

Letts Science Dictionary Teacher's Resources

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Worksheet 1

Dictionary Skills (1)

Name

Date

Class

A. Dictionaries

Answer these questions about the way we use dictionaries.

1. Look at your *Letts Science Dictionary* and a dictionary you use in English lessons.

(a) How are they the same?

.....

(b) How are they different?

.....

2. You use dictionaries in many different lessons. Make a list of the lessons in which you use dictionaries.

.....

.....

3. For each of the lessons you listed in question 2, describe the sort of dictionary you use.

.....

.....

4. Why do you think that you need different dictionaries for different lessons?

.....

.....

B. Using your *Letts Science Dictionary*

We are now going to look in more detail at the information that your *Letts Science Dictionary* provides.

1. It gives you the meaning of words. What is the meaning of **ductile**?

.....

2. It tells you what part of speech each word is. What part of speech is the word **hydraulic**?

.....

3. It tells you if the word has an unusual plural. Write down the plural of **alveolus**.

.....

4. It tells you if the word or words can be represented by a symbol or an abbreviation. What is the symbol for **carbon dioxide**?

.....

5. It tells you the topic area that each word belongs to. Which topic area does the word **ampere** belong to?

.....

6. It lists related words that you can look up. List the words that are related to **solution**.

.....

7. It tells you how to pronounce difficult words. How should you say **etiolation**?

.....

Worksheet 2

Name

Date

Class

Dictionary Skills (2)

A. Alphabetical order

All the words in a dictionary are in alphabetical order. This means that they are in the same order as the letters in the alphabet. (The alphabet is listed down the side of each page of the *Letts Science Dictionary*.)

These words are in alphabetical order: **artery, energy, limestone, sodium, temperature.**

Words that start with the same letter are placed in alphabetical order by the second letter. If the second letter is the same, the third letter is used to put the words in alphabetical order. If necessary, this continues for all the letters in the word. Examples of words in alphabetical order, as they appear in the *Letts Science Dictionary*, are shown below.

- (1) botany, brain, breathing
- (2) fat, feature, fern
- (3) nucleus, nutrient, nutrition
- (4) zinc, zoology, zygote

Can you put the following words in alphabetical order?

- | | | | | | | | |
|---------|--------|-------------|---------|------|--------|---------|--------|
| yield | carbon | temperature | zygote | area | opaque | density | liquid |
| 1. | | | 5. | | | | |
| 2. | | | 6. | | | | |
| 3. | | | 7. | | | | |
| 4. | | | 8. | | | | |

B. Using the guide words

The *Letts Science Dictionary* has pairs of words at the top left and top right of each page. These are called 'guide words', because they help you to find out quickly which page contains the word you are looking for. The first guide word tells you the first word listed on this page of the dictionary. The second guide word tells you the last word on the page. If the word you are looking for is between these two words in alphabetical order, it is on this page.

For each of the words listed below, write down the guide words that appear on the page in the dictionary that the word is on. Write the first guide word on the left, and the second on the right, so that the three words are in alphabetical order.

- | | | |
|---------|--------------------|-------|
| 1. | antibody | ..... |
| 2. | charcoal | ..... |
| 3. | dormant | ..... |
| 4. | inherit | ..... |
| 5. | luminous | ..... |
| 6. | oxygen | ..... |
| 7. | sedimentary | ..... |
| 8. | weight | ..... |

Worksheet 3

Name

Date

Class

Dictionary Skills (3)

To make best use of any dictionary you must know how alphabetical order works. On this page are some activities to help you practice your alphabetical order skills. Answer the questions first, and then use your Letts *Science Dictionary* to check your answers.

A. First in order

Look at the word lists below. For each one, write the word that comes first in alphabetical order.

1. align, albumen, alcohol
2. breathing, botany, brain
3. element, elodea, embryo
4. liver, litre, litmus
5. trachea, toxin, trace
6. voltage, volcano, voltmeter


B. Out of order

The words in the following lists are in alphabetical order, but one word is out of place. Underline the word that is out of place.

- | | |
|---|-------------------------------------|
| 1. atom, attraction, axis, average | 4. laser, leaf, lever, lava |
| 2. convection, correlation, core, corrosive | 5. planet, placenta, pollen, porous |
| 3. friction, function, fuel, fungicide | 6. tension, testis, test, theory |

C. Arrange the words

The words in each of the boxes below belong to one topic area, but they are jumbled up. Arrange the words in alphabetical order beside each box.



quadrat sampling

embryo


bacteria

exhale

nutrition

1.
2.
3.
4.
5.

1.
2.
3.
4.
5.



chloride


hydroxide

alloy

hydrogen

reactivity series

1.
2.
3.
4.
5.



energy

conductor

velocity

generator

ammeter



Worksheet 4

Name

Date

Class

Cells and Reproduction

A. Organs

The bodies of animals and plants are made of organs. Look up the word **organ** in your Letts *Science Dictionary*. Write down the names of five organs found in animals.

1.
2.
3.
4.
5.

B. Plant and animal cells

Cells contain a number of structures. Look up the word **cell** in your Letts *Science Dictionary*. Look at the following names of some of the structures found in cells.

cell membrane cell wall chloroplast nucleus vacuole

1. Which two of these structures are found in plant cells but not animal cells?
 - (a)
 - (b)
2. Which part controls the actions of the cell?
3. Which part may be filled with waste products or nutrients?

C. Gametes

Special cells are produced for reproduction. These are called gametes. Look up the word **gamete** in your Letts *Science Dictionary*. Fill in the blanks with words from your dictionary to complete these sentences.

In animals, the male gamete is called the and the female gamete is called the During the process of fertilisation, the from a male gamete and a female gamete fuse together to form a

D. Menstrual cycle

Menstruation is part of the monthly menstrual cycle that occurs in women of child-bearing age. Look up the word **menstruation** in your Letts *Science Dictionary*. Draw a line from each part of the menstrual cycle shown below to the day or days in the 28-day cycle when this part occurs.

- | | |
|----------------------|-------------|
| lining falls away | day 13 |
| menstruation | day 8 |
| new lining is formed | days 1 to 6 |
| ovulation | day 1 |



Worksheet 5

Name

Date

Class

Environment and Feeding Relationships

A. Habitats

1. A habitat is the natural home of a plant or animal. Look up the word **habitat** in your *Letts Science Dictionary*. Write a sentence about one type of animal and its habitat.

.....
.....

2. Plants and animals are suited to the **environmental conditions** in their habitat. List three environmental conditions that may affect plants and animals.

- (a)
- (b)
- (c)

B. Food chains

1. Look up **food chain** in your *Letts Science Dictionary*. What is a food chain?

.....
.....

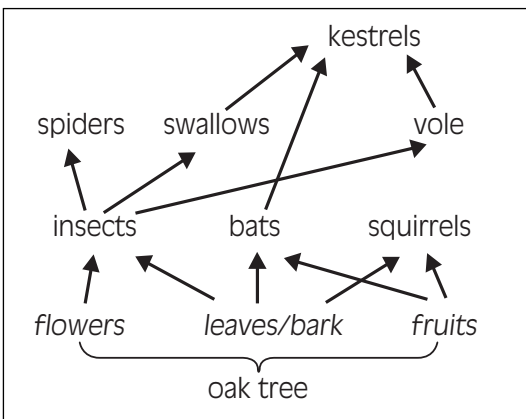
2. Arrange these animals and plant into a food chain.

frog grass grasshopper hawk

.....

C. Food webs

This diagram shows a food web.



Look up **food web** in your *Letts Science Dictionary*. Choose each of the following from this food web.

- 1. A primary consumer
- 2. A producer
- 3. A tertiary consumer



Worksheet 6

Name

Date

Class

Variation and Classification

A. Species

1. Look up the word **species** in your *Letts Science Dictionary*. What is unusual about the plural of this word?

.....

2. All of the animals or plants in one species are alike. They have similar characteristics. The members of one species are not identical. They do have some differences.

In the species of humans, list three characteristics that are:

(a) similar

(b) different

.....
.....
.....

B. Variation

Variation between individuals of the same species may be genetic (inherited from parents) or environmental (caused by the conditions in which they grew up).

Look up the word **variation** in your *Letts Science Dictionary*. Complete the table below to show which of the characteristics are genetic and which are environmental. The first one has been done for you. You may wish to tick both columns for one or more of the characteristics.

characteristic	genetic	environmental
broken leg		✓
eye colour		
hair colour		
pierced ears		
tattooed arms		

C. Classification

The classification of plants and animals organises them into groups with similar characteristics.

1. Animals can be classified as **invertebrate** or **vertebrate**. What is the difference between these two groups?

.....

.....

2. Vertebrates can be divided into five groups. Name these groups.

- (a)
- (b)
- (c)
- (d)
- (e)



Worksheet 7

Name

Date

Class

Food and Digestion

A. Food types

The food we eat contains several types of substances that are essential to our health. Food contains **carbohydrate**, **protein**, **fat**, **vitamins**, **minerals** and **fibre**. Look up the words in bold in your Letts *Science Dictionary*.

1. Name a substance that is a carbohydrate.
2. Name a food that contains a lot of protein.
3. Describe how you can test food to see if it contains fat.
.....
.....

4. Which food type helps to prevent constipation?
5. What may happen if your food does not contain enough of the mineral iron?
.....

6. Complete this table about vitamins.

vitamin	source	use
A		healthy skin sight at night
B complex	yeast	
	lemons	healthy skin resistance to colds
D	butter	

B. Digestion

Look up the words **digestion** and **digestive system** in your Letts *Science Dictionary*.

1. Why does food need to be digested?
.....
.....
2. Name the four parts of the digestive system.
(a) (b)
(c) (d)
3. In which part of the digestive system does the **absorption** of small molecules, such as glucose, into the bloodstream take place?
4. In which part of the digestive system is water removed from undigested food?
.....
5. Draw a line from the food type on the left to the small molecules made in the digestion of this food type in the middle. Then draw another line from the small molecules to their correct use in the body on the right.

carbohydrate	amino acids	growth and repair
protein	fatty acids	respiration
fat	glucose	food store



Worksheet 8

Name
Date
Class

Respiration

A. Respiration equation

All living organisms need energy. This energy is obtained by the process of respiration.

Look up the word **respiration** in your Letts *Science Dictionary*.

1. Complete this word equation for respiration.

glucose + oxygen → +

Respiration takes place in all of the cells of an organism, for example a human.

2. Where does the glucose come from?

.....

3. How is the glucose transported to the cells?

.....

B. The lungs

Oxygen is taken out of the air by the lungs. Look up the word **lung** in your Letts *Science Dictionary*.

1. List three things that make lungs efficient.

(a) (b) (c)

Lungs are made up of tiny air sacs. Each air sac is called an alveolus. Look up the word **alveolus** in your Letts *Science Dictionary*.

2. What is the plural of alveolus?

3. Describe two features of an alveolus that enable it to pass oxygen into the blood quickly.

(a)

(b)

4. Which gas is lost from the blood into the air through each alveolus?

C. Breathing

Look up the word **breathing** in your Letts *Science Dictionary*.

1. What word is used to describe breathing in?

2. What word is used to describe breathing out?

3. Write down two differences between the air that is breathed in and the air that is breathed out.

(a)

(b)

4. The number of breaths taken per minute is the breathing rate. Describe how a person's breathing rate changes before, during and after a 100 m sprint race and why.

.....
.....
.....
.....



Worksheet 9

Name

Date

Class

Microbes and Disease

A. Types of micro-organisms

Micro-organisms are very small living organisms. Examples are **bacteria**, **viruses** and **fungi** (singular **fungus**). Look up the words in bold in your Letts *Science Dictionary*.

1. What are micro-organisms sometimes called?
2. Bacteria is plural. What is the singular of this word?
3. Why are some bacteria harmful?
.....
4. Describe three steps in the way that a virus reproduces.
 - (a)
 - (b)
 - (c)

B. Protection against disease

Bacteria, viruses and fungi can each cause diseases. An organism that causes a disease is called a pathogen. Look up the word **pathogen** in your Letts *Science Dictionary*.

1. Why do pathogens cause diseases?
.....
.....
.....

Some disease-causing micro-organisms can be killed by antibiotics. Look up the word **antibiotic** in your Letts *Science Dictionary*.

2. What is the name of the first antibiotic found?
3. Which micro-organisms are not killed by antibiotics?

The body produces antibodies which kill some harmful micro-organisms. Look up the words **antibody** and **antigen** in your Letts *Science Dictionary*.

4. Which body cells make antibodies?
.....
5. Give an example of an antigen.
.....
6. Look up the word **immunisation** in your Letts *Science Dictionary*. Explain how this can protect you against infection.
.....
.....
.....

C. Useful micro-organisms

Some micro-organisms can be used to make useful things. Look up the word **yeast** in your Letts *Science Dictionary*. Name three processes in which yeast is used to make things for us.

- (a) (b) (c)



Worksheet 10

Name

Date

Class

Inheritance and Selection

A. Sexual and asexual reproduction

Living organisms make more of the same sort of organism as themselves. Some do this by **sexual reproduction** and others by **asexual reproduction**. Look up the words in bold in your Letts *Science Dictionary*. Use words from this list to complete the sentences.

identical gametes genes variation

In asexual reproduction, the organism produces offspring that are to the single parent. They have identical and identical appearance. In sexual reproduction, genes from both parents are in the two, an egg cell and a sperm, which fuse to form a zygote. The offspring are not identical to the two parents. They show

B. Selective breeding

To improve a variety of plant, gardeners can use selective breeding. They make sure that pollination occurs only between plants that have the characteristics they want to see in the offspring. Look up the word **pollination** in the Letts *Science Dictionary*.

1. Suggest how a gardener can make sure that pollen is transferred between the chosen plants and not plants with undesirable characteristics.

.....

.....

.....

Farmers can use the same technique to produce animals with the characteristics they want. Look up **selective breeding** in the Letts *Science Dictionary*.

2. Describe an example of how selective breeding has been used by farmers.

.....

.....

.....

Scientists can now use genetic modification to produce new varieties of plant or animal more quickly. Look up the words **genetic modification** in your Letts *Science Dictionary*.

3. Give three examples of useful things that have been produced by the use of genetic modification.

(a) (b) (c)

C. Cloning

To produce new plants that are identical to an existing plant, gardeners can use cloning. Look up the word **clone** in the Letts *Science Dictionary*.

1. Why do all plants cloned from the same 'parent' plant look the same?

.....

2. Describe how gardeners produce clones from a geranium plant.

.....

.....



Worksheet 11

Name

Date

Class

Photosynthesis and Plant Nutrition

A. Photosynthesis

Green plants make their own 'food' by a process called photosynthesis. Look up the word **photosynthesis** in the Letts *Science Dictionary*.

1. Complete this word equation for photosynthesis.
carbon dioxide + → glucose +
2. What other substance present in the leaves of green plants is needed for photosynthesis to take place?
3. What is absorbed by this substance to provide the energy needed for photosynthesis to take place?

B. Uses of glucose

The plant has several uses for the glucose produced by photosynthesis. Some of the glucose is converted in to starch, and stored in leaves or roots. Look up the word **starch** in your Letts *Science Dictionary*.

1. What is starch made of?
.....
2. How can you test for the presence of starch?
.....
.....
.....

Glucose is also used to produce energy for the plant by the process of respiration. Look up **respiration** in your Letts *Science Dictionary*.

3. What other substance needed for respiration is produced by photosynthesis?
.....

C. Fertiliser

Plants need other nutrients as well as glucose. They take in minerals in solution in water through the roots. In fields and gardens, fertiliser is used to supply these minerals. Look up the word **fertiliser** in your Letts *Science Dictionary*.

Name three elements present in the compounds in plant fertiliser.

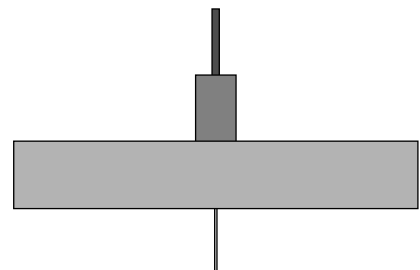
- (a) (b) (c)

D. Pyramid of numbers

Plants are producers because they make glucose by photosynthesis. All animals depend on plants for their supply of food. The plants and animals in a food chain can be represented by a **pyramid of numbers**. Look up this term in your Letts *Science Dictionary*.

Use the words in this list to label this pyramid of numbers.

- caterpillars hawk oak tree small birds





Worksheet 12

Name

Date

Class

Acids and Alkalis

A. Common acids and alkalis

Many everyday substances are acids or alkalis. Ethanoic acid is found in vinegar and citric acid is found in lemon juice. Look up the word **acid** in your *Letts Science Dictionary*.

- Find the names of three more acids.
 (a) (b) (c)
- Alkalis are also found in everyday materials, such as sodium hydroxide in oven cleaner. Look up **alkali** in your *Letts Science Dictionary*. Find the names of two more alkalis.
 (a) (b)

Under the entries **acid** and **alkali**, your *Letts Science Dictionary* also gives the formulae of some acids and alkalis.

- Look at the formulae of the acids. What element is present in all of the acid formulae?

- Look at the formulae of the alkalis. What group of two elements is present in all of the alkali formulae?

B. Indicators and pH

An indicator turns different colours in an acid and an alkali. Look up the word **indicator** in your *Letts Science Dictionary*.

- How could you use the indicator litmus to tell if a liquid is an acid or an alkali?

How acidic or alkaline a solution is can be measured using the pH scale. Look up **pH** in the *Letts Science Dictionary*.

- What part of the range of the pH scale is acid?
- What pH is a neutral solution (not acidic or alkaline)?
- Which of these pH values is the most alkaline? Circle your answer.
 pH 4 pH 6 pH 8 pH 10 pH 12

Universal Indicator has a range of colours each showing a different pH of a solution. Look up **Universal Indicator** in your *Letts Science Dictionary*.

- What colour would this indicator be in:
 (a) an acid at pH 4? (b) an alkali at pH 11?

C. Neutralisation

When an acid and an alkali are mixed together, a reaction called neutralisation takes place. A salt and water are produced. Look up **neutralisation** in your *Letts Science Dictionary*.

- Finish this word equation for a neutralisation reaction.
 sodium hydroxide + hydrochloric acid → +
- When exact amounts of acid and alkali are mixed, a neutral solution is formed. What would be the pH of this solution?



Worksheet 13

Name

Date

Class

Chemical Reactions

A. Acids and salts

When a metal reacts with an acid a salt is made. The gas hydrogen is also given off. Look up the word **salt** in your *Letts Science Dictionary*.

- Which atoms in the acid are replaced by the metal to form a salt?
- Name three other substances which will react with an acid to form a salt.
 (a) (b) (c)
- This table gives information about some reactions that make salts. Fill in the gaps.

first reactant	second reactant	salt	other products
sodium hydroxide	hydrochloric acid		water
magnesium	hydrochloric acid	magnesium chloride	
copper oxide	sulphuric acid		water
sodium carbonate	sulphuric acid		water carbon dioxide

In the reaction of sodium carbonate with sulphuric acid, the gas carbon dioxide is produced. Look up **carbonate** and **carbon dioxide** in your *Letts Science Dictionary*.

- How could you test for the gas carbon dioxide?

.....

B. Acids and burning

When an element burns in oxygen it forms an oxide. Many oxides dissolve in water to give acidic or alkaline solutions. Look up the word **oxide** in your *Letts Science Dictionary*.

- Which oxides may give acidic solutions?
- Which oxides may give alkaline solutions?

Burning fossil fuels such as oil and coal produces carbon dioxide, which causes global warming. Look up **global warming** in your *Letts Science Dictionary*.

- What is global warming?
-

Because fossil fuels also contain compounds of sulphur, when they burn the gas sulphur dioxide is formed. When sulphur dioxide is released into the air it forms acid rain. Look up **acid rain** in your *Letts Science Dictionary*.

- Describe three problems that acid rain can cause.
 (a)
 (b)
 (c)



Worksheet 14

Name

Date

Class

Solids, Liquids, Gases and Solutions

A. Particle model

The behaviour of the three states of matter, **solid**, **liquid** and **gas**, can be explained by the **particle theory**. Look up the words in bold in your Letts *Science Dictionary*. Use words from the list to fill in gaps in the sentences.

closely container fixed random regular vibrate widely

A solid has a shape. Particles in a solid have a arrangement, are packed together, and the only movement they can make is to A liquid takes the shape of its The particles in a liquid are close together but have a arrangement. Liquid particles are free to move around inside the liquid. In a gas the particles are spaced and move rapidly in all directions.

B. Dissolving

1. Use your Letts *Science Dictionary* to look up each of the words in the list on the left. Draw a line from each of these words to the correct definition in the list on the right.

dissolve	the mixture produced when a solute is completely dissolved in a solvent
soluble	when a substance disappears into a solution
solution	when a substance can dissolve in a liquid
solute	a liquid in which another substance can be dissolved
solvent	a substance that is dissolved in a solvent

2. What is meant by the **solubility** of a substance?

.....

C. Separating

A solid can be separated from the liquid it is dissolved in by distillation. Look up the word **distillation** in your Letts *Science Dictionary*. Distillation involves two processes.

1. Choose from this list the two processes involved in distillation, in the order in which they happen.

boiling crystallising condensing dissolving freezing melting

1st process 2nd process

A mixture of several solids in one liquid can be separated by chromatography. Look up the word **chromatography** in your Letts *Science Dictionary*. The dissolved solids are carried up a piece of filter paper by the solvent.

2. Why do the solids travel different distances up the paper?

.....

.....



Worksheet 15

Name

Date

Class

Elements, Compounds and Mixtures

A. The chemical elements

Everything around us is made from very small particles called atoms. There just over a hundred different kinds of **atoms**, each belonging to a different chemical **element**. Each element has only one kind of atom. Each element can be represented by a **symbol**.

Look up the words in bold using your Letts *Science Dictionary*.

- How many elements occur naturally?
- How many elements are 'man-made'?
- Why is sodium chloride not an element?
.....
- What are the symbols for the following elements?

(a) helium	.....	(b) hydrogen	.....
(c) magnesium	.....	(d) mercury	.....

B. Compounds

- Look up the word **compound** in your Letts *Science Dictionary*. How is a compound different from an element?
.....
.....
- Look at the names of substances in this list. Put a circle around those that are compounds.
copper copper oxide hydrogen oxygen sodium chloride water

When two or more elements react together a compound is made. This involves a chemical **reaction**, which can be represented by a **word equation**. Use your Letts *Science Dictionary* to look up the words in bold.

- Finish this word equation for the reaction between the elements sodium and chlorine.
sodium + chlorine →
- Look up the word **mixture** in your Letts *Science Dictionary*. How is a mixture of elements different from a compound?
.....
.....
- How can you show that a mixture of iron and sulphur is not a compound?
.....
.....

Air is a mixture of gases. Some of these gases are elements and some are compounds. Look up the word **air** in your Letts *Science Dictionary*.

- List the elements and compounds that may be present in air.

elements	compounds
.....
.....
.....



Worksheet 16

Name

Date

Class

The Rock Cycle

A. Weathering

Rocks that are exposed on the surface of the Earth are broken down by the process of weathering. Look up the word **weathering** in your *Letts Science Dictionary*.

- There are two types of weathering. What are they called?
 (a) (b)
- Name a chemical in rainwater that causes weathering.

Fragments of rock are carried away by wind and water. Later they sink to form deposits. Look up the word **deposit** in your *Letts Science Dictionary*.

- Write a definition of the word deposit.

B. Sedimentary, igneous and metamorphic

Over a period of millions of years, deposited layers of rock fragments are turned into sedimentary rock. Look up the word **sedimentary** in your *Letts Science Dictionary*.

- How are rock fragments turned into sedimentary rock?

- Give two examples of sedimentary rocks.
 (a) (b)

The Earth's **crust** is a solid outer layer. Below this the rocks melt to form **magma**. When magma cools it solidifies to form **igneous** rock. Use your *Letts Science Dictionary* to look up the words in bold.

- How thick is the Earth's crust?
- Describe one way that magma can reach the Earth's surface and so cool down.

Basalt and **granite** are both igneous rocks. Use your *Letts Science dictionary* to look up the words in bold.

- Which of these rocks contains large crystals?
- Which of these rocks cooled down slowly?

Both igneous and sedimentary rocks can be turned into metamorphic rocks. Look up **metamorphic** in your *Letts Science Dictionary*.

- What are the two conditions that lead to the formation of metamorphic rock?
 (a) (b)
- The formation of new rocks is summarised in the **rock cycle**. What two processes drive the rock cycle?
 (a) (b)



Worksheet 17

Name

Date

Class

Metals and Reactivity

A. Useful metals

Many metals are very useful. Some, such as copper, are used on their own. Others are used as mixtures called alloys. Look up the words **alloy** and **steel** in your *Letts Science Dictionary*.

- Which two substances are in the alloy steel?
..... and
- Write the name of another alloy and the metals that it contains.
alloy: metals: and

All metals are conductors of electricity. Look up the word **conductor** in your *Letts Science Dictionary*.

- Why is copper good for making the wires used to carry electricity in our houses?
.....

B. Metal reactions

Metals react with substances such as acids. The rate or speed of this reaction depends on the reactivity of the metal. The metals can be placed in order of their reactivity to form the reactivity series. Look up **reactivity series** in your *Letts Science Dictionary*.

- Put the metals in this list in order of reactivity.

	most reactive	
aluminium	calcium	.....
copper	silver	.....
sodium	zinc	.....
	least reactive	.....

In a displacement reaction, a more reactive metal is added to a solution containing a less reactive metal. The metals 'swap places' so that the more reactive metal goes into the solution and the less reactive metal is released from the solution as a solid. Use your *Letts Science Dictionary* to look up **displacement reaction**.

- In which of the following experiments will displacement take place?
 - magnesium added to zinc sulphate solution
 - copper added to aluminium nitrate solution
 - magnesium added to sodium chloride solution
 - iron added to copper sulphate solution
 - copper added to silver nitrate solution

The Thermit Reaction is an example of a displacement reaction.

- Write a word equation for the Thermit Reaction.
.....
- Which metal is displaced in this reaction?
.....
- What is the Thermit Reaction used for?
.....



Worksheet 18

Name
Date
Class

How Useful is Chemistry?

A. Environmental problems

The burning of a **fossil fuel** such as oil or petrol releases sulphur dioxide into the air. This causes **acid rain**. Use your *Letts Science Dictionary* to look up the words in bold.

1. What is a fossil fuel?

.....
.....

2. What is acid rain?

.....
.....

3. What harm does acid rain do?

.....
.....

Burning fossil fuels also releases carbon dioxide into the air, leading to global warming. Look up **global warming** in your *Letts Science Dictionary*.

4. How does carbon dioxide cause global warming?

.....
.....

B. Useful reactions

We use combustion reactions to heat our homes, power our factories and run our cars. Look up **combustion reaction** in your *Letts Science Dictionary*.

1. What is given out during a combustion reaction?

..... and

2. What are the products of combustion reactions?

.....

3. When coal is burned, the carbon in the coal reacts with oxygen in the air. Write a word equation for this reaction.

.....

All living things depend on chemical reactions in their cells. Examples of these reactions are **photosynthesis** and **respiration**. Use your *Letts Science Dictionary* to look up the words in bold.

4. Write a word equation for photosynthesis.

.....

5. Why is photosynthesis important to animals as well as plants?

.....
.....

6. Write a word equation for respiration.

.....

7. How are the equations for photosynthesis and respiration similar?

.....



Worksheet 19

Name

Date

Class

Energy Resources

A. Fuels

Look up the words **fuel** and **fossil fuel** in your Letts *Science Dictionary*. Use words from the list below to finish the sentences that follow.

energy millions oil pressures radioactivity temperatures

A fuel is a substance that releases when it burns. We use this energy to heat our homes, run our factories and power our cars. Coal, and natural gas are examples of fossil fuels. They were made by the action of high and on dead plants and animals. This process took of years. Nuclear fuels give out heat because of They do not burn.

B. Renewable energy resources

Fossil fuels are non-renewable, which means that they will eventually run out. Some other fuels are renewable, which means that more of the fuel can be made.

1. Put a circle around the renewable fuels in this list.

coal oil natural gas straw wood

Natural gas is made of methane. Methane is an example of a hydrocarbon, as are all of the fuels obtained from oil. Look up **methane** in your Letts *Science Dictionary*.

2. What elements is methane made from?

.....

Other renewable energy sources include wind, solar and wave power.

3. Explain why fossil fuels are a non-renewable energy source, but wind power is a renewable energy source.

.....
.....
.....

C. Energy in living things

The unit used to measure energy is the joule, abbreviated to J. Look up the word **joule** in your Letts *Science Dictionary*.

1. How did the unit of energy get this name?

.....
.....

2. Look up the word **energy** in your Letts *Science Dictionary*. What is the definition of energy?

.....

Living things need energy to move and to power the chemical reactions they need to live. Look up **food chain** in your Letts *Science Dictionary*.

3. Where do plants get their energy from?

.....

4. Where do animals get their energy from?

.....



Worksheet 20

Name

Date

Class

Electrical Circuits

A. Flow of electricity

Electricity travels round an electrical circuit. This can be represented by a **circuit diagram**. Each device in the circuit is shown by a **circuit symbol**. For electricity to flow, a **complete circuit** is needed. Use your Letts *Science Dictionary* to look up the words in bold.

1. What does each of the circuit symbols shown below represent?

	(a)		(b)
	(c)		(d)

2. Why must the circuit be complete for the electricity to flow?

.....

3. Describe how a switch works.

.....

B. Amps and volts

An **ammeter** measures the **current** in a circuit. A **voltmeter** measures the voltage, also called the **potential difference**, in a circuit. Use your Letts *Science Dictionary* to look up the words in bold.

1. What is electric current?

.....

2. What units are used to measure electric current?

.....

3. How must a voltmeter be connected to a circuit to measure the voltage across a lamp?

.....

C. Series and parallel

Components may be connected in a **series** circuit or a **parallel** circuit. Use your Letts *Science Dictionary* to look up the words in bold.

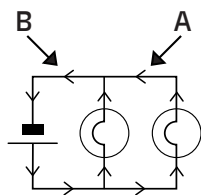
1. In a series circuit the electricity flows through each component in turn. What happens if another lamp is added to a series circuit which already has two lamps?

.....

In a parallel circuit the current splits at a junction and rejoins at a second junction.

2. The current at position A in this circuit is 2.0 A. What is the current at position B?

.....





Worksheet 21

Name

Date

Class

Forces and the Solar System

A. Forces and floating

A force can be described simply as a push or a pull. Look up the word **force** in your Letts *Science Dictionary*.

1. What effects can a force have on an object?

.....

.....

.....

When an object is placed in water there are two forces acting upon it. One force is the **weight** of the object, the other is the **upthrust**. The object may **float** or sink. Use your Letts *Science Dictionary* to look up the words in bold.

2. What is the meaning of the word weight?
3. If the object floats, what must be true about these two forces?
4. If the object sinks, what must be true about these two forces?

.....

.....

.....

An object will float on water if its density is greater than that of water. Look up the word **density** in your Letts *Science Dictionary*.

5. What is meant by the term density?

.....

B. The Solar System

The **Solar System** consists of the Sun and the planets. Each **planet** moves in an **orbit** around the Sun. Use your Letts *Science Dictionary* to look up the words in bold.

1. Name the nine planets in our Solar System.

(a)	(d)	(g)
(b)	(e)	(h)
(c)	(f)	(i)

2. Which planet is furthest away from the Sun?

Many planets in the Solar System have moons. The Earth has one moon. Look up the word **reflection** in your Letts *Science Dictionary*.

3. In our Solar System the Sun is the only source of light. How are we able to see the Moon?

.....

.....

Infrequently, a solar eclipse takes place. For a few minutes some places on the Earth experience darkness during the daytime. Look up the word **eclipse** in your Letts *Science Dictionary*.

4. Explain how a solar eclipse takes place.

.....

.....



Worksheet 22

Name

Date

Class

Heating and Cooling

A. Temperature

We use a **thermometer** to measure the **temperature** of an object or material. Use your Letts *Science Dictionary* to look up the words in bold.

1. What is meant by the word temperature?
2. What units are used to measure temperature?
3. Using these units, write the temperature you would expect for:
 - (a) boiling water
 - (b) freezing water
 - (c) a comfortable room
4. Explain how a thermometer works.

B. Conductors and insulators

Heat travels through solid materials by **conduction**. A material that allows heat to pass through it easily is a **conductor**. A material through which heat does not pass is an **insulator**. Use your Letts *Science Dictionary* to look up the words in bold.

1. What moves to carry the heat energy in conduction?
2. Put a circle around each of these materials that is a good conductor of heat.
aluminium glass magnesium plastic steel wood
3. How can an insulator be used to reduce the heat lost through the walls of a house?

C. Convection and radiation

Heat travels through gases and liquids by convection. Look up the word **convection** in your Letts *Science Dictionary*.

1. What moves to carry the heat energy in convection?
2. In a room, hot air from a fire has a lower density than cold air. The hot air rises and is replaced by the cold air. What name is given to this air movement?

As air gets hot it expands, which is why it gets less dense. This also happens in liquids and solids. Look up the word **expansion** in your Letts *Science Dictionary*.

3. Why might expansion cause a problem to railway trains?

Heat energy travels from the Sun to the Earth through space by radiation. Look up the word **radiation** in your Letts *Science Dictionary*.

4. Space is a vacuum. This means that it contains no particles. Why can heat energy not travel by convection in space?



Worksheet 23

Name

Date

Class

Magnetism

A. Magnetic materials

When a piece of iron is magnetised it will attract other pieces of iron. Two other metals have the power of magnetism. Look up the word **magnetic** in your Letts *Science Dictionary*.

- Put a circle around the two magnetic metals in this list.

aluminium cobalt copper nickel tin

A magnet has a **north-seeking pole** and a **south-seeking pole**. Use your Letts *Science Dictionary* to look up these terms.

- How can you find out which is the north-seeking pole of a bar magnet?

.....

.....

Look up the words **attraction** and **repulsion** in your Letts *Science Dictionary*.

- Two bar magnets are brought together. The poles attract each other. Which poles have been brought together? and

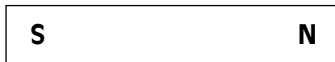
B. Magnetic field

A magnet has a **magnetic field** around it. This consists of **magnetic field lines**. Use your Letts *Science Dictionary* to look up the words in bold.

- In which direction do magnetic field lines go?

.....

- Draw the magnetic field around the bar magnet in this diagram.



C. Electromagnets

Look up the word **electromagnet** in your Letts *Science Dictionary*.

- How is an electromagnet made magnetic?

.....

.....

- Name two devices that use electromagnets.

(a)

(b)

- What is the advantage of using an electromagnet in these devices instead of a permanent magnet?

.....



Worksheet 24

Name

Date

Class

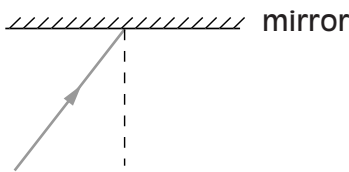
Light and Sound

A. Reflection and refraction

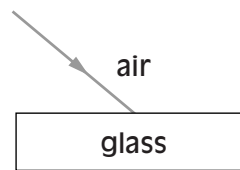
Light travels in straight lines. When a **light beam** meets a smooth surface such as a mirror, the light is turned back. This is called **reflection**. When a light beam passes from one transparent material to another, it is bent. This is called **refraction**. Use your *Letts Science Dictionary* to look up the words in bold.

1. What is the speed of light?
2. Finish the two diagrams below to show

(a) reflection



(b) refraction



B. The spectrum

Dispersion takes place when a beam of light passes through a prism. The white light forms a **spectrum** with the colours seen in a **rainbow**. Use your *Letts Science Dictionary* to look up the words in bold.

1. List the colours of the spectrum.
.....
2. How is a rainbow made?
.....

C. Amplitude and frequency

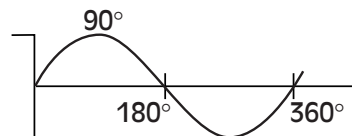
Energy is carried by the **vibration** of materials such as air and water, forming a **sound wave**. Use your *Letts Science Dictionary* to look up the words in bold.

1. What type of wave is sound?
2. Name the two parts of this type of wave.

(a) (b)

Sound can be represented by a wave graph, as shown in the diagram below. Use your *Letts Science Dictionary* to look up the words **amplitude** and **frequency**.

3. Mark amplitude on the diagram.



D. Hearing sounds

Sound vibrations travel through the air and enter the ear. Look up the word ear in your *Letts Science Dictionary*.

1. Which part of the ear picks up vibrations from the air?
2. How is the sound information passed from the ear to the brain?
.....



Worksheet 25

Name

Date

Class

Energy Transfer, Pressure and Moments

A. Energy transfer

Energy exists as kinetic energy, potential energy and **chemical energy** (for example in a cell). Use your *Letts Science Dictionary* to look up **energy**, **kinetic energy**, **potential energy** and **cell**.

1. Use the words in bold to complete these sentences. You will need to use some of the words more than once.

When an object moves it possesses This type of is also possessed by moving particles. The amount of possessed by an object depends on its position or state. Water at the top of a waterfall has more of this energy. As the water falls, this energy is converted into Energy can also be stored in an electrical as

Energy cannot be created or destroyed, but it can transfer from one form to another. Look up the term **energy transfer** in your *Letts Science Dictionary*.

2. What energy transfers take place in the following energy transfer devices.

- (a) loudspeaker: from energy to energy
- (b) electrical cell: from energy to energy
- (c) lamp: from energy to energy

B. Pressure

Pressure is the force acting on a unit area of surface. Look up the word **pressure** in your *Letts Science Dictionary*.

1. Write a formula that can be used to calculate pressure.

.....

2. Use this formula to calculate the pressure on the floor of a standing person with a weight of 500 N and a total shoe area of 0.03 m² (300 cm²).

.....

.....

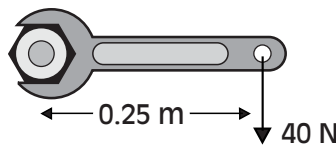
.....

C. Moments

Use your *Letts Science Dictionary* to look up the terms **moment** and **moment of force**.

1. Write a formula that can be used to calculate moment of force.

2. Use this formula to calculate the moment of force acting on this spanner.



.....

.....

.....



Worksheet 26

Name

Date

Class

Speed, Gravity and Space

A. Speed and velocity

The speed of an object is given by the formula $\text{speed} = \text{distance} \div \text{time}$. Look up the word **velocity** in your *Letts Science Dictionary*.

1. What is the difference between speed and velocity?
.....
2. Calculate the average speed of an athlete who runs 100m in 12s.
.....
.....

B. Gravity

Look up the word **gravity** in your *Letts Science Dictionary*.

1. Explain why a ball thrown into the air falls back to the Earth.
.....
.....

Use your *Letts Science Dictionary* to look up the words **weight** and **mass**.

2. An object has a mass of 6kg and weight of 60N on Earth. The same object on the Moon still has a mass of 6kg but has a weight of 6N. Explain why.
.....
.....
3. The size of the gravitational pull of an object depends on its mass. Which of these objects will have the greatest gravitational pull? Put a circle around the correct choice.
Earth Jupiter Moon Sun

C. Satellites and planets

Look up the words **satellite** and **planet** in your *Letts Science Dictionary*.

1. Place a tick in the box to show whether each of these statements is true or false.

	true	false
The Moon is a satellite of the Earth.		
The first artificial satellite was called <i>Sputnik 1</i> .		
The is Sun a satellite of the Earth.		
Artificial satellites are used to send telephone messages.		
Mars is a satellite of Jupiter.		

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