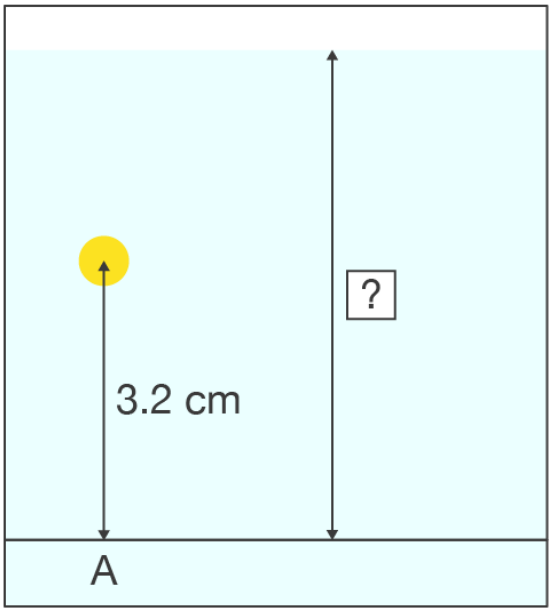
$$R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$$

$$R_f = \frac{4}{10} = 0.4$$

What is an R_f value?

- the speed at which each substance moves up the chromatography paper
- the ratio of the distance moved by a substance to the distance moved by the solvent front
- the percentage of the chromatogram that is covered by each spot

Q4.



R_f of substance A is 0.65

$$R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$$

Calculate the distance moved by the solvent if the R_f value is 0.65.

Give your answer to two decimal places. Don't include a unit in your answer.

- 4.92
- 4.9

Year 10 Progress Test revision

Model Answers

Q1. Distillation
Q2. The solvent
Q3. The ratio of the distance moved by a substance to the distance moved by the solvent front.
Q4. 4.92

Topic / Skill:

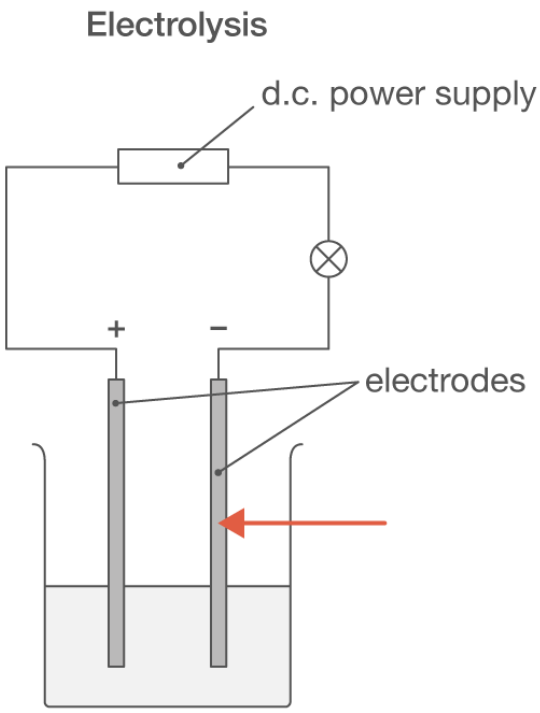
Chemistry - Electrolysis

Notes / revision links

1.https://www.bbc.co.uk/bitesize/guides/zpxn82p/revision/1
2.https://www.savemyexams.co.uk/notes/igcse-chemistry-cie-new/5-electricity-chemistry/5-1-electrochemistry/5-1-1-electrolysis/

Sample Questions

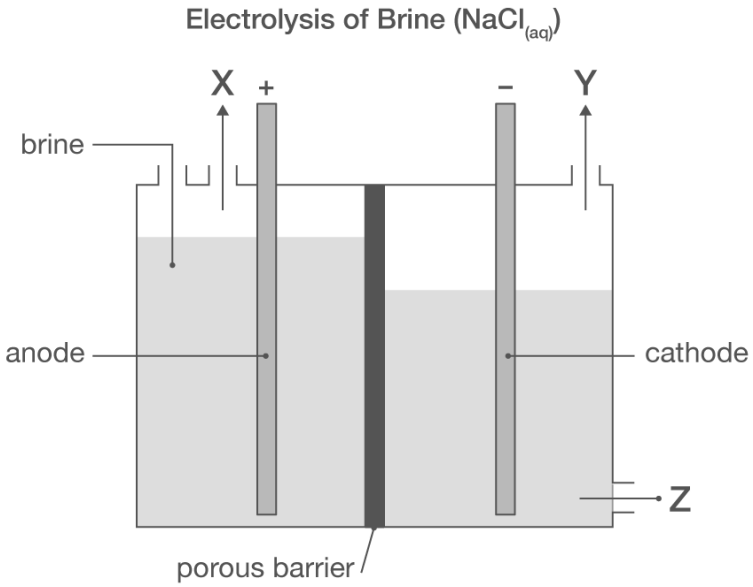
Q1.



Which part of the electrolysis cell is the arrow pointing to?

- negative electrode (cathode)
- positive electrode (anode)
- electrolyte
- products of electrolysis

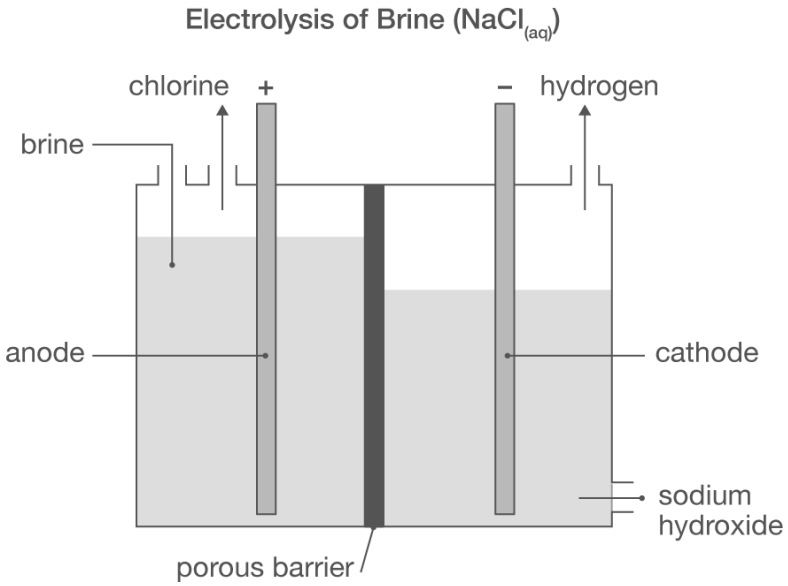
Q2.



Product Y is hydrogen. Why is hydrogen, and not sodium, produced at the negative electrode (cathode)?

- Hydrogen ions travel faster than sodium ions.
- Hydrogen is a gas.
- Hydrogen is less reactive than sodium.
- Hydrogen is a non-metal.

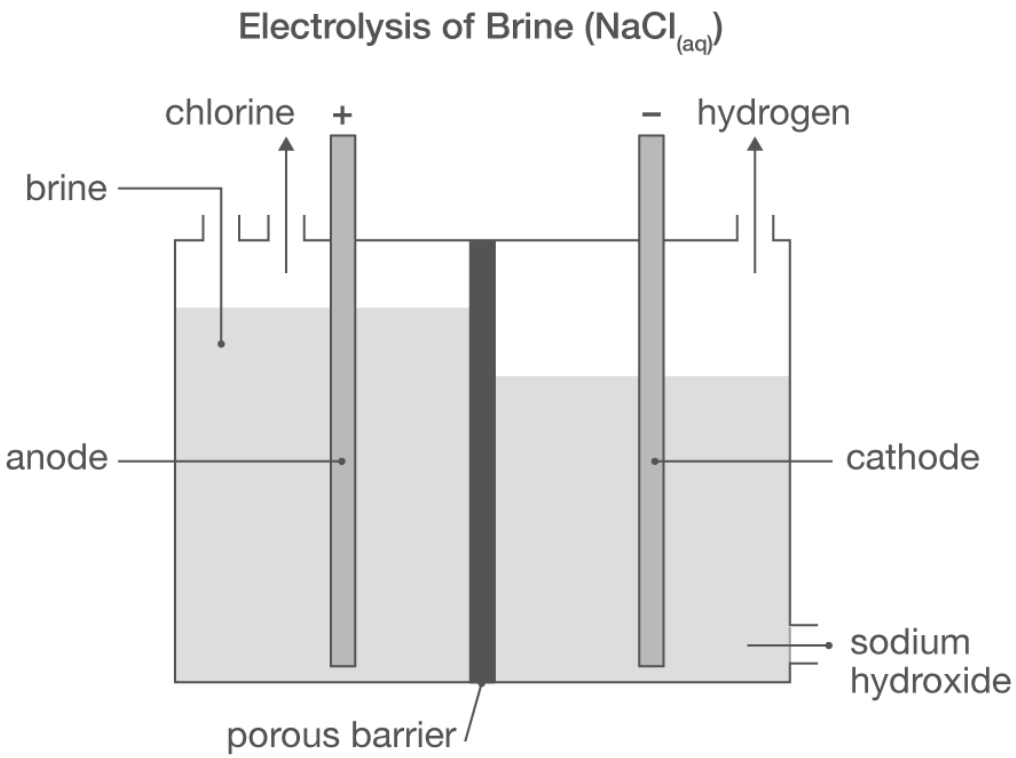
Q3.



In the electrolysis system shown, what is the balanced ionic half-equation for the reaction at the negative electrode (cathode)?

- $H^+ + e^- \rightarrow H_2$
- $H^+ + e^- \rightarrow H$
- $2H^+ + 2e^- \rightarrow H_2$
- $2H^+ - 2e^- \rightarrow H_2$

Q4.



What is the balanced ionic half-equation for the reaction at the positive electrode (anode)?

- $2Cl^- - 2e^- \rightarrow Cl_2$
- $Cl^- - e^- \rightarrow Cl$
- $2Cl^- + 2e^- \rightarrow Cl_2$
- $Cl^- - e^- \rightarrow Cl_2$

Model Answers

Q1. negative electrode (cathode)
Q2. Hydrogen is less reactive than sodium.
Q3. $2H^+ + 2e^- \rightarrow H_2$
Q4. $2Cl^- - 2e^- \rightarrow Cl_2$

Year 10 Progress Test revision

Topic / Skill:
Chemistry - The mole concept
Notes / revision links
1.https://www.savemyexams.co.uk/notes/igcse-chemistry-cie-new/4-stoichiometry/4-2-the-mole-concept/ 2. https://www.bbc.co.uk/bitesize/guides/z84wfrd/revision/2
Sample Questions

Q1.

Moles of Atoms and Molecules

One mole of atoms contains 6.02×10^{23} atoms.

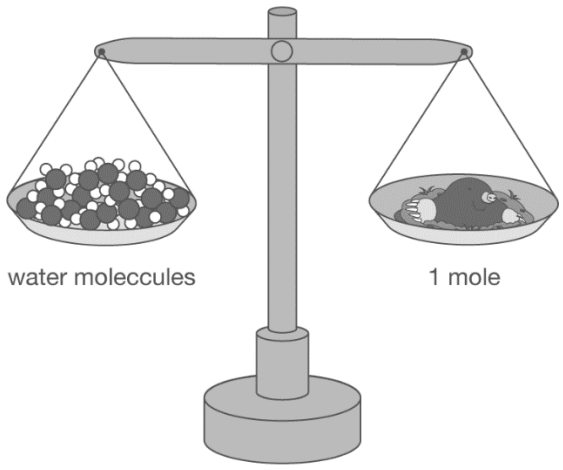
One mole of molecules contains 6.02×10^{23} molecules.

A mole of molecules can contain a different number of moles for each atom. For example, in one mole of water molecules, H_2O, there are 2 moles of hydrogen atoms and 1 mole of oxygen atoms.

How many molecules are there in one mole of carbon dioxide (CO_2) molecules?

- 6.02×10^{23}
- 12.04×10^{23}
- 18.06×10^{23}

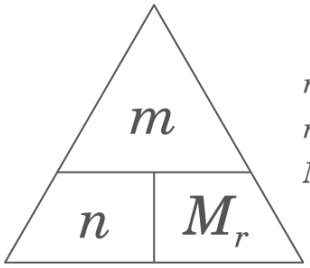
Q2.



How many molecules are there in one mole of water (H_2O) molecules?

- 2.06×10^{23}
- 6.02×10^{23}
- 2.06×10^{-23}
- 6.02×10^{-23}

Q3.



m = mass (g)
n = number of moles
M_r = relative formula mass

Relative atomic masses:
C = 12, O = 16

How many moles are there in 88 g of carbon dioxide, CO_2?
Don't include the unit in your answer.

- 6
- 2

Q4.

Relative atomic masses:
K = 39, N = 14, O = 16

In kilograms, what is the mass of 22 moles of potassium nitrate, KNO_3?
Give your answer to 2 significant figures, and don't include the unit.

- 2200
- 2.2
- 2222
- 2.22

Q5.

Balanced symbol equation for the combustion reaction between ethanol and oxygen:

$$C_2H_5OH + 3O_2 \longrightarrow 2CO_2 + 3H_2O$$

Atomic masses: H = 1, C = 12, O = 16

In kilograms, what mass of ethanol can combust in 220.8 kg of oxygen?
Give your answer to 1 decimal place, and don't include the unit.

- 105800
- 105.8

Year 10 Progress Test revision

Model Answers

Q1. 6.02×10^{23}
Q2. 6.02×10^{23}
Q3. 2
Q4. 2.2
Q5. 105.8

Topic / Skill:

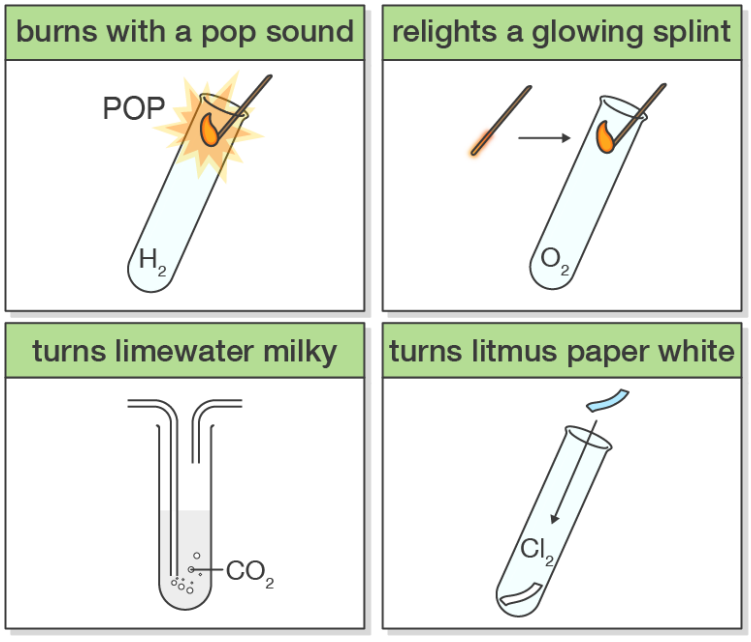
Chemistry - Chemical Analysis

Notes / revision links

1.https://www.bbc.co.uk/bitesize/topics/z2tpmsg
2.https://www.savemyexams.co.uk/gcse-chemistry-aqa-new/revision-notes/chemical-analysis/methods-of-identifying-ions/flame-tests/
3. https://www.savemyexams.co.uk/gcse-chemistry-aqa-new/revision-notes/chemical-analysis/identifcation-of-common-gases/test-for-carbon-dioxide/

Sample Questions

Q1.



Which gas relights a glowing splint?

- oxygen
- hydrogen
- carbon dioxide
- Chlorine

Q2.

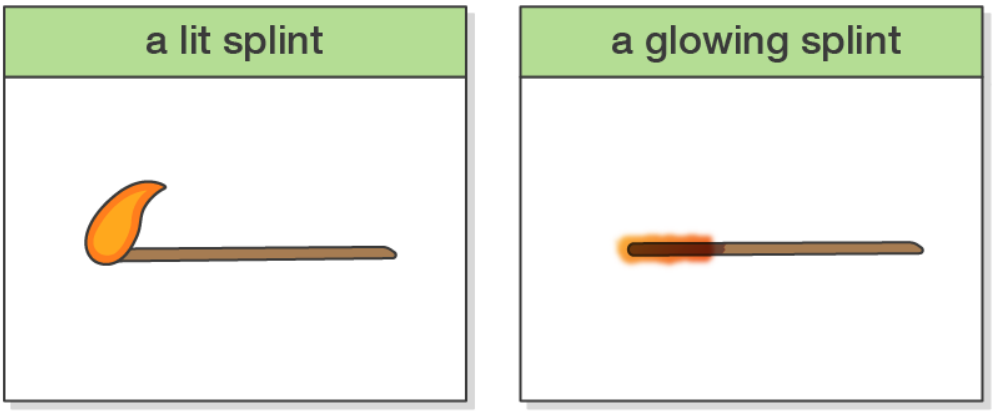
Gas Test Results for Gas A

test	result
Hold a lit splint at the open end of the test tube.	The splint goes out.
Put a glowing splint into the test tube.	The splint goes out.
Bubble the gas through limewater.	The limewater goes milky.
Put damp litmus paper into the test tube.	The litmus paper turns red.

Use the results shown in the table to identify gas A.

- hydrogen
- oxygen
- carbon dioxide
- Chlorine

Q3.



A glowing splint is placed into a test tube of gas to test for oxygen. What is a glowing splint?

- a splint that is on fire
- a splint that has been lit and then blown out so that it glows red

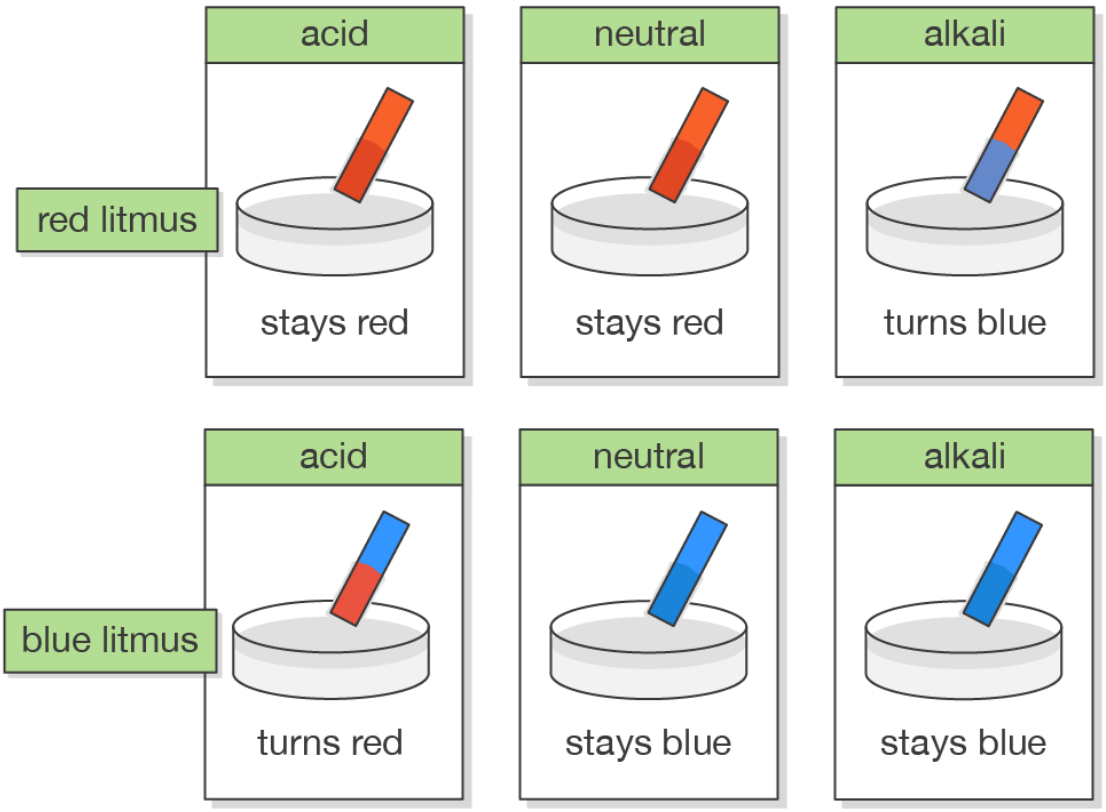
Q4.

Gas is bubbled through an aqueous solution of calcium hydroxide to test for carbon dioxide. What is the common name for an aqueous solution of calcium hydroxide?

- quick lime
- slaked lime
- Limewater

Year 10 Progress Test revision

Q5.



A damp piece of litmus paper is placed into a test tube of gas to test for chlorine. What is litmus paper commonly used to test for?

- temperature
- pH
- alkalinity or acidity

Model Answers

Q1. oxygen
Q2. carbon dioxide
Q3. a splint that has been lit and then blown out so that it glows red
Q4. limewater
Q5. alkalinity or acidity

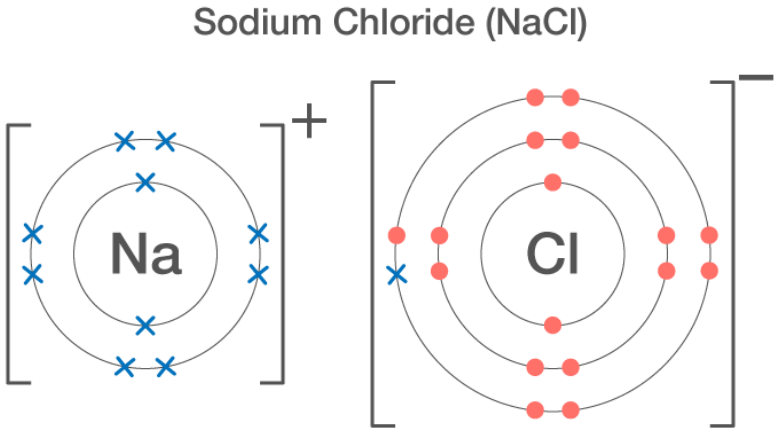
Year 10 Progress Test revision

Topic / Skill:
Chemistry - Bonds, structure and properties of matter

Notes / revision links
1. https://www.savemyexams.co.uk/gcse-chemistry-aqa-new/revision-notes/bonding-structure-the-properties-of-matter/ionic-covalent-metallic-bonding/chemical-bonds/ 2. https://www.bbc.co.uk/bitesize/topics/z33rrwx

Sample Questions

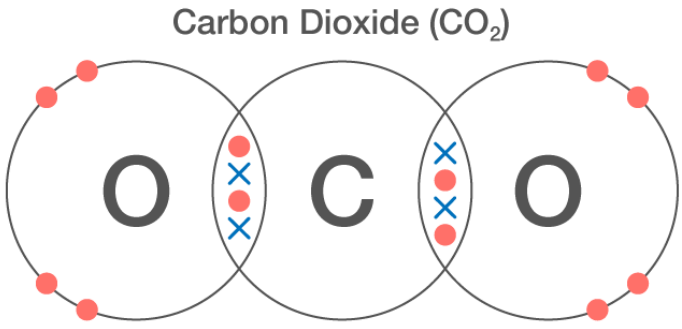
Q1.



What type of bonding occurs in sodium chloride (NaCl)?

- ionic bonding
- covalent bonding
- metallic bonding

Q2.

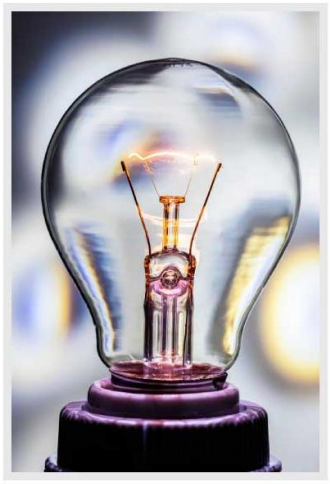


What type of bonding occurs in carbon dioxide (CO_2)?

- ionic bonding
- covalent bonding
- metallic bonding

Q3.

A Light Bulb with a Metal Filament



Metals are good electrical conductors. Good electrical conductors . . .

- can be bent or hammered into shape without shattering.
- can be drawn out into thin wires.
- allow electrical charge to pass through them easily.
- allow thermal energy to be transferred through them easily.
- have closely packed particles.

Q4.

A Metal Acting as a Thermal Conductor

Metals are good thermal conductors. Good thermal conductors . . .

- allow electrical charge to flow through them easily.
- allow thermal energy to be transferred through them easily.
- can be drawn out into thin wires.
- can be bent or hammered into shape without shattering.
- have closely packed particles.

Year 10 Progress Test revision

Q5.

A High Density Metal

Metals typically have a high density. High density materials . . .

- have closely packed particles.
- can be bent or hammered into shape without shattering.
- allow electrical charge to flow through them easily.
- can be drawn out into thin wires.

Model Answers

Q1. Ionic bonding
Q2. Covalent bonding
Q3. allow electrical charge to pass through them easily.
Q4. allow thermal energy to be transferred through them easily.
Q5. have closely packed particles.

Year 10 Progress Test revision

Topic / Skill:
Chemistry – Acids, Bases and salts

Notes / revision links
1. https://www.bbc.co.uk/bitesize/topics/zjmpgwx 2.https://www.savemyexams.co.uk/notes/igcse-chemistry-cie-new/8-acids-bases-salts/8-1-acids-bases-oxides/8-1-1-the-characteristic-properties-of-acids-bases/

Sample Questions

Q1.

A	$H^+ \rightarrow H_2O + OH^-$
B	$H_2O + H^+ \rightarrow OH^-$
C	$H^+ + OH^- \rightarrow H_2O$
D	$H_2O \rightarrow OH^- + H^+$

Which equation is the ionic half-equation for the formation of water during an acid-alkali neutralisation reaction?

- equation A: $H^+ + H_2O \rightarrow OH^-$
- equation B: $H_2O + H^+ \rightarrow OH^-$
- equation C: $H^+ + OH^- \rightarrow H_2O$
- equation D: $H_2O \rightarrow OH^- + H^+$

Q2.

		red litmus	blue litmus
A	acidic solution		
B	neutral solution		
C	alkaline solution		

Litmus paper is an indicator used to see whether a substance is acidic or alkaline. Select the option which completes the alkaline solution row **C** of the table.

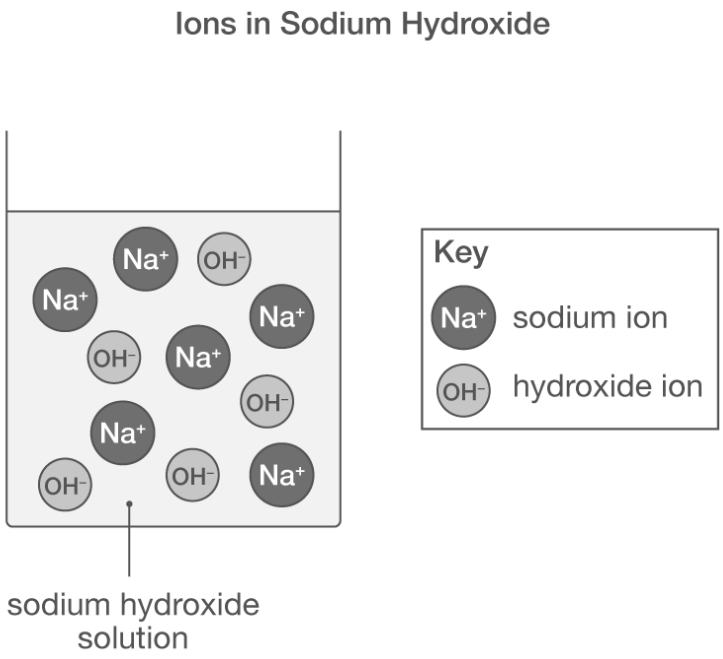
- stays red & stays blue
- turns blue & stays blue
- stays red & turns red

Q3.

common substance	pH	colour
stomach acid	1	
lemon juice	2	dark orange
vinegar		yellow
urine	6	light green
pure water		green
baking powder	8	
toothpaste	10	light blue
soapy water		dark blue
oven cleaner	14	

Catherine and Salome have carried out an investigation to find the pH values of some common substances, but they haven't completed their table. Using the information in the table, what colour will universal indicator turn when mixed with **oven cleaner**?

Q4.



Sodium hydroxide dissolves in water and forms hydroxide ions. What type of substance is sodium hydroxide?

- alkali
- base
- Acid

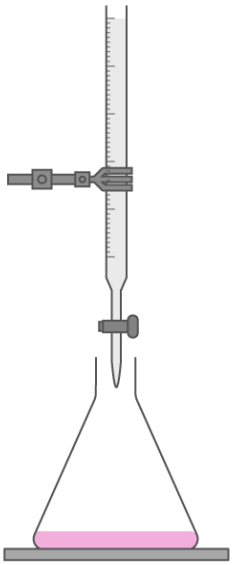
Year 10 Progress Test revision

Q5.

Titration of Sodium Hydroxide with Sulfuric Acid

Preparation:

1. Place 25 cm^3 of 0.1 mol/dm^3 sodium hydroxide solution into a conical flask.
2. **Add 5–10 drops of phenolphthalein so that the sodium hydroxide turns pink.**
3. Stand the conical flask on a white tile.
4. Fill a burette with with an unknown concentration of sulfuric acid.
5. Clamp the burette above the conical flask.



In step 2 of the method, phenolphthalein is added to the sodium hydroxide. What is the purpose of phenolphthalein in the titration?

- It is used as an indicator.
- It is used as a catalyst.
- It is used as an oxidising agent.

Model Answers

Q1. $H^+ + OH^- \rightarrow H_2O$
Q2. stays red & turns red
Q3. Purple
Q4. alkali
Q5. It is used as an indicator.

Year 10 Progress Test revision

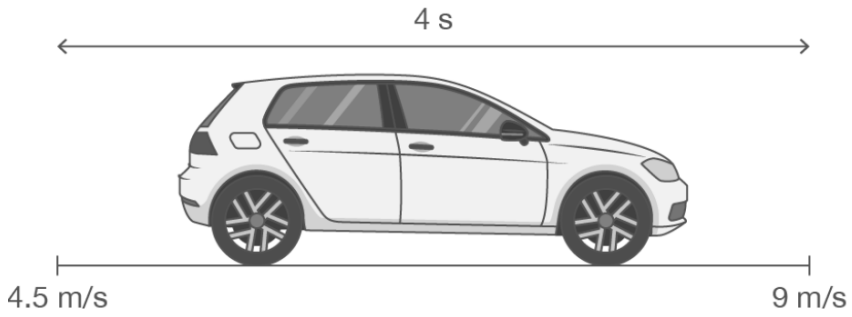
Topic / Skill:
Physics - Motion

Notes / revision links

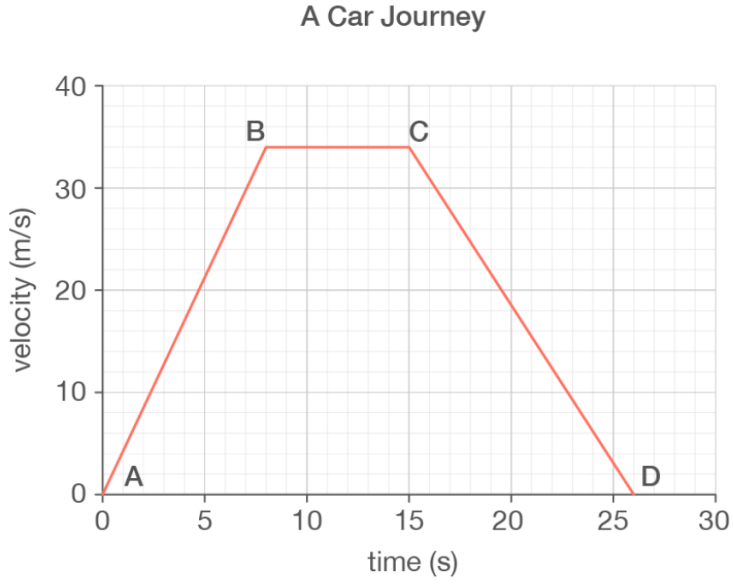
1. https://www.bbc.co.uk/bitesize/guides/zp2fcj6/revision/1
2. https://www.bbc.co.uk/bitesize/guides/zwc7pbk/revision/1
3. https://www.bbc.co.uk/bitesize/guides/z9v8msg/revision/1

Sample questions

1. A car accelerates at a constant rate in a straight line. The velocity of the car increases from 4.5 m/s to 9 m/s in 4 seconds. Calculate the acceleration of the car in m/s².
Give your answer to 4 significant figures and don't include the units



2. Use the graph to calculate the deceleration of the car between C and D.
Give your answer in m/s² to 3 significant figures, and don't include the unit.



Year 10 Progress Test revision

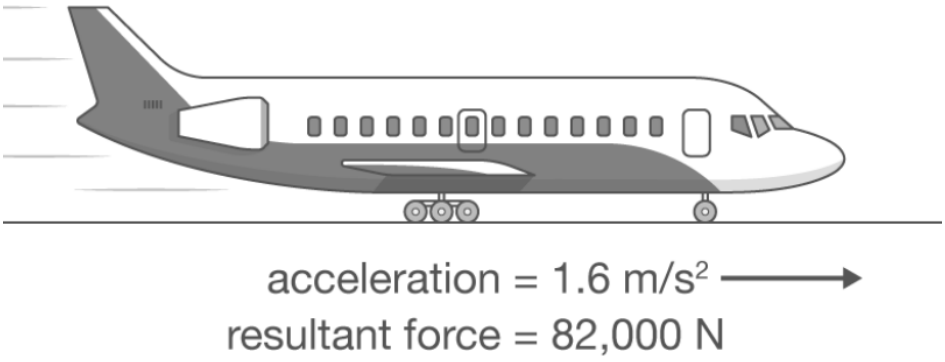
3. According to Newton's first law, an object that is moving will _____ unless a resultant force acts upon it.

- remain stationary.
- move at a constant velocity.
- Accelerate

4. Which of Newton's laws can be expressed as the following equation:
resultant force = mass × acceleration

- Newton's first law
- Newton's second law
- Newton's third law

5. At take off, an aircraft accelerates at 1.6 m/s^2. The force applied by the engines is 82,000 N. Calculate the mass of the aircraft in kg.



Model Answers

1. 1.125
2. -3.09
3. move at a constant velocity.
4. Newton's second law
5. 51250

Year 10 Progress Test revision

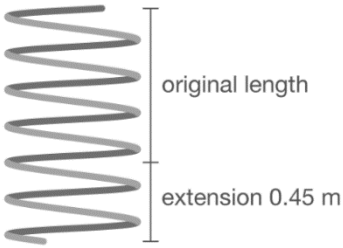
Topic / Skill:
Physics - Forces and energy

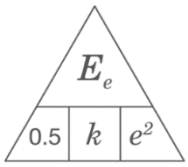
Notes / revision links
1. https://www.bbc.co.uk/bitesize/guides/z8hsrwx/revision/1 2. https://www.bbc.co.uk/bitesize/guides/zp8jtv4/revision/1

Sample questions

1. How many joules are in the elastic potential energy store of the spring? Give *your answer to 3 significant figures, and don't include the unit.*

The diagram shows a stretched spring with a spring constant of 2 N/m.

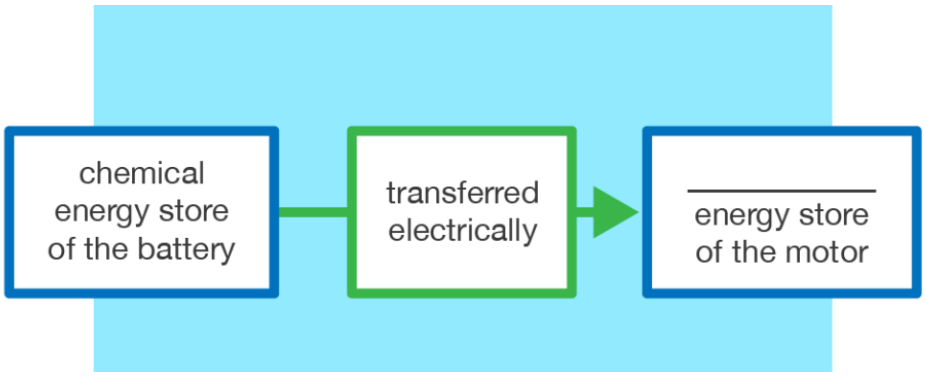




$$\text{elastic potential energy} = 0.5 \times \text{spring constant} \times (\text{extension})^2$$

2. This energy transfer diagram shows how energy is transferred when an electric motor is powered by a battery, but there are some key words missing. What is final energy store?

a) electrostatic
b) kinetic
c) electrical

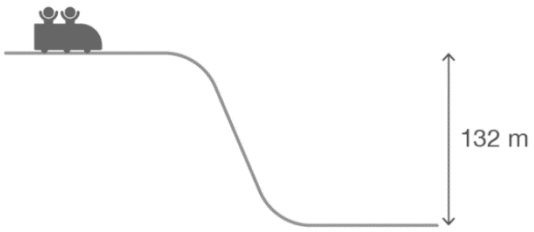


Year 10 Progress Test revision

3. How many joules are in the gravitational potential energy store of the roller coaster cart?

a) 937.86
b) 937860
c) 95700

The diagram shows a roller coaster cart with a total mass of 725 kg.



gravitational field strength = 9.8 N/kg

$$\text{gravitational potential energy} = \text{mass} \times \text{gravitational field strength} \times \text{height}$$

Model Answer

1. 0.203
2. kinetic
3. 937860

Year 10 Progress Test revision

Topic / Skill:
Physics - Waves

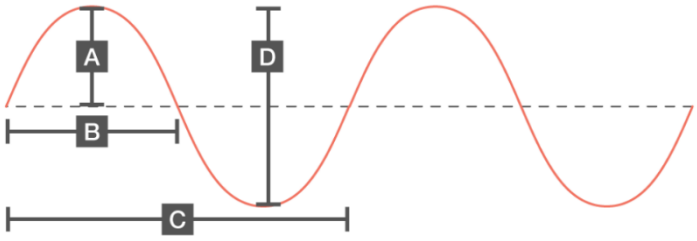
Notes / revision links
1. https://www.bbc.co.uk/bitesize/guides/zgf97p3/revision/1 2. https://www.bbc.co.uk/bitesize/guides/z9bw6yc/revision/1 3. https://www.bbc.co.uk/bitesize/guides/z2dtv9q/revision/1

Sample questions

1. Which line on the wave diagram represents the wavelength of the wave?

a) line A
b) line B
c) line C
d) line D

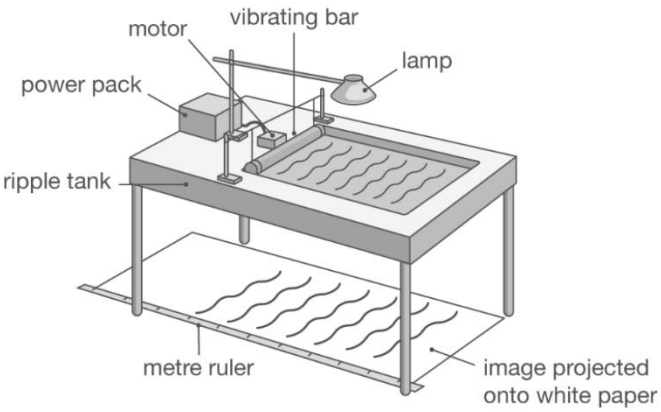
Wave Diagram



2. How do you change the frequency of the waves in a ripple tank?

a) Change the speed of the electric motor.
b) Adjust the height of the lamp.
c) Change the depth of water in the tank.

Using a Ripple Tank to Study Water Waves



Year 10 Progress Test revision

3. A musical note played on a flute has a frequency of 496 Hz. The speed of sound in air is 330 m/s. Calculate the wavelength of the musical note in metres. Give *your answer to 1 significant figure and don't include the unit.*

frequency = 465 Hz
wave speed = 330 m/s

$v = f\lambda$

v = wave speed
f = frequency
λ = wavelength

Model Answer

1. line C
2. Change the speed of the electric motor.
3. 0.7

Year 10 Progress Test revision

Topic / Skill:
Forces
Notes / revision links
https://www.youtube.com/watch?v=oZpvGs2-Xyk file:///C:/Users/jeny.a_wsd/Downloads/1620269821_Hull_Trinity_House_Academy_Document.pdf
Sample questions

1. When the net force on an object is zero, we say that the two forces are:

A. Cancelled out
B. Gross
C. Balanced
D. Unbalanced

2. A combination of all the forces acting on an object is called_____.

A. unbalanced force
B. balanced force
C. net force
D. gross force

3. **If you are pushing a box toward your friend with a force of 20 N, and your friend is pushing the box toward you with a force of 30 N, what will happen to the box?**

A. The box will move toward your friend with a force of 50 N.
B. The box will move toward you with a force of 10 N.
C. The box will move toward your friend with a force of 10 N.
D. The box will move toward you with a force of 50 N.

4. **Which of the following statements describes unbalanced forces?**

A. Unbalanced forces can cause a still object to move, a moving object to speed up or slow down, a moving object to stop, or a moving object to change direction.
B. Unbalanced forces can only change the direction an object is moving.
C. Unbalanced forces can only change the speed an object is moving.
D. Unbalanced forces cannot change the motion of an object.

5. **What units are used to measure force?**

A. Kilogram
B. Meter
C. Pascal
D. Newton

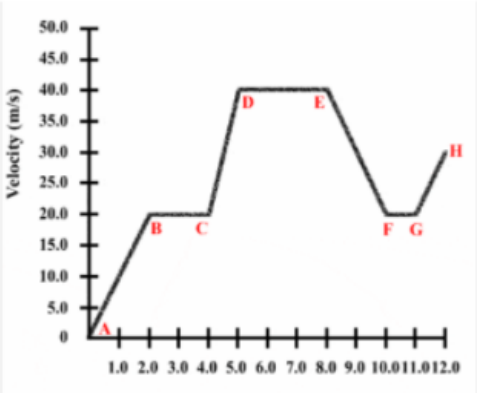
6. **_____ is the amount of matter in an object.**

A. mass
B. weight
C. volume
D. force

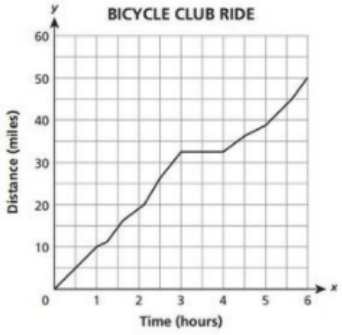
7. What is the net force?

A. 30 N left
B. 25 N right
C. 5 N left
D. 55 N right

8. **During which interval is the object not moving?**



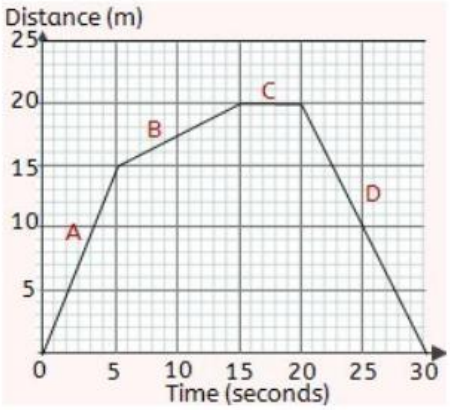
9. **At hour one, the average speed of the bicyclists was approximately -**



A. 1 mph
B. 2 mph
C. 5 mph
D. 10 mph

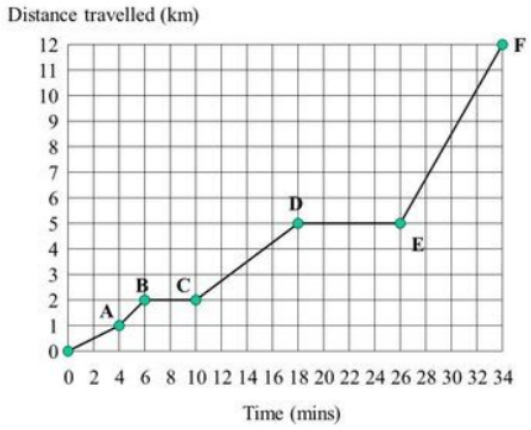
Year 10 Progress Test revision

10. **Which letter represents the object at rest?**



A. A
B. B
C. C
D. D

11. **According to the graph, which segment shows the biggest increase in speed? (the fastest speed)**



A. C to D
B. E to F
C. A to B
D. B to C

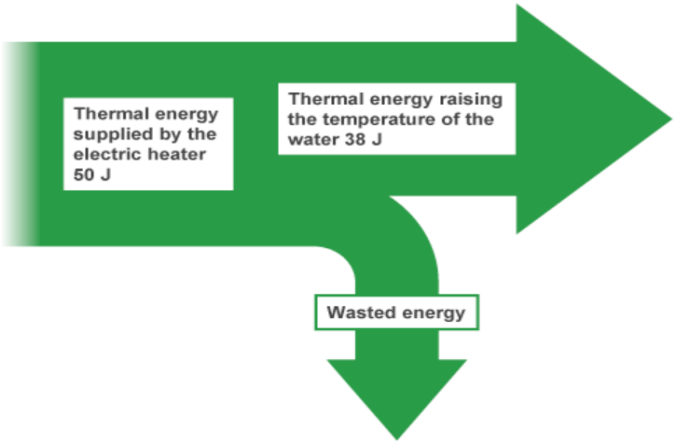
Model Answer

1.C
2.C
3.B
4.A
5.D
6.A
7.C
8.D
9.D
10.C
11.B

Year 10 Progress Test revision

Topic / Skill:
Physics - Energy transfers and efficiency
Notes / revision links
https://www.bbc.co.uk/bitesize/guides/zgvc6fr/revision/1
Sample questions

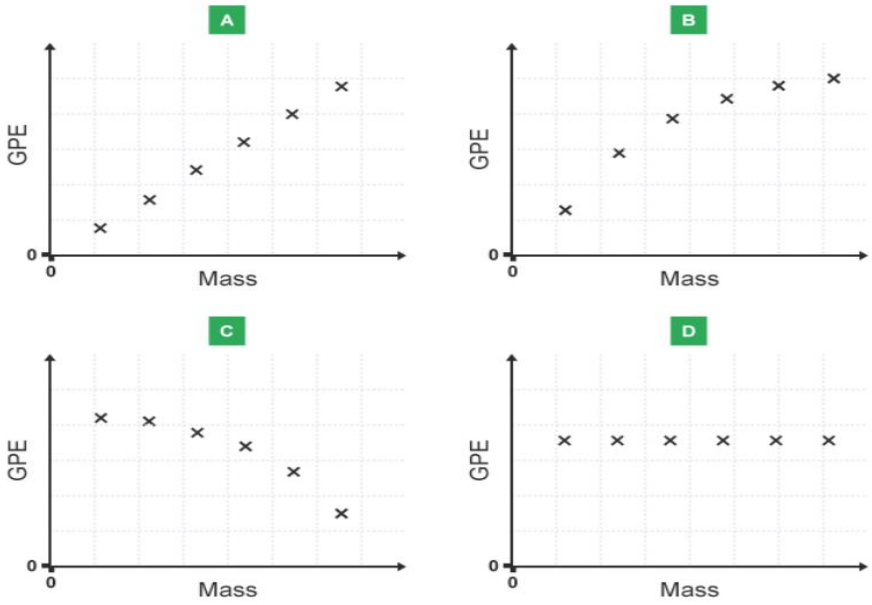
Q1. This diagram shows the energy transferred by an electric heater in one second:



How much energy is wasted each second?
Tick **one** box.

A	12 J	
B	38 J	
C	50 J	
D	88 J	

Q2: Some students investigate a model of the craters produced by meteorite impacts. They drop balls into a tray filled with sand. They use six balls with different masses. They drop each ball from the same height.



Which one of these graphs shows the relationship between the gravitational potential energy (gpe) of the balls and their mass when they are all at the same height?

Year 10 Progress Test revision

Model Answer

1.

A	12 J	✔

2.Graph A

gravitational potential energy = mass × gravitational field strength × height

Gravitational potential energy is directly proportional to mass (when *g* and *h* are constant). This results in a straight-line graph through the origin.