Cells – the Building Blocks of Life

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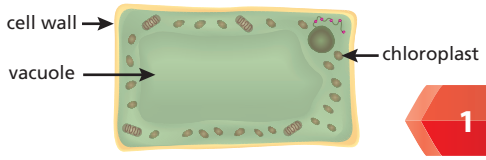
Name the three **cell structures** that are found in plant cells, but not in animal cells.

1

Cells – the Building Blocks of Life

The vacuole, cell wall and chloroplast are three **cell structures** found in plant cells, but not animal cells.



1

Cells – the Building Blocks of Life

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What is **gestation**?

2

Cells – the Building Blocks of Life

Gestation is the process of the embryo developing in the uterus.

2

Eating, Drinking and Breathing

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Give three ways in which **alveoli** are adapted for gas exchange.

3

Eating, Drinking and Breathing

Alveoli are adapted for gas exchange by having:

- thin, moist walls
- a good blood supply
- a large surface area.

3

Eating, Drinking and Breathing

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Describe what happens to someone when they suffer from an **asthma** attack.

4

Eating, Drinking and Breathing

When someone has an **asthma** attack the bronchioles narrow, which reduces the space for air to enter. Less air inside the lungs means less oxygen is absorbed into the blood, leaving the sufferer gasping for breath.

4

Getting the Energy your Body Needs

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What is meant by the term **antagonistic pair**?

5

Getting the Energy your Body Needs

An **antagonistic pair** is when one muscle contracts and the other relaxes.

5

Getting the Energy your Body Needs

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What is the word equation for **aerobic respiration**?

6

Getting the Energy your Body Needs

The word equation for **aerobic respiration** is:

glucose + oxygen → carbon dioxide + water + energy

6

Looking at Plants and Ecosystems

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What is needed for **photosynthesis** to take place?

7

Looking at Plants and Ecosystems

Carbon dioxide, water, light and chlorophyll are needed for **photosynthesis** to take place.

7

Looking at Plants and Ecosystems

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What does the term **bioaccumulation** mean?

8

Looking at Plants and Ecosystems

Bioaccumulation describes the build-up of toxic materials in the organisms that are at the top of the food chain.

8

Variation for Survival

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Name the scientists who deduced and then published the **structure of DNA** in 1952.

9

Variation for Survival

The scientists who deduced the **structure of DNA** were James Watson and Francis Crick.

9

Variation for Survival

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Explain the purpose of a **gene bank**.

10

Variation for Survival

A **gene bank** stores seeds and cells from as many organisms as possible. This is to ensure that no genes are lost due to extinction. The genes may be helpful in the future to provide medicines or food.

10

Variation for Survival

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If an adult body cell of a wolf contains 78 **chromosomes**, how many chromosomes will be in a wolf's sperm cell?

11

Variation for Survival

The number of **chromosomes** in a wolf's sperm cell will be 39.

Adult body cells have two pairs of every chromosome, so $78 \div 2 = 39$

11

Our Health and the Effects of Drugs

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What are the three different types of **microbes** that can cause disease?

12

Our Health and the Effects of Drugs

The three different types of **microbes** that can cause disease are:

- bacteria
- viruses
- fungi.

12

Our Health and the Effects of Drugs

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Drugs can be divided into four main groups. What are these groups?

13

Our Health and the Effects of Drugs

The four main groups of **drugs** are:

- painkillers
- depressants
- stimulants
- hallucinogens.

13

Mixing, Dissolving and Separating

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What is meant when a chemist says that a substance is **pure**?

14

Mixing, Dissolving and Separating

A substance is **pure** when it only contains one type of atom or compound.

14

Mixing, Dissolving and Separating

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What is the **law of conservation of mass**?

15

Mixing, Dissolving and Separating

The **law of conservation of mass** states that in any physical change or chemical reaction, the mass after the change will be the same as the mass before the change.

15

Elements, Compounds and Reactions

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In a reaction, magnesium reacts with oxygen to form what **compound**?

16

Elements, Compounds and Reactions

The **compound** formed in the reaction between magnesium and oxygen is magnesium oxide.

16

Elements, Compounds and Reactions

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How many **atoms** are in a molecule of maltose, $C_{12}H_{22}O_{11}$?

17

Elements, Compounds and Reactions

There are 45 **atoms** in a molecule of maltose.

(12 × C) + (22 × H) + (11 × O)

17

Explaining Physical Changes

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What name is given to a **reaction** that produces **heat energy**?

18

Explaining Physical Changes

A reaction that produces heat energy is called an **exothermic reaction**.

18

Explaining Chemical Changes

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When a **hydrocarbon fuel** is burned in excess oxygen, what gas is produced as a product?

19

Explaining Chemical Changes

When a **hydrocarbon fuel** is burned in the presence of excess oxygen, carbon dioxide gas is produced.

19

Explaining Chemical Changes

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What **products** are formed when an acid reacts with a metal?

20

Explaining Chemical Changes

The **products** salt and hydrogen are formed when an acid reacts with a metal.

20

Obtaining Useful Materials

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What happens in a **displacement reaction**?

21

Obtaining Useful Materials

In a **displacement reaction** the metal that is in a compound is displaced by another metal that is higher up in the reactivity series.

21

Obtaining Useful Materials

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What is the chemical reason why carbon **displaces** iron from its ore?

22

Obtaining Useful Materials

Iron is lower in the reactivity series than carbon, so carbon **displaces** it.

22

Obtaining Useful Materials

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In pottery, what has to happen to clay in order to make a **ceramic**?

23

Obtaining Useful Materials

A **ceramic** is made by heating the clay at a high temperature in an oven / kiln.

23

Using our Earth Sustainably

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What are the three main **rock types**?

24

Using our Earth Sustainably

The three main **rock types** are:

- igneous
- sedimentary
- metamorphic.

24

Using our Earth Sustainably

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According to scientists, what is the main cause of the increased **carbon dioxide** levels on our planet today?

25

Using our Earth Sustainably

The increased **carbon dioxide** levels are due to human activity, mainly burning fossil fuels.

25

Using our Earth Sustainably

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Explain why carbon dioxide causes **climate change**.

26

Using our Earth Sustainably

Carbon dioxide causes **climate change** because it is a greenhouse gas. The more carbon dioxide, the more energy from the sun is trapped. This causes temperatures to rise and unpredictable changes to weather patterns.

26

Forces and their Effects

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For an object to speed up or slow down, what has to happen to the **forces** acting on that object?

27

Forces and their Effects

The **forces** on the object must become unbalanced. If the forward force is greater, the object will speed up. If the force in the opposite direction to movement is greater, then the object will slow down.

27

Forces and their Effects

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A boy weighing 80 N is sitting at the end of a seesaw, 2 m from the pivot. What is the **moment**?

28

Forces and their Effects

The **moment** is 160 Nm.

Moment = Force × Distance from pivot

28

Forces and their Effects

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How does **Hooke's Law** apply to a spring?

29

Forces and their Effects

Hooke's Law states that the stretch of the spring will be directly proportional to the force applied to it.

29

Forces and their Effects

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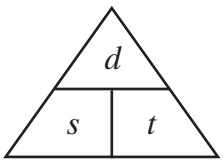
What is the formula used to calculate **speed**?

30

Forces and their Effects

Speed = $\frac{\text{Distance}}{\text{Time}}$



30

Forces and their Effects

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In physics, what is meant by the term **work**?

31

Forces and their Effects

Work is only done when a force has acted on an object and that object has changed.

31

Exploring Contact and Non-Contact Forces

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What would happen if two magnets with the same **poles** were brought together?

32

Exploring Contact and Non-Contact Forces

The **poles** are the same, so the magnets would repel.

32

Exploring Contact and Non-Contact Forces

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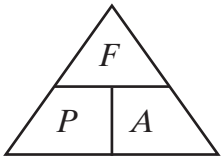
What is the formula for **pressure**?

33

Exploring Contact and Non-Contact Forces

Pressure = $\frac{\text{Force}}{\text{Area}}$



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Exploring Contact and Non-Contact Forces

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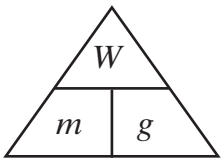
What is the formula for **weight**?

34

Exploring Contact and Non-Contact Forces

Weight = Mass × Gravitational Field Strength



34

Motion on Earth and in Space

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Why are **shadows** of objects longer at noon in winter in Northern latitudes?

35

Motion on Earth and in Space

Shadows are longer at noon in winter in Northern latitudes because the sun appears lower in the sky, so the light shines on the object from a smaller angle.

35

Energy Transfers and Sound

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What do we mean when we say that a wave has a **frequency**?

36

Energy Transfers and Sound

The **frequency** of a wave is the number of waves per second, measured in Hz.

36

Magnetism and Electricity

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What makes a **parallel** circuit different to a **series** circuit?

37

Magnetism and Electricity

A **parallel** circuit has branches through which the current is divided, whereas a **series** circuit has only one route for the current to flow.

37

Magnetism and Electricity

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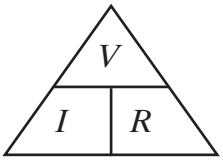
What is the formula for **resistance**?

38

Magnetism and Electricity

Resistance = $\frac{\text{Voltage}}{\text{Current}}$



38

Magnetism and Electricity

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Give three ways in which an **electromagnet** can be made more powerful.

39

Magnetism and Electricity

An **electromagnet** can be made more powerful by:

- increasing the number of coils in the wire
- increasing the current
- adding a core made from a magnetic material, e.g. iron.

39

Waves and Energy Transfer

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State the **Law of Reflection**.

40

Waves and Energy Transfer

The **Law of Reflection** is:

The angle of incidence = The angle of reflection

40