

Build your own plankton net

Author: Callum Hollingsworth

This resource was developed as a result of participation in CSIRO's teacher professional learning program, Educator on Board.

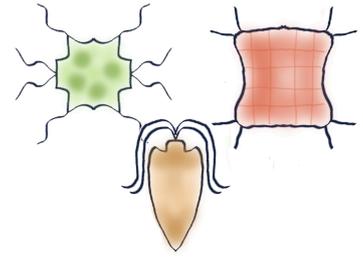
© *Build your own plankton net for Years 7 (created by Callum Hollingsworth) (2018)*. Copyright owned by Department for Education, Tasmania. Except as otherwise noted, this work is licenced under the Creative Commons Attribution 4.0 International Licence. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>



Title – Build your own Plankton Net by Callum Hollingsworth			
<p>Blurb – The RV <i>Investigator</i> can be equipped with numerous devices used for collecting samples of water, air, mud and plankton. One device used on board is called a Continuous Plankton Recorder (CPR). The CPR is an effective device for collecting plankton samples and has changed very little since it was originally developed in the 1930s by Sir Alister Hardy. The device is lowered off the back of RV <i>Investigator</i> and dragged along behind the vessel. As the CPR is towed plankton enters the front of the device and then becomes trapped in layers of silk. The silk is then wound onto a spool ready to be collected and analysed by scientists.</p> <p>Although a plankton net is quite different from the CPR device it acts on the same principles. Creating a filter for water to move through, trapping and leaving the plankton behind.</p>			
<p>Nature of the inquiry problem – This activity is designed for students to build and use their own plankton net to collect samples for further investigation. Depending on the year levels (see below) students will help develop investigations around the use of the plankton net. The plankton samples can then be used across a range of year levels depending on the learning objectives and outcomes (see below links).</p>			
<p>Suitable year levels and subject areas This activity links to the national science curriculum for years 7 - 10</p>			
<p>Curriculum links – Australian Curriculum – Science</p>			
Year 7	Year 8	Year 9	Year 10
<p>Science Inquiry Skills - Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (AC SIS125 - Scootle)</p>	<p>Science Inquiry Skills – Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (AC SIS139 - Scootle)</p> <p>Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (AC SIS140 - Scootle)</p> <p>Measure and control variables, select equipment appropriate to the task and collect data with accuracy (AC SIS141 - Scootle)</p>	<p>Science Inquiry Skills - Formulate questions or hypotheses that can be investigated scientifically (AC SIS164 - Scootle)</p> <p>Plan, select and use appropriate investigation types, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods (AC SIS165 - Scootle)</p> <p>Select and use appropriate equipment, including digital technologies, to collect and record data systematically and accurately (AC SIS166 - Scootle)</p>	<p>Science Inquiry Skills - Formulate questions or hypotheses that can be investigated scientifically (AC SIS198 - Scootle)</p> <p>Plan, select and use appropriate investigation types, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods (AC SIS199 - Scootle)</p> <p>Select and use appropriate equipment, including digital technologies, to collect and record data systematically and accurately (AC SIS200 - Scootle)</p>
<p>Science Understanding - Classification helps organise the diverse group of organisms (AC SSU111 - Scootle)</p>	<p>Science Understanding – Multi-cellular organisms contain systems of organs carrying out specialised functions that enable</p>	<p>Science Understanding – Ecosystems consist of communities of interdependent organisms and abiotic components of</p>	<p>Science Understanding – The theory of evolution by natural selection explains the diversity of living things and is supported by a</p>

	them to survive and reproduce (ACSSU150 - Scootle)	the environment; matter and energy flow through these systems (ACSSU176 - Scootle)	range of scientific evidence (ACSSU185 - Scootle) (expanded) evaluating and interpreting evidence for evolution, including the fossil record, chemical and anatomical similarities, and geographical distribution of species
Learning Objectives – Students will learn how to collect plankton samples, and correctly classify plankton species; understanding reasons for collecting samples.			
Student Learning Outcomes* – Students will know how to conduct a scientific investigation, specifically the process of collecting plankton			
Format – Student Investigation			
<p>References:</p> <p>Australian Curriculum, Assessment and Reporting Authority. (n.d). Australian curriculum: Science. Retrieved from https://australiancurriculum.edu.au/f-10-curriculum/science/?year=12007&year=12008&year=12009&year=12010&strand=Science+Understanding&strand=Science+as+a+Human+Endeavour&strand=Science+Inquiry+Skills&capability=ignore&capability=Literacy&capability=Numeracy&capability=Information+and+Communication+Technology+(ICT)+Capability&capability=Critical+and+Creative+Thinking&capability=Personal+and+Social+Capability&capability=Ethical+Understanding&capability=Intercultural+Understanding&priority=ignore&priority=Aboriginal+and+Torres+Strait+Islander+Histories+and+Cultures&priority=Asia+and+Australia%u2019s+Engagement+with+Asia&priority=Sustainability&elaborations=true&elaborations=false&scotterms=false&isFirstPageLoad=false&page=2</p> <p>The New Jersey Sea Grant Consortium, n.d., Plankton. Retrieved from http://niseagrant.org/wp-content/uploads/2014/03/plankton.pdf .</p> <p>Image - Plankton division by size. Shannon Campbell, n.d., Chapter 15: Life Near the Surface. Retrieved from https://slideplayer.com/slide/12436960/</p>			

Plankton



The RV *Investigator* can be equipped with numerous devices used for collecting samples of water, air, mud and plankton.

One device used on board is called a Continuous Plankton Recorder (CPR). The CPR is an effective device for collecting plankton samples and has changed very little since it was originally developed in the 1930s by Sir Alister Hardy. The device is lowered off the back of the *Investigator* and dragged along behind the vessel. As the CPR is towed plankton enters the front of the device and then becomes trapped in layers of silk. The silk is then wound onto a spool ready to be collected and analysed by scientists.

Although a plankton net is quite different from the CPR device it acts on the same principles. Creating a filter for water to move through, trapping and leaving the plankton behind.



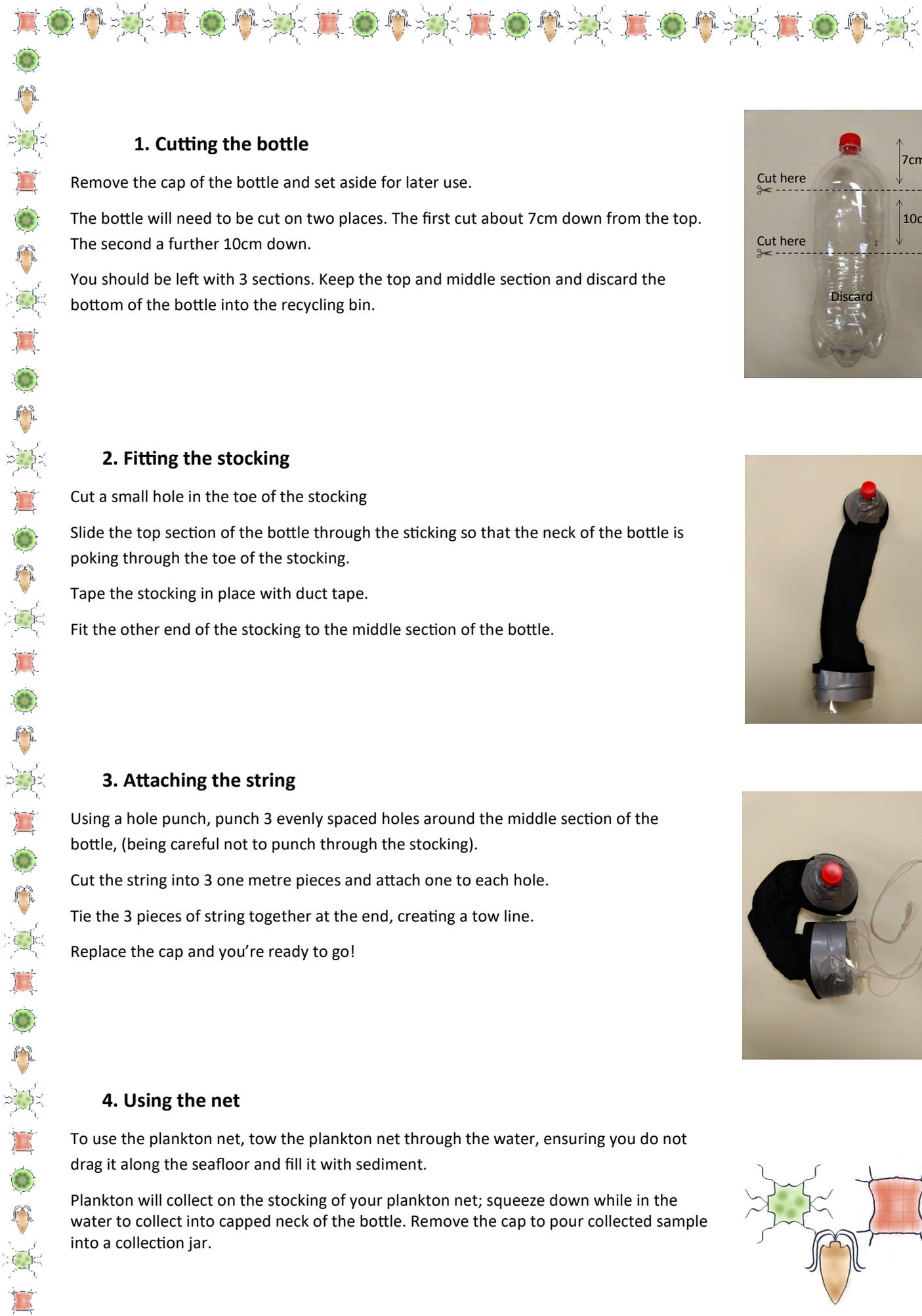
CPR device on board the RV *Investigator*.
Image by Christie Evans

Build your own Plankton Net

You will need:

- 2 litre soft drink bottle
- 1 Nylon stocking (knee high)
- String (3m approx.)
- Duct Tape



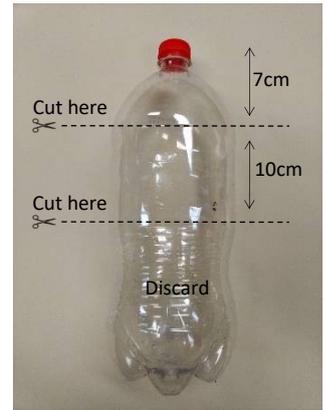


1. Cutting the bottle

Remove the cap of the bottle and set aside for later use.

The bottle will need to be cut on two places. The first cut about 7cm down from the top. The second a further 10cm down.

You should be left with 3 sections. Keep the top and middle section and discard the bottom of the bottle into the recycling bin.



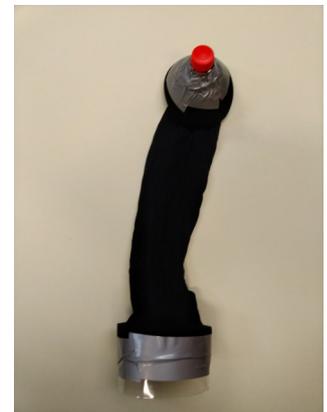
2. Fitting the stocking

Cut a small hole in the toe of the stocking

Slide the top section of the bottle through the stocking so that the neck of the bottle is poking through the toe of the stocking.

Tape the stocking in place with duct tape.

Fit the other end of the stocking to the middle section of the bottle.



3. Attaching the string

Using a hole punch, punch 3 evenly spaced holes around the middle section of the bottle, (being careful not to punch through the stocking).

Cut the string into 3 one metre pieces and attach one to each hole.

Tie the 3 pieces of string together at the end, creating a tow line.

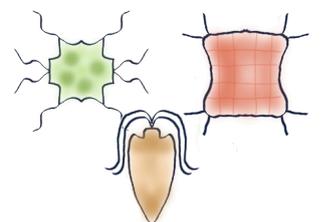
Replace the cap and you're ready to go!



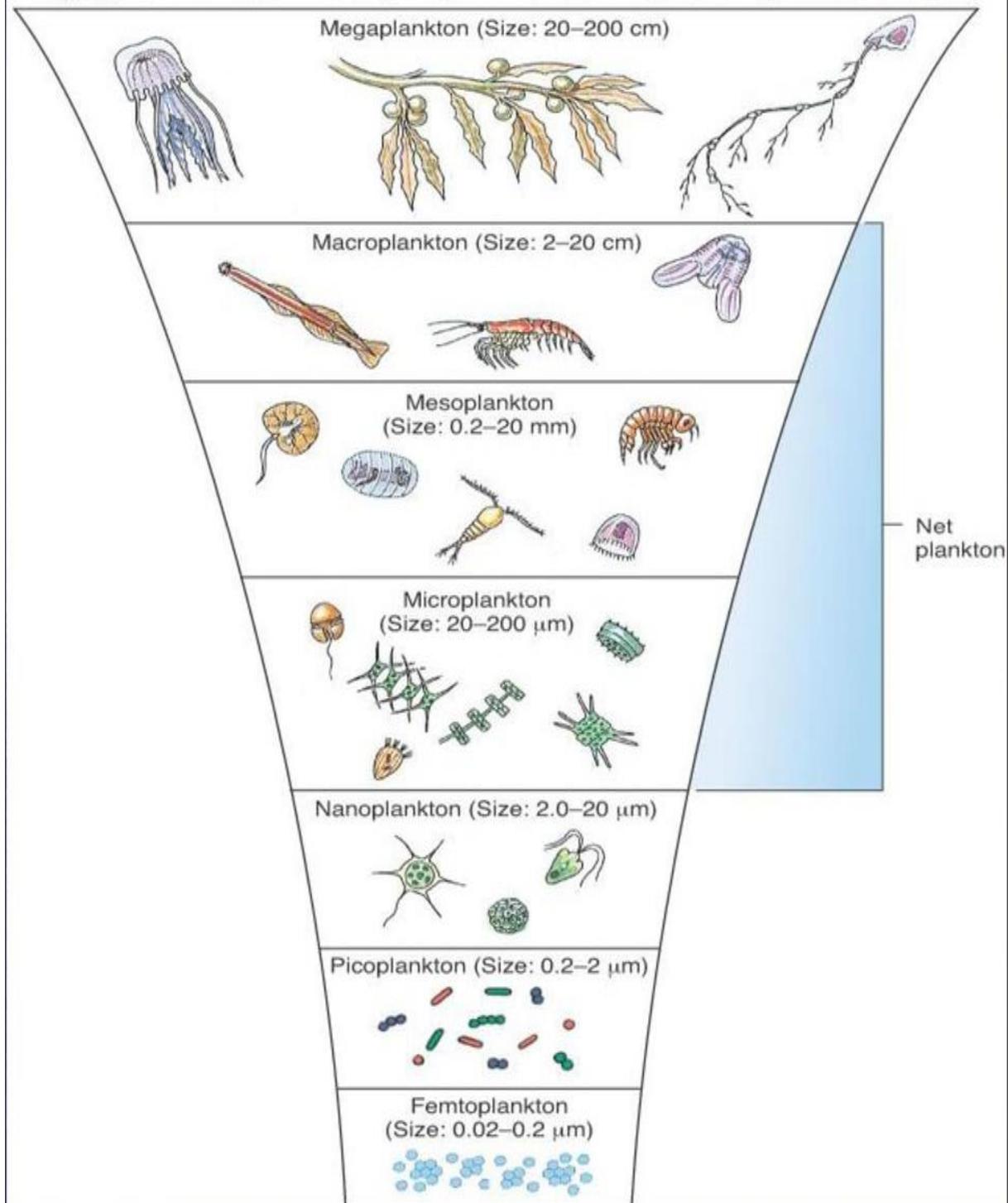
4. Using the net

To use the plankton net, tow the plankton net through the water, ensuring you do not drag it along the seafloor and fill it with sediment.

Plankton will collect on the stocking of your plankton net; squeeze down while in the water to collect into capped neck of the bottle. Remove the cap to pour collected sample into a collection jar.



Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.



Plankton division by size. Shannon Campbell, n.d., Chapter 15: Life Near the Surface. Retrieved from <https://slideplayer.com/slide/12436960/>. Accessed 10/10/2019.