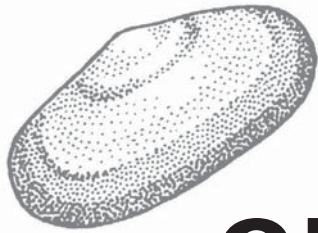
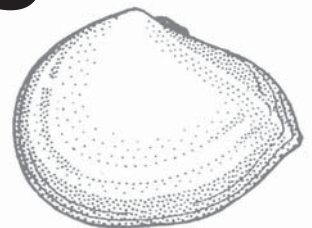


**Hauraki Gulf Forum**  
Tikapa Moana



# Shellfish

# Monitoring



# Learning Journal

**Name:**

**School:**

# Shellfish Monitoring

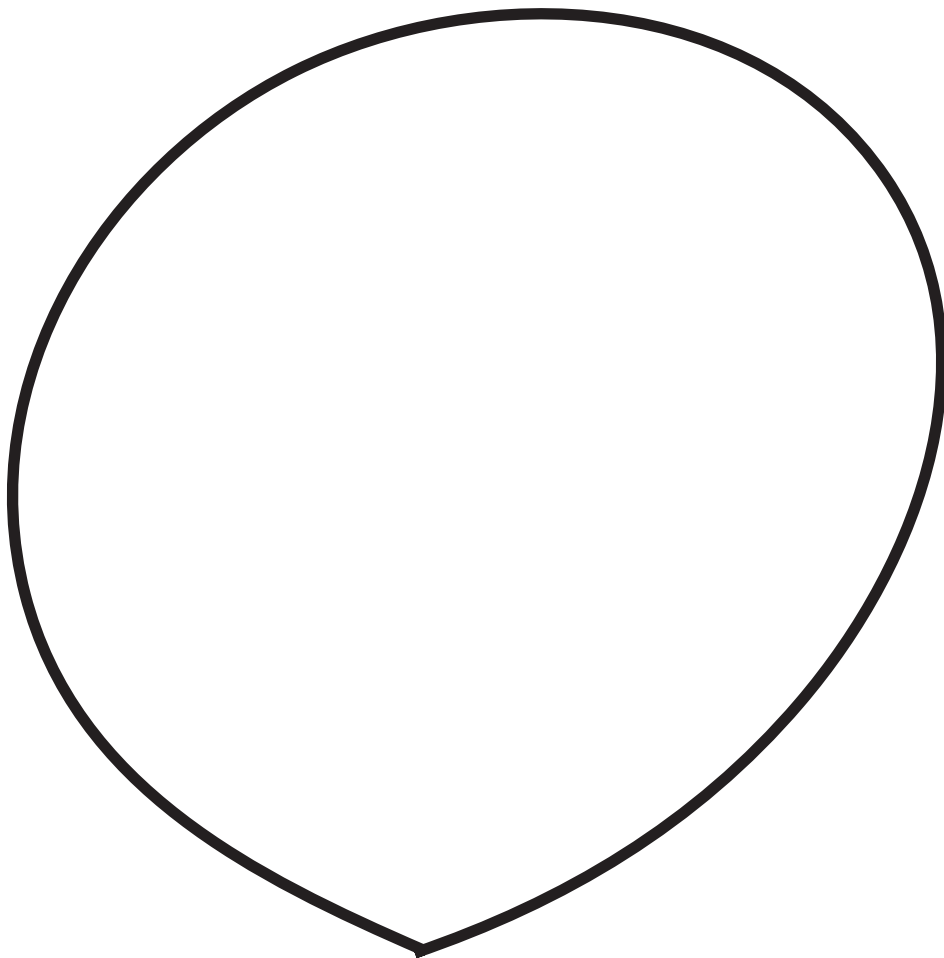
How much do you already know? Have a go at writing a 'first definition' for the key terms below. You will fill in the 'second definitions' later

Term	First Definition	Second Definition
marine		
shellfish		
bivalve		
gastropod		
survey		
monitoring		
harvesting		
kaimoana		
habitat		
ecosystem		
biodiversity		
transect		
sieve		
sediment		

A shellfish is ...

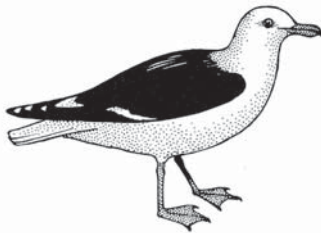
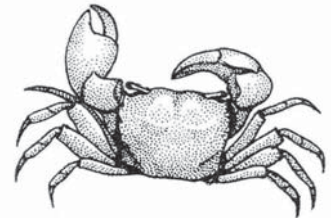
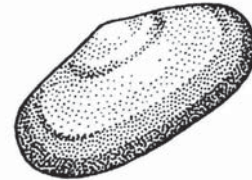
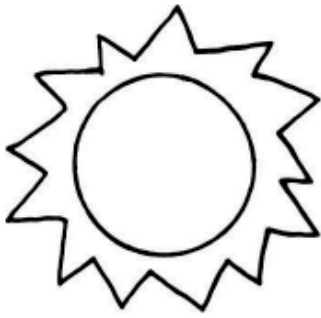
## Types of shellfish

Brainstorm all the different shellfish that you know of and write them in the shell outline below.

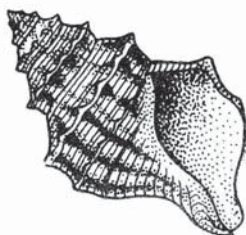


# Marine Ecosystem

Create an ecosystem by drawing lines to show what eats/uses what.



microscopic  
plants and  
animals



# Marine Biodiversity

My definition:

*Create an acrostic poem about marine biodiversity by starting each line with the letters below.*

**B**

**I**

**O**

**D**

**I**

**V**

**E**

**R**

**S**

**I**

**T**

**Y**

# What is an Environmental Indicator?

*Fill in the gaps below using the following words:*

different    measured    marine    indicator

An environmental indicator is something that is easily \_\_\_\_\_ that 'indicates' or shows us if anything is changing. There are many \_\_\_\_\_ sorts of indicators used.

Shellfish can do this job too. When an animal or plant is used as an \_\_\_\_\_, it is called an 'indicator species'. So shellfish are an important indicator species for the \_\_\_\_\_ environment.

We can learn a lot from studying shellfish!

---

*Have a go at using shellfish as an environmental indicator!*

If there are **less** shellfish at a beach compared to the previous year this could indicate...

If there are **more** shellfish at a beach compared to the previous year this could indicate...

# Shellfish are Important!

Fill in the chart below with reasons why shellfish are important

Reason No. 1:

Reason No. 2:

Reason No. 3:

Reason No. 4:

# Threats to Shellfish

What is a threat?

Draw a line to match the threat with the consequence.

## Threat

## Consequence

Over-harvesting:  
people taking too many  
shellfish

Can stop shellfish from  
breathing, stops plants  
from growing which  
some shellfish eat

Sediment run-off: soil  
from building sites  
washed into water when  
it rains

Poisonous to shellfish,  
if humans eat shellfish  
can also cause severe  
vomiting and diarrhoea

Chemical pollution:  
from stormwater,  
including heavy metals  
from cars

Numbers of shellfish  
keep reducing -  
eventually they may not  
live there anymore

Sewage: septic tank  
or sewage overflows  
washed into sea

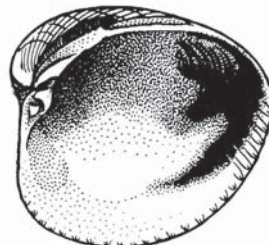
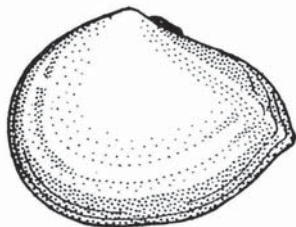
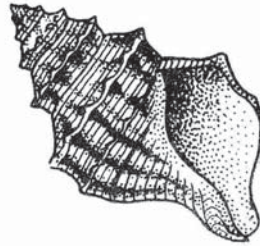
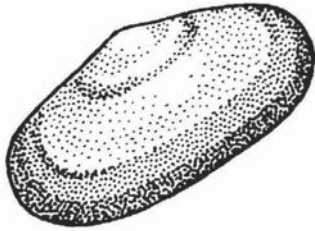
Poisonous to shellfish, if  
humans eat shellfish can  
lead to a wide range of  
illnesses



# Name that Shell

1) Write the name of the shell under the drawing

2) Circle the bivalves



# What Do Shellfish Eat?

Research the shellfish below to find out what they eat, and fill in the chart

Name	Eats
Top Shell	
Cockle	
Pipi	
Whelk	
Horn Shell	

Complete the following food chain by filling in the empty boxes with two of the above shellfish.



An extra challenge: Can you create a different shellfish food chain? Use the boxes below.



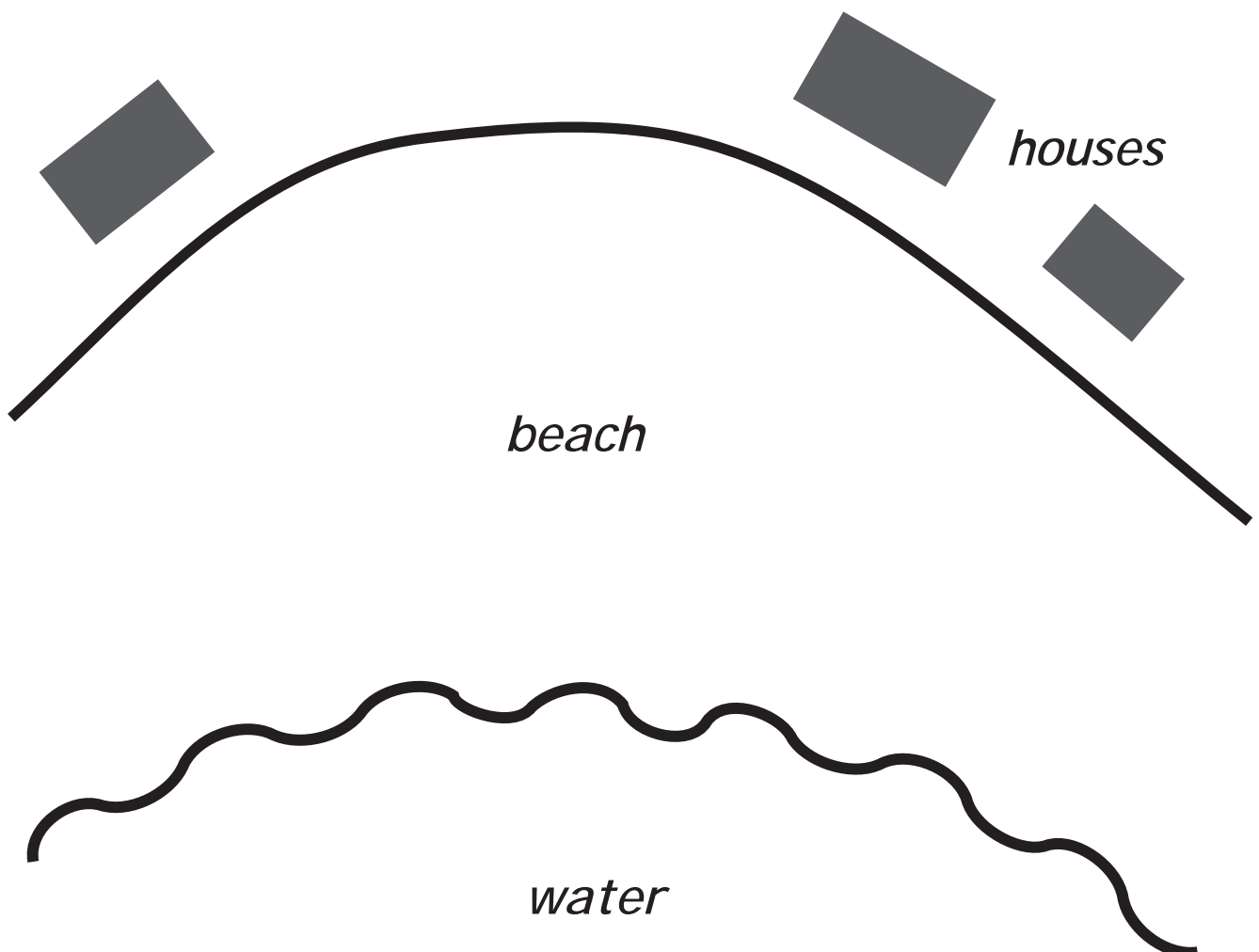
# What is a Shellfish Survey?

What is a survey?

What is a sample?

Why do we use transects?

Below is a bird's eye view of a beach. Imagine you were going to survey the beach for shellfish. Draw in the location of six parallel transect lines that you would set up.



# Survey Equipment

You will practice using the equipment in class so you will be experts in the field!

Write the names, or draw, three pieces of equipment you used.

--	--	--

Which piece of equipment was the most difficult to use? Why?

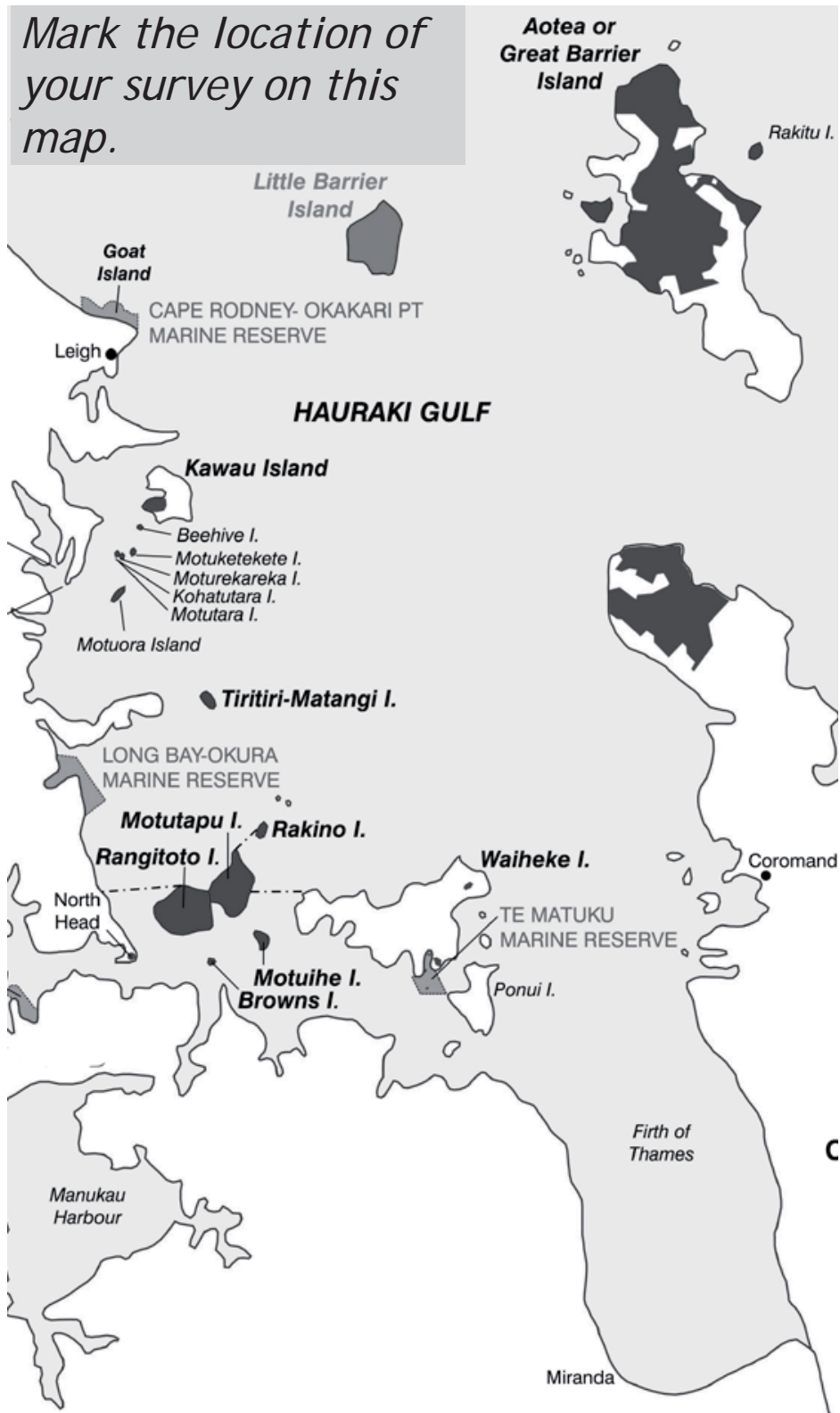
What is a sampling error?

Why is it important to be as accurate as possible when doing a survey?



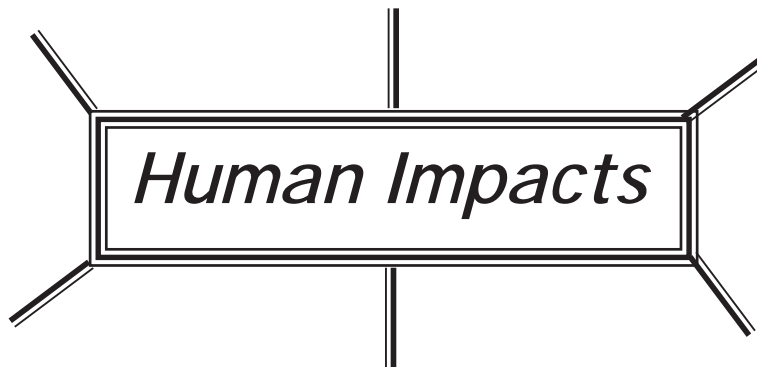
# Field Survey

Date: \_\_\_\_\_ Name of survey area: \_\_\_\_\_  
Description of marine habitat (e.g. sandy shore, muddy estuary): \_\_\_\_\_



# Human Impacts

Brainstorm below how humans have affected or changed your survey area. The picture on the next page may help you.

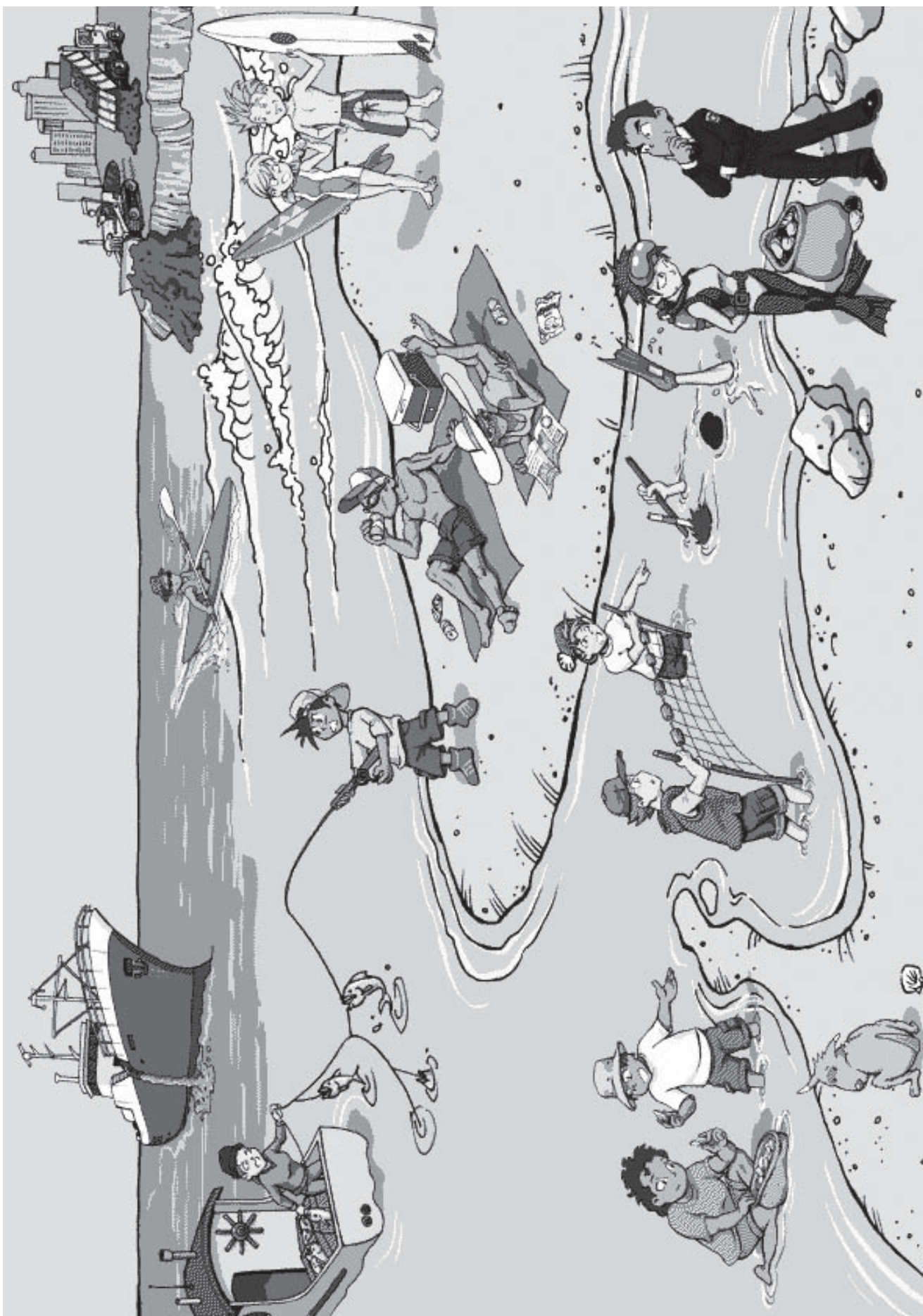


Circle those which you think are positive.  
Put a rectangle round those you think are negative.  
Some may be both!

Choose two of your impacts from above and fill in the table below

Impact	Effect on marine life







# Data

What is data?

What data did you collect on the shellfish survey?

The next step is to collect all the data into one place, for example on a electronic spreadsheet on a computer.

Make a start by filling in the below table.

Shellfish Species Present at .....

Species Name	✓ / X
Cockle	
Pipi	
Wedge shell	
Nut shell	
Whelk	
Topshell	
Horn shell	

# What Does the Data Tell Us?

Match the scientific term with the correct meaning

Abundance	the natural increases and decreases in population size
Natural Variation	the number of individuals of a species in a population
Density	the general direction/change in what is being measured - can go up or down or remain the same, over time or over distance
Trend	a measurement of population per unit area

Why is density a very useful measure of abundance?

What could cause natural variation?

If too many cockle were being harvested, over a few years what trend would this show?

# Our Shellfish Survey

## Conclusions

What did you find out about the types, abundance, density, and size of shellfish in your survey? After completing your data analysis, write three conclusions about the data collected in the space below.

Conclusion One:

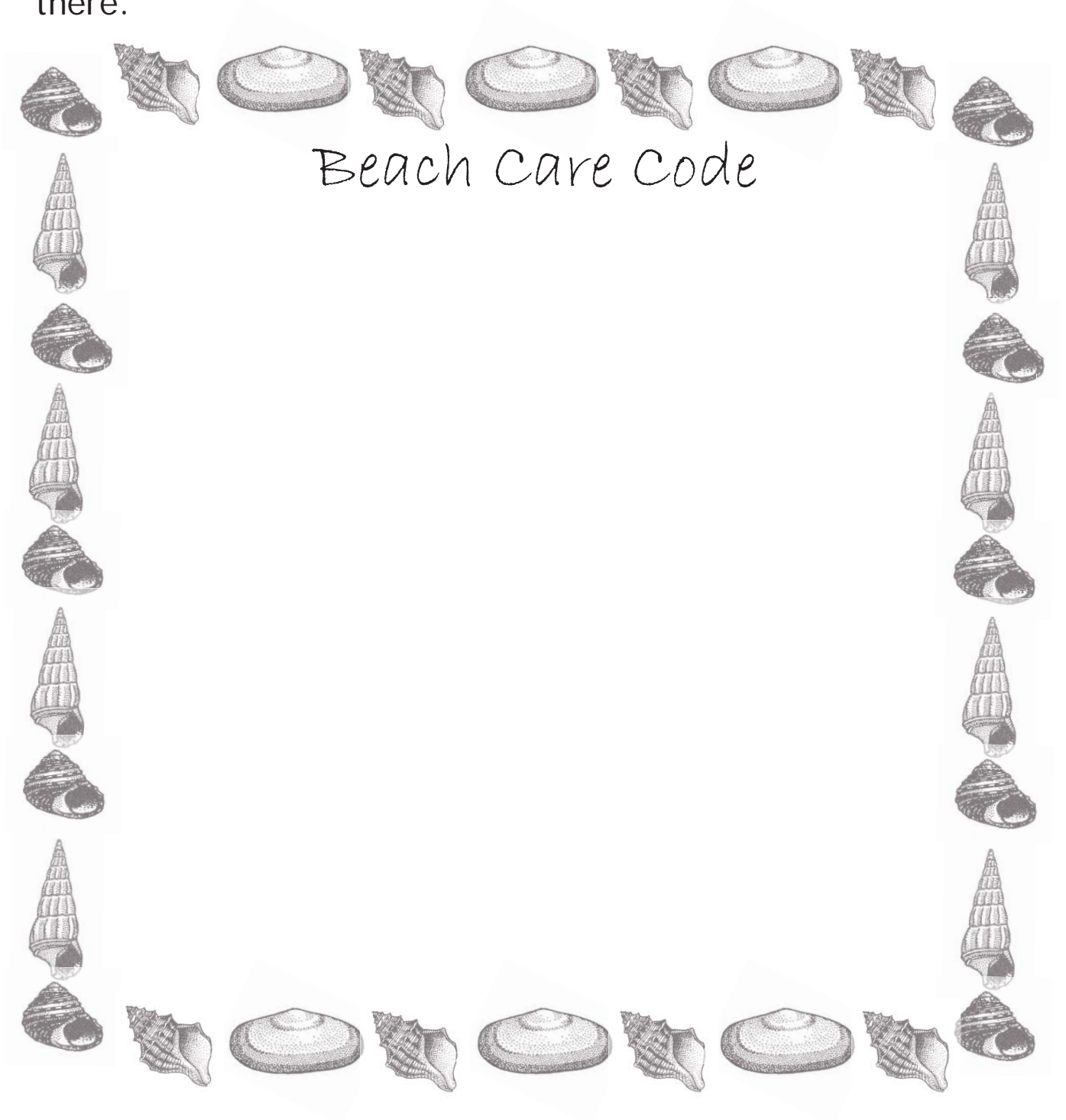
Conclusion Two:

Conclusion Three:

# Kaitiakitanga

What does 'kaitiakitanga' mean?

Show how you can be a kaitiaki for the marine environment by creating a beach care code below. Make a list of actions to protect and look after the beach, and the creatures that live there.



# *Topic Evaluation*

Complete the following sentences for the work you've done about shellfish surveying.

## Field Survey

I really liked...

I thought it could be improved by....

## Learning Journal

My favourite activity was...

I thought it could be improved by....

I learned that...

I didn't understand...

I was pleased to see that...

I was surprised to find...

Now I want to know...

### Overall topic rating

Colour in one of the faces below

