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.
oxidative phosphorylation /ˈɒksɪdətɪv ˌfɒsfɔːrɪˈleɪʃn/	Most ATP is made by **oxidative phosphorylation** on the inner membrane of the mitochondrion.
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.

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coenzyme /ˌkəʊˈenzaɪm/	NAD is a **coenzyme**: it helps enzymes by carrying hydrogen. 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. 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. ATP
cristae /ˈkrɪsti:/	The **cristae** are folds of the inner membrane that give more space for making ATP. ATP

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Word	Example
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.

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