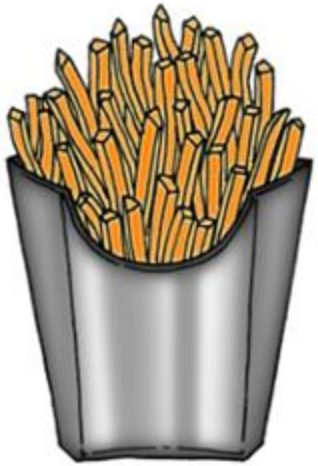

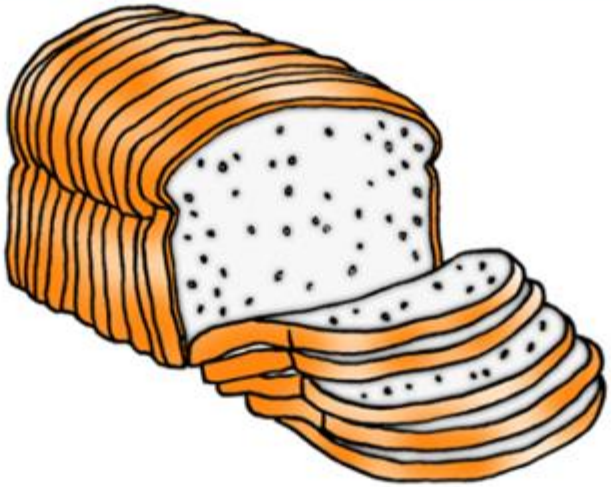

AQA GCSE BIOENERGETICS THINK IT!

Photosynthetic reaction:

- Discuss which organelle is more important to a plant - mitochondria or chloroplasts?
- Why is water not normally classed as a limiting factor of photosynthesis?
- Justify why oxygen is a waste product of photosynthesis.
- Suggest why conifers and pine trees grow in a cone shape?

Respiration:

- Discuss this statement - All living things respire.
- Can respiration be artificial?
- Tissues and organs which bring about breathing are part of the 'respiratory system'. Why is this confusing?
- How can mammals respire underwater? Can a root hair cell respire underground? Explain.
- Compare aerobic and anaerobic respiration in a Venn diagram.

Use of glucose from photosynthesis:

- What percentage of a glucose molecule is made from carbon?
- How do seedlings grow underground before they can photosynthesise?
- Design a method to extract oil from sunflower seeds. Why is oil present?
- How can we investigate that variegated leaves produce less glucose?
- Iodine solution turns black when dripped onto paper. Explain why.

Response to exercise:

- What differences might we see in heart rate, breath volume, lactic acid production and breathing rate between an athlete and an unfit person before, during and after vigorous exercise?
- A scientist claimed that they could identify cell type by counting the number of mitochondria present. Why might mitochondria number in cells vary?
- Decide if you think 'aerobics' is a good or bad name for a popular type of exercise .

AQA Bioenergetics

ThinkIT!

Rate of photosynthesis:

- Discuss whether photosynthesis occurring on land or under water produces most oxygen.
- Do leaves in the middle of a tree photosynthesise as efficiently as those at the top? Explain.
- If all the cells in a leaf contained chloroplasts wouldn't photosynthesis be more effective?
- Can a plant photosynthesise in moonlight?

Metabolism:

- 'Enzymes are important in the metabolism of a muscle cell'. Explain what this statement means.
- Under what conditions in the body would glycogen be converted back to glucose?
- A student stated that carbohydrates are the basis of all lipids and proteins. Do you agree with this? Explain your answer.

Aerobic respiration:

- Experiments which involve the oxidation of glucose are often explosive. Explain how aerobic respiration is controlled inside a cell to prevent an explosion.
- Suggest why aerobic respiration occurs in the mitochondria yet anaerobic respiration occurs in the cytoplasm of a cell.

Anaerobic respiration:

- Explain why a plant may die if it is overwatered.
- What would life be like if yeast had never existed?
- Explain why anaerobic respiration is less efficient than aerobic respiration.
- When a loaf of bread is cut there is evidence that bubbles were once present. What caused these bubbles?