

Isaac Biology

Lewis Thomson

lewis@isaacphysics.org



Isaac Biology

- Currently A-level content only
- Question pages (~300)
 - Original
 - Past Papers (OCR, CIE)
 - Natural Sciences Admissions Assessment (NSAA)
- Concept pages



Question Finder

Search for a question

e.g. Man vs. Horse

Filter by [Clear all](#)

Stage >

Topics 1 ▾

Physics Maths Chemistry **Biology**

Cell Biology

Bio-chemistry

Genetics

Physiology

Ecology

Evolution

Showing 30 of 293.

Q	ATP & NAD	A Level P P P	>
Q	Action Potentials	A Level P P P	>
Q	Active Transport	A Level P P P	>
Q	Adaptive Immunity	A Level P P P	>
Q	Adenosine Triphosphate (ATP)	A Level P P P	>
Q	Adrenaline	A Level P P P	>
Q	Aerobic vs Anaerobic Respiration	A Level P P P	>
Q	Albino Rabbits	A Level C C C	>
Q	Algal Population Changes	A Level C C C	>



Question Finder

Cell Biology	<ul style="list-style-type: none">Cell Structure	<ul style="list-style-type: none">Mitosis	<ul style="list-style-type: none">Meiosis	<ul style="list-style-type: none">Viruses	<ul style="list-style-type: none">Membrane Transport	<ul style="list-style-type: none">Tissues
Bio-chemistry	<ul style="list-style-type: none">Proteins	<ul style="list-style-type: none">Carbohydrates	<ul style="list-style-type: none">Lipids	<ul style="list-style-type: none">Respiration	<ul style="list-style-type: none">Photosynthesis	
Genetics	<ul style="list-style-type: none">DNA Replication	<ul style="list-style-type: none">Transcription	<ul style="list-style-type: none">Translation	<ul style="list-style-type: none">Genes & Alleles	<ul style="list-style-type: none">Inheritance	<ul style="list-style-type: none">Biotechnology
Physiology	<ul style="list-style-type: none">Plants	<ul style="list-style-type: none">Breathing & Circulation	<ul style="list-style-type: none">Hormones	<ul style="list-style-type: none">Digestion & Excretion	<ul style="list-style-type: none">Sense & Movement	<ul style="list-style-type: none">Disease & Immunity
Ecology	<ul style="list-style-type: none">Populations	<ul style="list-style-type: none">Ecosystems	<ul style="list-style-type: none">Nutrient Cycles	<ul style="list-style-type: none">Biodiversity		
Evolution	<ul style="list-style-type: none">Variation	<ul style="list-style-type: none">Theory	<ul style="list-style-type: none">Phylogenetics			



Question Difficulty

Search for a question

e.g. Man vs. Horse

Filter by [Clear all](#)

Stage >

Topics 1 >

Difficulty v

[Learn more about difficulty levels](#)

☐ Practice 1

☐ Practice 2

☐ Practice 3

☐ Challenge 1

☐ Challenge 2


☐ Challenge 3

Showing 30 of 293.


Q	ATP & NAD	A Level 	>
Q	Action Potentials	A Level 	>
Q	Active Transport	A Level 	>
Q	Adaptive Immunity	A Level 	>
Q	Adenosine Triphosphate (ATP)	A Level 	>
Q	Adrenaline	A Level 	>





Question Difficulty


Difficulty 


Learn more about difficulty levels


☐ Practice 1 

☐ Practice 2 

☐ Practice 3 

☐ Challenge 1 

☐ Challenge 2 

☐ Challenge 3 

Practice: Recall questions

- *What is the name of this cell type/process/?*
- *Label the diagram*
- *Fill-in-the-blanks*









































Challenge: Application questions

- *Data interpretation*
- *Logic & reasoning*
- *Problem-solving-style questions*



Example biology questions

Showcasing A Level Biology on Isaac

	Types of Cells Biology > Cell Biology > Cell Structure	A Level    >
	Cell Division and Cell Numbers Biology > Cell Biology > Mitosis	A Level    >
	Sequence Transcription and Translation Biology > Genetics	A Level    >
	The Cardiac Cycle Biology > Physiology > Breathing & Circulation	A Level    >
	Antibody Structure and Function Biology > Physiology > Disease & Immunity	A Level    >
	Ash Woodland Biodiversity Biology > Ecology > Biodiversity	A Level    >
	Blood Types Biology > Genetics > Genes & Alleles	A Level    >
	Sodium Ion Reabsorption Biology > Physiology > Digestion & Excretion	A Level    >
	Light-dependent Labelling Biology > Biochemistry > Photosynthesis	A Level    >
	Albino Rabbits Biology > Evolution > Theory	A Level    >





Biology Boards by Topic


[Home](#) > [Biology Boards by Topic](#)

Biology Boards by Topic


Prepared boards for use in classroom or homework




Boards for Physics



Boards for Chemistry



Boards for Biology





For Maths boards, see [Practise Maths](#).

The Biology topics below are ordered to allow for progression of ideas from one board to the next (within each section). To find a board on a specific topic, use `Ctrl+F` in your browser. You can also click on the links below to jump to the relevant section.

- [Biochemistry](#)
- [Cell Biology](#)
- [Ecology](#)
- [Evolution](#)
- [Genetics](#)
- [Physiology](#)

The "**What it contains**" column lists the [difficulty levels](#) of the questions and how many there are: for example, "3×P, 6×C" means three "Practice" questions and six "Challenge" questions. Generally, "Practice" questions are recall-based questions that test basic knowledge of a topic, while "Challenge" questions are application-based questions that test the ability to apply that knowledge to an unfamiliar scenario. Some ratings are preliminary and subject to change, so feedback from teachers is very welcome. The table also shows which question types are used in each board:

-  **MCQ**: multiple-choice with only one correct answer
-  **Item**: multiple-choice with multiple correct options to select



Concept pages

Concepts

Search concepts

Search Results

Filter: ☐ Physics ☐ Maths ☐ Chemistry ☒ Biology



An Introduction to Statistics in Biology

Why we use statistical tests, when to use each test, and how to interpret the results.



Chi-squared Tests in Biology

When and how to use chi-squared tests in biology.



Spearman's Rank Correlation Coefficient in Biology

When and how to use Spearman's rank correlation coefficient in biology.



Student's t-test (Unpaired Samples) in Biology

When and how to use Student's t-test (unpaired samples) in biology.



The Hardy-Weinberg Principle

What the Hardy-Weinberg principle is, and how to use it to calculate expected genotype frequencies.





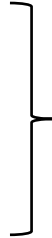
Example statistics questions

A Level Statistics in Biology		
Q	Selecting Statistical Tests Biology	A Level P P P >
Q	Fish Metabolic Rates Student's t-test (Unpaired Samples) Biology > Evolution > Variation	A Level P P P >
Q	Heart Rate Medication Student's t-test (Unpaired Samples) Biology > Physiology > Breathing & Circulation	A Level P P P >
Q	Goldfish Sizes Student's t-test (Unpaired Samples) Biology > Evolution > Variation	A Level P P P >
Q	Snapdragon Flowers Chi-squared Test Biology > Genetics > Inheritance	A Level P P P >
Q	Monohybrid Cross Phenotype Frequencies Chi-squared Test Biology > Genetics > Inheritance	A Level C C C >
Q	Drosophila Dihybrid Cross Chi-squared Test Biology > Genetics > Inheritance	A Level C C C >
Q	BCG Vaccine Spearman's Rank Correlation Coefficient Biology > Physiology > Disease & Immunity	A Level P P P >
Q	Zebrafish Spawning Spearman's Rank Correlation Coefficient Biology > Cell Biology > Tissues	A Level P P P >
Q	Habitat Rainfall and Species Diversity Spearman's Rank Correlation Coefficient Biology > Ecology > Biodiversity	A Level P P P >



t-tests

chi-squared tests

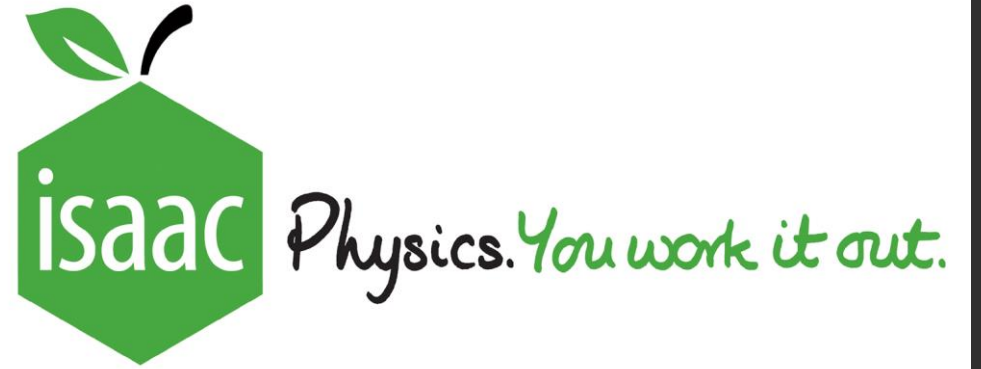


Spearman's rank correlation coefficient



Next steps for Isaac Biology

- More A-level questions & concept pages
- A-level biology book
- GCSE content
- “Stretch questions” (A-level)
 - Collaboration with Andrew Catherall-Ostler (funded by Isaac Newton Trust)
 - e.g. *“How does a cell fit its genome into such a small space?”* and *“Why don’t humans photosynthesise?”*



Thank you!

lewis@isaacphysics.org