

## Preparing for Secondary Science

**Dear Year 6,**

Welcome to Secondary Science at Tudor Grange Samworth Academy!



Science

When you start your Year 7 lessons, you will have one or two science teachers. They will teach you topics in the three 'areas' of science; biology, chemistry and physics.

To help you to prepare for your Year 7 science lessons, there are some short activities in this work booklet designed to introduce you to some of the key knowledge you will need when you start. Work through these tasks with the help of someone at home – you can work together to quiz each other to check what you can remember.

We look forward to welcoming you to Secondary Science soon!

The TGSA Science Department

## Preparing to work in a laboratory

One big difference between the science lessons at your primary school and the science lessons in Year 7 is that most of them will take place in our laboratories (labs). Whenever you carry out practical work, you need to know how to work safely in the lab.

A hazard is something that can cause harm. Whilst there are some hazards that we will encounter in the lab, you do not need to worry about this, as we will always carry out a risk assessment to reduce the risk of harm. However, it is important to understand the hazard involved and to follow the instructions from your teacher carefully to reduce the risk of harm. You will be given plenty of introduction to working safely in the lab, however, learning these hazard symbols will therefore be a good starting point!

| Symbol                                                                              | Hazard               | Description                                                         |
|-------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------|
|   | Environmental Hazard | Could cause damage to animal and plant life.                        |
|  | Explosive            | Substances carrying this label may explode.                         |
|  | Toxic                | Could cause serious illness and even death if swallowed or inhaled. |
|  | Flammable            | Catches fire easily.                                                |

| Symbol                                                                             | Hazard                               | Description                                                                                                                                                                |
|------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | Corrosive                            | Chemicals that may destroy living tissue. This means it can burn through skin, causing very painful chemical burns.                                                        |
|   | Caution<br>Moderate<br>Health Hazard | – This is a moderate health hazard. These substances are harmful if inhaled or in contact with the skin. They cause skin irritation and can cause serious eye irritation.  |
|  | Serious Health Hazard                | This is a serious health hazard – substances with this label can cause problems such as breathing difficulties or may lead to longer term health problems, such as cancer. |

## Task 1 – Self-Quizzing

Recall as many of the names of the hazard symbols as you can in the columns below. After attempt one, mark your work (in a different colour if possible) and fill in any gaps and/or correct any spelling errors using the knowledge organiser.

Try the second attempt, covering over your attempt one. Then repeat the process for attempt 3.

| Symbol                                                                             | Give the name of each hazard (you do not need to include the description) |           |           |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------|-----------|
|                                                                                    | Attempt 1                                                                 | Attempt 2 | Attempt 3 |
|    |                                                                           |           |           |
|    |                                                                           |           |           |
|   |                                                                           |           |           |
|  |                                                                           |           |           |
|  |                                                                           |           |           |
|  |                                                                           |           |           |
|  |                                                                           |           |           |
|  |                                                                           |           |           |

## What will I study in chemistry?

Chemistry is the branch of science that studies the properties of different substances and how they interact with each other. In Year 7 chemistry, you will study three important topics: Particles, Atoms, Elements and Compounds and Mixtures and Separation.

## Preparing for Chemistry Lessons - Key Knowledge

The periodic table displays all of the discovered elements in order of their atomic number. The first 20 elements in the periodic table are shown below. You have been given details about their atomic number, name, and symbol. The table also indicates whether the elements are metals or non-metals. Some of the elements are sometimes also described as semi-metals – this is because they have properties in between metals and non-metals.

| Atomic Number | Element Name | Symbol | Metal or Non-Metal     |
|---------------|--------------|--------|------------------------|
| 1             | Hydrogen     | H      | Non-metal              |
| 2             | Helium       | He     | Non-metal              |
| 3             | Lithium      | Li     | Metal                  |
| 4             | Beryllium    | Be     | Metal                  |
| 5             | Boron        | B      | Non-metal (semi-metal) |
| 6             | Carbon       | C      | Non-metal              |
| 7             | Nitrogen     | N      | Non-metal              |
| 8             | Oxygen       | O      | Non-metal              |
| 9             | Fluorine     | F      | Non-metal              |
| 10            | Neon         | Ne     | Non-metal              |
| 11            | Sodium       | Na     | Metal                  |
| 12            | Magnesium    | Mg     | Metal                  |
| 13            | Aluminium    | Al     | Metal                  |
| 14            | Silicon      | Si     | Non-metal (semi-metal) |
| 15            | Phosphorus   | P      | Non-metal              |
| 16            | Sulfur       | S      | Non-metal              |
| 17            | Chlorine     | Cl     | Non-metal              |
| 18            | Argon        | Ar     | Non-metal              |
| 19            | Potassium    | K      | Metal                  |
| 20            | Calcium      | Ca     | Metal                  |

## Task 1 – Self-Quizzing

Recall as many of the names of elements and symbols as you can in the columns below. After attempt one, mark your work (in a different colour if possible) and fill in any gaps and/or correct any spelling errors using the knowledge organiser. Try the second attempt, covering over your attempt one. Then repeat the process for attempt 3.

| Attempt 1     |        |              | Attempt 2     |        |              | Attempt 3     |        |              |
|---------------|--------|--------------|---------------|--------|--------------|---------------|--------|--------------|
| Atomic Number | Symbol | Element Name | Atomic Number | Symbol | Element Name | Atomic Number | Symbol | Element Name |
| 1             |        |              | 1             |        |              | 1             |        |              |
| 2             |        |              | 2             |        |              | 2             |        |              |
| 3             |        |              | 3             |        |              | 3             |        |              |
| 4             |        |              | 4             |        |              | 4             |        |              |
| 5             |        |              | 5             |        |              | 5             |        |              |
| 6             |        |              | 6             |        |              | 6             |        |              |
| 7             |        |              | 7             |        |              | 7             |        |              |
| 8             |        |              | 8             |        |              | 8             |        |              |
| 9             |        |              | 9             |        |              | 9             |        |              |
| 10            |        |              | 10            |        |              | 10            |        |              |
| 11            |        |              | 11            |        |              | 11            |        |              |
| 12            |        |              | 12            |        |              | 12            |        |              |
| 13            |        |              | 13            |        |              | 13            |        |              |
| 14            |        |              | 14            |        |              | 14            |        |              |
| 15            |        |              | 15            |        |              | 15            |        |              |
| 16            |        |              | 16            |        |              | 16            |        |              |
| 17            |        |              | 17            |        |              | 17            |        |              |
| 18            |        |              | 18            |        |              | 18            |        |              |
| 19            |        |              | 19            |        |              | 19            |        |              |
| 20            |        |              | 20            |        |              | 20            |        |              |

## Task 2 – Multiple Choice Quiz

Complete the multiple-choice questions, then mark your answers using the knowledge organiser. Correct each incorrect response (in a different colour if possible). Record your score in the space below.

1. What is the correct symbol for sodium?
  - a. NA
  - b. Na
  - c. nA
  - d. na
2. Which element has the symbol K?
  - a. Lithium
  - b. Potassium
  - c. Phosphorous
  - d. Boron
3. Is calcium a metal or a non-metal?
  - a. Metal
  - b. Non-metal
4. Is sodium a metal or a non-metal?
  - a. Metal
  - b. Non-metal
5. Is fluorine a metal or a non-metal?
  - a. Metal
  - b. Non-metal
6. Which element has an atomic number of 4?
  - a. Helium
  - b. Beryllium
  - c. Argon
  - d. Phosphorus
7. What is the atomic number of potassium?
  - a. 20
  - b. 12
  - c. 19
  - d. 15
8. What is the atomic number of aluminium?
  - a. 10
  - b. 16
  - c. 17
  - d. 13
9. Which elements are sometimes referred to as semi-metals?
  - a. Boron and sulfur
  - b. Boron and silicon
  - c. Beryllium and silicon
  - d. Beryllium and sodium
10. What is the name given to the element with the symbol Cl?
  - a. Calcium
  - b. Carbon
  - c. Chlorine
  - d. Potassium

Score = \_\_\_\_\_/10

### Task 3 – Recall Questions

Complete the recall questions, then mark your answers using the knowledge organiser. Correct each incorrect response (in a different colour if possible). Record your score in the space below.

1. What is the correct symbol for potassium? \_\_\_\_\_
2. Which element has the symbol Na? \_\_\_\_\_
3. Is lithium a metal or a non-metal? \_\_\_\_\_
4. Is oxygen a metal or a non-metal? \_\_\_\_\_
5. What is the name given to the element with the symbol Ca?  
\_\_\_\_\_
6. What is the correct symbol for hydrogen? \_\_\_\_\_
7. Which element has the symbol Mg? \_\_\_\_\_
8. Is nitrogen a metal or a non-metal? \_\_\_\_\_
9. Is chlorine a metal or a non-metal? \_\_\_\_\_
10. What is the name given to the element with the symbol Ar?  
\_\_\_\_\_

**Score = \_\_\_\_\_/10**

## What will I learn about in physics?

In Year 7 physics, you will start with a topic on forces – you will have learnt a lot about forces in your primary school and we will build on this knowledge. You will then look at two topics that come under the larger topic of ‘waves’ – here you will study sound and light. Again, you will already have some knowledge of these topics from your science lessons at primary school.

## Preparing for Physics Lessons - Key Knowledge

When you use a ruler to make a measurement, we say what we have measured in after the number. So, we might measure the length of a ladybird in millimetres (mm), however we would measure the length of the classroom in metres (m). When measuring temperature, we do not say “It is 20 millimetres today”, we say “It is 20 degrees Celsius today”. So, the unit of measurement for temperature is degrees Celsius. In all areas of science, you need to be familiar with different units of measurement. The table below shows some examples that are really important in physics.

| Measurement     | Unit              | Symbol         |
|-----------------|-------------------|----------------|
| Time            | seconds           | s              |
| Distance/length | metres            | m              |
| Temperature     | degrees Celsius   | °C             |
| Power           | watts             | W              |
| Mass            | kilograms         | kg             |
| Frequency       | hertz             | Hz             |
| Speed           | Metres per second | m/s            |
| Force           | newton            | N              |
| Energy          | joule             | J              |
| Volume          | cubic metre       | m <sup>3</sup> |

## Task 1 – Self-Quizzing

Recall as many of the names of the units as you can in the columns below. After attempt one, mark your work (in a different colour if possible) and fill in any gaps and/or correct any spelling errors using the knowledge organiser.

Try the second attempt, covering over your attempt one.

| Attempt 1       |      |        | Attempt 2       |      |        |
|-----------------|------|--------|-----------------|------|--------|
| Measurement     | Unit | Symbol | Measurement     | Unit | Symbol |
| Time            |      |        | Time            |      |        |
| Distance/length |      |        | Distance/length |      |        |
| Temperature     |      |        | Temperature     |      |        |
| Power           |      |        | Power           |      |        |
| Mass            |      |        | Mass            |      |        |
| Frequency       |      |        | Frequency       |      |        |
| Speed           |      |        | Speed           |      |        |
| Force           |      |        | Force           |      |        |
| Energy          |      |        | Energy          |      |        |
| Volume          |      |        | Volume          |      |        |

## Task 2 – Multiple Choice Quiz

Complete the multiple-choice questions, then mark your answers using the knowledge organiser. Correct each incorrect

response (in a different colour if possible). Record your score in the space below.

1. What is the correct unit for power?
  - a. w
  - b. Wts
  - c. W
  - d. V
2. What is the correct unit for energy?
  - a. newtons
  - b. watts
  - c. joules
  - d. seconds
3. What is the correct unit for force?
  - a. newtons
  - b. watts
  - c. joules
  - d. seconds
4. What is the correct unit for frequency?
  - a. joules
  - b. ohms
  - c. volts
  - d. hertz
5. What is the correct unit for mass?
  - a. cubic metres
  - b. kilograms
  - c. newtons
  - d. amperes
6. Which is the correct way to represent the symbol for cubic metres?
  - a. cm<sup>3</sup>
  - b. cm<sub>3</sub>
  - c. cm3
  - d. cM<sub>3</sub>

**Score = \_\_\_\_\_/6**

### Task 3 – Recall Questions

Complete the recall questions, then mark your answers using the knowledge organiser. Correct each incorrect response (in a different colour if possible). Record your score in the space below.

1. What is measured in joules? \_\_\_\_\_
2. What is measured in newtons? \_\_\_\_\_
3. What is hertz the unit of measurement for? \_\_\_\_\_
4. What are the units of measurement for volume (give the symbol)?  
\_\_\_\_\_
5. What is measured in degrees Celsius? \_\_\_\_\_
6. What is the unit of measurement for mass? \_\_\_\_\_
7. What does m/s mean? \_\_\_\_\_
8. What are distances measured in? \_\_\_\_\_
9. What is the unit of measurement for friction (HINT: friction is a force)?  
\_\_\_\_\_
10. Which unit has the symbol W? \_\_\_\_\_

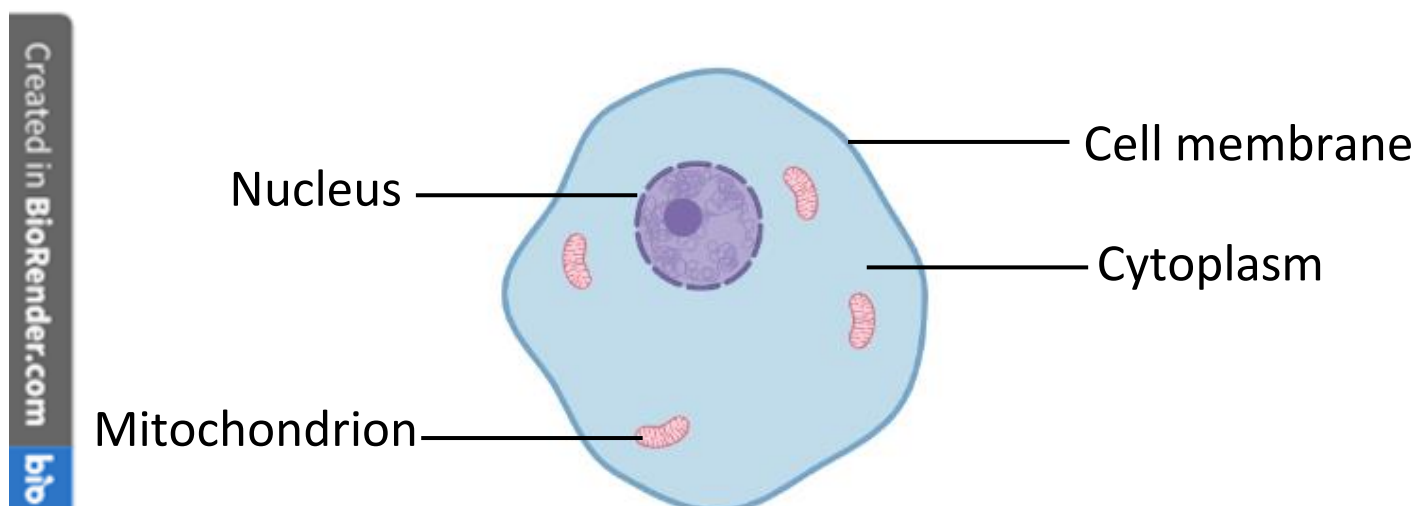
**Score = \_\_\_\_\_/10**

## What will I learn about in biology?

Biology is the study of living things. In your primary school, you will already have studied lots of different living things. In Year 7 biology, you will first learn about what all living things are made up of: cells.

### Preparing for Biology Lessons – Key Knowledge

In your primary school, you will have looked at different organs that we find in living things, like the heart, stomach, and lungs. Each of these organs are made up of lots of tiny ‘building blocks’ called cells. All living things are made up of cells. To help you to prepare for your first biology lessons in year 7, this task introduces you to the type of cell that makes up animals.



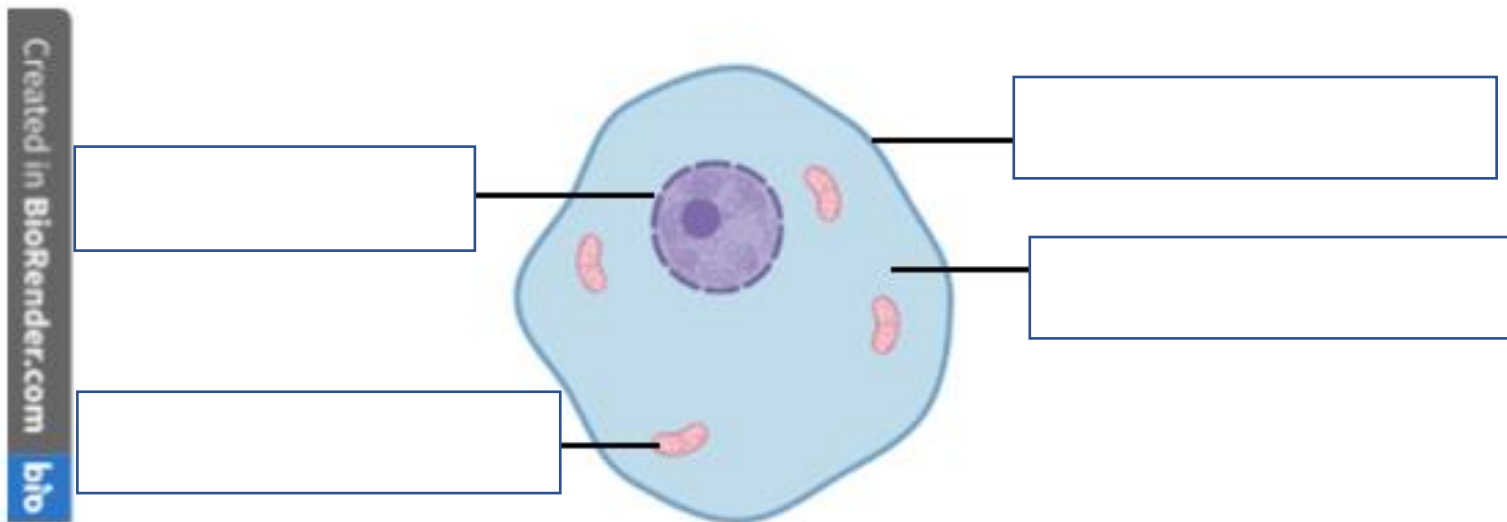
| Cell Part     | Description of function                                                      |
|---------------|------------------------------------------------------------------------------|
| Cell membrane | Controls the movement of substances (e.g. oxygen) into and out of the cell.  |
| Nucleus       | Contains the genetic material (DNA) and controls the activities of the cell. |
| Cytoplasm     | Gel-like substance where most chemical reactions take place inside the cell. |
| Mitochondrion | This is where reactions take place to release energy for the cell.           |

## Task 1 – Self-Quizzing

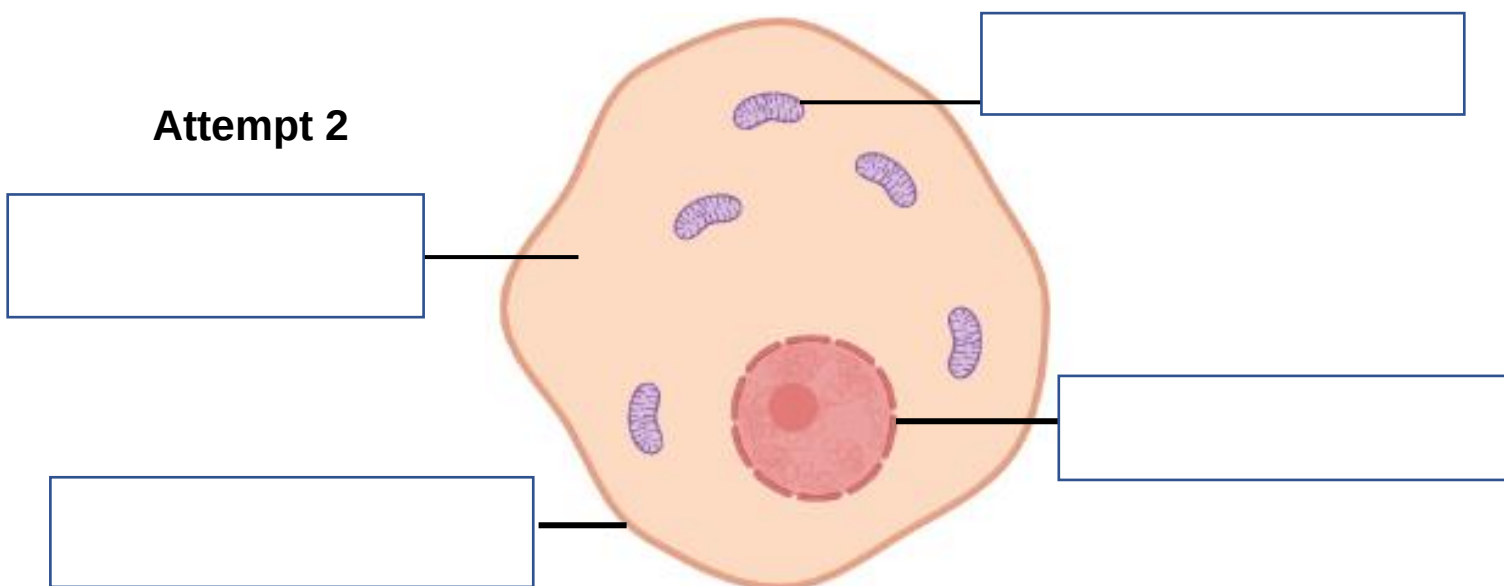
Recall as many parts of the cell you can by labelling the diagrams below. After attempt one, mark your work (in a different colour if possible) and fill in any gaps and/or correct any spelling errors using the knowledge organiser.

Try the second attempt, covering over your attempt one.

### Attempt 1



### Attempt 2



## Task 2: Complete the table to show the function of different cell parts

| Cell Part     | Description of function                                                   |
|---------------|---------------------------------------------------------------------------|
| Cell membrane | Controls the _____ of substances into and out of the cell.                |
| Nucleus       | Contains the genetic material (DNA) and _____ the activities of the cell. |
| Cytoplasm     | Gel-like substance where most _____ take place inside the cell.           |
| Mitochondria  | This is where reactions take place to release _____ for the cell.         |

**Score = \_\_\_\_\_/4**

## Task 3 – Multiple Choice Quiz

Complete the multiple-choice questions, then mark your answers using the knowledge organiser. Correct each incorrect response (in a different colour if possible). Record your score in the space below.

1. What is the function of the nucleus?

- a) Controls the movement of substances into and out of the cell.
- b) Controls the activities of the cell.
- c) Where reactions take place to release energy from glucose.

2. What is the function of the cell membrane?

- a) Where reactions take place to release energy from glucose.
- b) Controls the movement of substances into and out of the cell.
- c) Supports and strengthens the cell.

3. What is the function of the mitochondria?

- a) Controls the activities of the cell.
- b) Controls the movement of substances into and out of the cell.
- c) Where reactions take place to release energy from glucose.

4. What is the function of the cytoplasm?

- a) Where reactions take place to release energy from glucose.
- b) Where most of the chemical reactions take place.
- c) Controls the movement of substances into and out of the cell.

**Score = \_\_\_\_\_/4**