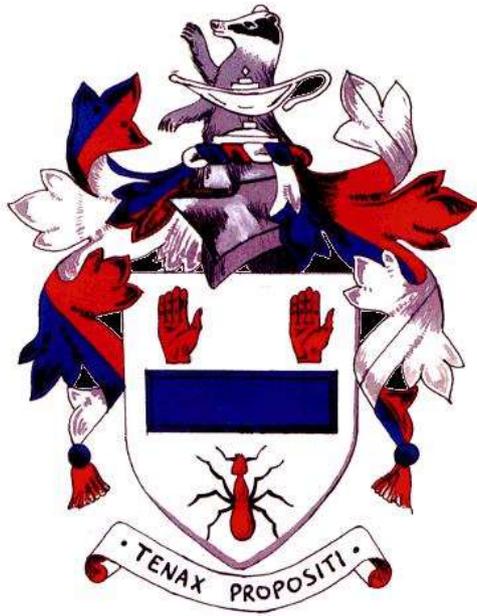


# Year 9 Science



## Summer Exam Revision Checklist

**Note - These are the learning outcomes from your pupil booklet. There is no need to print this entire document.**

**Your Year 9 exam will be 80 minutes long. You will need to remember...**

**2 Pens**

**Pencil, rubber and sharpener**

**30cm Ruler**

**Calculator**

**Protractor**



## Topic 1: Earth and Space



Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 1.
1. List the contents of our <b>Universe</b> .	The universe is a term used to describe everything that exists and contains galaxies, stars, planets, asteroids and comets.
2. Define the terms <b>Universe, Galaxy, star, planet, asteroid and comet</b> .	See page 3 of your booklet
3. State the <b>name</b> and <b>shape</b> of our Galaxy.	Our Galaxy is a Spiral universe.
4. Sketch the <b>approximate position</b> of our Sun within our Galaxy.	See Page 4 of your booklet.
5. Explain what a <b>constellation</b> is and give 2 examples.	A Constellation is a group of stars. For example, "Orion" and the "Big Dipper"
6. List the contents of a <b>Solar System</b> .	Solar systems contain a Star, Planets and their moons, Asteroids and Comets
7. List the <b>8 planets</b> in our Solar System <b>in order</b> from the Sun.	Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.
8. Explain why <b>Pluto</b> was down-graded to <b>dwarf-planet</b> status.	Its orbit is elliptical and has not cleared its orbit of other objects because it crosses the orbit of Neptune.
9. State the <b>angle</b> at which the Earth's axis is <b>tilted</b> .	The earth's axis is tilted at 23.5°
10. Define what a <b>day</b> is for a planet.	This is the time taken for a planet to rotate on its axis once
11. State how long an <b>Earth-Day</b> is.	24 hours
12. Mark <b>day</b> and <b>night</b> on a diagram of the Earth.	See page 6 of your booklet
13. Label the <b>Northern</b> and <b>Southern hemispheres</b> of the Earth.	See page 6 of your booklet
14. Explain what causes <b>seasons</b> .	We have seasons because the earth's axis is tilted. See page 7 for more information.
15. Mark the <b>seasons</b> on a diagram of the Earth and Sun.	See the bottom of page 8 in your pupil booklet
16. Describe the effect on the seasons of <b>altering the tilt</b> of a planet's axis.	The more the axis of a planet is tilted, the more of a fluctuation in the seasons and the more the length of a day changes throughout the year.
17. Define what a <b>year</b> is for a planet.	A year is the time it takes the planet to orbit its star once. E.g. The time it takes the earth to go round the sun once.
18. State how long an <b>Earth-year</b> is.	An earth year is 365 and a quarter days although we usually just say a year is 365. days
19. Explain why <b>leap-years</b> exist.	A leap year exists on earth to make up for the four quarters.

Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 1.
20. State the time taken for the <b>Moon</b> to orbit the Earth.	It takes 28 days for the moon to orbit the earth.
21. Draw the different phases of the <b>Moon</b> on a diagram.	See page 10
22. List the <b>phases of the Moon</b> in order.	Remember to always start with a new moon. See page 10 for all the different phases of the moon.
23. Define the term <b>satellite</b> .	A satellite is an object which orbits a planet.
24. Give an example of a <b>natural satellite</b> .	The moon is a natural satellite.
25. State 3 uses of <b>artificial satellites</b> .	<ol style="list-style-type: none"> <li>1. Satellite TV</li> <li>2. Weather Predictions</li> <li>3. Military Spying</li> </ol>
26. List 3 <b>limitations of Space Travel</b> .	<p><b><u>Logistics</u></b> – how to carry enough food, oxygen and water</p> <p><b><u>Risks</u></b> – journeys so long those leaving would die in space</p> <p><b><u>Cost</u></b> – it is very expensive to send people into space</p>



## Topic 2: Chemical Character



Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 1.
1. Recall that the huge range of materials and substances around us are made from approximately 100 elements	---
2. Observe and describe some elements	See Page 15
3. know that each element is composed of one sort of atom only	---
4. sort elements into metals and non-metals based on some of their properties	You should know the properties of metallic and non-metallic elements as listed on page 17 of your pupil booklet
5. recall the location of metals and non-metals in the Periodic Table	Know how to draw the staircase line like that on page 18
6. recall examples of different elements which are gases, liquids and solids at room temperature and their location in the Periodic Table	See the periodic table which you have colour coded on page 18 of your booklet.
7. select information, construct a table and represent this information using a bar chart	Make sure you follow to success criteria from your managing information sheet. You should learn these success criteria for your exam.
8. prepare a sample of hydrogen gas safely and state the apparatus and chemicals needed	See the diagram and method on page 20.
9. test a sample of hydrogen gas safely and recall this test	Hydrogen gas will give a <b>squeaky</b> pop with a <b>lit</b> splint.
10. research five facts about an element and clearly communicate the findings	See the Elements poster you made completed for homework.
11. describe the reaction of iron and sulfur to make iron sulfide	See page 21. Remember how the iron sulfide is not magnetic or like the elements it is made from in any way.
12. know that adding elements together may produce a mixture, or if they combine chemically, a compound	Make sure you know the difference between a mixture and a compound.
13. know that chemical change results in new substances that are different from the ones from which they are made	---
14. recall that a permanent change occurs when a new compound is formed from its elements	---
15. describe what happens when elements combine using the particle model	The particle model is the diagram at the top of page 21 which shows how the particles of hydrogen and oxygen rearrange to make water.

Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 1.
16. understand the terms <i>element, atom, molecule, compound, mixture</i>	See the definitions on Page 14 of your pupil booklet.
17. recognise the signs which show that a chemical reaction has taken place	For example a change in colour, heat given out, a sound, a glow or light given out are all possible signs of a chemical reaction taking place.
18. write a simple word equation to describe a chemical change	Reactant → Products Make sure you use an arrow, and equals sign is not correct.
19. observe some compounds and describe them	See the table in the middle of Page 22
20. state the main differences between a compound and a mixture	See the table at the bottom of Page 22
21. know that physical methods are used to separate mixtures	For example filtering, a sieve, magnet or by chromatography
22. know how to separate a mixture of sand and gravel	What apparatus would you use? See page 23
23. separate a mixture of iron and sand	What apparatus would you use? See page 23
24. separate a mixture of sand and water and draw the apparatus	What apparatus would you use? See page 23
25. separate a mixture of coloured materials in ink and draw the apparatus	What apparatus would you use? See page 23
26. obtain a sample of crystals from a solution of copper sulfate and draw the apparatus used	Evaporate off some of the water from the copper sulfate solution and then leave the solution too cool for a week and crystals to form.
27. define the terms; solute, solvent and solution	See the definitions on page 14 of your pupil booklet.
28. understand the terms filtration, crystallisation and chromatography	See the definitions on page 14 of your pupil booklet.



### Topic 3: Heat Transfer



	Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 1.
1.	Explain simply the difference between temperature and heat	See Page 26 of your pupil booklet
2.	List the three main methods by which heat energy travels	See Page 27 of your pupil booklet
3.	Name the process by which heat energy is transferred in solids	Conduction
4.	State the difference between a thermal conductor and an insulator	
5.	Carry out an experiment to compare the rate of heat travel by conduction in solids	Know that some solids conducted heat faster than others
6.	Carry out experiments to investigate if conduction occurs in liquids and gases	See Page 28 and 29. Liquids and Gases are poor conductors
7.	List examples of thermal conductors and insulators	Solids are good conductors Liquids and Gases are poor conductors
8.	Name the main process by which heat energy is transferred in a liquid	Convection
9.	Name the processes by which heat energy is transferred in a gas	Convection and Radiation
10.	Carry out experiments to show how heat travels by convection in liquids and gases	See pages 30 and 31
11.	Explain why heat radiation can travel through a vacuum	A Vacuum is an area with no matter. Radiation doesn't require any material to travel.
12.	Carry out an experiment to show which surfaces are good absorbers of heat radiation	See page 32
13.	State which surfaces are the best absorbers of heat radiation	Dull Black are the best
14.	State and explain practical applications of good and bad absorbers of heat radiation	See page 32
15.	Carry out an experiment to show which surfaces are good emitters of heat radiation	See Page 33 – The Leslie Cube
16.	State which surfaces are the best emitters of heat radiation	Dull Black are the best emitters of radiation
17.	State and explain practical applications of good and bad emitters of heat radiation	See Page 33

Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 1.
18. State how a thermos flask reduces heat loss by conduction, convection and radiation	See Page 38
19. Describe ways in which heat loss can be reduced in homes	See page 39



## Topic 4: Air and Burning



Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 2.
1. State the gases which make up the atmosphere.	The air is made up of Nitrogen, Oxygen, Carbon dioxide, Noble gases and water vapour.
2. Recall the percentage composition of the atmosphere and put this information into a pie chart.	See page 50. Also Check your pink managing information sheet for the success criteria on drawing a pie chart.
3. Recall the discovery of oxygen by Lavoisier and Priestley	---
4. Prepare a sample of oxygen gas.	See page 52 for this experiment.
5. Carry out the test for oxygen.	---
6. Describe the test for oxygen.	Oxygen will relight a glowing splint
7. Recall observations about the burning of magnesium and sulfur in oxygen.	See page 54
8. Know that these elements burn more vigorously in oxygen.	Remember, pure oxygen makes things burn better.
9. Write word equations for the reactions of magnesium and sulfur with oxygen	See page 54
10. Recall the effect of adding universal indicator to the solutions of some oxides	Metal oxides are basic (alkaline) so they turn universal indicator blue. Non-metal oxides are acidic so they turn universal indicator red.
11. Classify the solution produced from a soluble metal oxide or a non-metal oxide in water as acidic or alkaline	---
12. Describe the density of carbon dioxide compared to air.	Carbon dioxide is denser than air.
13. Recall the test for carbon dioxide.	It turns limewater cloudy.
14. Recall the effect of placing a burning splint in carbon dioxide.	The splint will go out.
15. Classify carbon dioxide as an acidic or alkaline gas	Acidic gas as it is a non-metal.
16. State at least 2 uses for oxygen, nitrogen, carbon dioxide and 1 use for each of argon, neon and helium.	See page 55.
17. Carry out the test for carbon dioxide	What happens when carbon dioxide is added to limewater? See page 54.
18. Know the effect of nitrogen gas on a lighted splint.	The splint goes out.
19. Burn a piece of magnesium safely.	---

Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 2.
20. Measure the mass before and after burning magnesium.	The mass of magnesium increases after it has been burnt.
21. Explain why magnesium changes mass after heating	The magnesium gains oxygen. See page 57 for more.
22. Write a word equation for the formation of magnesium oxide.	Magnesium + Oxygen → Magnesium oxide
23. Describe oxidation in terms of oxygen	Oxidation is the gain of oxygen
24. Identify the parts of a fire triangle	See page 58
25. Describe what happens if one side of the fire triangle is removed	The fire goes out.
26. Recall ways to put a fire out	See the table on page 58
27. Plan and carry out an investigation into the relationship between volume of air available and length of burning time of a candle	The results of this investigation are in your blue workbook
28. Construct a table and represent this information using a scatter graph	---
29. Name the substance that causes blackening of buildings etc. when fuels are burnt	Soot
30. List the substances that cause acid rain and recall how they are formed	See the table on page 61
31. Describe some of the damaging effects of acid rain, including the effects on buildings, trees and fish	See the table on page 61
32. Describe how carbon monoxide is produced and explain why it is dangerous	See the table on page 61
33. Explain how catalytic converters help reduce air pollution	They change polluting gases, such as carbon monoxide and nitrogen oxides, into less harmful gases, such as carbon dioxide and nitrogen.

Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 2.
34. Name the acid formed when sulfur dioxide comes in contact with rain water	Sulfuric acid
35. Investigate the effect of sulfur dioxide on growing cress seeds	See the experiment on page 62
36. Name the acid formed when nitrogen oxides come in contact with rain water.	Nitric acid
37. Investigate the effect of nitric acid on limestone	Nitric acid corrodes limestone
38. Name the gas associated with the greenhouse effect and global warming.	Carbon dioxide
39. Describe some possible effects of global warming.	Polar ice caps melt, sea levels rise, low level countries would be flooded, changes in climate and weather patterns
40. Recall some ways to reduce air pollution	See the box at the bottom of page 64



## Topic 5: Gas Exchange



Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 2.	
1. Label the main structures on the human gas exchange system	Learn all 8 parts as shown on page 67.	
2. Label the alveolus	Learn the 6 labels as shown on page 68.	
3. State four features of the alveolus which make it excellent for exchanging gases	See page 68.	
4. State the process by which gases are exchanged at the alveolus	The process is called diffusion.	
5. Identify the main structures of the human gas exchange system from a lung dissection	---	
6. Recall that there is more carbon dioxide in exhaled than inhaled air.	---	
7. Identify an association between lung capacity and height and draw an appropriate graph	As height increases, lung capacity as well as peak flow also increases.	
8. Recall the structures involved in breathing in and out	See the table at the top of page 52 to see how the ribs, diaphragm and chest cavity change as you breath.	
9. State the pathway taken by air when breathing in and out	See page 53 "Passage of air"	
10. State the word equation for respiration	Glucose + Oxygen → Carbon dioxide + Water + Energy	
11. Recall the differences between gas exchange and respiration.	See page 54.	
12. Name the 3 main harmful chemicals in cigarette smoke and explain their effects on the human body	<b>Chemical</b>	<b>Effect on your body</b>
	<b>Tar</b>	<b>Causes Cancer</b>
	<b>Carbon Monoxide</b>	<b>Less oxygen carried in the blood</b>
	<b>Nicotine</b>	<b>Increased heart rate</b>
13. State that smoking has both short term and long term implications and give some examples of these	See page 55.	
14. Recall how many of the population of GB are smokers	10 million people smoke in Great Briton.	
15. Explain what is meant by second hand smoke/passive smoking	Breathing in other people's cigarette smoke.	
16. State that the government gains money from cigarette sales	---	

Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 2.
17. Explain how the advertising of cigarettes has changed over the last 50 years.	Advertisement of cigarettes has changed from adverts which make smoking look like a good thing to do and adverts about smoking now highlight the health risks associated with smoking.
18. State how smoking affects our health service and industry.	Smoking costs the health service £1.5 billion pounds and reduces the productivity of industry.
19. Recall some of the ways in which health risks are publicised	Warnings on cigarette packets, pictures on cigarette packets and television advertisements are just some of the ways the risks of smoking are publicised.
20. State a couple of changes that the smoking ban in Northern Ireland has imposed on society.	Cleaner pubs and restaurants, decreased health problems related to second hand smoke to name a few. You may have more written on page 57 of your pupil booklet.
21. List three benefits of stopping smoking and be aware of the timescale of benefits of quitting	In 24 hours lungs start to clear of mucus In 72 hours breathing improves and you have more energy In 5 years, your risk of a heart attack is half that of a smoker.
22. Construct and present a PowerPoint using given success criteria	You will not be examined on this learning outcome.



## Topic 6: Photosynthesis



Learning Objective	Answer/ Location of answer in Year 9 Pupil Booklet 3.
1. Explain the importance of photosynthesis	Without photosynthesis we would have no food and eventually we would run out of oxygen.
2. State the word equation for photosynthesis	Carbon dioxide + Water → Oxygen + Glucose How is light used in this reaction?
3. Recall in which part of the leaf cell that photosynthesis occurs	Photosynthesis occurs in the chloroplasts.
4. Explain what chlorophyll is, where it is found and what its purpose is in the cell	See page 80.
5. Describe how the two raw materials for photosynthesis enter the leaf.	The two raw materials are carbon dioxide and water, see how they enter the leaf on page 80.
6. Describe what happens to the two products of photosynthesis.	The products are oxygen and glucose; see what happens to them on page 80.
7. Carry out an experiment to prove that chlorophyll is required for photosynthesis	See page 83.
8. Recall the steps in testing a leaf for starch and know why each step is carried out	Look at the table on page 84.
9. Design and carry out an experiment to prove that light is required for photosynthesis	---
10. Describe how to destarch a plant	Place it in the dark for at least 24 hours.
11. Test the gas given off by a photosynthesising plant	To test the gas you used a glowing splint. Look back to air and burning to remember the test for oxygen.
12. State where respiration occurs in a plant compared with where photosynthesis happens	Respiration happens in all cells, not just the leaves. Also see Learning outcome 3.
13. State when respiration occurs in a plant compared with when photosynthesis happens	Respiration occurs during the day and the night. Photosynthesis only occurs during the day.
14. State the colour change for hydrogen carbonate indicator when carbon dioxide is added to or removed from it	Adding CO <sub>2</sub> : Red → Yellow Removing CO <sub>2</sub> : Red → Purple
15. Predict the colour changes for hydrogen carbonate indicator in a number of different experimental situations	Your prediction should be based upon whether carbon dioxide has been added or removed.
16. Describe how a number of different plants are well adapted to carry out photosynthesis in their own particular habitats	See page 90.