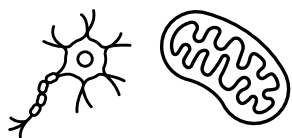


# Year 7 Cells and Organ Systems

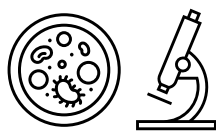


Start date:

Topic Sequence



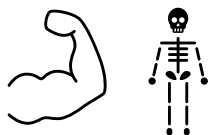
Cells and specialised cells



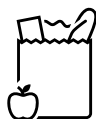
Viewing cells



Plant cells



Musculoskeletal system



Diet and Food



Digestive System

## Methods and Processes



How to use a microscope to get clear images.



Use new scientific words accurately



Understand the scale of size in Cell Biology



## Key Words

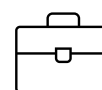
|                 |                 |              |                 |
|-----------------|-----------------|--------------|-----------------|
| Anus            | Chloroplast     | Microscope   | Rectum          |
| Ball and socket | Contract        | Mitochondria | Ribosome        |
| Benedict        | Cytoplasm       | Mouth        | Skeletal muscle |
| Biuret          | Enzymes         | Muscle       | Small intestine |
| Carbohydrate    | Fat             | Nucleus      | Smooth muscle   |
| Cardiac muscle  | Hinge           | Oesophagus   | Specialised     |
| Cell            | Iodine          | Organ        | Stomach         |
| Cell membrane   | Large intestine | Organ system | Tissue          |
| Cell wall       | Magnify         | Protein      | Vacuole         |



## Extra Support



## Further Reading



## Careers



## Reflection



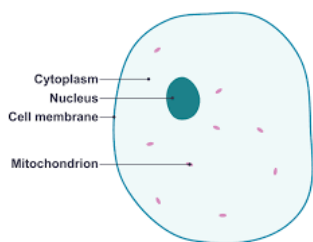
- 1) What's the most memorable thing you learnt during this unit?
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- 5) What will you do differently during the next unit?

# Year 7 Cells and Organ Systems

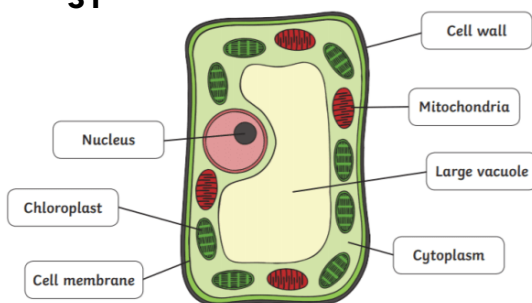
# Core Knowledge

|    |  |   |
|----|--|---|
| 1  | <b>What is MRS GREN?</b>                                       | An acronym to help us remember the things that all living things do.  |
| 2  | <b>What does MRS GREN stand for?</b>                           | Move, Respire (release energy), Sense their environment, Grow, Repair<br>Excrete waste products, take on Nutrients  |
| 3  | <b>What is meant by the hierarchy of living things.</b>        | Organelles make up cells, cells make up tissues, different tissues make up organs, different organs make up organ systems and different organ systems make up organisms.  |
| 4  | <b>What to animal cells contain?</b>                           | Cell membrane, cytoplasm, mitochondria, nucleus, ribosomes  |
| 5  | <b>What does each organelle do?</b>                            | Cell membrane - controls entry and exit to the cell<br>Nucleus - stores DNA - the cells instructions<br>Cytoplasm - place of chemical reactions<br>Mitochondria - releases energy<br>Ribosomes - makes new proteins |
| 6  | <b>Define a specialised cell</b>                               | Is a cell that has a specific structure that matches its function.  |
| 7  | <b>Describe a range of specialised animal cells.</b>           | Red blood cell - no nucleus so can store more oxygen<br>Sperm cell - has a tail so can move<br>Nerve cells - have a layer of fat on them to carry impulses faster.  |
| 8  | <b>Microscope</b>  | A piece of equipment used to see small objects at high magnification.   |
| 9  | <b>What do plant cells contain?</b>                            | Cell membrane, cytoplasm, mitochondria, nucleus, ribosomes, chloroplast, permanent vacuole, cell wall   |
| 10 | <b>What do the additional organelles do?</b>                   | Vacuole - stores cell sap<br>Chloroplast - site of photosynthesis<br>Cell wall - provides rigidity to stop cells bursting   |
| 11 | <b>Describe a root hair cell</b>                               | Found in the roots, have a large surface area to increase rate of water uptake into the plant.  |
| 12 | <b>Describe a palisade cell</b>                                | Large number of chloroplasts to increase rate of photosynthesis.  |
| 13 | <b>Describe a pollen grain</b>                                 | These are the equivalent of sperm cells in plants and depending on the plants reproductive strategy are adapted in different ways.  |
| 14 | <b>State the purpose of the musculoskeletal system</b>         | Movement and protection of key organs   |
| 15 | <b>Describe the three types of muscle</b>                      | Smooth muscle - internal tubes that can squeeze<br>Skeletal muscle - muscle that is attached to the skeleton to allow movement<br>Cardiac - muscle that is found in the heart                                       |
| 16 | <b>Describe the different types of joint in the bones</b>      | Ball and socket - found in shoulders and hips<br>Hinge - found in fingers, knees and elbows   |
| 17 | <b>Carbohydrates</b>   | Quick release energy source for mitochondria  |
| 18 | <b>Fats</b>  | Provides energy storage for the body and insulation   |
| 19 | <b>Proteins</b>  | Used to repair and build body tissues e.g. muscles  |
| 20 | <b>Vitamins and minerals</b>                                   | Needed in small amounts of chemical reactions in the body   |
| 21 | <b>Fibre</b>   | <i>Keeps food moving through digestive system</i>   |
| 22 | <b>Mouth</b>   | <i>Chews food and adds enzymes</i>  |
| 23 | <b>Oesophagus</b>  | <i>Squeezes food from mouth to stomach</i>  |
| 24 | <b>Stomach</b>   | <i>Churns food, adds enzymes</i>  |
| 25 | <b>Small intestine</b>   | <i>Adds enzymes, absorb soluble nutrients from food into blood</i>  |
| 26 | <b>Large intestine</b>   | <i>Removes water from left over material into blood</i>   |
| 27 | <b>Rectum</b>  | <i>Stores faeces until it is removed from the body</i>  |
| 28 | <b>Describe how food is broken down into soluble nutrients</b> | <i>Enzymes break down large insoluble molecules into small soluble ones that can move around the body.</i>  |
| 29 | <b>State what is meant by a deficiency</b>                     | <i>A lack of essential nutrients (as vitamins and minerals) in the diet resulting in disease.</i>   |

30



31



32

| Substance      | Test                                | Positive result                       |
|----------------|-------------------------------------|---------------------------------------|
| <b>Sugar</b>   | Add Benedict's solution and heat    | Turns from blue to red                |
| <b>Protein</b> | Add Biuret solution                 | Turns from blue to purple             |
| <b>Starch</b>  | add iodine solution                 | turns from orange to blue-black       |
| <b>Fats</b>    | Add ethanol, shake, add water shake | Turns from colourless to cloudy white |

# Year 7 Forces and Space



Start date:

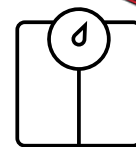
## Topic Sequence



Forces



Springs



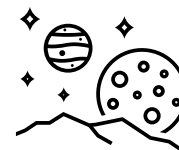
Weight and Mass



Speeds and Graphs



Moments



Space

## Methods and Processes



Use a range of measurement devices accurately.



Describe changes in magnitude scientifically.



Read and interpret graphs  
Use equations to calculate unknowns



## Key Words

Accelerate  
Astronomical Unit  
Atmosphere  
Contact  
Decelerate  
Distance  
Elastic  
Energy  
Extension  
Force  
Friction  
Galaxy

Gravity  
Lubrication  
Mass  
Metres  
Metres per Second  
Moment  
Moon  
Newtonmeter  
Non-contact  
Orbit  
Pivot  
Plastic

Plateau  
Proportional  
Reaction  
Resistance  
Resultant  
Revolution  
Satellite  
Season  
Seconds  
Shallow  
Solar  
Speed

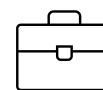
Star  
Stationary  
Steep  
Temperature  
Tension  
Thermal  
Time  
Unit  
Universe  
Upthrust  
Weather  
Weight



## Extra Support



## Further Reading



## Careers



## Reflection

- 1) What's the most memorable thing you learnt during this unit?
- 2) What was your favourite topic in this unit?
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# Year 7 Forces and Space Core Knowledge

|    |  |  |
|----|--|--|
| 1  | Which Force acts towards the centre of the planet?                 | Weight   |
| 2  | Which forces acts opposes movement                                 | Friction   |
| 3  | What are contact and non-contact forces?                           | Contact forces have interacting surfaces. Non-contact forces attract or repel from a distance. |
| 4  | Which unit are forces measured in?                                 | Newtons  |
| 5  | What is the impact of balanced forces?                             | Being stationary or moving with a constant speed   |
| 6  | What is the impact of unbalanced forces?                           | Accelerating, Decelerating or changing shape   |
| 7  | Independent variable   | Is the cause. The variable that is altered during a scientific experiment.                     |
| 8  | Dependent variable   | Is the effect. The variable being tested or measured during a scientific experiment            |
| 9  | Control variable   | A variable that is kept the same during a scientific experiment.                               |
| 10 | How does a graph show direct proportionality?                      | Constant steepness, through (0,0)  |
| 11 | What word describes a graph flattening?                            | Plateaus   |
| 12 | What does elastic mean?  | An object that can be stretched and return to its original size and shape.                     |
| 13 | What is the opposite of elastic?                                   | Plastic  |
| 14 | How is energy stored in a stretched spring?                        | Elastic potential energy   |
| 15 | What is friction?  | A force which opposes motion   |
| 16 | How do we reduce friction?   | Lubrication  |
| 17 | What are helpful uses of friction?                                 | Car brakes, preventing slipping  |
| 18 | What is air resistance?  | A contact force which opposes motion   |
| 19 | Who "discovered" the force of gravity                              | Isaac Newton   |
| 20 | What is Gravitational Field Strength (g) on Earth?                 | 10 N/kg (9.81 N/kg at GCSE)  |
| 21 | Is gravity the same strength everywhere?                           | g is different on each planet  |
| 22 | How is mass different to weight?                                   | Weight is a force of how strong a mass is pulled towards an object.                            |
| 23 | What is the speed equation?  | Speed = Distance / Time  |
| 24 | What are the scientific units of speed?                            | m/s  |
| 25 | What is plotted on each axis?                                      | Distance on the y axis and time on the x axis  |
| 26 | What does a steep line indicate?                                   | A greater speed  |
| 27 | What does a shallow line indicate?                                 | A smaller speed  |
| 28 | What is the moments equation?                                      | Moment = Force x Distance  |
| 29 | What happens when moments are not balanced?                        | Rotation around a pivot  |
| 30 | State the order of size of objects in the universe.                | Planet → Star → Solar System → Galaxy → Universe   |
| 31 | Name the planets of our Solar System                               | Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune                                  |
| 32 | How does temperature change will increasing distance from the Sun? | Temperature decreases as distance increases (except for Venus which is anomalous)              |
| 33 | What is a moon?  | A moon is a natural satellite of a planet  |
| 34 | Why are some planets not suitable for life?                        | They do not have the correct conditions  |
| 35 | Where are the elements that made the planets from?                 | The elements that make planets are made in stars   |
| 36 | What are the four seasons?   | Winter, Spring, Summer, Autumn   |
| 37 | What causes Summer?  | The Earth is tilted towards the Sun, there are more hours of sunlight each day.                |
| 38 | What causes Winter?  | The Earth is tilted away from the Sun, there are fewer hours of sunlight each day.             |
| 39 | What is one day on Earth?  | It is the time taken for the Earth to spin once on its axis.                                   |
| 40 | What is one year on Earth?   | It is the time taken for the Earth to orbit the sun once.                                      |

# Year 7 Particulate Model of Matter

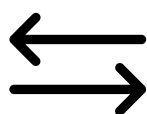


Start date:

## Topic Sequence



States of matter



Changing states



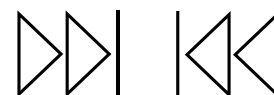
Dissolving



Density



Diffusion



Pressure

## Methods and Processes



Take measurements accurately using scientific equipment.



Describe physical properties using precise language.



Use equations to calculate unknown variables.



## Key Words

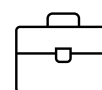
|               |           |                     |             |
|---------------|-----------|---------------------|-------------|
| Boiling       | Equation  | Liquid              | Purity      |
| Brownian      | Evaporate | Mass                | Random      |
| Collisions    | Flow      | Melt                | Solid       |
| Compress      | Fluid     | Model               | Temperature |
| Concentration | Freeze    | Motion              | Thermometer |
| Condense      | Gas       | Particles           | Vibrate     |
| Density       | Heat      | Pressure            | Volume      |
| Dissolve      | Insoluble | Physical properties |             |



## Extra Support



## Further Reading



## Careers



## Reflection



- 1) What's the most memorable thing you learnt during this unit?
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|    |  |  |
|----|--|--|
| 1  | What equipment is used to measure temperature?                       | <i>Thermometer</i>   |
| 2  | What impacts the temperature of an object?                           | <i>The amount of heat energy there is, and the number of particles present</i>           |
| 3  | State the unit of temperature  | <i>° Celsius</i>   |
| 4  | Physical properties of a solid                                       | <i>Has a definite shape and volume</i>   |
| 5  | Physical properties of a liquid                                      | <i>Has a definite volume, takes shape of a container</i>                                 |
| 6  | Physical properties of a gas   | <i>Has no fixed shape, will fill any given volume.</i>                                   |
| 7  | State how particles move in a solid                                  | <i>Vibrate</i>   |
| 8  | State how particles move in a liquid                                 | <i>Slide over each other</i>   |
| 9  | State how particles move in a gas                                    | <i>Quickly and randomly</i>  |
| 10 | What holds the particles together in solids?                         | <i>Forces</i>  |
| 11 | Name the transfer from solid to liquid                               | <i>Melting</i>   |
| 12 | Name the transfer from liquid to gas                                 | <i>Boiling</i>   |
| 13 | Name the transfer from gas to liquid                                 | <i>Condensation</i>  |
| 14 | Name the transfer from liquid to solid                               | <i>Freezing</i>  |
| 15 | What is the boiling point of water?                                  | <i>100°C</i>   |
| 16 | What is the melting point of water?                                  | <i>0°C</i>   |
| 17 | What is meant by boiling point?                                      | <i>The temperature at which a liquid turns into a gas or vice versa</i>                  |
| 18 | What is meant by melting point?                                      | <i>The temperature at which a solid turns into a liquid or vice versa</i>                |
| 19 | What happens to particle arrangement during dissolving?              | <i>When multiple substances are mixed and particles are spread evenly throughout.</i>    |
| 20 | How is total mass affected by dissolving?                            | <i>Mass is conserved (stays the same)</i>  |
| 21 | What property means something can dissolve?                          | <i>soluble</i>   |
| 22 | What property means something can not dissolve?                      | <i>insoluble</i>   |
| 23 | How is boiling point affected by purity?                             | <i>Pure substances have different boiling points to impure ones.</i>                     |
| 24 | Volume equation for a regular object                                 | <i>Volume = height x length x width</i>  |
| 25 | Density equation   | <i>Density = mass / volume</i>   |
| 26 | What is meant by density?  | <i>A measure of compactness and ratio of mass to volume</i>                              |
| 27 | State what happens to density as a fluid is heated.                  | <i>It decreases</i>  |
| 28 | State what happens to density as a fluid is cooled.                  | <i>It increases</i>  |
| 29 | How do fluids with different densities interact?                     | <i>Less dense fluids float on more dense fluids</i>                                      |
| 30 | What happens to particles during expansion?                          | <i>Particles vibrate more so move further apart</i>                                      |
| 31 | What happens to particles during contraction?                        | <i>Particles vibrate less so move closer together</i>                                    |
| 32 | What is meant by Brownian motion?                                    | <i>Random movement of particles in a fluid</i>   |
| 33 | In which states does Brownian motion occur?                          | <i>Liquids and gases</i>   |
| 34 | What is meant by a fluid?  | <i>A liquid or a gas</i>   |
| 35 | What is diffusion?   | <i>The random movement of particles from a high concentration to a low concentration</i> |
| 36 | In which state gas diffusion NOT happen?                             | <i>Solid</i>   |
| 37 | How can the rate of diffusion be increased?                          | <i>Higher temperatures, (higher surface area)</i>  |
| 38 | What is meant by pressure?   | <i>The force exerted over an area</i>  |
| 39 | What causes pressure in a fluid?                                     | <i>Particles hitting the surface of the container</i>                                    |
| 40 | How does pressure change with depth in a fluid?                      | <i>Pressure increases with depth</i>   |
| 41 | Why does pressure in a fluid increases with depth?                   | <i>Increased weight of fluid above</i>   |
| 42 | What causes pressure in a fluid?                                     | <i>Particles hitting the surface of the container</i>                                    |
| 43 | How does pressure of a fluid change with an increase in temperature? | <i>It increases</i>  |
| 44 | Why does pressure of a fluid change with an increase temperature?    | <i>More particle movement, so more collisions with container, so more pressure</i>       |

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