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**Knowledge Rich Curriculum Plan**

SCIENCE- Biochemistry



| **Lesson/Learning Sequence** | **Intended Knowledge:**  *Students will know that…* | **Prior Knowledge:**  *In order to know this, students need to already know that…* | **Working Scientifically** | **Tiered Vocabulary and Reading Activity** | **Assessment** | **Support** |
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| ***01***  ***Respiration Vs Breathing*** | *Respiration is a chemical reaction.*  *Glucose and oxygen are reactants. Glucose is a sugar we get from our diet and oxygen is a gas we get from the air when we breathe. The products of the reaction are Carbon Dioxide, Water and Energy. Carbon dioxide is exhaled from our body.*  *Breathing releases carbon dioxide and the chemical test is limewater turns cloudy.*  *Breathing is the movement of air into and out of the lungs. Also known as ventilation. Inhaling brings the oxygen needed for respiration into the body and exhaling gets rid of the unwanted waste product of respiration.* | *Students will know that respiration is one of the7 life processes.*  *Students will know that breathing allows oxygen into the body and carbon dioxide out.*  *The lungs are organ of our breathing system*  *Red blood cells are specialised cells that carry oxygen.*  *Students will know that respiration is a chemical reaction that happens in the mitochondria of cells*  *Students may have the misconception that respiration is the same as breathing* | *Gas test*  *Extracting information*  *Comparing 2 processes* | *Respiration:*  *A chemical reaction that releases energy from food*  *Reactants:*  *The substances present at the start of a chemical reaction*  *Products:*  *The substances formed in a chemical reaction*  *Involuntary:*  *Done without will or conscious control*  *Inevitable:*  *Certain to happen* | *Retrieval questions*  *Simple exam questions*  *Homework Quiz*  *End of topic test*  *Summative assessment 3* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zvrrd2p/articles/zdqx2v4#:~:text=Aerobic%20respiration,-Respiration%20is%20not&text=That%20is%20called%20ventilation%20.,it%2C%20these%20cells%20would%20die.&text=Aerobic%20respiration%20slowly%20releases%20lots%20of%20energy%20stored%20in%20glucose%20*](https://www.bbc.co.uk/bitesize/topics/zvrrd2p/articles/zdqx2v4#:~:text=Aerobic%20respiration,-Respiration%20is%20not&text=That%20is%20called%20ventilation%20.,it%2C%20these%20cells%20would%20die.&text=Aerobic%20respiration%20slowly%20releases%20lots%20of%20energy%20stored%20in%20glucose%20)*.* |
| ***02 Aerobic Respiration*** | *That Aerobic respiration only takes place in the presence of oxygen. The word equation for aerobic respiration is*  *Glucose + Oxygen 🡪 Carbon Dioxide + Water + Energy*  *Plants also respire to generate energy.*  *Retrieval- Respiration takes place in the mitochondria of cells.*  *How energy from respiration is used in the body.* | *Student misconception that plants don’t respire because they don’t breathe.* | *Extracting information* | *Aerobic - involving, or requiring oxygen.*  *Maintain- cause or enable (a condition or situation) to continue.*  *Process- a systematic series of mechanized or chemical operations that are performed in order to produce something.* | *Retrieval questions*  *Simple exam questions*  *Homework Quiz*  *End of topic test*  *Summative assessment 3* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zvrrd2p/articles/zdqx2v4#:~:text=Aerobic%20respiration,-Respiration%20is%20not&text=That%20is%20called%20ventilation%20.,it%2C%20these%20cells%20would%20die.&text=Aerobic%20respiration%20slowly%20releases%20lots%20of%20energy%20stored%20in%20glucose%20*](https://www.bbc.co.uk/bitesize/topics/zvrrd2p/articles/zdqx2v4#:~:text=Aerobic%20respiration,-Respiration%20is%20not&text=That%20is%20called%20ventilation%20.,it%2C%20these%20cells%20would%20die.&text=Aerobic%20respiration%20slowly%20releases%20lots%20of%20energy%20stored%20in%20glucose%20)*.* |
| ***03 Food Chains*** | *Students will learn that the arrows in the food chain represent the transfer of energy from one organism to another. Students will know that producers are at the beginning of the food chain and undergo photosynthesis to release energy for respiration. Producers are eaten by primary consumers. Primary consumers are eaten by secondary consumers. The primary consumers are called ‘prey’, while the secondary consumers are called ‘predators’. The secondary consumers are eaten by the tertiary consumers.* | *Students will know the definitions for herbivores, omnivores and carnivores. Students will know that plants photosynthesise to release energy.* | *Communicate: Students will be able to construct ideas about the different levels in a food chain.* | *Photosynthesis- Plants using energy from the sun to make sugar  Producer- Organisms that make their own food  Consumer- Organisms that get energy from eating others* | *Retrieval questions*  *Simple exam questions*  *Homework Quiz*  *End of topic test*  *Summative assessment 3* | *Knowledge organiser (provided on Teams and in class)* |