Year 8
Subject: Biology
Topic/Unit: Gaseous Exchange
When:

Huntington School
Learn and succeed

Overview: Why this? Why now?
Every living organism requires energy to survive, which is released through the chemical reaction of respiration. This unit explores how plants and animals exchange vital gases to support this cellular process. Having studied basic cell structures in Year 7, Year 8 students are developmentally ready to explore how complex multicellular organisms have evolved **specialised structures for rapid gaseous exchange**.

Building on...building to:
- **Building on:** Year 7 cell biology concepts, such as cellular diffusion, and organelles including mitochondria and chloroplasts.
- **Building to:** Key Stage 4/GCSE topics on organ systems, human disease pathology, and transport networks across different organisms.

Sequence summary:
- **Human Respiration & Anatomy:** Students compare inhaled and exhaled air, using **limewater to prove carbon dioxide is exhaled**. They identify parts of the ventilation system (trachea, bronchi, bronchioles, alveoli, and diaphragm), observe a lung dissection, and describe diffusion across specialised alveoli.
- **Exercise & Breathing:** Students plan and execute an investigation into exercise and pulse rate, identifying **independent, dependent, and control variables**.
- **Smoking & Asthma:** Pupils examine the impacts of smoking (tar paralysing cilia, emphysema, bronchitis) and asthma on the respiratory system.
- **Plant Gas Exchange:** Focuses on photosynthesis as the process by which plants make glucose. Students label leaf structures (palisade mesophyll, spongy mesophyll, stomata, and guard cells) and **observe stomata under a microscope**.
- **Assessment & Feedback:** Completion of the Detailed Feedback Task (DFT) and dedicated DIRT lessons for feedback.

Key Vocabulary:
Respiration, ventilation, diffusion, trachea, alveoli, bronchioles, diaphragm, stomata, guard cells, and photosynthesis.

Assessments:
- **Formative:** Exit tickets, post-it notes, and peer-marked extended writing tasks.
- **Summative:** The **Detailed Feedback Task (DFT)**, which tests recall (equations and organelles), data analysis (breathing volumes), and scientific application.

Able and interested:
High-attaining students **analyse historical investigations**, such as Van Helmont's experiment on plant growth. They tackle advanced application problems, explaining gas concentrations in closed ecospheres and evaluating categoric versus continuous experimental data.

Inclusion, Personal Development and Wider Skills:
Students develop practical dexterity and safety awareness when handling microscopes, glass slides, and dissecting instruments. Personal development is fostered through **collaborative "Be the Expert" tasks on asthma**. Health awareness is enhanced by discussing personal asthma management and the physiological risks of tobacco smoke.

Homework and Independent Learning:
Students will complete a task set on the SPARX online platform. The task is based on the current topic but also includes consolidation on previous topics. It will automatically adjust the level of challenge as the student complete the activities.