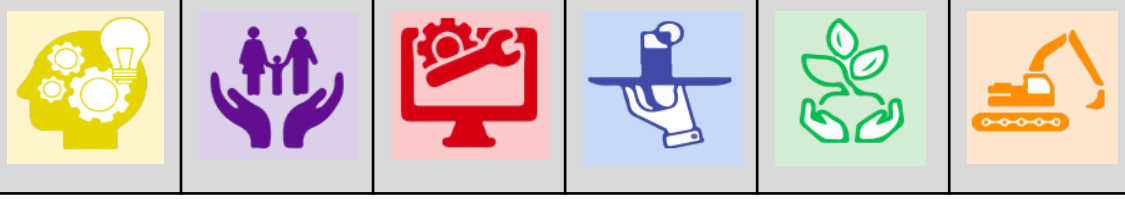
Biology
(Level 1)

PATHWAY INDICATORS



Learning Area 1	Biology	**Learning Area 2**	Science
Course Hook - Why?	Ever wonder how antibiotics work? What about why you and your brother look the same, but different? Or maybe how we can find out what might be polluting your Awa? Level 1 Biological science is an introduction to NCEA science. You will learn how to make sense of the living world around you, and on the way, develop a problem solving attitude. After all…. Your generation is going to need to save the planet!		
Course Hook Description	Biological science focuses on the living world around us. Students will learn: How ecosystems work and carry out investigations to identify threats to our local waterways; The processes that make living things alive, while making rewana bread, yogurt, and fizzy feijoa brew. Students will also be expected to sit an end of year exam, focused on genetic variation of living organisms.		

Learning Objectives

- Experience the way scientists carry out investigations to discover and learn about the world around us.
- Learn how to communicate using basic scientific language.
- Develop the ability to understand and discuss scientific information concerning the world around you.

Skills

- Analysing and evaluating scientific information
- Practical skills and planning related to science
- Critical thinking and problem solving
- Making links between scientific theories/information and different context

Entry Requirements

Have a keen interest in understanding the living world around you

Stationary Requirements

1B5 workbook
Notebook
Pen
Ruler (optional)
Pencil and eraser (optional)
Basic colouring pencils (optional)

Level 1 Achievement standards

I/E	Standard	Level	Title	Delivery
I	90925	1	Carry out a practical investigation in a Biological context, with direction	Practical investigation + report
I	90951	1	Investigate the Biological impact of an event on a New Zealand ecosystem	Practical investigation + report
I	90949	1	Investigate life processes and environmental factors that affect them	Test
I	90950	1	Investigate biological ideas relating to interactions between humans and microorganisms	Practical + report
E	90948	1	Demonstrate understanding of genetic variation and change	Exam

LEVEL 1 BIOLOGICAL SCIENCE ANNUAL PLAN 2022

TERM 1

WEEK	1	2	3	4	5	6	7	8	9	10	11
Dates	31 Jan-4 Feb	7-11 Feb	14-18 Feb	21-25 Feb	28 Feb-4 Mar	7-11 Mar	14-18 Mar	21-25 Mar	28 Mar-1 Apr	4-8 Apr	11-15 Apr
TOPIC	**Investigating the impact farming is having on our waterways** **AS 90925** *Carry out a practical investigation in a Biological context, with direction* **AS 90951** *Investigate the Biological impact of an event on a New Zealand ecosystem*										
Learning Concepts & Due Dates	Definition, Outcomes etc.	10, 11 innovation workshops TUTORIALS	Evaluating sources of info, Case studies What do we know? Research about own river	What is a practical investigation? Why/how do we do them? Scientific method	Ecology Abiotic and Biotic factors	Data collection and processing (Math teacher special guest)	Kahuterawa vs Turitea: Designing your own practical investigation L1: River visit	Carry out practical investigation and write up	Report write up	ASSIGNMENT DUE: 7th Apr	

TERM 2

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	2-6 May	9-13 May	16-20 May	23-27 May	30 May-3 Jun	6-10 Jun	13-17 Jun	20-24 Jun	27 Jun - 1 Jul	4-8 Jul
TOPIC	**Life processes** **AS 90949** *Investigate life processes and environmental factors that affect them*							**Humans and microorganisms** **AS 90950** Investigate interactions between humans and microorganisms		
Learning Concepts & Due Dates	MRS CG GREN -Evolution -Survival of the fittest and natural selection -Movement system	- Lung dissection Respiratory system (link with HPE)	-Anatomy Muscles (link with HPE)	- Sprint testing and breathing rate	-Anatomy bones (link with physics)	Environmental factors: Smoking, respiratory illnesses -Environmental factors and illness	Assessment	Virus, bacteria, fungi	Fungi and yeast structure	Fungi and yeast food production - Blue cheese - Rewana - Fizzy feijoa drink

TERM 3

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	26-30 Jul	2-6 Aug	9-13 Aug	16-20 Aug	23-27 Aug	30-3 Sep	6-10 Sep	13-17 Sep	20-24 Sep	27-1 Oct
	Humans and microorganisms **AS 90950** Investigate interactions between humans and microorganisms			**Genetic variation** **AS 90948** *Demonstrate understanding of biological ideas relating to genetic variation*						
	Bacteria structure	Bacteria and food production - Yogurt	Assessment due: 13th	What is genetics?	Section 1 DNA, genes, alleles, chromosomes	Section 2 Meiosis, mitosis, mutations lending to variation	Section 3 and 4 Pedigree charts	Section 5 Variation and why it is important	Review section specific exam questions	Review old exams

TERM 4

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	25-29 Jul	1-5 Aug	8-12 Aug	15-19 Aug	22-26 Aug	29 Aug-2 Sep	5-9 Sep	12-16 Sep	19-23 Sep	26 -30 Sep
TOPIC	**Genetic variation** **AS 90948** *Demonstrate understanding of biological ideas relating to genetic variation*									
Learning Concepts & Due Dates	Practice exams	Levels of competency 1- Answer identified topic questions using notes 2- Identify topics of questions and answer using notes 3- Identify and answer questions without notes								

Biology
(Levels 2-3)

PATHWAY INDICATORS

Learning Area 1	Biology	**Learning Area 2**	Science
Course Hook - Why?	The biggest issue facing your generation is the survival of planet Earth. That includes the survival of mankind! Part of solving this problem is knowing how to look after our environment, and appreciating the diversity we have on our amazing planet. Biology is the study of life!		
Course Hook Description	Biology involves studying the ways living organisms interact with each other and the environment. This course studies: the importance of maintaining healthy ecosystems and the impact of humans on the environment; life processes and the range of adaptations that allow organisms to survive; genetic diversity amongst humans, animals and plants; working with plants for a sustainable future; and how to evaluate the validity of scientific information.		

Learning Objectives

- Understand biological theories and how they develop over time with technology.
- Experience the way biologists carry out investigations to discover and learn about the living world around us.
- Learn how to communicate using the language of biology.
- Develop the ability to understand and discuss biological information concerning socio-scientific issues.

Skills

- Analysing and evaluating biological information
- Practical skills and planning related to biology (testing waterways, using microscopes, plant propagation, ect, designing reliable investigations)
- Critical thinking and problem solving
- Making links between biological theories/information and different context

Entry Requirements

It is highly recommended that students have a good base knowledge of the content at Level 1 when moving into Level 2, and Level 2 when moving into Level 3. Level 1 and 2 genetics exam experience is also highly recommended.

Stationary Requirements

1B5 workbook
Notebook
Pen
Ruler (optional)
Pencil and eraser (optional)
Basic colouring pencils (optional)
Highlighters (optional)

Level 2 Achievement standards

I/E	Standard	Level	Title	Delivery
I	91153	2	Carry out a practical investigation in a biology context, with supervision	Practical investigation + report
I	91158	2	Investigate a pattern in an ecological community, with supervision	Practical investigation + report
I	91155	2	Demonstrate understanding of adaptations of plants and animals to their way of life	Slide show presentation
I	91160	2	Investigate biological material at a microscopic level	Practical + test
E	91157	2	Demonstrate understanding of genetic variation and change	Exam

LEVEL 2 BIOLOGY ANNUAL PLAN 2022

TERM 1

WEEK	1	2	3	4	5	6	7	8	9	10	11
Dates	31 Jan-4 Feb	7-11 Feb	14-18 Feb	21-25 Feb	28 Feb-4 Mar	7-11 Mar	14-18 Mar	21-25 Mar	28 Mar-1 Apr	4-8 Apr	11-15 Apr
TOPIC	**Practical investigation** **91153** *Carry out a practical investigation in a biology context, with supervision* **Ecology** **91158** *Investigate a pattern in an ecological community, with supervision*										
Learning Concepts & Due Dates	STAFF ONLY day 1-2. Y13s day 3-4 Y10-12 day 5	Intro to L2 bio: Evaluating sources, Scientific method and method writing, log books.	Research of similar investigations Ecology Abiotic and Biotic factors, recap L1	Kahuterawa vs Turitea: Designing your own practical investigation Aim, purpose, plan, hypothesis. Milestone 1	Scientific method and method writing. Research of similar investigations Milestone 2	Carry out practical investigation and write up. River visit: 10th March Milestone 3.	Data processing, Findings, initial interpretation, graph Milestone 4.	Discussion Milestone 5	Evaluation and conclusion Milestone 6	DRAFT DUE: 1st Apr Milestone check points will be made over the term, specific tasks will need to be completed at each milestone	ASSIGNMENT DUE: 12th Apr

TERM 2

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	2-6 May	9-13 May	16-20 May	23-27 May	30 May-3 Jun	6-10 Jun	13-17 Jun	20-24 Jun	27 Jun - 1 Jul	4-8 Jul
TOPIC	**Adaptation** **91155** *Demonstrate understanding of adaptations of plants and animals to their way of life*						**Microscopy** **91160** *Investigate biological material at a microscopic level*			
Learning Concepts & Due Dates	Survival of the fittest and natural selection (adaptations and evolution) Life processes	Mammals- lung dissection	Fish- gills dissection	Insects- tracheal	SCHOOL WIDE TESTING Forming a powerpoint	Assessment presentation DUE: 7th Jun	Parts of a microscope, setting up a slide, biological drawing	Cell organelles and parts of a leaf	Lab visit Wednesday 29th June Drawing completion	Tuesday 5th July annotations test and assessment due.

TERM 3

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	26-30 Jul	2-6 Aug	9-13 Aug	16-20 Aug***	23-27 Aug****	30-3 Sep	6-10 Sep	13-17 Sep	20-24 Sep	27-1 Oct
TOPIC	CATCH UP WEEKS Bio in the media option		**Genetic variation** **91157** *Demonstrate understanding of genetic variation and change*							
Learning Concepts & Due Dates			Intro and L1 revision key vocab and concepts	Meiosis and mutations- causes of variation	Migration and genetic drift	Natural selection, monohybrid inheritance	Dihybrid inheritance and Punnett squares	Revision and trouble-shooting	Old exams	Old exams

TERM 4

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	17-21 Oct	24-28 Oct	31 Oct-4 Nov	7-11 Nov	14-18 Nov	21-25 Nov	28 Nov-2 Dec	5-9 Dec	12-16 Dec	19-23 Dec
TOPIC	**Genetic variation** **91157** *Demonstrate understanding of genetic variation and change*									
Learning Concepts & Due Dates	Practice exam week	Levels of competency 1- Answer identified topic questions using notes 2- Identify topics of questions and answer using notes 3- Identify and answer questions without notes								

Level 3 Achievement standards

I/E	Standard	Level	Title	Delivery
I	91601	3	Carry out a practical investigation in a biological context with guidance	Practical investigation and report
I	91604	3	Demonstrate understanding of how and animal maintains a stable internal environment	Test
I	91602	3	Integrate biological knowledge to develop an informed response to a socio-scientific issue	Research report
E	91603	3	Demonstrate understanding of the responses of plants and animals to their external environment	Exam

LEVEL 3 BIOLOGY ANNUAL PLAN 2022

TERM 1

WEEK	1	2	3	4	5	6	7	8	9	10	11
Dates	31 Jan-4 Feb	7-11 Feb	14-18 Feb	21-25 Feb	28 Feb-4 Mar	7-11 Mar	14-18 Mar	21-25 Mar	28 Mar-1 Apr	4-8 Apr	11-15 Apr
TOPIC	**Biological investigation** **91601** *Carry out a practical investigation in a biological context, with guidance*										
Learning Concepts & Due Dates	STAFF ONLY day 1-2. Y13s day 3-4 Y10- day 5	All students MODULE 1 starts	Practical investigation concept development. Aim, purpose, plan, hypothesis. Milestone 1	Scientific method and method writing. Research of similar investigations Milestone 2.	Investigation and data collection River visit: 3rd March Milestone 3.	Data processing, Findings, initial interpretation, graph Milestone 4.	Discussion Milestone 5	Evaluation and conclusion Milestone 6	DRAFT DUE: 1st Apr Milestone check points will be made over the term, specific tasks will need to be completed at each milestone.	ASSIGNMENT DUE: 7th Apr	

TERM 2

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	2-6 May	9-13 May	16-20 May	23-27 May	30 May-3 Jun	6-10 Jun	13-17 Jun	20-24 Jun	27 Jun - 1 Jul	4-8 Jul
TOPIC	**Homeostasis** **91604** *Demonstrate understanding of how humans maintain a stable internal environment*					**Socio-scientific issues** **91602** *Integrate biological knowledge to develop an informed response to a socio-scientific issue*				
Learning Concepts & Due Dates	Unit review and intro	Glucose and thermoregulation	Negative feedback loops and mechanisms	Scenario / case study examples	Homeostasis assignment DUE: 2nd June	Socio-scientific issues. What are they? Look at a current issue	Referencing, Evaluating sources of information, Research techniques, Critiquing arguments, Taking a stance,	Example topic breakdown: Transgender weightlifter, Covid vaccination, Auckland landfill, Mica	Example topic breakdown and discover own topics	Identify issue and research

TERM 3

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	26-30 Jul	2-6 Aug	9-13 Aug	16-20 Aug	23-27 Aug	30-3 Sep	6-10 Sep	13-17 Sep	20-24 Sep	27-1 Oct
TOPIC	**Socio-scientific issues** **91602** *Integrate biological knowledge to develop an informed response to a socio-scientific issue*			**Plant and animal responses** **91603** *Demonstrate understanding of the responses of plants and animals to their external environment*						
Learning Concepts & Due Dates	Definition, Outcomes etc.		DUE: 9th Aug	Plant and animal responses	Migration, homing and navigation	Biological timings (entrainment, photoperiodism)	Actograms	Interspecific and Intraspecific relationships	Reproductive strategies	Old exam questions

TERM 4

WEEK	1	2	3	4	5	6	7	8	9	10
Dates	25-29 Jul	1-5 Aug	8-12 Aug	15-19 Aug	22-26 Aug	29 Aug-2 Sep	5-9 Sep	12-16 Sep	19-23 Sep	26 -30 Sep
TOPIC	**Plant and animal responses** **91603** *Demonstrate understanding of the responses of plants and animals to their external environment*									
Learning Concepts & Due Dates	Practice exam week	Levels of competency 1- Answer identified topic questions using notes 2- Identify topics of questions and answer using notes 3- Identify and answer questions without notes								