



# Diveline

## Open Water Snorkeller

2024/07/10



Open Water Snorkel Diver





# About Diveline

- Teaching Divers and Snorkeller's since the early 1970's
- Located in Frankston
  - Opposite the Train Station near Beach Street (03) 9783 7166
- Have equipment for all types of underwater sport for hire and purchase
- Part of the PADI worldwide scuba organisation
- Goals of Diveline include :
  - Properly educate and promote diving
  - Train divers in a safe, modern and up-to-date techniques
  - To promote Diving in all it's forms as a recreational sport

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# What will we be doing ?

- **Classroom**

- Introduction
- Equipment
- Safety
- Buddy Procedures
- Review
- Some things to watch out for
- Physics
- Where we will go snorkelling

- **Open Water**

- Get fitted for gear (Remember your suit and fin sizes)
- Review buddy system (and choose a buddy)
- Go for a Snorkel (Shore and Boat) (Keep your mask clear)

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# Introduction – The Basics



- You need to get the proper training (That's us)
- You need to always dive with a buddy (That's you)
- Use the proper equipment and maintain it...
  - Rinse equipment out in fresh water and store it out of the sun
- You need to always Start WARM
  - It is MUCH easier to start warm than it is to try to get warm
- Stay within your limits
- Take responsibility for yourself
  - Even though your buddy will look out for you, always remember



***“Only you can think for you, swim for you and breathe for you. No one can do these for you!”*** [Start History](#)

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# Introduction - A Brief History

- Snorkeling through the Ages
- Pearl divers of Japan and Korea (4500 BC)
- Military operations: (415 - 413 BC)
  - Athenian attacks on Greek ships
  - Roman soldiers using hollow reeds as snorkels
- The search for food :
  - Caribbean and Polynesia for conch, fish, lobster
  - Techniques handed down through generations
- In Australia

Start  
Safety

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# Introduction – Types of Diving

- Snorkelling - Shallow Breathe Holding - (including Spear fishing)
  - No Air Tanks
  - Usually floating on top of the water (With or without a wet suit)
  - The amount of time you can stay underwater is based on fitness
    - Not Very Deep (approx 20m)
- Free Diving - Deep Breathe Holding - (click on picture below)
  - Similar to snorkelling except depths are much deeper
  - Assisted descents (Mechanical means to get down deep)
  - Competitions held for depth records
    - Deepest is 172m (men) 160m (women)
- Scuba Diving (Go to Diveline)
  - Air Tanks
  - Extra training required
  - Can stay under water for much longer
  - Spearfishing on tanks not encouraged
    - (unfair on the fish)



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# Equipment

- Mask (not goggles) and Snorkel
- Fins (not flippers)
- Exposure Protection Suit (Wet Suit)
- Weight Belt and Weights (optional)
- Float and Diver Flag
  - where applicable
- Ascent/Descent line with surface float
  - where applicable





# Safety

- Don't Panic or Stress
- Barotraumas (Pressure Injuries)
  - Equalising Ears
  - Sinus
  - Lungs
  - Mask Squeeze
- Heat Loss
  - The Bodies Reaction
- Blackout or Loss of Consciousness

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# Safety – Don't Panic or Stress

- Snorkelling can be a very relaxing activity
  - You will float
- Remember to breathe out of your mouth
  - It is a bit different to normally breathing out of your nose
- Your breathing should be deep and slow
- *Always ask for assistance if you need it*
  - *That's what we're here for.*

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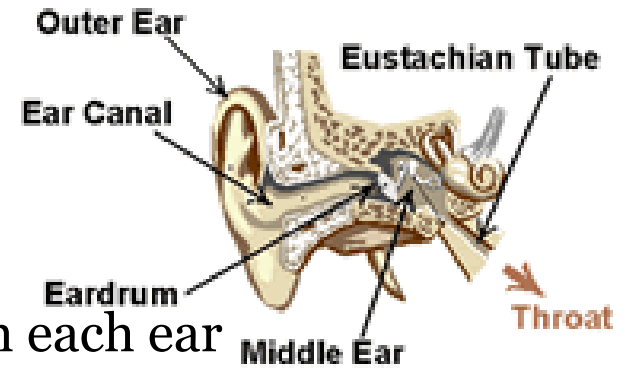
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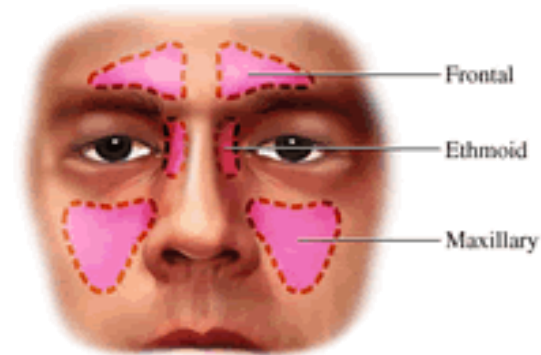
# Safety - Barotraumas



- Ears
  - Vertigo (Dizziness)
    - Pressure or temperature different in each ear
  - Middle Ear Barotraumas
  - Burst Ear Drum
  - Reverse Block
    - Blockage in the Eustachian Tube



- Sinus Squeeze
- Lung Squeeze
- Mask Squeeze



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# Safety - Mask Squeeze

- The mask pulls to your face and draws blood to the surface of skin and eyes
  - When internal mask pressure is less than external water pressure
  - The decreasing mask volume puts negative pressure on surrounding facial tissues
- Can result in :
  - Bloodshot eyes and possible bruising around the face
  - Takes about a month to heal
  - Not painful or harmful





# Safety - Heat Loss

- **Always START WARM**
- There are two main means of heat loss for divers
  - Conduction (water in the wetsuit), and
  - Evaporation (wind at the end of a dive)
    - Dry off ASAP and put some dry clothes back on after diving
- Physiological (*how the body reacts*) to heat loss
  - Vasoconstriction (restriction of blood vessels)
    - Reduced blood flow to skin and limbs
    - Extremities (fingers and toes) get cold
  - Shivering works on the muscles to create heat
    - Burns calories from body stores





# Safety - Heat Loss (Core Temperatures)

° C

**Body reaction as core temp. lowers**

37.0° C

Normal core temperature

36.0° C

Shivering

34.0° C

Disorientation and loss of cognitive capacity

33.5° C

Amnesia

33.0° C

Muscle Rigidity

30.0° C

Unconsciousness





# Safety - Blackout

- Caused by not enough oxygen to the brain (Hypoxia)
- Usually caused by excessive hyperventilation
  - Multiple deep breathes before diving
  - CO<sub>2</sub> drops to point where the body is unable to recognise the urge to breathe
  - PO<sub>2</sub> drops below 0.10 ata ??
- Can happen in 3m of sea water and shallower
- Can happen with prolonged time at depth
- More of an issue for Free Divers
  - Generally occurs during an ascent
    - But can also happen at depths
  - Can also happen upon reaching the surface

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# Buddy Procedures

- Cramp Removal
- Separation
- Stories at the end of the day

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# Buddy Procedures - Cramp Removal

- Cramps are reduced by stretching and hydration
- On Surface Cramp Removal :
  - Massage the affected area
  - Pull or Push fin tips towards body to help stretch the affected muscle
  - If cramp continues, drop any weight belt if needed and ascend back to the surface
  - Signal for assistance if required





# Buddy Procedures – Separation

- Easily avoided - Keep close to your buddy
- If separated :
  - Use Visual or Sound signals to relocate your buddy
  - Start looking in the last known location
- Search for no more than 5 minutes and then return to agreed meeting / exit point
  - Discuss relocation procedures with buddy beforehand
    - i.e. if you get separated go to...
- If necessary, utilise people on shore or in boats
- Scuba divers are best used for underwater searches





# Buddy Procedures - Stories

- Always important
- Not everyone sees the same things
- Good to tell family and friends
- Even better if you have a camera so you can show them...

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# Review

- Things to remember
  - Your Wet Suit and Fin sizes from the first day
  - Clear your masks of hair and hoods to stop leaking
  - Ask for ANY assistance if / when you need it
  - Look out for your buddy
  - Start WARM
  - Have fun
- Any Questions?
  - What about dredging the bay?
  - Are there any animals we should look out for ?
  - Where are we going snorkelling ?
  - What if I we want to go Scuba Diving ?

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# Dredging The Bay

- What damage will be done to the environment?
- Where will the spoil be dumped?
- What about the turbidity in the water and what affect will this have on the eco-system?
- What about the heavy metals being disturbed?

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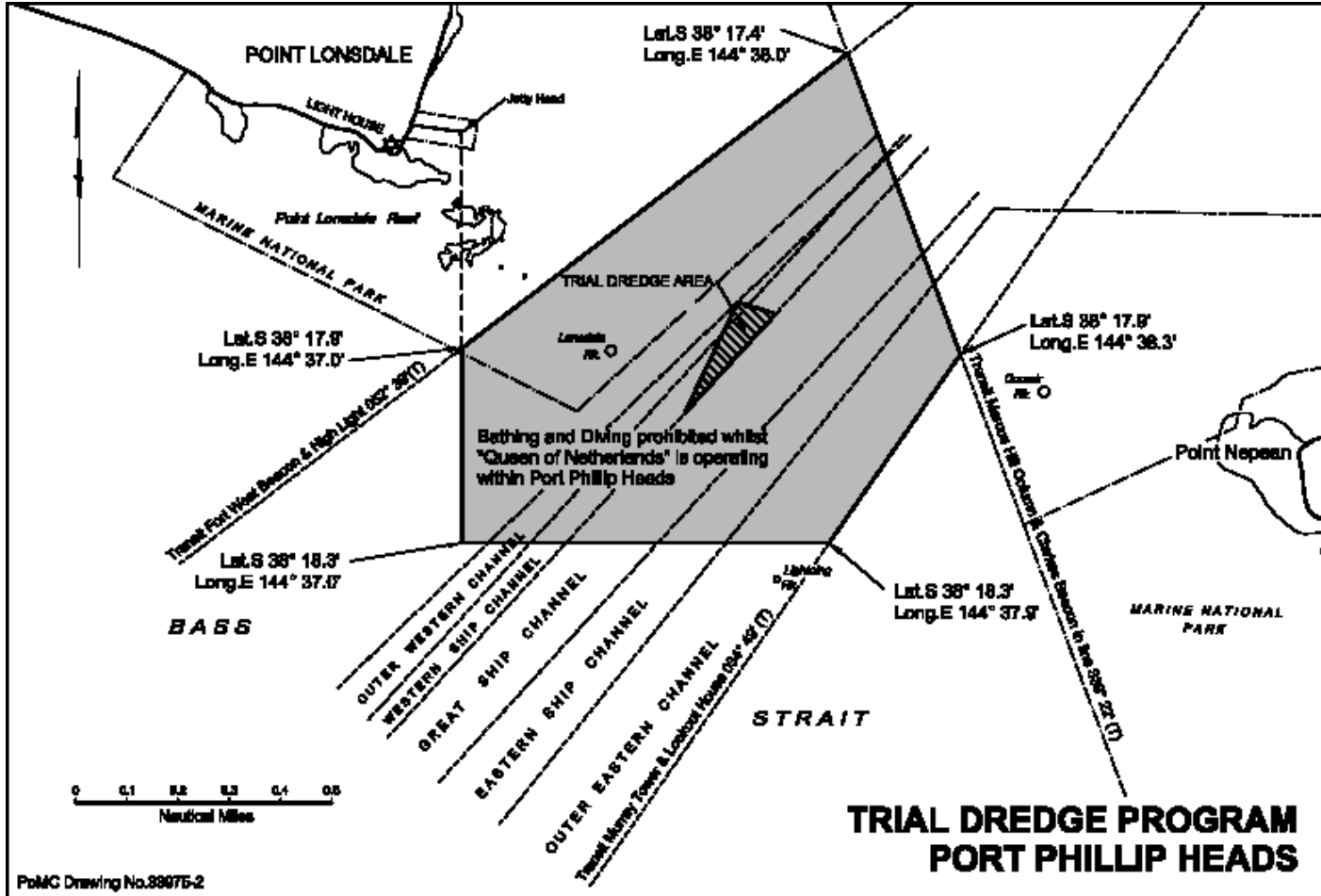


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# Dredging The Bay (continued)



**TRIAL DREDGE PROGRAM  
PORT PHILLIP HEADS**

**Start  
Things  
Physics**

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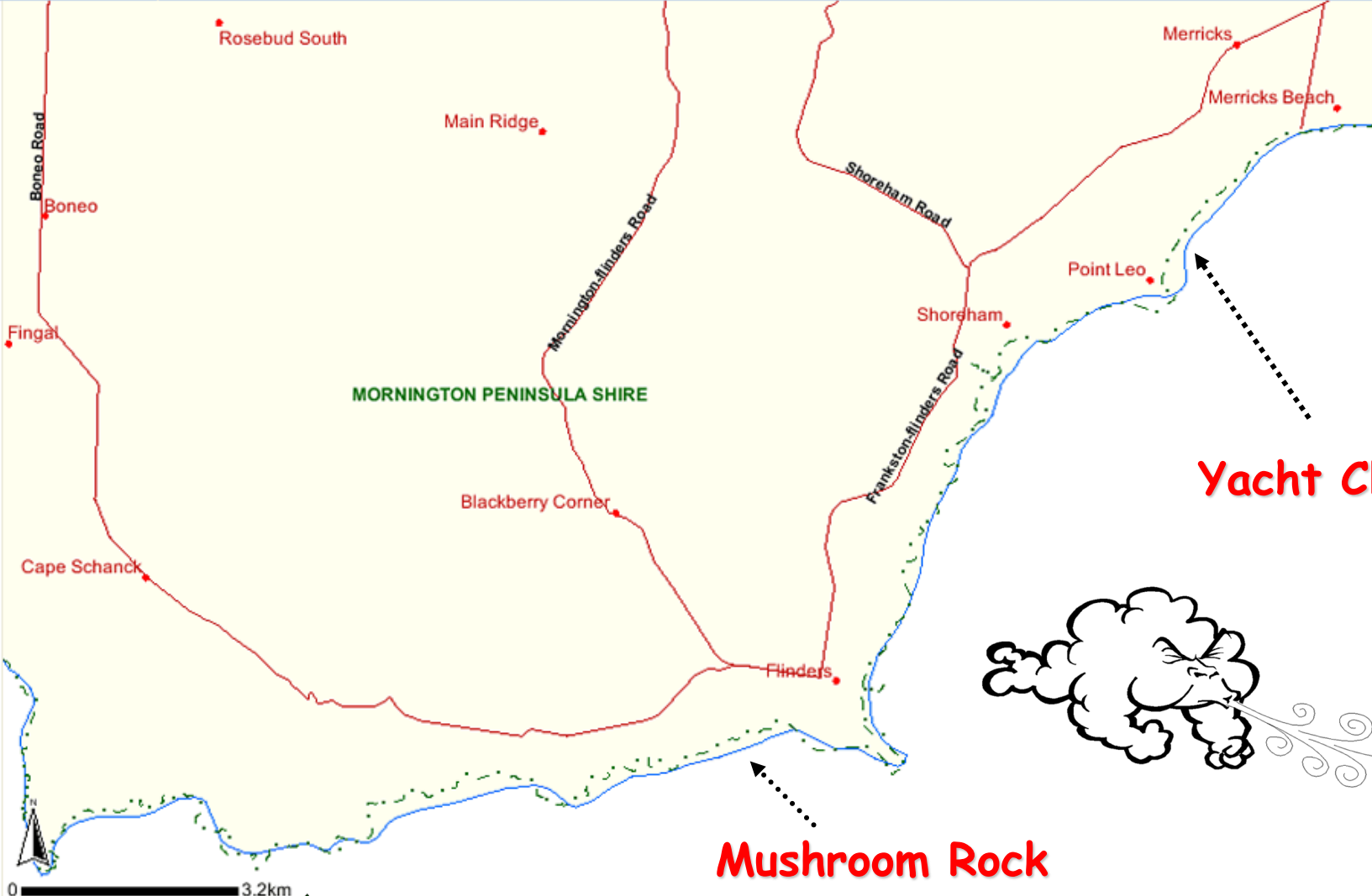


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# Shore Dive - Flinders



**Yacht Club**



**Mushroom Rock**

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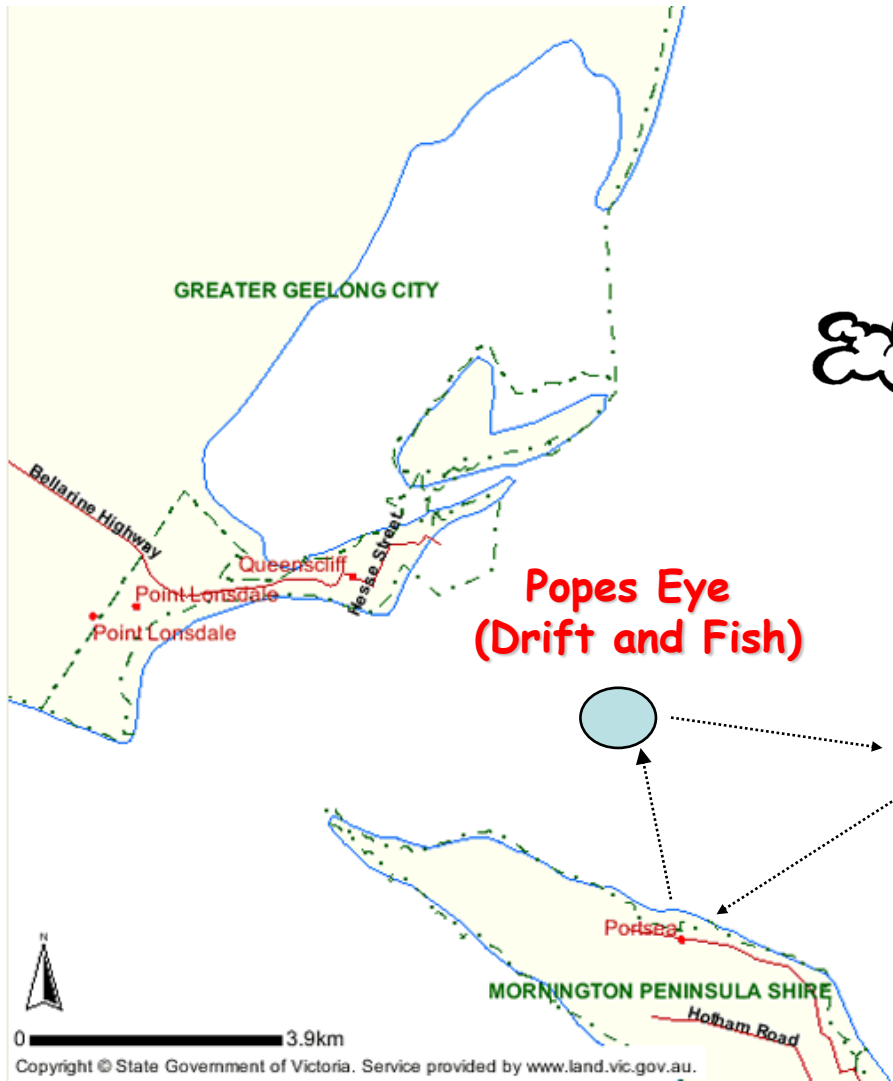


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# Popes Eye and China Man's Hat



**Popes Eye  
(Drift and Fish)**

**Chinaman's Hat (Seals)**

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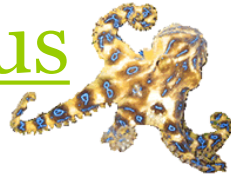
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# Some Things to Watch Out For

- Blue Ringed Octopus



- Sting Rays



- Box Jelly Fish



- Coral



- Stone Fish



- Cone Shells



Start  
Bud.Proc  
Physics

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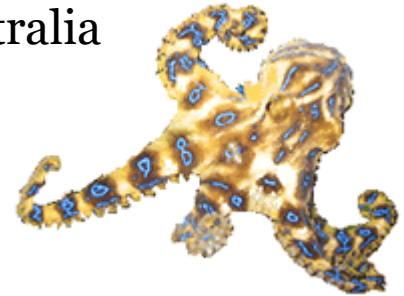
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# Watch Out For - Blue Ringed Octopus

- They are found in the shallow coral and rock pools of Australia - under rocks and in crevices
- While resting, the Blue Ring Octopus is a pale brown to yellow colour
- The blue rings only "light up" when the animal feels threatened.
- They carry enough poison to kill 26 adults within minutes.
- Symptoms included : Onset of nausea, Hazy Vision. ( Within seconds you are blind.), Loss of sense of touch, speech and the ability to swallow, Within 3 minutes, paralysis sets in and your body goes into respiratory arrest
- ***There's no known antidote.***
- ***The only treatment is hours of heart massage and artificial respiration until the poison has worked its way out of your system.***



Start  
Things

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# Watch Out For - Sting Rays

- Stingrays are not usually aggressive
- They rummage on the sea bottom and only attack if they have been stepped on or threatened
- 
- The major problem with the sting is often from the cut and wound
- Symptoms are rare, but may include nausea and vomiting, muscle cramps, diarrhea, salivation, sweating, syncope, cardiac arrhythmias and convulsions
- **First Aid. It may produce severe penetrating injuries or and subsequent infection, including tetanus. Apply a pressure bandage to cuts**



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Things

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# Watch Out For - Box Jelly Fish

- Box Jellyfish are up to 20 cm along, pale blue, transparent and bell or cubed shaped
- They are not usually found over coral, deep water, or seagrass or weed beds
- You have virtually no chance of surviving the venomous sting, unless treated immediately
- **First Aid : **Never** use methylated spirit or alcohol.**
- **Domestic vinegars poured liberally over the tentacles as soon as possible. Then remove the tentacles.**
- **Artificial respiration and cardiac massage may be required. Where antivenin is unavailable, pressure-immobilisation**



Start  
Things

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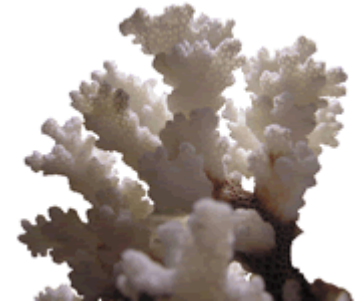
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# Watch Out For - Coral

- Many Hard corals are found in warm water
- Corals can cause cuts and abrasions
- In warm water cuts and abrasions can become infected
  
- Rinse in fresh water and use disinfectant creams



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# Watch Out For - Stone Fish

- Usually well camouflaged, look like stones or rocks
- Poisonous Spines on back
- The sting causes excruciating pain, swelling and death to tissues.
- The symptoms of the venom are muscle weakness, temporary paralysis and shock, which may result in death if not treated.
- **First Aid :**
- **Do not** attempt to restrict the movement of the injected toxin.
- Bathing area in hot water may be effective in reducing the pain.
- Hospitalisation may be required



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Things

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# Watch Out For - Cone Shells

- Cone Shells have teeth like small harpoons and can penetrate clothing.
- They inhabit mostly mud, sand flats shallow reef waters where the low and the high tides alternate
- The venom consists of numerous neurotoxic peptides and can result in the death of humans
- symptoms such as weakness, lack of co-ordination and disturbed vision, hearing and speech
- **Pressure immobilisation first aid should be applied and left in place until resuscitation facilities are available.**



Start  
Things

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# Physics - Boyle's Law

- Boyle's Law :
  - **As pressure increases :**
    - **volume decreases, density increases**
  - **As pressure decreases :**
    - **volume increases, density decreases**

*“If the temperature of a fixed mass of gas is kept constant, the relationship between the volume and pressure will vary in such a way that the product of the pressure and volume will remain constant.”*





# Physics - Atmospheric Pressure

<b>Depth</b>	<b>ATA</b>	<b>Volume</b>	<b>Density</b>
(0 m)	1 ata	6.0 Litre	1X
(10m)	2 ata	3.0 Litre	2X
(20m)	2 ata	2.0 Litre	3X
(30m)	4 ata	1.5 Litre	4X
(40m)	5 ata	1.2 Litre	5X
(50m)	6 ata	1.0 Litre	6X



## Relationships on Descent from the Surface





# Physics - Atmospheric Pressure

Depth	ATA	Volume	Density
(50m)	6 ata	1.0 Litre	6x
(40m)	5 ata	1.2 Litre	5x
(30m)	4 ata	1.5 Litre	4x
(20m)	3 ata	2.0 Litre	3x
(10m)	2 ata	3.0 Litre	2x
(0 m)	1 ata	6.0 Litre	1x



## Relationships on Ascent from Depth

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# Boyle's Law and Snorkellers

- Need to equalize body air spaces during descent
  - Ears and Sinus
- Need to equalize artificial air spaces
  - Mask
- The increased pressure compresses lungs and decreases their volume

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# Buoyancy and Archimedes Principle

*“Any object wholly or partly immersed in a fluid is buoyed by a force equal to the weight of the fluid displaced by the object.”*

3 States of Buoyancy: Positive, Negative, Neutral

Weigh more than the water you displace     **Sink (-)**

Weigh equal to the water you displace     **Neutral**

Weigh less than the water you displace     **Float (+)**

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# Equipment - Masks

- Make things look bigger
- Need to be equalised (air space)
- You cannot breathe out of your nose when wearing a mask
- Make sure you clear hair and hood from under the mask skirt.





# Equipment - Snorkels

- 
- 
- 
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# Equipment - Fins

- Should be about the same as your shoe or boot size (We'll be using Slip-Ons)
- Shake them around and if they are loose on your heel, they are too big.
- If you go further, you will get 'open heel' fins and booties





# Equipment - Wetsuits

- Wet Suits help you to **STAY WARM**
- To help to extend time in the water
- Should be suitable for the water conditions
  - (Usually) Colder = Thicker
  - Really Cold = Dry Suit (scuba diving)
- Works by heating a layer of water between your skin and the wetsuit material



- *No weeing in the wetsuit*

*– Yours or ours – it can cause a rash and a pong*

Start  
Bud.Proc

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# References

- <http://www.diveLine.com.au/>
- <https://iantd.com/index.php/en-us/courses/iantd-free-diving>
- <https://www.barrierreefaustralia.com/plan-your-trip/about-the-reef/>

## Free diving videos

- [http://www.apneablue.com/?page\\_id=33](http://www.apneablue.com/?page_id=33)  
<https://www.bing.com/videos/search?q=free+dive+videos&FORM=HDRSC4>





# Introduction - Preparation

- **Don't Stress !!!!**
- **Use Relaxation Techniques**
  - Sit or lie down keeping still
  - Breathing patterns slow and relaxed
    - Through nose and mouth, stomach and then chest
  - Start relaxing all muscles in your body from head to toes
  - Maintain relaxed position for 5-10 minutes

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# Procedures - Psychological Factors

- **Stress !!!!**
- **Use Relaxation Techniques**
  - Sit or lie down keeping still
  - Breathing patterns slow and relaxed
    - Through nose and mouth, stomach and then chest
  - Start relaxing all muscles in your body from head to toes
  - Maintain relaxed position for 5-10 minutes





# Review



- Any Questions?
  - What about dredging the bay?
  - Are there any animals we should look out for ?
  - Where will we go snorkelling ?
- In Water work - What we will be looking for :
  - Competency and safety in free diving
  - Keep Hair and Hood out of Mask to prevent leaking
  - Remember your wet suit sizes for the next day
- Having fun

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