Scheme of Learning: Photosynthesis and Respiration

Topic Sequence:

1	2	3	4	5	6	7	8	9
Acids & Alkalis	Motion & Pressure	Photosynthesis & Respiration	Metals & Materials	Waves	Inheritance & Evolution	Earth & Atmosphere	Space	Ecosystems & Interdependence

Topic Overview:

The national curriculum requirements for this topic are to cover the following:

- The reactants in, and products of, photosynthesis, and a word summary for photosynthesis
- The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
- The adaptations of leaves for photosynthesis.
- Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
- A word summary for aerobic respiration
- The process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration
- The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism.

Lesson Sequence:

First pupils are introduced to the ideas of how plants absorb light and photosynthesise. This is then linked to how leaves are adapted to allow this process to take place efficiently, involving leaf cell types, organelles and stomata. Pupils then move on to respiration and the different types and situations this takes place in, aerobically, anaerobically and in yeast.

Sequence of Lessons:

1	Photosynthesis
2	Structure of leaves
3	Stomata
4	Plants for Food
5	Aerobic Respiration
6	Anaerobic Respiration in Humans
7	Fermentation in Yeast
8	Assessment

Resources:

1	Ethanol, leaves, kettles, white tiles, iodine.
2	Need to print leaf structure worksheet. Leaf structure card sort in drawers.
3	Leaves with nail varnish on underside, microscopes, microscope slides, cover slips.
4	Graph paper, could print pyramids of biomass worksheet
5	Limewater, straws, small mirrors
6	n/a
7	Yeast solution, sugar solutions (high, medium and low concentrations), marker pens to write on test tubes, kettles. Could print results table. Graph paper.
8	Print MCQ and 6-mark question on yellow paper

Supportive Reading:

Comprehension activity	TBC

Assessment:

Knowledge:	20 question multiple choice knowledge test
Application of Knowledge:	Extended written answer comparing photosynthesis and respiration.