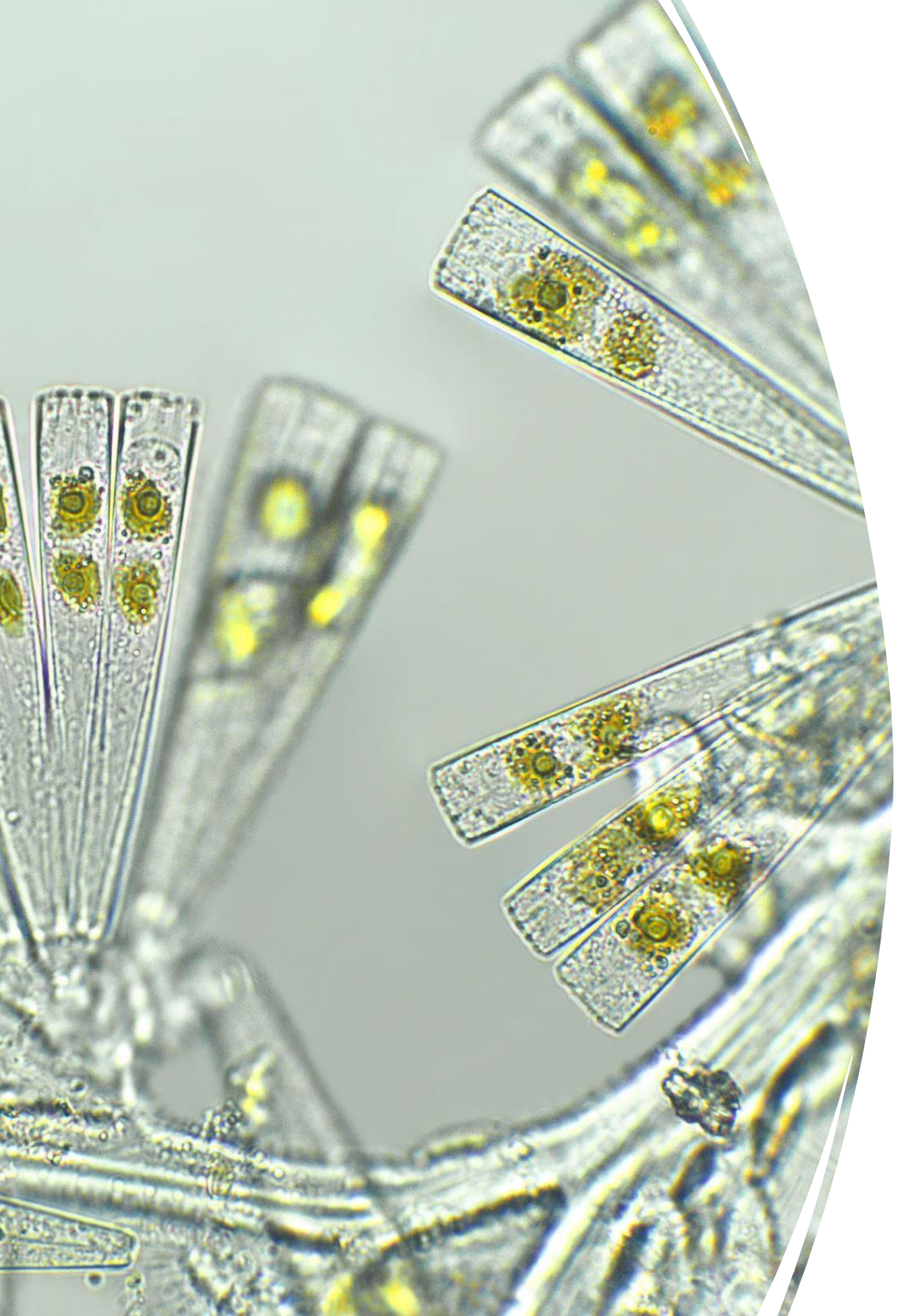
Biology

Enniskillen Royal Grammar School

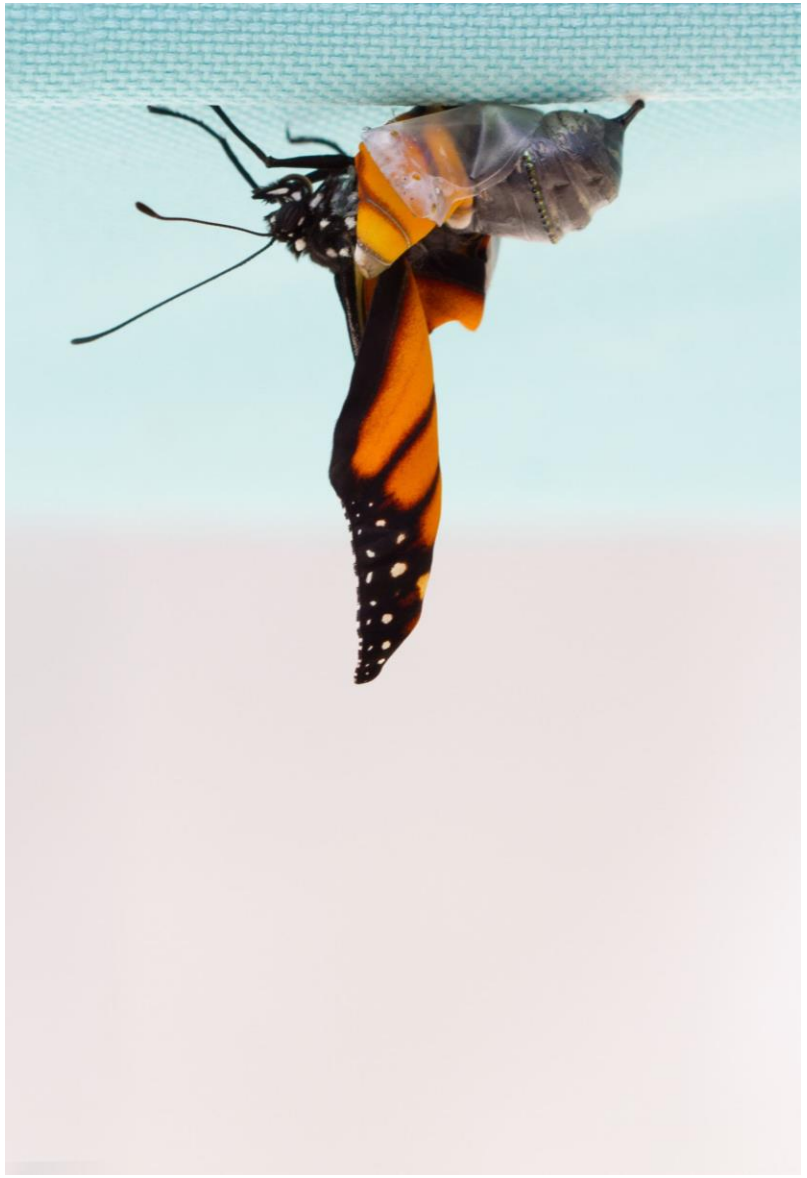


WHAT IS BIOLOGY?

- Biology is the study of life and, as complex living organisms ourselves, many of us are naturally drawn to find out more about how we work.
- Biologists study organisms and the relationship they have with their environment.

WHAT IS BIOLOGY ABOUT?

- Through exploring biology at this level, you can find out more about how organisms are built and how they function, as well as learning how they interact with each other and with their surroundings.



AIMS OF THE COURSE

To develop the students interest in and enthusiasm for biology, including developing an interest in careers in the subject

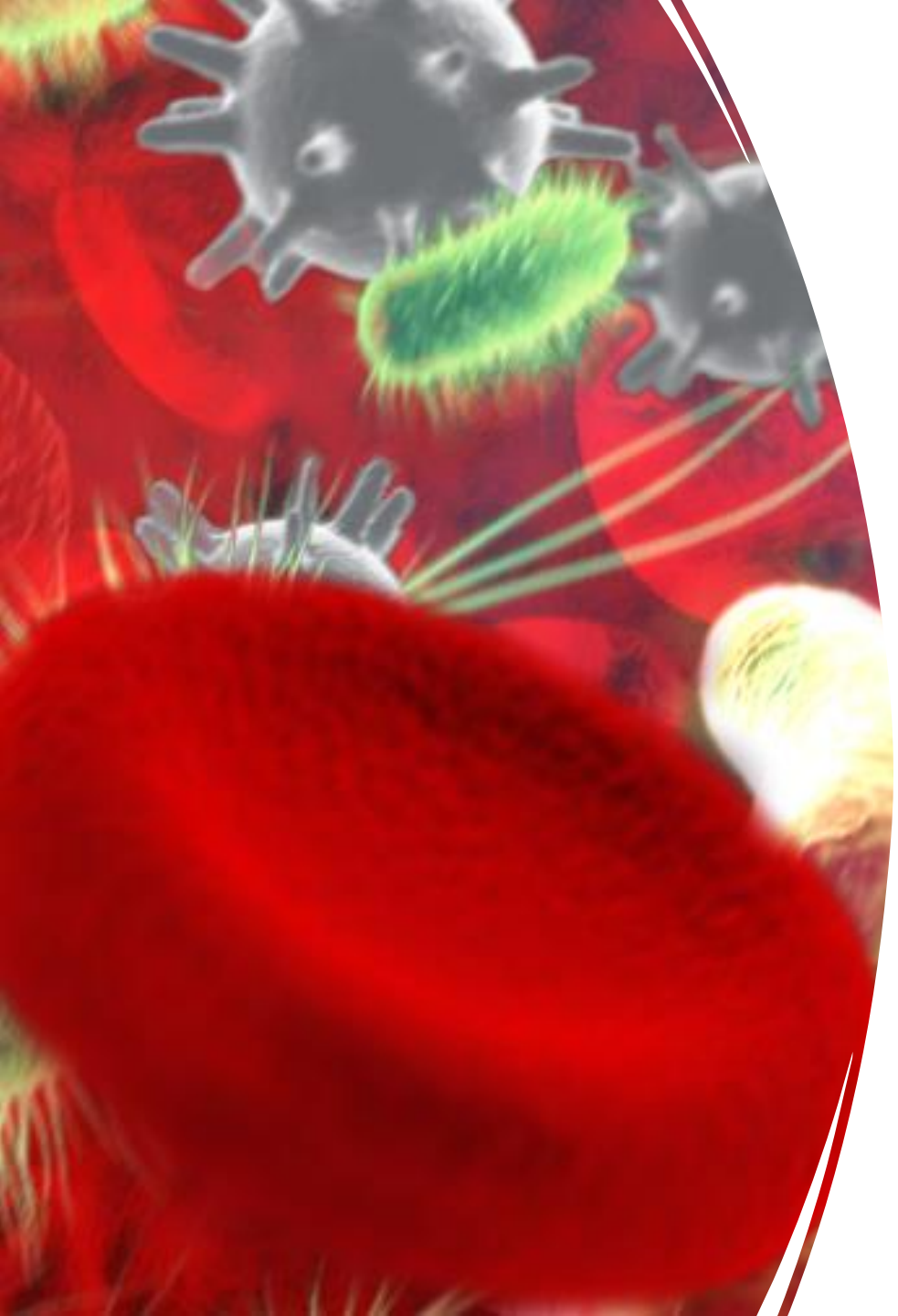
To develop and draw together different areas of knowledge, skills and understanding of different aspects of the subject

To develop competence and confidence in a number of skills, including independent learning, creative thinking, practical, mathematical and problem-solving

To carry out practical tasks and present findings

To develop an appreciation and understanding of scientific methods

To appreciate how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society



COURSE CONTENT:

- The full A level in Biology is based on two levels:
  - Advanced Subsidiary (AS) Biology
    - 40% of the full A level
  - Advanced (A2) Biology
    - 60% of the full A level

SPECIFICATION OVERVIEW:

Unit	Topic	Assessment	Weighting
AS Unit 1	Molecules and Cells	External examination 1hr 30 minutes	37.5% (15% A Level)
AS Unit 2	Organisms and Biodiversity	External examination 1hr 30 minutes	37.5% (15% A Level)
AS Unit 3	Practical Skills in AS Biology	External examination 1hr 15 minutes Internal practical assessment	25% (10% A Level)
A2 Unit 1	Physiology, Co-ordination and Control, and Ecosystems	External examination 2hrs 15 minutes	24%
A2 Unit 2	Biochemistry, Genetics and Evolutionary Trends	External examination 2hrs 15 minutes	24%
A2 Unit 3	Practical Skills in Biology	External examination 1hr 15 minutes Internal practical assessment	12%
All modules require some mathematical/statistical knowledge, but more so at A2. Practical work is included in all modules and students also participate in a fieldtrip.			

ASSESSMENT OBJECTIVES:

AO1

demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures.

AO2

apply knowledge and understanding of scientific ideas, processes, techniques and procedures:

- in a theoretical context;
- in a practical context;

when handling qualitative data; and

when handling quantitative data.

AO3

analyse, interpret and evaluate scientific information, ideas and evidence to:

- make judgements and reach conclusions; and
  - develop and refine practical design and procedures.

AS COURSE: OVERVIEW OF TOPICS

AS 1

- Molecules
- Enzymes
- Viruses
- Cells
- Cell physiology
- Continuity of cells
- Tissues and organs

AS 2

- Transport and exchange mechanisms
- The adaptation of organisms
- Biodiversity
- Human impact on biodiversity

AS 3 PRACTICAL SKILLS

- Dissection
- Chromatography
- Enzyme Investigations
- Colorimeter
- Bioloigical molecule tests
- Sampling

AS 3 PRACTICAL SKILLS

TRANSFERABLE SKILLS A BIOLOGIST WILL DEVELOP?

- Analytical skills
- Communication
- Creative thinking
- IT skills
- Leadership
- Multitasking
- Mathmatical
- Observational skills
- Planning
- Presentation skills
- Problem-solving
- Research
- Scientific techniques
- Self-motivation
- Team working
- Time management

WHAT WILL I DO WITH BIOLOGY?

- Go on to further study in biology
- Enter the world of work, where many of the skills you have developed will be highly sought after.
- Knowledge of biological processes has implications for a wide range of fundamentally important areas, including health, food production, conservation and technology.
- A qualification in biology may be a recommendation or a prerequisite for entering further study in the fields of medicine, nursing, dentistry, veterinary science, speech and language therapy, pharmacology, physiology, biomedical science, forensic science and agriculture.
- Use the skills developed to take on board new concepts quickly and to suggest improvements (analysis, evaluation of practices, problem-solving and research, as well as practical skills such as using a microscope, handling apparatus and fieldwork.
- Use the transferable skill of understanding data in a variety of forms, including text, tables and graphs

CAREER CHOICES

- Accountant
- Bioengineer
- Bioinformatician
- Clinical Technician
- Curator
- Doctor
- Epidemiologist
- Geneticist
- Librarian
- Mycologist
- Neuroscientist
- Patent lawyer
- Press officer
- Publisher
- Teacher
- Zoologist

MAKE A DIFFERENCE WITH A CAREER IN BIOLOGY


Make a difference
with a career in biology
SOCIETY OF Biology
Animals
Whether it's the animals we use for food or the pets in our home, animals have a huge impact on our lives.
Biologists help by:
• studying animal behaviour in the wild and planning ways to conserve endangered animal species around the world
• developing drugs and treatments to keep our pets healthy
• monitoring the animals we rely on for food
• researching diseases that can be passed from animals to humans
Biology careers involving animals are varied and they take place in many different environments. You might study albatross at the Antarctic, or work in a lab using high-tech equipment to track the spread of disease in livestock.
Follow a career in biology and you can make a difference.
You could improve the well-being of domestic animals and expand our understanding of animals in the wild.
www.societyofbiology.org/careers

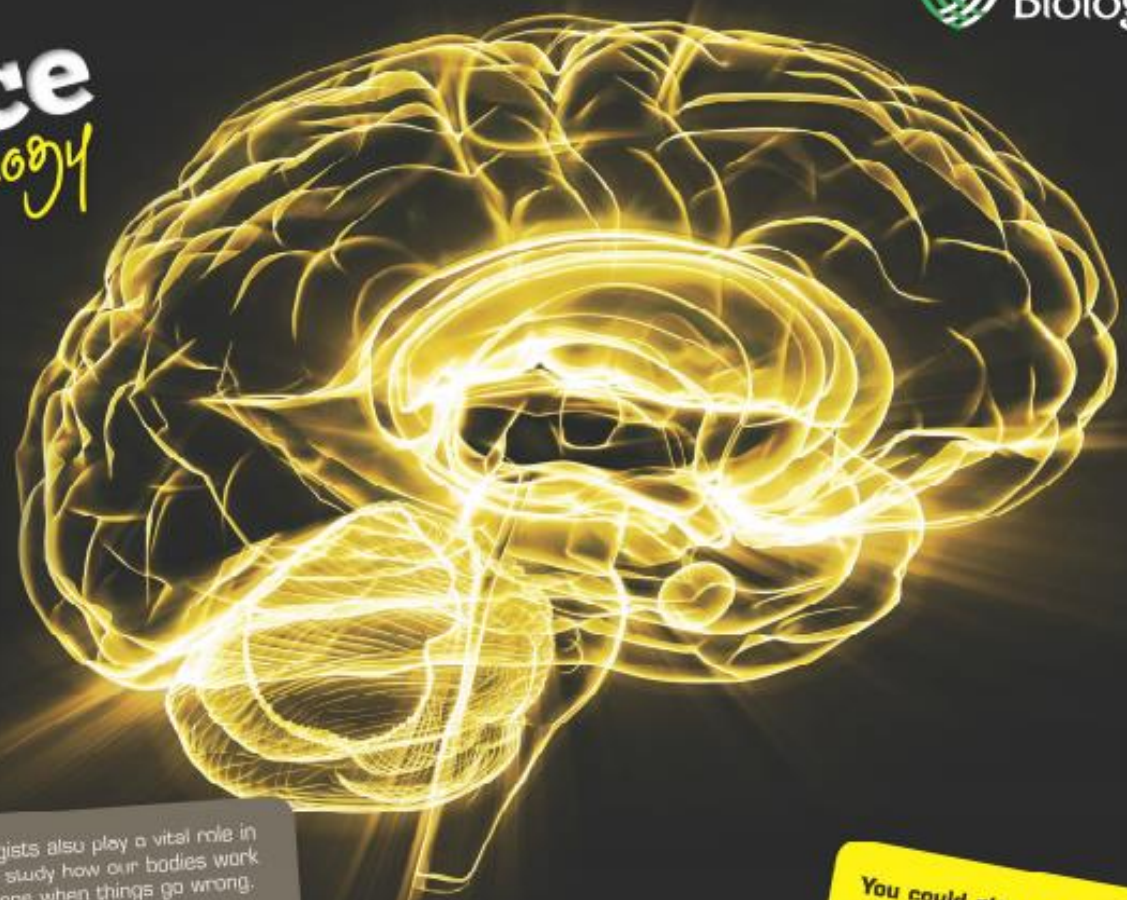

Make a difference
with a career in biology
SOCIETY OF Biology
Food
The world's population is growing rapidly and so is the demand for food. Less land will be available to produce food and climate change is likely to affect where crops can grow. This means there will be a shortage of food.
Biologists are helping to tackle the problem by developing crops that can cope with difficult growing conditions.
Crops can be genetically modified to have important properties like:
• resistance to pests
• increased nutritional value
• allergen free
• resistance to drought
Follow a career in biology and you can make a difference.
You could help to feed the world.
www.societyofbiology.org/careers


Make a difference with a career in biology
SOCIETY OF Biology
Sport
Athletes strive to improve their performance to meet their full potential.
Biologists help them achieve this by:
• measuring their fitness levels
• planning a nutritional diet
• highlighting strengths and weaknesses
• developing personalised training programmes
Exercise keeps our bodies healthy. It can also be used to prevent disease, like obesity and osteoporosis, and help patients recover from illnesses like cancer and heart attacks.
Biologists can design exercise 'prescriptions' and monitor patients to help their recovery.
Follow a career in biology and you can make a difference.
You could play a vital role in patient recovery or help to train an Olympic athlete.
www.societyofbiology.org/careers


SOCIETY OF Biology
Make a difference
with a career in biology
Sustainability
We make our land work hard for us, to feed us and provide us with water and places to live. Often we have to restore habitats so that other animals and plants can return to live land we use.
Biologists help by:
• analysing soil, water and air for chemical pollution
• finding ways to clean up pollution
• identifying, recording and monitoring the plants and animals that share the land we use
Biologists find ways of helping humans to live sustainably
Follow a career in biology and you can make a difference.
You could protect our plants and animals and the habitat they live in.
www.societyofbiology.org/careers

Make a difference with a career in biology

SOCIETY OF Biology



Medicine

When we are ill the correct diagnosis is vital in planning the medical treatment needed to cure us.

Clinical biologists work in hospitals helping to find out what is wrong. They:

- **analyse blood, DNA, tissue or bodily fluids**
- **interpret test results**
- **diagnose diseases**
- **advise on treatments**

Research biologists also play a vital role in medicine. They study how our bodies work and what happens when things go wrong. Understanding what causes diseases allows them to develop new treatments and diagnostic techniques.

Follow a career in biology and you can make a difference.

You could play a key part in diagnosing, treating and curing diseases.

www.societyofbiology.org/careers

Make a difference with a career in biology

SOCIETY OF Biology

The Future

Biologists have a vital role to play in exciting developments of the future. Many revolutionary new technologies are closer than you think.

These include:

- **analysing your genome and developing personalised medicines**
- **developing biofuel technologies to help replace fossil fuels**
- **growing organs from stem cells for transplantation**
- **finding new ways to clean up pollution**

Biologists work at the cutting edge, so produce new and innovative technologies.

Follow a career in biology and you can make a difference.

You could tackle some of the big problems facing our society and help to improve our quality of life for the future.

www.societyofbiology.org/careers

LINKS:

- CCEA Biology
  - https://ccea.org.uk/post-16/gce/subjects/gce-biology-2016
- Royal Society of Biology
  - https://www.rsb.org.uk/
- Becoming a Biologist
  - https://www.rsb.org.uk/images/Becoming_a_Biologist_Degrees_and_Careers_in_Biology.pdf
- Spotlight on the Life Sciences - a guide to biology careers and interviews with Biologists
  - www.rsb.org.uk/spotlight

QUESTIONS?