KOGNITY

# IBDP Biology

Our IBDP Biology SL / HL subject supports the full DP syllabus for the first examination from 2016.



## Key Features

**Apparatus and safety**

A standard method for this investigation involves measuring the mass change of plant tissue samples bathed in a range of hypertonic and hypotonic solutions. You will need to consider what tools you will need to achieve this.

**Be aware**

For all the choices we make in apparatus and lab design, we should have reasons for our choices based on research, biological facts or good experimental design. A common error is to make unsupported, random choices for tools and variables.

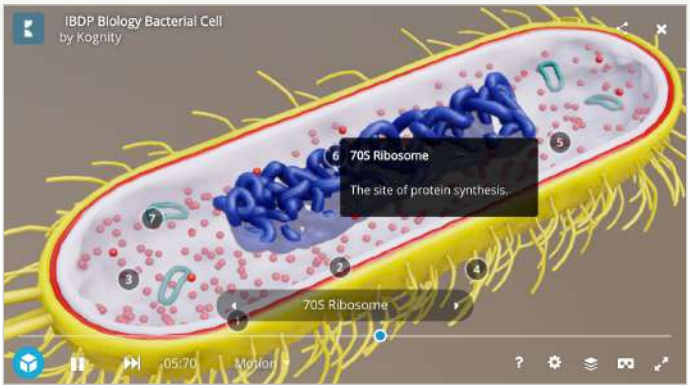
You will need a balance to measure mass; make sure that you choose one with a high level of precision. Mass changes can be quite small in this investigation, and thus, error can be very high if the tool you use is not well suited to measuring such small masses.

**Skills**

This experiment is an excellent chance to practise your skills in making accurate measurements. As you continue through this section, consider how you can achieve high levels of accuracy. Consider also how being less accurate can affect your results, including raw data, calculated data and the strength of your conclusion.

Kognity IBDP Biology contains example experiments for each of the required practicals. Each experiment has a detailed procedure with apparatus and safety requirements that can be followed by teachers and students alike. There are also example calculations and practice questions for students to answer as they work through the experiment.

Diagrams, illustrations, photos and videos add a visual perspective to key concepts of the syllabus. Kognity Biology also contains 3D models that are embedded directly into the text so that students can access them while they read. These clickable, interactive resources make learning fun and engaging.



### Nature of Science

**Models can be made to investigate the real world.**

Living systems are highly complex and studying their function is complicated by the many variables that affect the workings of an organ or cell within an organism. There are a number of projects that are attempting to model living systems in isolation in order to investigate cell or organ function by both mathematical and physical means. An example was the German initiative, the Virtual Liver Network, which is using both kinds of modelling to investigate liver function and regeneration. A simple model is that of gut absorption using semi-permeable dialysis tubing. As with all attempts at modelling, the applicability to the living system has to be carefully analysed – the dialysis tubing is a valid model of diffusion, but the gut has other methods of molecular transport and a complex anatomy. Another model of living systems is the creation of a 'mini-gut' to investigate bacterial communities that live in human intestines: the authors of this paper also discuss drawbacks of previous models of gut systems. At what point do the limitations of a model make it no longer useful?

### Theory of Knowledge

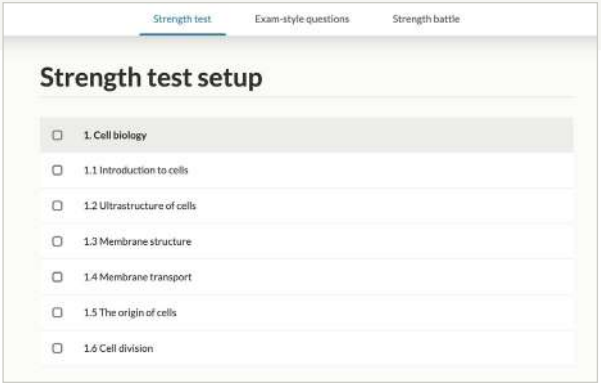
**How does the naming of a phenomenon affect its acceptance?**

Phenomena are named by scientists based on a current theory – this terminology may later be seen to be inappropriate.

The term 'junk DNA' was first used in the 1960s and was meant to mean that this DNA had no known function. This was widely accepted as both a term and as a fact. It was later discovered that this DNA, while not coding for proteins, is functional in, for example, regulating transcription. It is now the accepted term for DNA that may have a function but does not encode for proteins. The term is no longer correct, because some so-called 'junk' is functional. Despite this, the term is still used, but the meaning of the term has changed to accommodate new knowledge. Does the term 'non-coding DNA', used in this text, affect the way we view this DNA's function?

Within Kognity Biology you will find TOK boxes that help students make connections between TOK and biology. These provide interesting discussion points together with examples of knowledge questions. Additionally, Nature of Science boxes make clear the application of TOK to the Natural Sciences.

In addition to the fully syllabus-aligned textbook, Kognity Biology includes a detailed support guide for the Internal Assessment as well as a fully-equipped practice centre.


Kognity Biology comes complete with exam-style questions to support paper 3 practice, as well as data-based exam-style questions to support paper 2 practice.