DairyNZ

Investigating the biodiversity of stream life in a local waterway.

TESTING STREAM HEALTH AND RESILIENCE BY MEASURING BIODIVERSITY.

ESSENTIAL QUESTION

Eventually all things merge together and a river runs through it.

WHAT ARE WE LEARNING?

- Explaining how living things respond to environmental changes both natural and human induced.
- Finding evidence and carrying out appropriate investigations to develop simple explanations.
- Understanding the basic components and methods involved in examining biodiversity in a waterway.

TRY THIS WITH

- Years 6 – 11
- Students who respond well to real world examples.
- Students who enjoy categorising and documenting.

FIND

Recognise	Classify
Identify	Interpret
Observe	Demonstrate

Listen to DOC's Nicola Toki talk about Inganga in Critter of the Week.

Watch the TED Ed Feedback Loop and Attack of the Killer Algae video.

I dentify the items that might be in a stream feedback loop.

Highlight the importance of native species as opposed to introduced species.

Use Popplet to connect the items.

Understand how biodiversity and resilience are connected.

Understand the difference between larvae and pupa.

Ask: Which stage of the insect life cycle do you think fish would find the tastiest.

Consider dissecting a fish such as a rainbow trout to discover what it has been eating.

Familiarise your class with the NIWA Invertebrate identification guide.

APPLY

Transfer	Dissect
Practice	Establish
Question	Compare

Conduct a staff site visit and evaluate hazards.

Account for activity induced hazards such as flow testing as well as physical environment.

Research the site so some of the social factors can be addressed.

Introduce the site students are visiting and the things to be measured.

Locate the testing site on a map using Google Maps and Google Satellite View.

Analyse the waterway by identifying surrounding land use and possible pollution sources.

Identify sites of historic or cultural significance.

Understand what projects are already underway to address river health.

Practice how to conduct the tests on this water before site visit.

Use Evernote to record findings – aim to record photographic and video evidence.

Conduct your stream condition survey test in at least two locations.

PRODUCE

Visualise	Conclude
Measure	Determine
Estimate	Validate

Sample invertebrates by placing a sample of stream bed material on the gauze.

Wash invertebrates from under rocks found in both still and steadily moving water.

Document invertebrates using Project Noah for later identification.

Measure the approximate speed at which water flows along the middle of your site by timing a floating object, such as an orange or apple.

Measure dissolved oxygen levels by dissolving a tablet in a sample of water.

Conduct a Wolman Walk to measure the composition of the stream bed.

Assess the condition of the stream bank by identifying plants, planting and erosion.

Remind students to remove any rubbish they see during the day from the site.

Use the NIWA invertebrate guide to identify what it is that you found.

Using a photo of the stream site (taken on the day) as a base image.

Create a Thinglink to illustrate test results – use visual material collected on the day.

SUCCESS CRITERIA

Students can check they have completed the task successfully by:

- Giving evidence to describe the connection between biodiversity and resilience.
- Conducting a stream survey and explaining their findings.
- Creating a Thinglink that identifies core aspects of stream health and biodiversity.

PRINCIPLES	VALUES	KEY COMPETENCIES	LEARNING AREAS	WORD BANK	KEY CONCEPTS
Future Focus Learning to Learn	Ecological Sustainability Community and Participation	Participating and Contributing Using language, symbols and texts Thinking	Science Social Science	Invertebrate Biodiversity Resilience Wolman Walk	Metamorphosis Biodiversity webs Insect Life Cycles Freshwater invertebrates