# Energy and respiration

A-Level Biology · Vocabulary in context

| Word | Example |
|---|---|
| **energy** /ˈenədʒi/ | Food gives your body the **energy** it needs to move. |
| **respiration** /ˌrespɪˈreɪʃn/ | **Respiration** releases energy from glucose. |
| **active transport** /ˈæktɪv ˈtrænspɔːt/ | **Active transport** uses energy to move ions into root cells. |
| **anabolic** /ˌænəˈbɒlɪk/ | Building proteins from amino acids is an **anabolic** reaction: it needs energy. |
| **phosphorylation** /ˌfɒsfɔːrɪˈleɪʃn/ | In **phosphorylation**, a phosphate group is added to a molecule, such as ADP to make ATP. ADP ATP |
| **chemiosmosis** /ˌkemɪəzˈməʊsɪs/ | In **chemiosmosis**, hydrogen ions flow back through the membrane and drive ATP synthase. |
| **mitochondria** /ˌmaɪtəˈkɒndrɪə/ | **Mitochondria** release energy from food. |
| **respiratory substrate** /rɪˈspɪrətəri ˈsʌbstreɪt/ | Glucose is the main **respiratory substrate**, but fats and proteins can also be used. |
| **respiratory quotient** /rɪˈspɪrətəri ˈkwəʊʃənt/ | The **respiratory quotient** for glucose is 1.0: the carbon dioxide made equals the oxygen used. 1.0 |
| **respirometer** /rɪspɪˈrɒmɪtə/ | A **respirometer** measures how much oxygen small animals use. |
| **oxygen** /ˈɒksɪdʒn/ | Your cells need **oxygen** to release energy. |



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| **germinate** /ˈdʒɜːmɪneɪt/ | Seeds **germinate** when they are warm and wet. |
| **invertebrate** /ɪnˈvɜːtɪbreɪt/ | A woodlouse is an **invertebrate**: it has no backbone. |
| **aerobic** /eəˈrəʊbɪk/ | **Aerobic** respiration needs oxygen and releases a lot of energy. |
| **glycolysis** /glaɪˈkɒləsɪs/ | In **glycolysis**, glucose is split into two pyruvate molecules in the cytoplasm. |
| **cytoplasm** /ˈsaɪtəplæzəm/ | Chemical reactions happen in the **cytoplasm**. |
| **link reaction** /lɪŋk rɪˈækʃn/ | In the **link reaction**, pyruvate loses carbon dioxide and joins coenzyme A. |
| **matrix** /ˈmeɪtrɪks/ | The Krebs cycle happens in the **matrix**, the fluid inside the mitochondrion. |
| **Krebs cycle** /krebz ˈsaɪkl/ | The **Krebs cycle** releases carbon dioxide and makes reduced NAD. NAD |
| **oxidative phosphorylation** /ˈɒksɪdətɪv ˌfɒsfɔːrɪˈleɪʃn/ | Most ATP is made by **oxidative phosphorylation** on the inner membrane of the mitochondrion. ATP |
| **glucose** /ˈgluːkəʊs/ | Cells use **glucose** for energy. |
| **oxidise** /ˈɒksɪdaɪz/ | Cells **oxidise** glucose to release energy. |
| **pyruvate** /ˈpaɪruːveɪt/ | Glycolysis turns one glucose into two molecules of **pyruvate**. |
| **reduce** /rɪˈdjuːs/ | NAD is **reduced** when it picks up hydrogen. NAD |

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| **coenzyme** /ˌkəʊˈenzaɪm/ | NAD is a **coenzyme**: it helps enzymes by carrying hydrogen.<br>NAD |
| **carbon dioxide** /ˈkɑːbən daɪˈɒksaɪd/ | We breathe out **carbon dioxide**. |
| **acetyl** /ˈæsɪtaɪl/ | The **acetyl** group from pyruvate enters the Krebs cycle. |
| **coenzyme A** /ˌkəʊˈenzaɪm eɪ/ | **Coenzyme A** carries the acetyl group into the Krebs cycle. |
| **oxaloacetate** /ˈɒksələʊsɪteɪt/ | The acetyl group joins **oxaloacetate** to start the Krebs cycle. |
| **citrate** /ˈsɪtreɪt/ | The first product of the Krebs cycle is **citrate**, with six carbon atoms. |
| **decarboxylation** /dɪˌkɑːbəksɪˈleɪʃn/ | In **decarboxylation**, carbon dioxide is removed from a molecule. |
| **dehydrogenation** /ˌdiːhaɪˈdrɒdʒəneɪʃn/ | In **dehydrogenation**, hydrogen is removed from a molecule and passed to NAD.<br>NAD |
| **electron** /ɪˈlektrɒn/ | An **electron** has a negative charge. |
| **electron transport chain** /ɪˈlektrɒn ˈtrænspɔːt tʃeɪn/ | The **electron transport chain** passes electrons along proteins in the inner membrane. |
| **proton** /ˈprəʊtɒn/ | A **proton** has a positive charge. |
| **ATP synthase** /ˌeɪ tiː ˈpiː ˈsɪnθeɪs/ | **ATP synthase** makes ATP as hydrogen ions flow through it.<br>ATP |
| **cristae** /ˈkrɪstiː/ | The **cristae** are folds of the inner membrane that give more space for making ATP.<br>ATP |



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| **fermentation** /fɜːmənˈteɪʃn/ | Yeast makes alcohol by **fermentation** when there is no oxygen. |
| **lactate** /ˈlækteɪt/ | During hard exercise, muscles make **lactate** when oxygen runs short. |
| **yeast** /jiːst/ | **Yeast** makes bread rise. |
| **ethanol** /ˈeθənɒl/ | Shake the food with **ethanol** to test for fat. |
| **anaerobic** /ˌæneəˈrəʊbɪk/ | **Anaerobic** respiration happens without oxygen and releases little energy. |
| **aerenchyma** /ˈeərəntʃɪmə/ | Rice roots have **aerenchyma**, air spaces that carry oxygen down into wet soil. |
| **indicator** /ˈɪndɪkeɪtə/ | The **indicator** changes colour at the end point. |