# Human Biology Year 1 Plans

Hello Everyone! Welcome to Year 1 of Human Biology. This is a two year course and you can join us at any time! This shows what we will be covering this year.

You may see topics appearing more than once, this is to give us chance to revise as we go through and spend some extra time on those more tricky topics. The practical experiments are entirely optional but a lot of fun so join in with any that you can, but don't worry if you cant as I will demo everything and there will be alternative tasks to complete in the lessons.

The after lesson questions are designed to consolidate and extend your learning or give you something to research, but also give you something to write down from the lesson so that you don't have to worry during the lesson. It is of course up to you if you take notes during the lesson or not and please feel free to take screen shots to look at again.

I hope you enjoy learning about Human Biology as much as I enjoy teaching it! See you in lesson!

*Emma*

| Year | Week | Week Beginning Date | Topic | Spec point | What you need | After lesson question |
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| 1 | 1 | 8th Sept | Looking at Cells | 1.1 | Magnifying glass of a camera or phone with zoom, some objects of different materials or fruits/vegetables, paper and pencil. | Why do we need electron microscopes to study certain structures? |
| 1 | 2 | 15th Sept | The Nucleus and Chromosomes | 1.2 | Play dough of different colours, string or wool, scissors, a tray or chopping board. | Why are chromosomes so important in heredity? |
| 1 | 3 | 22nd Sept | The Cell Membrane | 1.2 | A sponge, cling film or ziplock bag, small needle or skewer, water and food colouring, rice or small beads. | Why must membranes be selectively permeable? |

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| 1 | 4 | 29th Sept | Mitochondria – Powerhouse of the Cell | 1.2 | Calculator , paper, somewhere to do some exercises. | Why do muscle cells have many mitochondria? |
| 1 | 5 | 6th Oct | Endoplasmic Reticulum & Ribosomes | 1.2 | Couloured pens, paper and scissors. You could also use coloured beads or counters (you will need at least 5 different colours) | How does protein synthesis resemble a factory? Explain what happens in each part of the cell. |
| 1 | 6 | 13th Oct | DNA Double Helix | 1.3 | 4 different sweets or fruit pieces, cocktail sticks, strawberry laces (optional) | How does base-pairing ensure accurate DNA copying? |
| 1 | 7 | 20th Oct | DNA Replication | 1.4 | Lego, counters, beads or coloured squares from week 5. | Why is DNA polymerase needed in replication? |
| 1 | 8 | 27th Oct | Genes & Proteins | 1.5 | Nothing specific | How does DNA code become a protein? |
| 1 | 9 | 3rd Nov | RNA – The Messenger | 1.6 | Nothing specific | Why can't DNA leave the nucleus? |
| 1 | 10 | 10th Nov | Mutations | 1.7 | A simple, very short magazine or newspaper article or story that you can cut up (a simple children's one will be best or you can write some simple sentences out), paper, pen, scissors. | How can a single mutation change phenotype? |
| 1 | 11 | 17th Nov | Protein Synthesis – Transcription | 1.8 | Nothing specific | Why is transcription essential? |
| 1 | 12 | 24th Nov | Protein Synthesis – Translation | 1.8 | Nothing specific | Why does translation require tRNA? |
| 1 | 13 | 1st Dec | Genetic Engineering – Insulin | 1.9 | Pens, paper, ruler and colours. | How has GM insulin changed diabetes care? |
| 1 | 14 | 8th Dec | Genetic Engineering – Crops | 1.9 | Nothing specific | Should we use GM crops to solve malnutrition? |
| 1 | 15 | 15th Dec | Why Cells Divide | 1.10 | For a bit of fun download a free stop motion app on a phone or tablet (can be one where you take photos or draw digitally), | Why do cells divide by mitosis? |

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| | | | | | coloured pens, paper, scissors, craft items, lego… | |
| 1 | | 22nd Dec HOLIDAY | | | | |
| 1 | | 29th Dec HOLIDAY | | | | |
| 1 | 16 | 5th Jan | Stages of Mitosis | 1.11 | String or wool, marker pen and big paper, glue, scissors. | Why must chromosomes duplicate before mitosis? |
| 1 | 17 | 12th Jan | Stem Cells | 1.12 | | Why are stem cells so powerful? |
| 1 | 18 | 19th Jan | Stem Cell Ethics | 1.13 | Nothing specific | Should all stem cell research be allowed? |
| 1 | 19 | 26th Jan | Cells to Organs | 1.14 | Paper and coloured pens | Why do multicellular organisms need tissue organisation? |
| 1 | 20 | 2nd Feb | Types of Tissues | 1.15 | Nothing specific | Why are tissues specialised for their roles? |
| 1 | 21 | 9th Feb | Reproductive Cells | 1.16 | Nothing specific | How do their structures suit their function? |
| 1 | 22 | 16th Feb | Elements in Biomolecules | 2.1 | paper, coloured pens, scissors, tape or glue and string | Why do proteins need nitrogen but carbs don't? |
| 1 | 23 | 23rd Feb | Structure of Carbs, Proteins, Lipids | 2.2 | Nothing specific | How are big molecules built from small ones? What type of bonds to the different molecules contain? |
| 1 | 24 | 2nd March | Food Tests: Glucose | 2.3 | Nothing specific | Why does glucose turn Benedict's solution orange? |
| 1 | 25 | 9th March | Food Tests: Starch | 2.3 | Iodine and food samples (if you can, don't worry if not, I will demo) | Why does iodine turn blue-black? |
| 1 | 26 | 16th March | Food Tests: Protein | 2.3 | Nothing specific | Why does Biuret turn purple with protein? Describe how to carry out the biuret test for protein |

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| 1 | 27 | 23rd March | Food Tests: Lipids | 2.3 | hand sanitiser or rubbing alcohol, oil or grease, water, washing up liquid, small jars with lids or test tubes with lids/bungs. | Why does fat form a cloudy layer? |
| 1 | | 30th March HOLIDAY | | | | |
| 1 | | 6th April HOLIDAY | | | | |
| 1 | 28 | 13th April | Vitamin C Practical | 2.3 | Iodine if you have it from week 25, starch solution (potato water should work), lemon, lime and orange juice, small glasses or test tubes, white paper. | Which fruits have the most vitamin C? |
| 1 | 29 | 20th April | Energy in Food | 2.4 | dry food samples such as crisps, pasta, bread… heat proof board or tile, long lighter or matches, timer. (Adult permission and supervision required. This should only be carried out in a safe environment such as the kitchen or outside). | Why does fat release more energy than carbs? |
| 1 | 30 | 27th April | Enzymes as Catalysts | 2.5 | Nothing specific | Why are enzymes essential in cells? |
| 1 | 31 | 4th May | Enzyme Action | 2.6 | Paper or card and scissors, coloured pens. | Why does enzyme shape matter? |
| 1 | 32 | 11th May | Enzymes & Temperature | 2.7 | Nothing specific | Why does high heat stop enzyme action? |
| 1 | 33 | 18th May | Enzymes & pH | 2.7 | Nothing specific | Why does pH affect enzymes? |
| 1 | 34 | 25th May | Enzyme Concentration | 2.7 | Nothing specific | Why does more substrate increase enzyme action (up to a point)? |

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| 1 | 35 | 1st June | Immobilised Enzymes | 2.7 | Tapioca pearls (uncooked)<br>Yeast (as your "enzyme" substitute)<br>Sugar solution (glucose or sucrose)<br>Warm water<br>Clear cups or jars | Why are immobilised enzymes useful in industry? |
| 1 | 36 | 8th June | Diffusion | 2.9, 2.10 | food colouring and water of different temperatures | Why is diffusion faster in hot water? |
| 1 | 37 | 15th June | Osmosis | 3.1 | jelly babies and water | Why does potato gain/lose mass? |
| 1 | 38 | 22nd June | Active Transport | 3.1, 3.2 | Nothing specific | Why does active transport need energy? |
| 1 | 39 | 29th June | Movement Factors | 3.1, 3.2 | Nothing specific | Why does temperature affect rate of movement? |
| 1 | 40 | 6th July | Skeleton Overview | 3.3 | Paper, scissors | Why does the skeleton need two main parts? |
| 1 | 41 | 13th July | Long Bone Structure | 4.1 | Honeycomb pieces, jam and/or nutella, hard biscuits or wafer, cooked pancake (might need to warm it to make it flexible)- feel free to substitute for savoury options like cheese, peanut butter, butter, bread or crackers, you could do fruit options too using a crunchy fruit like apple, a soft fruit like banana that can be cut into strips and jam, berries etc... a plate, knife and spoon to eat it! | Why do long bones need spongy and compact areas? |
| 1 | | 20th July HOLIDAY | | | | |