

# **KS3 mini projects**

# Cells

Watch this video: <https://www.youtube.com/watch?v=v2lHztS4sMU&t=7s>

Task	Description
1	Make a poster to show a Animal cell, Label the parts and explain the function
2	Make a poster to show a Plant cell, Label the parts and explain the function.
3	Visit the website <a href="http://cellsalive.com">cellsalive.com</a>
4	Explain the difference between a plant cell and a Animal cell
5	Pick an organ in the body and explain its structure and function
6	Make a model of a specialised cell - Sperm cell, nerve cell, red blood cell
7	Define these key words - Nucleus, Cytoplasm, Cell membrane, tissue, organ, Specialised.
8	Make a mind map of the whole cells topic - include animal cells, plant cells, specialised cells.

# Interdependence

Watch an episode of your choice: <https://www.bbc.co.uk/iplayer/episodes/p07dzjwl/seven-worlds-one-planet>

Task	Description
1	Classification: Make a leaflet on vertebrates and invertebrates for the Year 6s when they visit the school
2	Habitats: Think of a habitat – or find one in your garden – describe the environmental conditions
3	Adaptations: Find a picture of an animal and label its adaptations for survival in it's habitat
4	Competition: Write 20 questions for a quiz on this topic
5	Predator/Prey: Design the ultimate predator – label its adaptations and explain its ideal environment
6	Food chains and webs: Create a mind map on this area
7	Pyramids: Use BBC bitesize to do revision for this topic so far: <a href="#">Food chains and webs</a> , complete the revision, have a go at the activity then complete the test.
8	Research: Research how does a predator affect food chains. And bring your information ready for next

# Variation

Watch this video: <https://www.youtube.com/watch?v=sNU30T2EmQ8>

Task	Description
1	Create a family tree for your family looking at one inherited characteristic for example noting down the eye colours of each member next to their name.
2	Explain how sexual reproduction promotes variation.
3	Research the reasons why variation is beneficial within a species
4	Define the following key words (in terms of biology): variation, inherited, characteristics, classification, adaptations, habitat, species
5	Make a poster showing the different types of variation (inherited and environmental characteristics) with examples for each.
6	Choose two closely related species that live in two very different environments. Compare and contrast the variations between these species.
7	Research the classification system we use to classify living organisms today. Create a short project about its history and how the species are grouped. Evaluate this system of classification.
8	Make a game based on this topic that could be used as a revision activity for year 7 pupils preparing for their assessment.

# Digestion

Watch this video: <https://www.youtube.com/watch?v=irdT9Av6ZPk>

Task	Description
1	Read through this website: <a href="#">10 tips for a healthy diet</a> Make your own leaflet saying advertising why we should eat healthily
2	Create a comic strip showing how food goes through the body.
3	Find the chemical formula for Glucose
4	How can obesity affect a person's life? Create a poster advertising the dangers of obesity
5	Write a newspaper article about the starvation of people in 3 <sup>rd</sup> World under developed countries. You must include research and the science of what can happen if you are malnourished.
6	Draw and label a diagram of the digestive system- label all the parts and explain their jobs
7	What are the 78 food groups and what are they used for?
8	What does the word malnourished mean?

# Respiration

Watch this video: <https://www.youtube.com/watch?v=CjLzQNtKnN8>

Task	Description
1	Write down the word and symbol equation for respiration
2	Explain how we get glucose into our body and into our cells
3	Write a paragraph explaining the importance of the circulatory system in respiration
4	Watch this advert: <a href="#">Every cigarette is doing you damage</a> Design a TV advert about the effects of smoking- this can be done on power point, prezzi or as a board by board sketch with descriptions as to what is happening
5	Research the short term and long term effects of exercise on your respiratory system
6	Draw and label a scientific diagram of the heart and lungs. High extension: Explain the concept of gaseous exchange
7	Plan an investigation to show how your pulse rate changes with exercise. You must include: <ul style="list-style-type: none"><li>• Independent Variable (What you change)</li><li>• Dependent Variable (What you measure)</li><li>• What will you keep the same</li><li>• Method for your investigation</li><li>• Prediction of what you think will happen in your experiment</li></ul>
8	Watch the series of videos: <a href="#">Miracle of respiration 1</a> <a href="#">Miracle of respiration 2</a> <a href="#">Miracle of respiration 3</a> <a href="#">Miracle of respiration 4</a> <a href="#">Miracle of respiration 5</a> <a href="#">Miracle of respiration 6</a> <a href="#">Miracle of respiration 7</a>

# Particles

Watch this video: <https://www.youtube.com/watch?v=frFFoiXwqww>

Task	Description
1	Create a decorative cover sheet for your project using pictures and as many keywords from the topic as possible.
2	Write up at least 3 of the practical activities your group carried out describing what you saw, (or any smells you noticed). Add conclusions to say what you think your results tell you. Include the states of matter, solids, liquids and gases in your work.
3	Draw labelled particle diagrams for a solid, liquid and a gas. Write definitions, either dictionary or in your own words, for the following: solid, liquid, gas, matter, and particle.
4	Produce a leaflet detailing how a hot air balloon works. Include a labelled diagram, and explain your answer using the particle theory.
5	Using graph paper, plot your results to show how the temperature changes with time. This should be a line graph. Label the axes, including the units, and give your work a title, (underlined). Don't forget to use a ruler and pencil.
6	There are substances like jelly, ice cream, custard and paint that seem to be both liquid and solid. Make a table for jelly showing what properties it has as a solid and what as a liquid. You need to think about size, (volume) and shape.
7	Draw and explain the practical carried out in class mixing water with alcohol, label diagrams clearly. Your explanation should include where the particles move to and why the volume of the mixture is less than the volume of the 2 liquids added together.
8	Produce a cartoon strip to show how making a cup of tea illustrates diffusion with the teabag and dissolving with the sugar cube. You may do this as one or 2 cartoon strips.

# Acids and Alkalis

Watch this video: [https://www.youtube.com/watch?v=63IG\\_6JmCes](https://www.youtube.com/watch?v=63IG_6JmCes)

Task	Description
1	Create a decorative cover sheet for your project using pictures and as many keywords from the topic as possible.
2	Draw or print the hazard symbols and describe each one, what it means and say how to deal with a spillage of acid in the lab
3	Name some indicators and say what colour change occurs when it is mixed with acid and alkalis
4	Write down the method for making your own indicator with a fully labelled diagram
5	Draw or print the pH scale and label each pH section with strong and weak, acids and alkalis and label the neutral pH value.
6	Write a story on how acids neutralise alkalis, include the steps and the apparatus used in the process
7	Find out how stomach tablets are used to cure indigestion using the key words for this topic
8	Research the neutralisation of acids and alkalis, write down the method and list the apparatus. Write down the word and symbol equations for the neutralisation of some acids and alkalis

# Separating mixtures

Watch this video: <https://www.youtube.com/watch?v=XC1RxloV0Mo>

Task	Description
1	Create a decorative cover sheet for your project using pictures and as many keywords from the topic as possible.
2	Write a definition for an insoluble substance and soluble substance, and give two examples of each.
3	Draw or print off a diagram of a separating mixture of rock and water and label each part of the apparatus. After that, write a paragraph explaining filtration.
4	Draw or print off a diagram of a separating mixture of salt and water and label each part of the apparatus. After that, write a paragraph explaining evaporation.
5	Produce a leaflet detailing the process of dissolving salt in water using a diagram to show the particles of salt and water, and label the diagram.
6	Write a story to show how to use distillation to separate a mixture of ink and water. Include a diagram for the distillation and label it.
7	Write the method for separating dyes using chromatography. Research the uses of chromatography.
8	<p>*High level <b>EXTENSION</b> task:</p> <p>Draw a poster that explains what happens to the sugar that is put in a cup of tea. Make sure you use the keywords correctly. Try to describe and explain melting using particle theory.</p>

# Chemical reactions

Watch this video: <https://www.youtube.com/watch?v=5iowJs6MryI>

Task	Description
1	<b>Explain why</b> a) Baking a cake is a <u>chemical change</u> b) Melting ice is a <u>physical change</u>
2	a) Write <b>word equations</b> for when each of the following <u>react with sulphuric acid</u> ( ) I. Copper II. Zinc III. Iron IV. Magnesium b) Then write out all the word equations using <b>symbols</b>
3	Use the internet or text books, to produce a <b>poster</b> on A4 paper, on “ <b>The Uses of</b> ” (carbon dioxide)
4	Create a table showing the differences between chemical changes and physical changes. Think of a practical example of each. You must write a detailed method for each example.
5	Prepare a “ <b>Fire Safety</b> “ brochure
6	Go to <a href="#">The Environment</a> and <u>read</u> up on <b>fossil fuels</b> . <b>Make a summary to show what they are and how they are used. Include what are the problems with using fossil fuels.</b>

# Atoms and Elements

Watch this video: <https://www.youtube.com/watch?v=nxRGahK7B48>

Task	Description
1	Create a decorative cover sheet for your project using pictures and as many keywords from the topic as possible.
2	Draw or print a table to show the similarities and the differences between man-made and natural materials, also include three examples for each
3	Produce a leaflet to show a diagram of atoms of an element such as iron or zinc
4	Draw or print the periodic table and label the sections of metals and the non-metals .Label and name the groups of the periodic table
5	Draw or print a table for ten metal elements with their symbols and ten non-metal elements with their symbols
6	Find the definition of a compound and write down he names of three compounds and state the difference between a compound and a mixture
7	Draw a poster to show the difference between chemical and physical changes. Include an example for each. State how to identify a chemical change.
8	Name different compounds and molecules and list the rules for naming compounds with examples for each.

# Heating and cooling

Watch this video: <https://www.youtube.com/watch?v=UCFgM1GkTyM>

Task	Description
1	Make a poster (A4) of your model of heat flow that you discussed in class.
2	Write definitions, either dictionary or in your own words, for the following: solid, liquid, gas, state of matter, particle, conduction, convection, radiation, insulator and conductor.
3	Draw labelled particle diagrams for a solid, liquid and a gas at normal temperatures. Repeat but showing how they change when heated up. For each, explain whether the process is conduction, convection and / or radiation.
4	Complete sheet 8lc2m "The Conduction of Heat"
5	Produce a leaflet detailing how a hot air balloon works. Include a labelled diagram, and explain your answer using the appropriate transfer of energy.
6	Draw a graph to show temperature changes with time as ice is heated. This should be a line graph. Label the axes, including the units, and give your work a title, (underlined). Don't forget to use a ruler and pencil. Mark parts of the graph where the ice is a solid, liquid and gas and explain what is happening when the graph levels out at 2 stages.
7	<p>Saving energy at home: Think about ways that energy is used and wasted in your house. Draw your house and show where heat is lost, for example, through the windows and doors.</p> <p>Say whether the heat is being lost by conduction, convection, and / or radiation. Make suggestions as to how you could stop heat escaping and so reduce the household bills.</p>
8	<p>Explain why</p> <ul style="list-style-type: none"><li>• Food cooks faster at the top of an oven</li><li>• Fire-fighters enter smoke-filled rooms by crawling</li><li>• Houses in hot countries are often white.</li><li>• There is shiny metal behind the bar of an electric fire.</li></ul>

# Electricity

Watch this video: <https://www.youtube.com/watch?v=KYKVf6edvcA>

Task	Description
1	Draw and label 10 components (symbols) of a circuit
2	Draw a series circuit and explain the current around the circuit
3	Draw a parallel circuit and explain the current around the circuit
4	Design a poster on electrical safety in the home. You must include a slogan and at least 5 different ways to stay electrically safe!
5	Find out what voltage is
6	Watch the video on Electricity and write your own summary <a href="#">Electricity</a>
7	Make a board game or card game on energy resources or make a model island with a number of renewable energy resources on it.
8	Generate a glossary of the keywords from this topic. A glossary is a detailed list of keywords and their meanings or descriptions.

# Energy

Watch this video: <https://www.youtube.com/watch?v=nbXXFtF8Lzs>

<https://www.youtube.com/watch?v=z -BPpmFet8>

Task	Description
1	Draw energy transfer diagrams of 5 household items, label fully.
2	Define stored (potential) energy and give examples.
3	Make a table of what you eat in a day, include how many calories each food contains and how many calories you have eaten in total for one day. (May need to look up on internet or on food labels.)
4	Make a table of how many calories different people are recommended to eat each day eg toddlers, teenagers (boys/girls), man/woman, pregnant woman, an older person.
5	Draw diagram(s) of how fossil fuels were made. Label fully.
6	Write a newspaper article on “are fossil fuels contributing to global warming?”
7	Make a board game or card game on energy resources or make a model island with a number of renewable energy resources on it.
8	Watch the bbc website on solar furnaces, <a href="http://news.bbc.co.uk/1/hi/sci/tech/6616651.stm">http://news.bbc.co.uk/1/hi/sci/tech/6616651.stm</a>
9	Generate a glossary of the keywords from this topic. A glossary is a detailed list of keywords and their meanings or descriptions.

# Forces and pressure

Watch this video: <https://www.youtube.com/watch?v=IJWEtCRWGvI>

<https://www.youtube.com/watch?v=zILpKzPz84Q>

Task	Description
1	List all the forces that you have used in one day and where/ when you used them
2	Create a poster on Friction
3	Explain the difference between Mass and Weight
4	Create a poster showing the difference in Gravity between the Moon and Jupiter. Consider what is the gravity on the moon and Jupiter?, what is the effect of the change in gravity?
5	Find out what resultant force is
6	Design a high speed race car- you must include how to limit the air resistance and streamline the car. You must add labels and explanations for your design.
7	What is Upthrust? Where might it be used?
8	Watch this video: <a href="#">Collapsing Can</a> Write a paragraph explaining the science behind this experiment

# The universe

Watch this video: <https://www.youtube.com/watch?v=Qd6nLM2QIWw>

Task	Description
1	Write 2 paragraphs describing and explaining the differences between day and night.
2	Research what a Luna and Solar eclipse is.
3	Produce a leaflet detailing the changes in the seasons and relating it to the tilt or axis of the Earth.
4	Watch the Video on Black Holes and write a paragraph about what you like or dislike Video Link: <a href="#">Sam Neill- Black Holes</a>
5	Find a list of well known Constellations
6	Design your own Alien and write all the adaptations as to why it survives on your planet.
7	Compare to planets of your choice in a table. You must compare: <ul style="list-style-type: none"><li>• Length of a day</li><li>• Length of a year</li><li>• Temperature</li><li>• Atmosphere</li><li>• Can we survive on it? Why?</li></ul>
8	Create a poster on the order of the planets- find facts about each planets.
9	Research the Apollo 13 mission. You must outline: What was their mission? What went wrong? Why did it go wrong? What did they learn from it? What did they hope to achieve?

# Light

Watch this video: <https://www.youtube.com/watch?v=hjKme3ci8W0>

Task	Description
1	Explain: <ul style="list-style-type: none"><li>• How do we see things?</li><li>• The formation of shadows</li><li>• Draw a diagram of a pinhole camera and explain how pinhole cameras suggest that light travels in straight lines.</li></ul>
2	Define 'reflection' and explain in your own words how the periscope could help you see over a wall.
3	Refraction and dispersion effects: Write all the factors that affects the way light travels through different Materials.
4	Plants need light to make food. What would happen if you tried to grow plants under green light? Explain your answer using the words absorb, transmit and reflect.
5	How is sound made and how does it travel?
6	Mary's parents are thinking about confiscating her drum kit. What could Mary do to stop the noise leaving her room? Use words reflect, transmit, absorb and energy in your answers.
7	Make a glossary of the keywords from this topic. A glossary is a detailed list of keywords and their meanings or descriptions.

# Sound

Watch this video: <https://www.youtube.com/watch?v=aWieHpsZ7ik>

Task	Description
1	Write a simple description of how sound is made
2	Write a description and draw a picture examples of musical instruments labelled appropriately stating how sound travels
3	Research the uses of sound in medical practice
4	Research the uses of sound in Marine studies
5	Watch the 2 minute video and write down what happens <a href="#">Bell Jar experiment</a>
6	Find a diagram of the ear- label it and explain what happens at each part, bring this in and stick it in your book
7	Create a revision poster on everything you know about sound and hearing.

# Magnetism

Watch this video: <https://www.youtube.com/watch?v=zKUetTDGNoM>

Task	Description
1	Research the discoveries of William Gilbert on Magnetism.
2	<ul style="list-style-type: none"><li>• Sometime a person is described as having a 'magnetic personality'. What does this mean?</li><li>• Some times two people are described as having ideas that are 'poles apart'. What does this mean?</li></ul>
3	How does a compass work?
4	Write a paragraph containing some information about magnets and magnetism. Also write a sentence to summarise which metals are magnetic and which are not.
5	Some modern cars are made of Aluminium. What problems will this cause for scrap yard owners? Explain why?
6	Not all the magnets are shaped like a bar. Think of a horseshoe-shaped (u-shaped) magnet. Design an experiment to find out the size and shape of the magnetic field around it.
7	<ul style="list-style-type: none"><li>• What is the difference between a permanent magnet and a temporary magnet?</li><li>• How can we make an electromagnet?</li><li>• How an electric bell works?</li></ul>