Quizzes for Science *Workbooks*

The electronic revision activities on the *Workbook* CDs work well to help students learn the memory work needed for Level 5 Science, but very few students will use them unprompted. You need to direct them to do specific activities for homework, and then test their memory of the work the next day in class.

You cannot expect what you do not inspect.

Quizzing the work in class also helps students to remember the work they learnt the previous lesson, and provides revision for those who did not do their homework. Those students who did learn the work are greatly encouraged when they find they know the answers to the quiz questions.

The number codes on these quizzes match the coding system used for the revision activities. Revision task 1C 101 matches Quiz 1C 1; Revision tasks 2A 101, 2A 102 and 2A 103 all go with Quiz 2A 1. Quizzes 10A 1a and 10A 1b are parallel quizzes that both go with revision tasks 10A 101 and 10A 102. The Workbook Map lists all the revision tasks and quizzes so you can see the correlations clearly.

It can be convenient to have students do all their quizzes in a small (1B 4) exercise book that is kept in the lab. After each quiz is marked (by the students), it may be given a grade such as A–D, where A is close to 100%, B is above 85%, C is above 65% and D is below 65% (with the exact criteria for each grade shifting according to the difficulty of the quiz). It then becomes very easy to monitor student progress by flicking through the books every week or so. They can also be useful to bring along to parent interviews.

Printing this file

If you want to make a paper copy of this entire file, we suggest that you reduce the page size to 50%, printing 4 pages to a single A4 sheet. Start printing at page 2 — this will put question and answer pages next to each other. In the **Print** menu, first select **Pages from 2 to 105**, click on the **Properties** button (near the top), and select **4 Pages Per Sheet**, then click on **OK**, and **OK** again to print the file.

1E 4 Atomic particles 2

Fill in the missing values.

Particle	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons
$^{26}_{13}Al^{3+}$	13	26			
$^{14}_{7}N^{3-}$		14	7		
$^{37}_{17}Cl^{-}$	17	37			
$^{56}_{26}Fe^{2+}$	26	56			
$^{40}_{20}Ca^{2+}$		40	20		

1E 4 Answers to Atomic particles-2

Particle	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons
$^{27}_{13}Al^{3+}$	13	26	13	14	10
$^{14}_{7}N^{3-}$	7	14	7	7	10
$^{37}_{17}Cl^{-}$	17	37	17	20	18
$^{56}_{26}Fe^{2+}$	26	56	26	30	24
$^{40}_{20}Ca^{2+}$	20	40	20	20	18

1H 1 Writing ionic formulae 1

Write formulae for these compounds.

1	zinc sulfide	6	aluminium sulfate
2	sodium sulfate	7	lead chloride
3	iron(III) hydroxide	8	hydrochloric acid
4	potassium hydrogen carbonate	9	calcium carbonate
5	copper nitrate	10	magnesium oxide

1H 1 Answers to: Writing ionic formulae 1

1	ZnS	6	$Al_2(SO_4)_3$
2	Na_2SO_4	7	$PbCl_2$
3	$Fe(OH)_3$	8	HCl
4	$KHCO_3$	9	$CaCO_3$
5	$Cu(NO_3)_2$	10	MgO

2H 3 Neutralisation equations

Complete equations using symbols, and balance.

1 magnesium oxide + nitric acid $\longrightarrow$

2 hydrochloric acid + lead carbonate $\longrightarrow$

3 sulfuric acid + potassium hydroxide $\longrightarrow$

4 nitric acid + ____ $\longrightarrow$
zinc nitrate + carbon dioxide + water

2H 3 Answers to Neutralisation equations

1 $MgO + 2HNO_3 \rightarrow Mg(NO_3)_2 + H_2O$

2 $2HCl + PbCO_3 \rightarrow PbCl_2 + H_2O + CO_2$

3 $H_2SO_4 + 2KOH \rightarrow K_2SO_4 + 2H_2O$

4 $2HNO_3 + ZnCO_3 \rightarrow Zn(NO_3)_2 + CO_2 + H_2O$

5E Stopping microbes (KF36-41)

Write **one full sentence** to answer the following.

1	What do all microbes need to grow?
2	Explain the difference between aerobic and anaerobic microbes.
3	Explain how the freezer is able to preserve food.
4	Explain how salting preserves food.
5	Explain why UHT milk doesn't need refrigeration before it is opened.
6	Explain how sugar preserves fruit when you make jam.
7	Discuss why dried foods keep from spoiling.
8	Discuss why vacuum-packed foods keep so well.
9	Explain how the fridge protects food from decay.

5E Answers to Stopping microbes

1	All microbes need water to grow.
2	Aerobic microbes need oxygen to grow and anaerobic microbes don't need oxygen to grow.
3	The freezer preserves food because it makes the microbes dormant and they cannot reproduce.
4	The high salt concentration produced by salting dehydrates the cells and so prevents growth.
5	UHT milk has been sterilised which means the microbes have been killed.
6	The high sugar concentration in jam dehydrates their cells and so stops the growth of microbes.
7	Microbes need moisture for growth and in dried foods there is no moisture to allow growth.
8	Vacuum packaging removes the air and so prevents the growth of microbes.
9	The fridge prevents food decay by slowing the growth of microbes.

7F Chromosomes (KF84–94)

1	The molecule of life is called ___.	6	A change or mistake in the DNA is a ___.
2	The small molecules that make up the ‘rungs’ of the DNA molecule are called ___.	7	The place within plant and animal cells where the chromosomes are found is called ___.
3	Thread-like structures within each cell that contain the genes are called ___.	8	Large molecules that contain complex coded instructions.
4	The shape made by the DNA molecule is called a double ___.	9	A C T & G are codes for___ in the DNA.
5	The number of chromosomes in most human cells is ___.	10	A change or mistake in the DNA is called a ___ .

7F Answers to Chromosomes

1	DNA	6	mutation
2	bases	7	nucleus
3	chromosomes	8	DNA
4	helix	9	bases
5	46	10	mutation

7H Mitosis and meiosis (KF95–104)

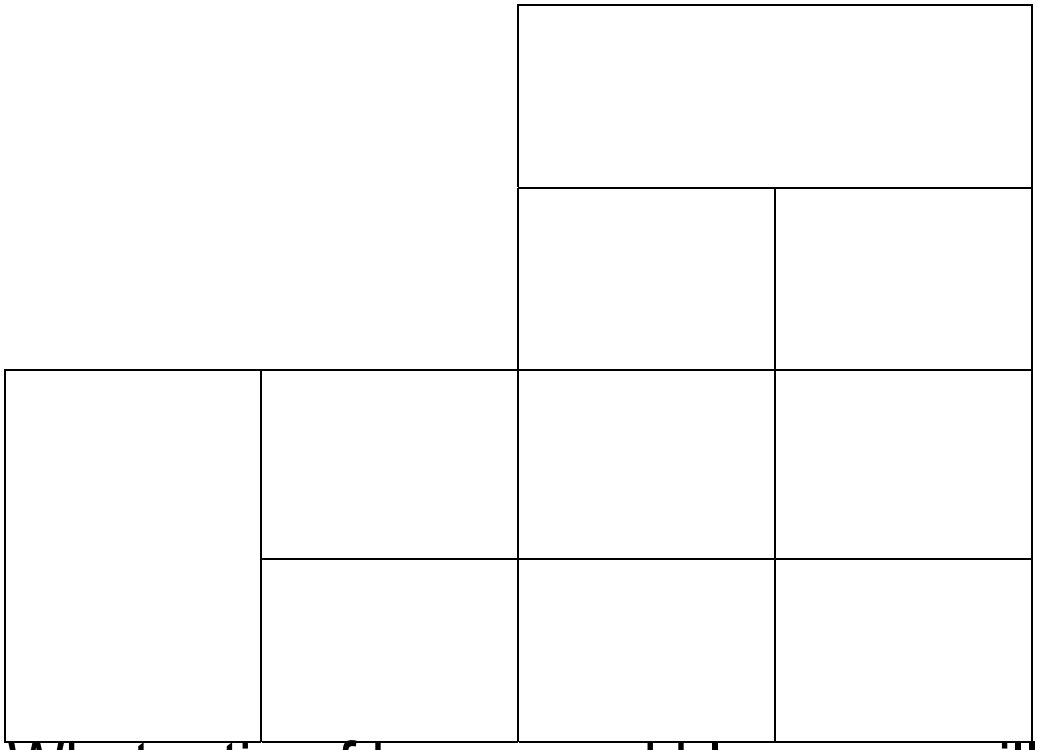
1	Normal cell division is called ___.	6	After meiosis the chromosome number will be ___.
2	Cells with half the number of chromosomes are called ___.	7	The process of combining two gametes.
3	Artificial production of genetically identical individuals	8	Cell division to form sex cells.
4	Humans have 23 pairs of these.	9	Meiosis results in ___ (number) daughter cells.
5	After fertilisation the first cell is called a ___.	10	How does meiosis affect the chromosome number in the new cell?

7 H Answers to Mitosis and meiosis

1	mitosis	6	half
2	gametes	7	fertilisation
3	cloning	8	meiosis
4	chromosomes	9	four
5	zygote	10	it halves it

7I 3 Punnett squares 2

Complete the Punnett Square for a blue eyed mother (bb) and a brown eyed father where the first child is known to be blue eyed. Brown eyes (B) is dominant.



1 What ratio of brown and blue eyes will the children h

7I 3 Answers to: Punnett squares 2

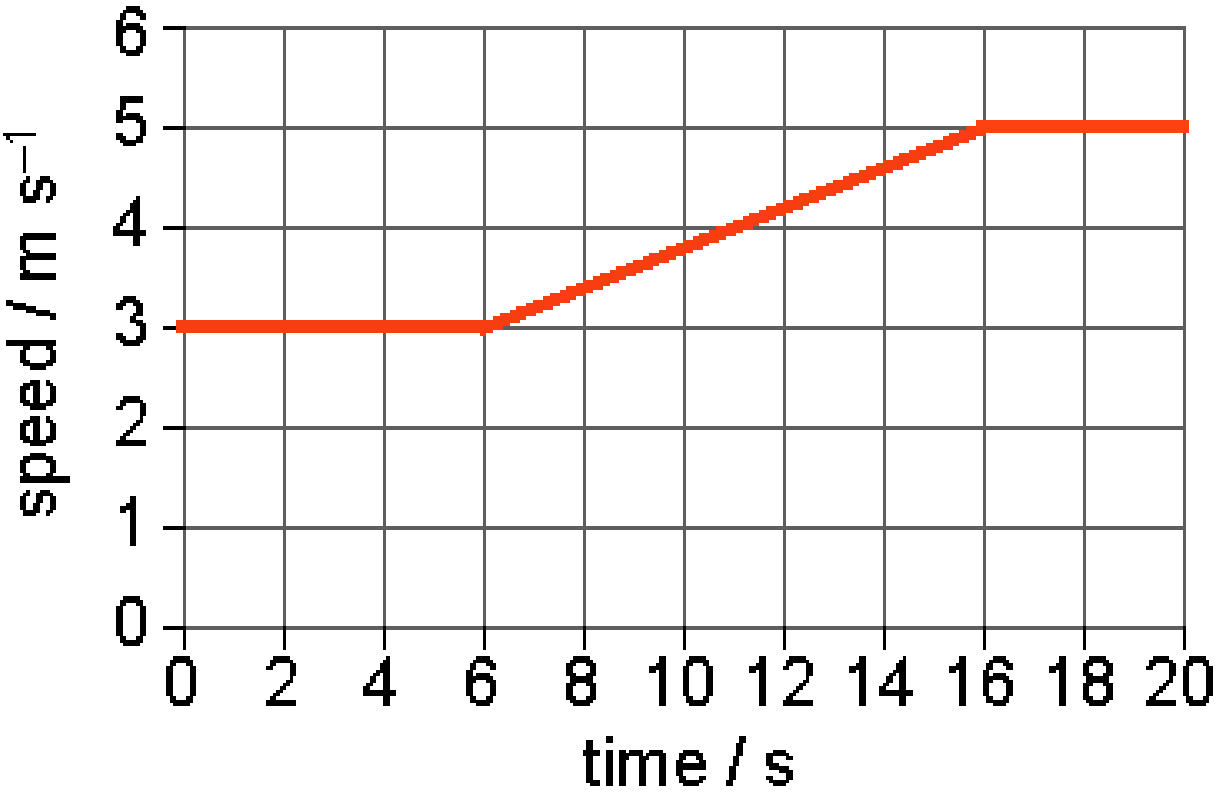
		Bb	
		B	b
bb	b	Bb	bb
	b	Bb	bb

1 50% blue eyes

50% brown eyes

8F Speed-time graph

The graph below slows the motion of a car over a 20 s period.



1 Describe fully the motion of the car over the first 6 seconds.

2 Calculate the acceleration of the car from the 6th to the 16th second. Show all working.

3 What is the distance travelled by the car from the 6th to the 16th seconds?

8F Answers to Speed-time graph

1 During the first 6 seconds the car travels at a constant speed of 3 m s^{-1}.

2 Change in speed is 2 m s^{-1}.
Change in time is 10 s.

$$a = \frac{\Delta s}{\Delta t}$$

$$= \frac{2 \text{ m s}^{-1}}{10 \text{ s}}$$

$$= 0.2 \text{ m s}^{-2}$$

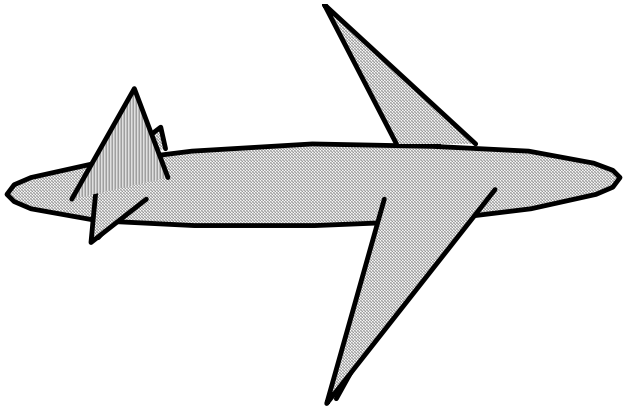
3 Distance travelled is the area under the graph.

$$(3 \text{ m s}^{-1} \times 6 \text{ s}) + (\tfrac{1}{2} \times 2 \text{ m s}^{-1} \times 10 \text{ s})$$

$$= 18 \text{ m} + 10 \text{ m}$$

$$= 28 \text{ m}$$

9D Balanced and unbalanced forces



1 The aeroplane shown above is flying at a constant speed and altitude. Copy the plane, and draw arrows showing the forces acting on it.

2 On a completely calm night, a man fires a sky-rocket into the air. It flies straight up, stops, then falls straight down again.
Draw three diagrams showing the forces on the rocket. Name each force.

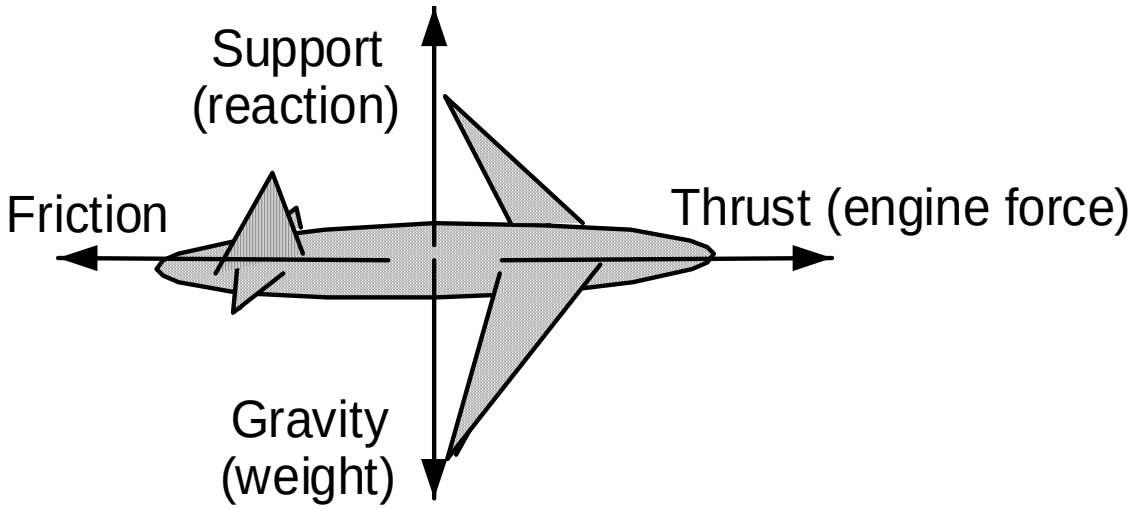
a immediately after it has been lit, when the explosive is burning

b at the top of its flight when it is stopped.

c when it is half-way down.

9D Answers to Balanced and unbalanced forces

1



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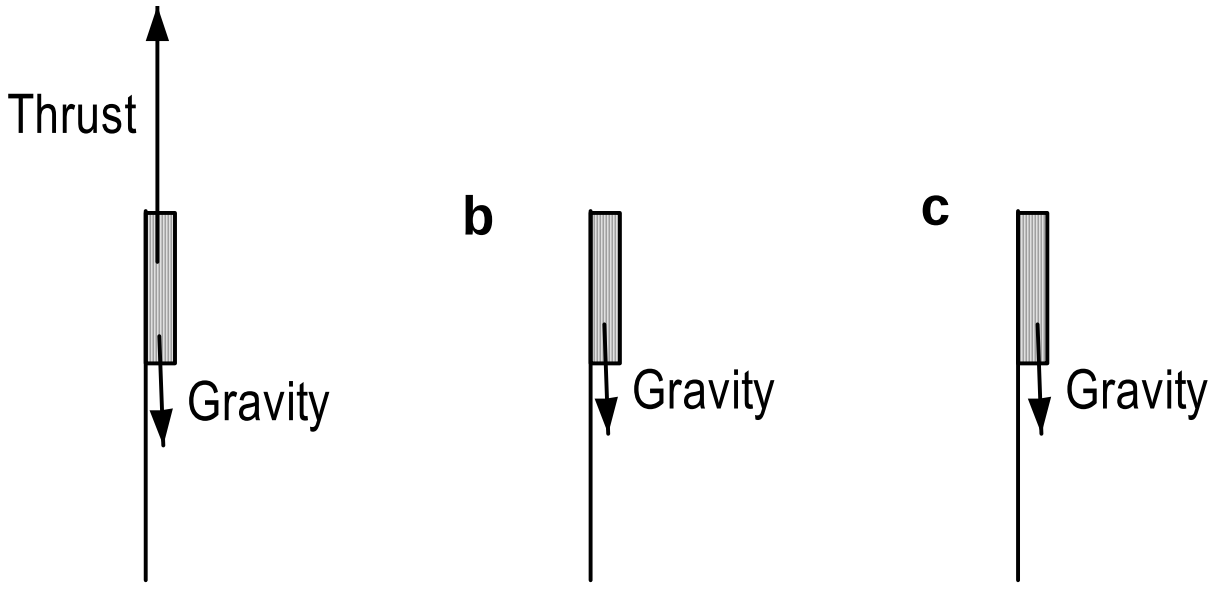


Just after lighting. At the top of its flight. Half-way down.

You may also have included air resistance – downwards in a, and upwards in c.

10D Work calculations

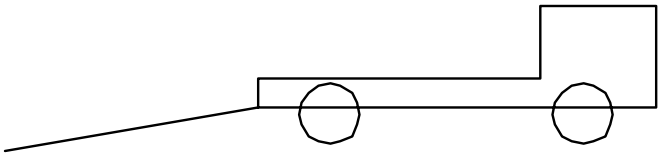
1 A weight-lifter lifts a 500 N weight from the ground to a height of 2 m.

a Calculate the work she does in lifting the weight.

b How much work does she do in holding the weight above her head for 30 s? Why?

c What force must she provide as she gently lowers the weight and places it on the ground? Why?

2



Gerard wheels a old 1500 N fridge-freezer onto a truck using a 2.5 m ramp. The deck of the truck is 0.75 m above the ground. How much work does he do? Show your working.

11D Answers to Work calculations

1 a $W = F \times d$

$= 500\ N \times 2\ m$

$= 1000\ J$

b No work, because the weight is not being moved through any distance.

c 500 N. She must supply an upward force to balance the force of gravity pulling it down.

2 $W = F \times d$

$= 1500\ N \times 0.75\ m$

$= 1125\ J$

11D 1 Heat transfer methods 1

State whether each example is convection, radiation or conduction.

1	Heat travels through metals by ___.	6	In an electric jug the water touching the element is heated through ___.
2	Warm air rising is ___.	7	White objects like snow reflect ___.
3	A plastic handle on an electric jug is to prevent ___ of heat.	8	The tectonic plates are moved by ___ currents within the mantle.
4	All hot objects give off ___.	9	Polystyrene foam stops heat loss by ___.
5	Energy from the Sun reaches the Earth through ___.	10	This happens only in fluids.

11D 1 Answers to heat transfer methods 1

1	conduction	6	conduction
2	convection	7	radiation
3	conduction	8	convection
4	radiation	9	conduction
5	radiation	10	convection

11F Keeping warm

Janis is taking a cooked chicken to a friend's house for dinner. She wants to keep it hot.

She wrapped the chicken (still in the oven bag it was cooked in) in aluminium foil as soon as it was cooked. Then she put crumpled newspaper in the bottom of a small polystyrene foam chilly bin, put the chicken on top, filled the chilly bin with more crumpled newspaper and put the lid on.

1 Explain the purpose of the aluminium foil.

2 Explain why is it better to surround the chicken by crumpled newspaper than to carry it in the otherwise empty chilly bin.

3 Explain how a chilly bin keeps the chicken warm.

11F Answers to Keeping warm

1 The aluminium foil reduces heat loss by radiation, because the shiny foil is a poor radiator of heat.

2 The crumpled newspaper traps air in many small pockets, thus reducing heat loss by convection. Without the newspaper, convection currents could move warm air away from the chicken and throughout the container, until all the air inside the chilly bin was the same temperature as the chicken.

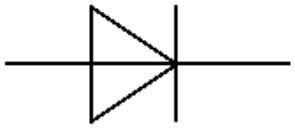
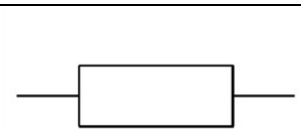
3 The foam chilly bin contains a very large number of tiny bubbles of trapped air. Air is a poor conductor of heat, and by trapping the air in many small pockets heat loss by convection is also prevented.

12C 2 Circuit components 2

Draw circuit symbols for the components described here.

1	Allows current to flow in only one direction.
2	Converts electrical energy to heat energy.
3	Measures current through a given point in a circuit.
4	Creates a break in the circuit.
5	Supplies electrical energy.
6	Measures the electrical potential difference across a part of a circuit.
7	Changes the current in a circuit by changing the resistance.
8	Converts electrical energy to heat and light.

12C 2 Answers to Circuit components 2

1	
2	
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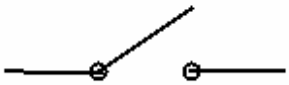
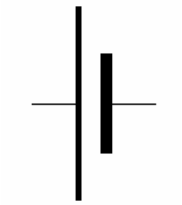
4	
5	
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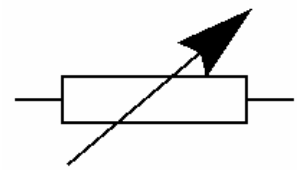
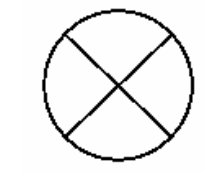
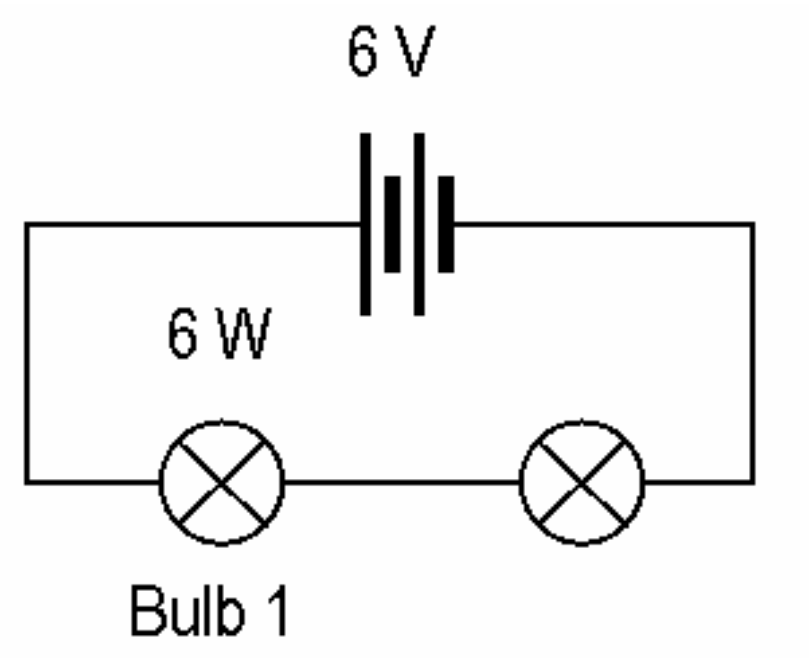
7	
8	

12H Electricity calculations



In the circuit above, the bulbs are identical.

1 What is the voltage across bulb 1?

2 Use the formula $P = V I$ to calculate the current through bulb 1.

3 Use the formula $V = I R$ to calculate the resistance of bulb 1.

4 Calculate the voltage across a 20 Ω resistor with 25 mA of current passing through it.

12H Answers to Electricity calculations

1 3 V across each bulb.

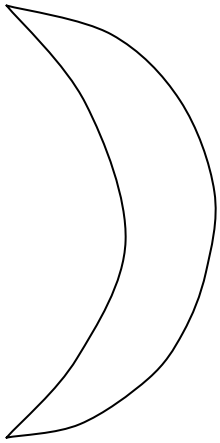
2
$$I = \frac{P}{V}$$
$$= \frac{6\ \text{W}}{3\ \text{V}}$$
$$= 2\ \text{A}$$

3
$$R = \frac{V}{I}$$
$$= \frac{3\ \text{V}}{2\ \text{A}}$$
$$= 1.5\ \Omega$$

4
$$V = I \times R$$
$$= 0.025\ \text{A} \times 20\ \Omega$$
$$= 0.50\ \text{V}$$

13D Phases of the Moon

1 State the approximate times of moonrise for each of the four main phases.



Tuesday 1st, 6.00

2 Kelvin drew a picture of the Moon, and wrote the time and date that he drew it, as shown above.

a What will the next major phase of the Moon be?

b Work out whether this picture was drawn at 6 am or 6 pm. Explain your reasoning.

13D 1 Answers to Phases of the Moon

1 Moonrise at New Moon is about sunrise (6 am)
Moonrise at First Quarter is about noon (12 pm).
Moonrise at Full Moon is about sunset (6 pm)
Moonrise at Last Quarter is about midnight (12 am)

2 a The next major phase is New Moon.

b Between Last Quarter and New Moon the Moon rises between midnight and sunrise and is visible in the morning sky, setting before the Sun. Thus the moon in this phase would be visible at 6 am, but not at 6 pm. Therefore the picture was drawn at 6 am.

15C Metamorphic rock facts

Write the missing words.

1	Metamorphism caused by large sections of rock being pushed together.	6	Sedimentary rock that makes up most of the mountains in both the North and South Islands.
2	When the ___ is high, mudstone or shale become slate.	7	Semi-solid region below the Earth's crust.
3	Term used to describe what happens when an area of crust moves downwards.	8	A ___ zone is where one tectonic plate moves under another plate.
4	Metamorphism caused by hot magma intruding into existing rocks.	9	Type of rock that has been changed by heat or pressure.
5	A type of plate which is relatively thick, composed mainly of granite.	10	Under high ___ limestone is changed into marble.

15C Answer to Metamorphic rock facts

1	regional	6	greywacke
2	pressure	7	mantle
3	subsidence	8	subduction
4	contact	9	metamorphic
5	continental	10	temperatures

15D 3 Rock story 2

A short river carries water and rocks down to a stony beach. Most of the stones on the beach are grey, but some are rounded chunks of white limestone.

Write the geological history of one of these rounded pieces of limestone.

15D 3 Answer to Rock story 2

- In a **shallow sea** marine creatures live and die. Their calcium-rich remains (shells, bones) **build up on the ocean floor** and become **compressed** and **cemented** into **limestone**.
- Other layers of **sediment** form on top of the limestone.
- The whole region is **uplifted** to become hills or mountains.
- **Weathering** breaks off large pieces of the limestone – along with pieces of other grey rocks. These pieces are **transported** by water in the river and **become rounded** as they hit other material in the water.
- Eventually the stones reach **the beach** where further rounding occurs as the waves pound the coast.

16B Past environments

What rock is likely to be formed in each of these situations?

1 An estuary formed when a large river enters the ocean.

2 A swampy forest that was later flooded.

3 A sandy beach.

4 Limestone touching an igneous intrusion.

5 A river bed.

6 High-silica magma rises into the crust and slowly sets.

7 A shallow sea with lots of shellfish.

8 High-silica lava flows into the ocean and sets very quickly.

16B Answers to Past environments

1 Mudstone or siltstone

2 Coal

3 Sandstone

4 Marble

5 Conglomerate

6 Granite

7 Limestone

8 Obsidian