

Info sheet for LIMPET assistants

Thank you for assisting on a LIMPET outing! We've put together this sheet to get you up to speed with the LIMPET programme and prepare you for your role on the day of the outing.

Schedule on the day of the outing:

1. Preparations & set-up
2. LIMPET activities
 - Activity 1 – Exploration & photo quadrats
 - Activity 2 – Counts and Measurements of key species
 - Activity 3 – Dirty Dozen clean-up
3. Wrapping up

1. Preparations & set-up

The LIMPET coordinators will let you know the time you need to meet them at Dalebrook rocky shore (next to the tidal pool). This is usually 2.5 hours before low tide, which will allow for a quick briefing and preparations before the learners arrive. Each of you will be assigned to a coordinator, who will lead all the activities. Your job is to assist her/him in the process.

To avoid confusion on the day, please familiarise yourself with the main features of the study site (Figure 1).

The following needs to be done before the arrival of the learners:

- **Set-up of gazebos:** three gazebos need to be set up, one at the top of each transect line (Figure 1).
- **Rope enclosures:** at each transect line, 2-3 zones will need to be marked by tucking a thin rope under 4 plain silver bolts that mark rope enclosures (see Figure 1). Your coordinators will provide you with details how to set up the ropes.
- **Assembly of clipboards:** there are three activity data sheets, which need to be added to clipboards.

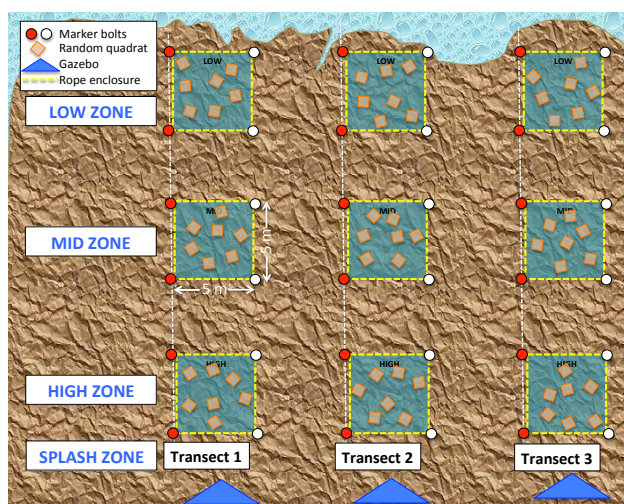


Figure 1. Schematic map of the study site with the following features:

- Three transect lines reach from the from the SPLASH ZONE (top) via the HIGH and MID ZONES to the LOW ZONE (edge of the sea);
- Bolts that mark each transect line (depicted as red) have orange/red rubber markers (unless lost);
- Additional plain silver bolts without red markers (depicted as white) serve to mark areas where HIGH, MID and LOW ZONES are (or the beginning of a transect line);
- Gazebos that need to set up at the top of each transect line;
- Rope enclosures (yellow dashed lines) that need to be laid out around each of the marker bolts for HIGH / MID / LOW zones;
- Random quadrats inside marked enclosures indicate where learners will do counts and measurements.

2. LIMPET activities

Once the learners arrive at Dalebrook, they will assist with carrying equipment from the car park down to the shore. They will be split up in three groups of 15-20 learners, each of which will be taught by a different coordinator. Each of the three groups will have its own gazebo and work along its own transect line. You will be assigned as assistant to one of the coordinators, and help her/him facilitate the various activities.

After a short lesson under the gazebo, the learners will be further split up in groups of 3-4 learners, and **each group gets given a clipboard with data sheets and a pencil.**

Activity 1 – Exploration & photo quadrats

The learners will spend 45 min - 1 hour exploring the rocky shore and learning about life in this exciting zone between the tides. Activity sheet 1 (see Appendix: ***Exploring the rocky shore***) will provide guidance. While having fun and getting intimate with creatures, their task is to find and identify up to 23 species, and tick on the sheet:

- What type of feeder they are
- What zone they live in

We have provided answers in the Appendix, in case you are unfamiliar with the species.

Please familiarise yourself with the correct answers, so you can assist the learners on the day.

Activity 2 - Counts and Measurements of key species

The next activity is the most challenging to coordinate, when learners are “doing real science”. We would like the data to be used for monitoring, so care needs to be taken that learners are doing it correctly. Learners will work in groups of three, with a scribe and two observers.

- **Each scribe needs a clipboard, pencil and quadrat**
- **Each observer needs a knee pad and a ruler**

The coordinator and you will demonstrate how data are collected. In the demonstration, you will usually take the role of the scribe and the coordinator will take the role of the observer. Pupils will be shown how to identify two key species per zone (five in total), how to find and count them by using their hands to feeling the rock surface square-by-square, and how to measure their length (not width) with a ruler. After the demonstration, the learners will get to count and measure themselves, and enter data in the datasheet (see Appendix: ***Counts and lengths of key species in different zones***).

You need to **keep an eagle eye** on the learners and make sure that they:

- **Identify species correctly** and avoid counting/measuring the wrong species (or a mix of species). Tips for species IDs are provided in the Appendix.
- **Measure lengths correctly**; measurements are taken of the longest of the animals; measurements are done in mm.
- **Enter data correctly on the datasheet**; It is important to check the numbers the scribes write down and make sure that they are realistic (see comments on data sheet in Appendix).

Activity 3 – Dirty Dozen clean-up

This activity will get the youth moving again. They will do a “Dirty Dozen race” (without running!!), whereby the winners are those who collect and score (on a data sheet) the most litter items in a given time (usually 10 minutes). The winners will be named on our LIMPET Blog (www.limpet.co.za). While collecting items in a bag/bucket/basket, the scribe takes a tally of the type of items collected (see Appendix: **Litter collection: The Dirty Dozen**). They can collect litter on the rocky shore and beach.

You need to encourage the learners to collect litter, and possibly show them the litter hotspots, e.g. pools.

3. Wrapping up

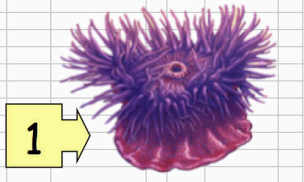
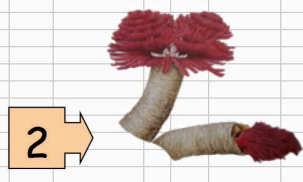
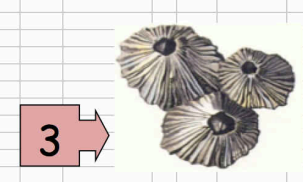
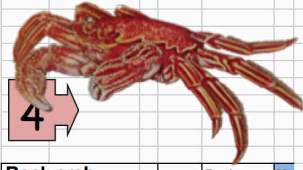
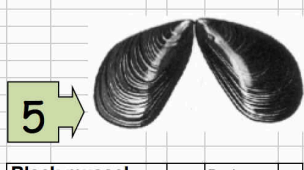
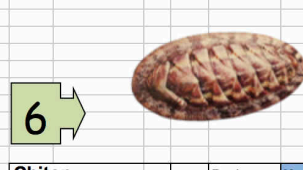
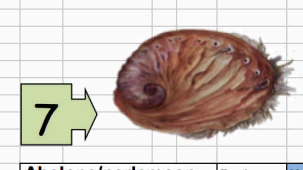

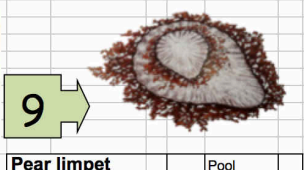
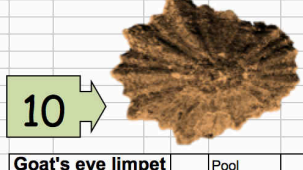
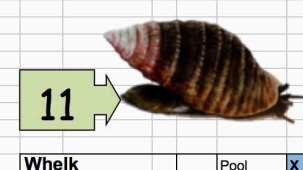
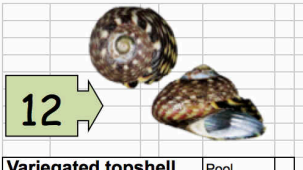
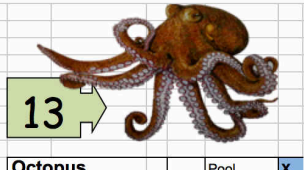
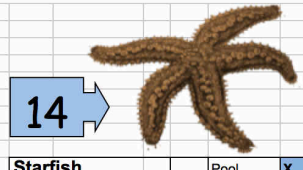
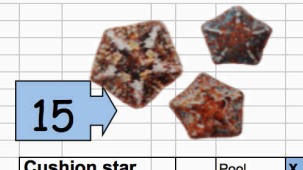
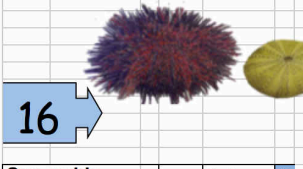
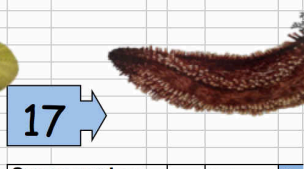
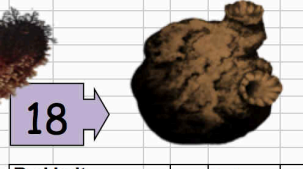
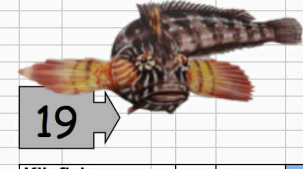
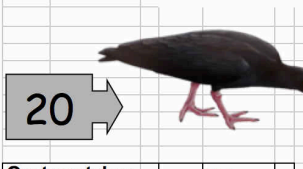
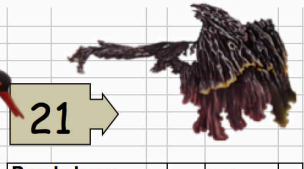
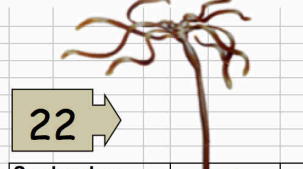

- Learners are asked to complete an evaluation form before their departure. **Please assist in distributing and collecting these forms and pencils.**
- All data sheets (with exception of the exploration sheet) and evaluation sheets need to be compiled for the whole class and handed to one of the coordinators. **Please make sure all data sheets are compiled.**
- Gazebos need to be disassembled and – with the help of the learners - all equipment carried back to the car park.

Appendix

Data sheet & memo: Exploring the rocky shore

Exploring the rocky shore

- * Identify the following creatures found on the rocky seashore.
- * Tick which feeding method they use.
- * Tick in which zone they are found.

																																																																	
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Counts and measurements: what to look out for

lim:pet Long-term Intertidal Monitoring through Participation, Evaluation & Training

COUNTS AND LENGTHS OF KEY SPECIES IN DIFFERENT ZONES

1. Fill in the date, transect number and your names:

SITE	Dalebrook (Kalk Bay)	OBSERVER name(s)	Joseph
DATE	3 Feb 2018	SCRIBE name	Adilah, Thoko
TRNSECT #	2	NOTES (if you have)	Big waves!

2. In each zone, place your quadrat randomly, record the position of your quadrat, and score counts and lengths of key species:

Example of count data

= 5

Example of size data

= 24, 28, 17, 12, 30

How to measure length (longest distance)

LOW zone		COUNTS	$18 + 31 = 49$				
		LENGTH in mm <small>(of 20 individuals, unless there are fewer)</small>	22	34	16	12	13
	COUNTS	$3 + 1 = 4$					
	LENGTH in mm <small>(of 20 individuals, unless there are fewer)</small>	18	28	32	20	16	
MID zone		COUNTS					
		LENGTH in mm <small>(of 20 individuals, unless there are fewer)</small>					
		COUNTS					
		LENGTH in mm <small>(of 20 individuals, unless there are fewer)</small>					
HIGH zone		COUNTS					
		LENGTH in mm <small>(of 20 individuals, unless there are fewer)</small>					
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lim:pet Long-term Intertidal Monitoring through Participation, Evaluation & Training

MID zone		COUNTS					
		LENGTH in mm <small>(of 20 individuals, unless there are fewer)</small>					
HIGH zone		COUNTS					
		LENGTH in mm <small>(of 20 individuals, unless there are fewer)</small>					

Make sure that each scribe has completed this section. This information is crucial for the analysis of data.

Often hidden under tufts of Afro weed (*Gelidium pristoides*).

These are usually small (< 15 mm). If numbers are >20 mm, they are measuring the wrong species!

Babies on top of adults also need to be counted and measured!

This is how length of a limpet is measured – along the middle of its long axis.









Usually two learners count separately, each counting half of the quadrat. The scribe can record both numbers and add them up.



Only the first 20 individuals of a species are measured.


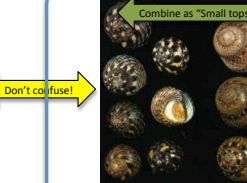

If there are <20 individuals of a species, all are measured. This means that the number of measurements is the same as the number of counts, here 4.


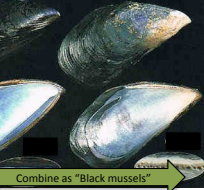

Make sure measurements are recorded in mm (not cm!).

Tips for species ID: key species relevant for LIMPET are marked by blue outline


<p>Bearded limpet (<i>S. barbara</i>)</p>  <ul style="list-style-type: none"> Variable, usually tall Spiky ribs; white shell 	<p>Long-spined limpet (<i>S. longicosta</i>)</p>  <ul style="list-style-type: none"> 2 longest ribs not in centre Flat; ca. 11 ribs 	<p>Goat's eye limpet (<i>Cymbula oculus</i>)</p>  <ul style="list-style-type: none"> Longest rib in centre Flat; ca. 10 ribs 	<p>Granite limpet (<i>Cyranatina</i>)</p>  <ul style="list-style-type: none"> More ribs (ca. 15) Taller than <i>C. oculus</i>
<p>Pear limpet (<i>Scutellastra cochlear</i>)</p>  <ul style="list-style-type: none"> Pear shaped Flat 	<p>Granular limpet (<i>S. granularis</i>)</p>  <ul style="list-style-type: none"> Oval shaped Textured with granules Resembles tortoise when eroded 	<p>Argenville's limpet (<i>S. argenvillei</i>)</p>  <ul style="list-style-type: none"> Oval shaped Gets very large and tall Teeth on inner margin to cut kelp 	<p>Pink-raved limpet (<i>C. miniata</i>)</p>  <ul style="list-style-type: none"> Oval shaped Gets large, but flat Pink rays visible on edge

<p>Smooth turban shell (<i>Turbo sinensis</i>)</p>  <ul style="list-style-type: none"> Round, brown Smooth, glossy 	<p>Alikreukel (<i>T. sarmaticus</i>)</p>  <ul style="list-style-type: none"> Round, brown, coarse Gets very large "Door" with nodules
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<p>Pink-lipped topshell (<i>Oxystele sinensis</i>)</p>  <ul style="list-style-type: none"> Round, black Pink inner lip 	<p>Tiger topshell (<i>O. tigrina</i>)</p>  <ul style="list-style-type: none"> Round, black No pink inner lip 	<p>Variegated topshell & Beaded topshell (<i>O. variegata</i>) & (<i>O. impervia</i>)</p>  <ul style="list-style-type: none"> Combine as "Small topshells" Round, multi-coloured (not black) Pearly inside aperture Smaller than the black topshells
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<p>Ribbed mussel (<i>Aulacomya ater</i>)</p>  <ul style="list-style-type: none"> Wavy ridges Brown or black 	<p>Black mussel (<i>C. meridionalis</i>)</p>  <ul style="list-style-type: none"> Black/blue, smooth Can get fairly large 	<p>Mediterranean mussel (<i>Mytilus galloprovincialis</i>)</p> 
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Cape urchin
(*Parechinus angulosus*)





- Colour variable (purple, pink, red, green)
- Shortish pointed spines

<p>Ridged burnupena (<i>B. cincta</i>)</p> 	<p>Variable burnupena (<i>B. lagenaria</i>)</p> 	<p>Common dogwhelk (<i>Nucella dubia</i>)</p> 	<p>Scaly dogwhelk (<i>N. squamosa</i>)</p> 
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Combine as "Whelks", but don't confuse with periwinkles & topshells

- Elongated shell, oval aperture
- Often dark-brown, often purple around the aperture


<p>Siffe (<i>Haliotis spagicea</i>)</p>  <ul style="list-style-type: none"> Fairly smooth Smaller (<8 cm) 	<p>Perlemoen (abalone) (<i>Haliotis midae</i>)</p>  <ul style="list-style-type: none"> Corrugations Get very large (up to 19 cm)
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Red bait (sea squirt)
(*Pyura stolonifera*)



- Wrinkled dark-brown tough skin
- Get large; two "siphon" holes

Giant / armadillo chiton
(*Dinoplex gigas*)



- 8 grey-green shell plates
- Large (up to 10 cm)

The Dirty Dozen data sheet



LITTER COLLECTION: THE DIRTY DOZEN



1. Fill in the date, transect number and your names:

SITE	<i>Dalebrook (Kalk Bay)</i>	Collector(s)	
DATE		NOTES (if you have)	

2. Let learners have a race to pick up as much litter as possible in a given time. Record how many learners searched for how many minutes, and record numbers collected for each of the Dirty Dozen (developed by The Beach Co-op).

<i>Numbers of:</i>	<i>Total</i>	<i>Description</i>
Example: Cooldrink bottles <i>JHT III</i>	8	
1. Plastic pieces		Various types of plastic bits
2. Plastic cutlery		Knives, forks, spoons, or pieces of
3. Water bottles		clear/light blue bottles for drinking water
4. Cooldrink bottles		PET fizzy drink bottles (Coke, Fanta, etc.)
5. Cooldrink lids		lids from PET/water bottles only (exclude larger lids from milk bottles)
6. Carrier bags		Supermarket bags with built in handles
7. Chip/snack packets		foil plastic packets used for crisps, chips, popcorn, etc.
8. Individual sweet wrappers		wrappers for single sweets
9. Straws		drinking straws
10. Glass pieces		disposable cigarette lighters
11. Fishing line		fishing line (single strands or tangles) – check washed up seaweed!
12. Lightsticks		lightsticks used by the fishing industry
Other items		