TEACHER OUTLINE:

FISHY CONNECTIONS (2.1) & WHAT IS A FISH (2.2)

OVERVIEW

We start this topic by exploring what it might feel like to be a fish living under the sea! We investigate ways that we are connected with fishes – either as a food source, by spending time on, at or under the sea and through our whakapapa.

Activities develop understanding of these connections with fishes (2.1).

We then look at what actually makes a fish a fish? A fish can be defined as 'a scaly skinned vertebrate [animal with back bone] that breathe using gills and lives in water'.

These learning activities develop knowledge of about fish, their features and characteristics (2.2).

See accompanying slide sets Fishy connections and What is a fish?

FOCUS QUESTIONS

- *How am I connected with fishes?*
- *What makes a fish a fish? What fish live near us?*
- *What new words and concepts have we learnt?*

LEARNING OBJECTIVES

- Identify ways we as people are connected with fish
- Describe key features of fishes
- Observe a fish and record evidence
- Experience and identify local marine species
- Use scientific and fisheries related vocabulary

LOCATION

Indoors & Outdoors

DURATION

50 minutes+

+ field trip

LEVEL

Level 3 - 5

CURRICULUM

Science

Pūtaiao

NEXT STEPS

This topic

- Body shapes of fishes (2.3)

Other topics

- Topic 8 (connections to the sea)

MATERIALS

- Slide set Fishy connections and What is a fish?
- This Teacher Outline
- Access to the internet (for film clip)
- Something to write with
- Copies of Fishy worksheet
- Copies of Local fish spotty worksheet and Local fish worksheet
- Copies of Field trip info and worksheet (pages 5-11) (see also field trip list below)

FOR THE FIELD TRIP

- Bait catchers (set up with lanyard, bait, weight) (one per group)
- Buckets (one per group)
- Shade cloth (wet tea towel or umbrella)
- Timer
- Copies of the worksheet, clip board and pencil
- ID Books for your local area

PROCEDURE

Fishy connections

1. Using Chrome, WATCH the short film [1:55] to see what it is like underwater in Aotearoa New Zealand [slide 10]
2. CONSIDER your connection with fish that live in the sea through tūpuna [ancestors] as well as through your current actions and sources of kai moana. Write a short story called 'a creature of the sea and me' [slide 10]
3. EXPLORE our connection with fishes and sea through te ao Māori and whakapapa [slide 11]
4. And, perhaps as a homework activity, FIND OUT how fishes feature in your whakapapa or ancestry? For example, are there any fish related stories or legends in the history of your whānau? Did your tūpuna [ancestors] catch fish? Where and how? Bring back some stories to share with the rest of your class [slide 12]

What is a fish?

5. DISCUSS briefly ‘what is a fish? [side 13] and use the prior knowledge chart to record what learners already know about fish [slide 14]
6. INVESTIGATE features that fish have and don’t have using slide 15 and complete Fishy worksheet [slide 15]
7. IDENTIFY AND LABEL features of a fish using information from the worksheet [slide 16 & 17] Answers are on slide 17.
8. Consider booking a real or virtual VISIT to the National Aquarium of New Zealand to explore more deeply fishy features [slide 17]
9. READ, RESEARCH and ANSWER questions about local fish (could set as homework) Local fish spotty worksheet and / or Local fish worksheet [slide 18]
10. BRAINSTORM what we know about the fish and sea near us [slide 18] and complete the prior knowledge chart
11. VISIT a local wharf with a set of bait catchers and have fun trying to catch a Spotty [slide 19]. For full information on how to run the field trip, data collection sheets and worksheets see Field trip info & worksheet [slide 19] (pages 5-11). If taking your class to the wharf for the field trip isn’t possible then look out for our VIRTUAL FIELD TRIP coming soon with the team from National Aquarium of New Zealand

KEY WORDS

Fish	Vertebrate
Whakapapa	Gills
Cartilaginous fish	Bony fish

CURRICULUM LINKS

Nature of Science (Level 3-5)

- Investigating in science
- Communicating in science
- Participating and contributing

Living World (Level 3-5)

- Ecology
- Life processes

Science (Level 6+)

- Participating and Contributing
- Ecology
- Life processes

Pūtaiao

- *The Natural World: The Organism:* Recognise that there are biological processes common to all organisms, which occur in different ways in different species. *The Biological Environment*: Recognise and explain the changes undergone by species (especially those of Aotearoa) over long periods of time (Level 4+)
- The Natural World: The Biological Environment: Investigate the effect of human actions, and natural processes, on an Aotearoa ecosystem (Level 6+)

FIELD TRIP: TEACHER NOTES

- Find a local site to conduct the field trip. A local wharf would be ideal.
- Identify the species of fish to target. We suggest the Spotty *Notolabrus celidotus* also known as Paketi or Pakirikiri. This endemic species [native only to Aotearoa New Zealand] belongs to the wrasse family and can be found all around Aotearoa New Zealand. Triple fins or blennies would also be good.

  NOTE: We are targeting one fish species so learners get some [albeit over simplified] experience of how hard it might be to catch just the one species of fish they are targeting!
- Explain how to transfer fish from bait catchers to buckets without harming fish. We don't want to harm or kill any sea creatures during this field trip! This Responsible Fishing Guide might be helpful.
- We have set the fishing time at 5 minutes. It may take longer for the fish to pick up the scent of bait in which case you may need to extend to 10 minutes.

PROCEDURE: CATCH A LOCAL FISH FIELD TRIP

PRE TRIP (15+ minutes)

1. Brainstorm what we already know about local fish and complete the prior knowledge chart (page 8).
2. Discuss species of fish targeted. Make sure learners can recognise the target fish. Explain what we will do on our field trip.
3. Have learners read 'Local fish fact sheet: spotty'. If you are targeting a different type of fish then use the 'Local fish worksheet'.

IN THE FIELD (60+ minutes)

1. Once at the site, break learners into small groups.
2. Each group needs to
    a. Complete the top two rows of the field trip data sheet.
    b. Set up a bait catcher [add bait such as buttered bread, one or two small fishing weights and securely tie a lanyard or line to the catcher].
    c. Fill a bucket with seawater and ensure it is in the shade or shaded by a shade cloth / umbrella [this is a safe haven for any creatures caught by the group].
    d. Gently lower the catcher into the sea and start the timer.
    e. Leave the bait catcher in the water for exactly five minutes then retrieve.

f. Carefully put the catcher in the bucket of water and open to allow any fish or other sea creatures to escape.

g. Use the data sheet provided [see final pages] to record what was caught.

h. Check bait and rebait if needed.

3. Repeat steps d-h five times [giving a total of 25 minutes of fishing] and record all creatures caught].
4. Observe the target species. What do you notice about the fish? How does it swim? Where are the mouth and eyes? Do you think this fish is benthic [bottom dweller] or pelagic [mid water]? [You could also complete the activity called 'observe and decode a fish' on the final page of Fishy Fact Sheet]
5. Gently release all creatures back to the sea!

POST FIELD TRIP (50+ minutes)

1. Review and evaluate. What did we learn? What more do we want to learn…
2. Talk about fishing effort i.e. how long it took to catch the Spotty [see also extension activity].
3. Talk about the Marine Stewardship Council's three principles for sustainable fisheries and consider the fish just caught:

    i. Fishing effort: Is there evidence of overfishing for this fish?

    ii. Bycatch: Was it easy to just catch the targeted fish or was there bycatch? Was it easy to catch the required amount (one fish)? What percent of bycatch were released unharmed?

    iii. Habitat damage: Was there any damage to the environment from our fishing method?

    iv. Fishery management: Are there rules around catching this fish and is there a long term management plan in place for this species of fish?

    v. Fishing method: What would be the likely impact of other methods? Was ours the best method?

    vi. Marine Stewardship Council's sustainability assessment: Discuss that i-v are all factors that you would look at if you were assessing a fishery on behalf of the Marine Stewardship Council and looking at whether a fishery was fished sustainably.

EXTENSION

Collate and graph findings (i) Simple bar graphs showing length of time taken to catch first Spotty. (ii) Bar graph showing taxonomic groups of bycatch [e.g. mollusc, crustacean, bony fish…].

PRIOR KNOWLEDGE CHART

THE FISH THAT LIVE NEAR US

PRIOR KNOWLEDGE CHART

What we know	What we would like to know	What we have learned

SAMPLE FIELD TRIP DATA SHEET

Your name(s): Aroha Jones & Finn Taniwha	**Date & time:** Monday 13th May 2020 @ 10.20am	**Site location [name / GPS coordinates if available]:** Panea Wharf
High tide today is at: 10.43 AM	**Name of target fish:** *Notolabrus celidotus* (Spotty)	**Time taken to catch first target fish:** 15 minutes

Five minute period	Type of creature / species if known	# caught	Other notes [e.g. f / m]
0-5 minutes	Shell fish [Cats eye]	x 2	
	Fish [Triple fins]	x 4	
5 – 10 minutes	Fish [Spotty]	x 1	female

FIELD TRIP DATA SHEET

Your name(s):	Date & time:	Site location [name / GPS coordinates if available]:
High tide today is at:	Name of target fish:	Time taken to catch first target fish:

Five minute period	Type of creature / species if known	# caught	Other notes [e.g. f v m]

Five minute period	Type of creature / species if known	# caught	Other notes [e.g. f v m]