Key Stage 2 – Upper
ACTIVITY BOOK
Ages 9-11

Name:_____

Class: _____

Date: _____

Welcome to Anglesey Sea Zoo!

HI! My name is **Seamor**, and in this activity book my friends and I will give you lots of fun facts about the animals you will see.

Front Room

1. There are several different types of flatfish in the Pier tank. Name two species of flatfish you can see.
   _____ and _____

2. Lots of animals, like Turbot, can change their colour to blend in with their surroundings. This is called ***camouflage***. Why do you think they have adapted to be able to change their colour?
   _____
   _____

3. True or false? Flatfish such as Turbot are actually lying on their side.
   ☐ ***True*** ☐ ***False***

4. What two advantages do fish like Turbot have by being flat?
   1. _____
   2. _____

No Bone Zone

5. All of the animals in this room are in a group called the Invertebrates. What does "***invertebrate***" mean? _____
_____
_____

6. Animals can be put into groups with other similar animals. This is called classification. Can you find an animal from each group in this room? Write your answers in the correct spaces below.

   Crustaceans – Have a hard shell, eight walking legs and two claws, for example:

   _____ and _____

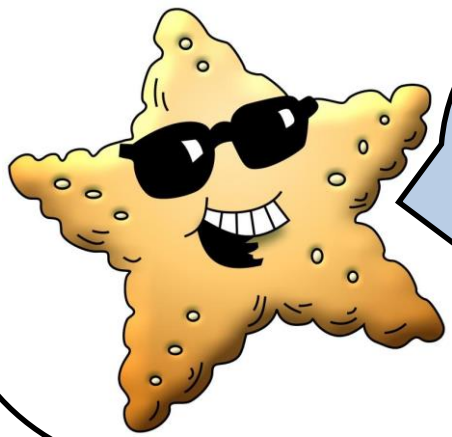
   Cephalopods – Have eight legs called tentacles, and can crawl along the seabed or swim using jet propulsion. Most can change colour, for example:

   _____ and _____

   Echinoderms – Have spiny skin, a central mouth and hundreds of tiny tube feet, for example:

   _____ and _____

7. Which group of animals do humans belong to? ***Tick the right answer***.
   (a) Reptiles ☐
   (b) Mammals ☐
   (c) Crustaceans ☐



Did you know?

Starfish are in a group of animals called the Echinoderms, which means 'spiny skinned'.

Starfish are able to regenerate (**re-grow**) an arm if they are attacked by a predator.

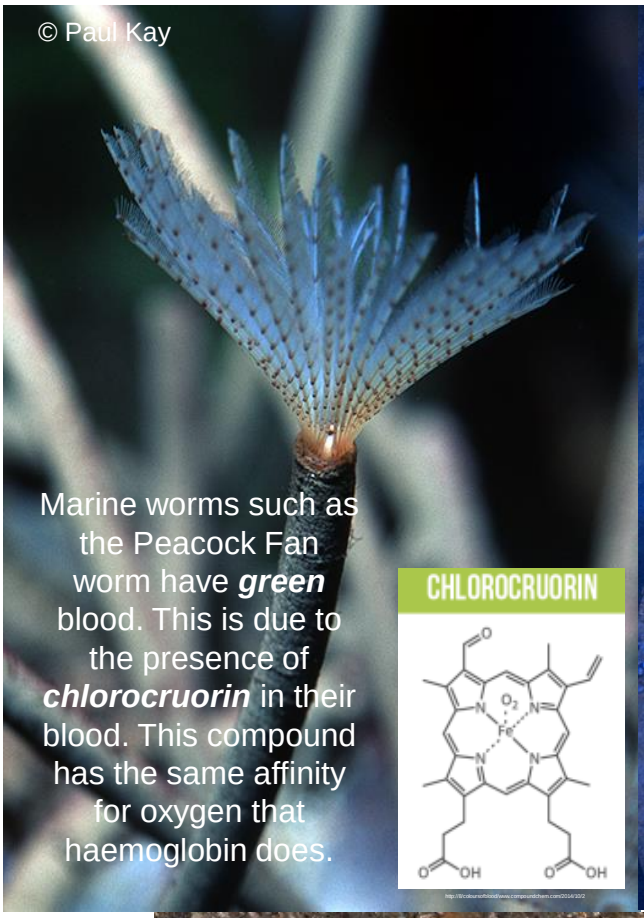
Fact File

Weird and Wonderful Blood

Most animals have some form of blood in their bodies. This blood can have different properties depending on it's chemical make up.

Humans blood contains ***haemoglobin***. This contains Iron which gives our blood a red colour.

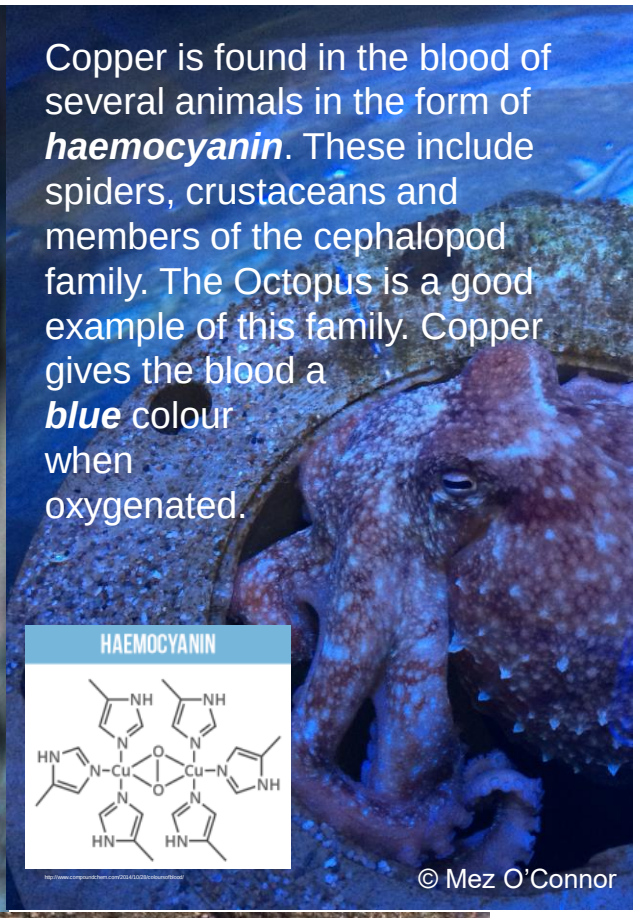
Iron isn't the dominant element found in all blood however. These different elements give different coloration to their blood.



Marine worms such as the Peacock Fan worm have ***green*** blood. This is due to the presence of ***chlorocruorin*** in their blood. This compound has the same affinity for oxygen that haemoglobin does.

CHLOROCRUORIN

http://itcolourofblood.wwx.compoundchem.com/2014/10/2



Copper is found in the blood of several animals in the form of ***haemocyanin***. These include spiders, crustaceans and members of the cephalopod family. The Octopus is a good example of this family. Copper gives the blood a ***blue*** colour when oxygenated.

HAEMOCYANIN

http://www.compoundchem.com/2014/10/28/colourofblood/

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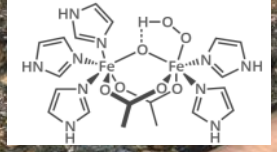
HAEMERYTHRIN



http://www.compoundchem.com/2014/10/28/colourofblood/

Some animals living in difficult places such as at the bottom of the ocean, have changed their blood completely. Deep sea marine worms such as the Priapulid worms have ***haemerythrin*** in their blood. This gives a ***violet*** colour to the blood, and has only 25% of the carrying capacity of haemoglobin.

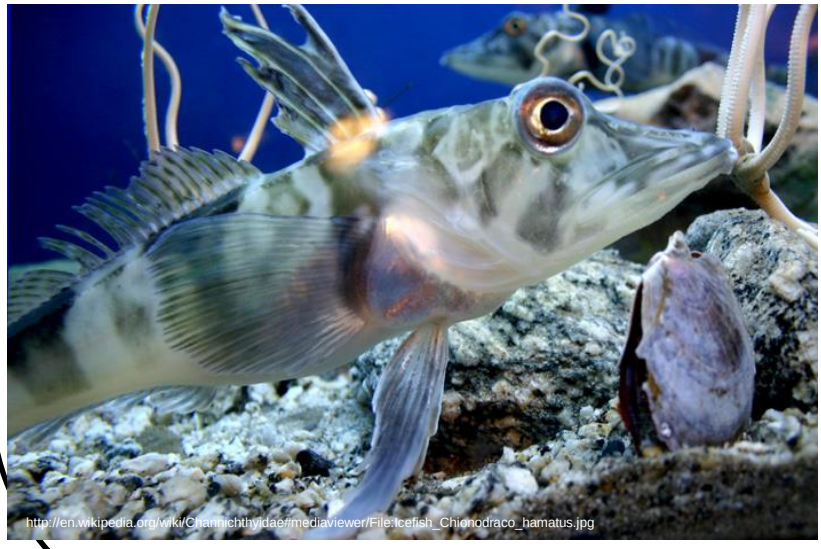
http://artsprinkledscience.tumblr.com/post/34524244315/penis-worms-anuses-shake-the-ground-of

Fact File

Its not always the colour of an animals blood that can make it unique.

Atlantic Wolffish live in cold northern regions in the ocean, where temperatures can come close to, if not below freezing point. To allow them to survive these harsh conditions, they have an ***anti-freeze*** within their blood. These molecules bind to ice crystals that form in the blood, preventing them from growing. The anti-freeze makes up 3-4% of their blood concentrations.

Conger eels have blood that is ***toxic*** to humans and other predators. This toxin can be broken down at high temperatures making eels safe to eat once cooked. Not much is scientifically known about these toxins



Oscillated Ice fish that inhabit Antarctica have ***clear blood due to the complete lack of haemoglobin***. To account for the fact that they have no haemoglobin these fish have a much larger quantity of blood in their body. Their blood is less viscous (thick) and so circulates faster. This is all enabled due to the fact they live in oxygen rich cold waters.

Breeding and Conservation

8. Find the Web of Life poster. This tells us about evolution. From the poster, are humans more closely related to:
(a) Fish, **(b)** Chimpanzees, or **(c)** Dogs?
_____

9. ***Read the information on the wall about Marine Litter.*** Name two marine animals that can be affected by litter in the sea:
_____ and _____

10. Looking at the Cuttlefish in the tank, what adaptation do they have to help them blend in with the sand? _____
_____

11. What kind of habitats do Pipefish like to live in?
_____

12. Why do they live in this habitat?
_____

13. Lots of plants and animals are linked by a food chain. Complete this pipefish food chain by filling in the words from the choices below.

Pipefish	***Energy***	***Animals***	***Photosynthesis***	***Grow***

The sun provides sunlight, a source of _____ .
Phytoplankton (***tiny microscopic plants***) use the sun's energy to grow. This process is called _____.
Zooplankton are tiny _____ . They get energy to _____ by eating the phytoplankton.
_____ then eat the tiny zooplankton as it is carried past in the currents.

The Wreck

14. Look at the artefacts on display. These items were found in shipwrecks around the UK. What is a shipwreck? _____
_____

15. What is the name of the ship where the Ship's log was found?
_____

Animals don't always spend their entire lives at the same location. Many will move from one place to another either annually following the availability of food, or during mating seasons ready for the birth of their young.

16. Conger eels are an animal that moves from place to place. Female Conger eels make long journeys during their lives from British waters where they live to the Atlantic trenches where they reproduce. What is a journey like this called?

M I __ __ __ T __ __ N

17. There is a fish in the wreck that is venomous. A venomous animal can inject you with a toxin that is harmful to the body.
Which fish is it?
_____

18. Can you think of any other animals that use poison or venom?
This doesn't have to be a Marine example
_____

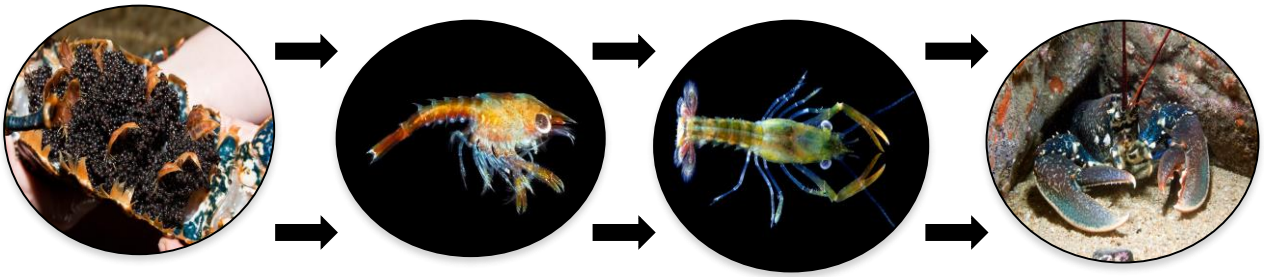
The Lobster Hatchery

19. What is the scientific name of the species of lobster on display?

_____

20. Lobsters look different at various stages of their life cycle.
Draw a line to match these words to the correct picture:

Larvae	*Juvenile*	*Eggs*	*Adult*



When an animal reproduces their characteristics are passed onto their offspring. These are passed on through genes in the parent's DNA. Colouration is a good example of a characteristic being passed on. With this in mind answer the following questions.

21. When the European Lobsters reproduce, what colour are their juvenile lobsters? ***(Look at the juveniles in the trays)***

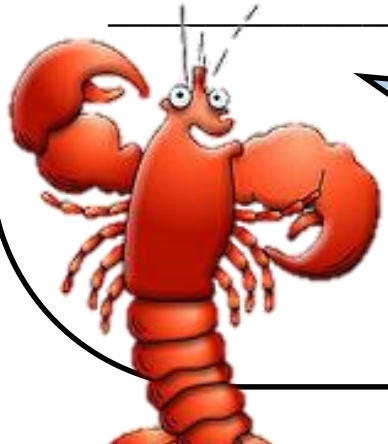
_____

22. When the Spiny Lobsters or Crawfish reproduce, what colour do you think the juvenile lobsters will become? (***These were the Lobsters you saw when you first came into the aquarium***).

_____

23. What determines the colour of the young produced?

_____



Did you know?

In the wild, European lobsters live a solitary life, and do not allow other lobsters to invade their territory.

They are **cannibals**, willing to fight to the death. The loser may even be eaten by the winner!

Fact File

Sir David Attenborough

"I just wish the world was twice as big and half of it was still unexplored."
David Attenborough

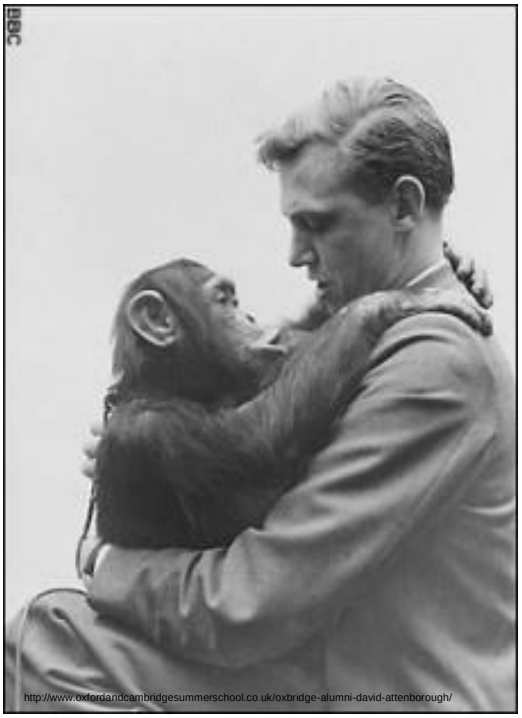
Born ***8th May 1926*** Sir David Attenborough became the iconic face and voice of Natural history documentaries.

Having always been interested in animals from a young age he went to Cambridge university to study natural sciences.

In ***1952 he joined the BBC***; this kicked off 50 years of natural history programs which made him one of the most travelled people in human history.

He not only presented these nature programs but also wrote and edited them. His programs include Life on earth (1979), Living planet (1984) and The trials of life (1990).

Following this lifetime of achievement he was ***knighted*** in 1985. He has received the ***Lifetime achievement award*** and had ***new species named after him***. These species include the Attenborough goblin spider (*Prethepalus attenboroughl*).

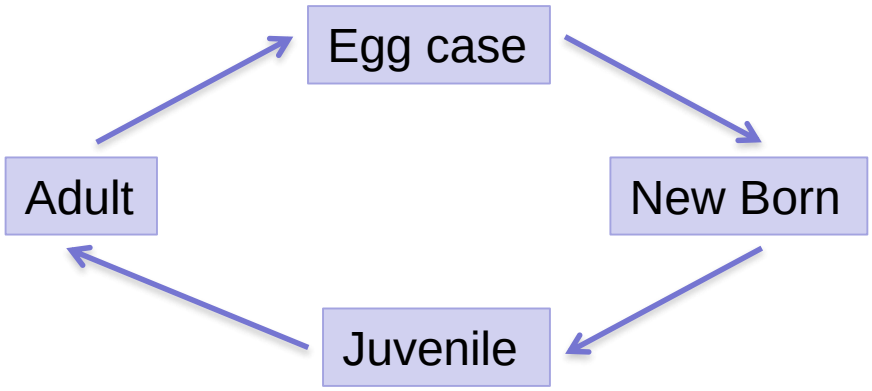


Shark Pool

24. Shark skin is covered in tiny teeth called denticles. What protective covering do most other fish have covering their bodies?

_____

Here is a simple lifecycle of the Smallspotted Catshark.



25. How long is the gestation period of the Smallspotted Catshark? (***How long its in the egg before hatching***).

_____

26. When Catsharks reproduce, it requires both a male and a female shark; this is called sexual reproduction. Can you name another animal that needs both a male and female to reproduce?

_____

27. Not all animals need both a male and female to reproduce. This is called Asexual reproduction. An example of this is the Jellyfish. Can you name another animal that reproduces Asexually? (***Hint they look like blobs of jelly when you find them on the shore***).

_____

28. Can you write some differences between Sharks (***fish***) and Dolphins (***marine mammals***)? _____

_____

_____

_____

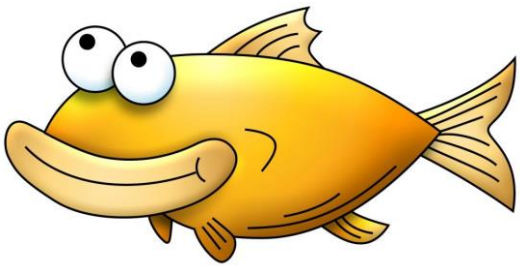
Big Fish Forest

29. Are these statements ***true*** or ***false***?

	True	False
Spider crabs can grow up to 3 metres across.	☐	☐
Thornback rays are well camouflaged.	☐	☐
Crabs moult their shells to grow.	☐	☐
Rays can only be found in tropical seas.	☐	☐
Thornback rays lay egg cases (***mermaid's purses***).	☐	☐
Sea bass also lay mermaid's purses.	☐	☐
Bullhuss are a type of shark.	☐	☐

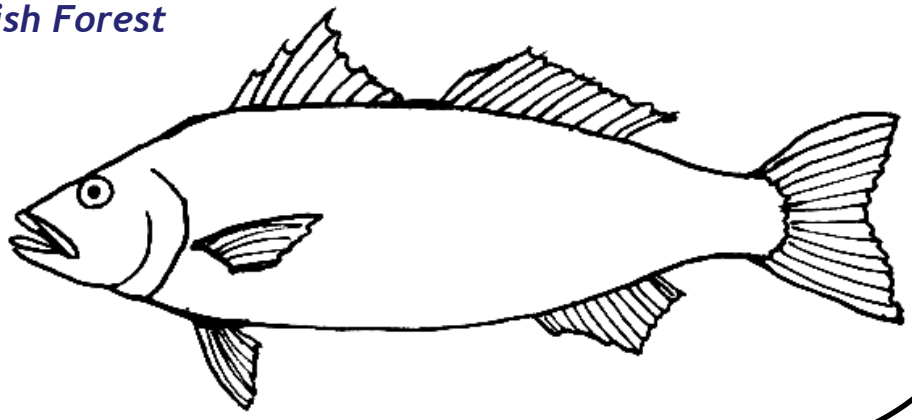
Did you know?

Some fish such as juvenile sea bass swim together in a group called a **shoal**. Shoaling protects them from predators and lets them help each other to find food.



30. Fish have a lateral line down the side of their bodies. This is full of sensors which tell them where other fish are in the group. Draw the lateral line onto the fish:

***Hint:* Look at the Sea Bass in the Big Fish Forest**



Fact File

Jacques-Yves Cousteau

"What is a scientist after all? It is a curious man looking through a keyhole, the keyhole of nature, trying to know what's going on."

Jacques-Yves Cousteau

Born on ***June 11th 1910*** in Saint-André-de-Cubzac in France, Jacques Cousteau went on to become one of the leading names in conservation.

Known for always wearing his iconic ***red beanie hat***, Jacques was not only a leading conservationist but a marine explorer, inventor and film maker.

Jacques Cousteau not only worked for science but helped politically. He helped pass the international whaling commission and prevent the dumping of Nuclear waste into the Mediterranean sea.

Jacques Cousteau and fellow inventor Emile Gagnan were the pioneers of the Self contained underwater breathing apparatus (SCUBA)

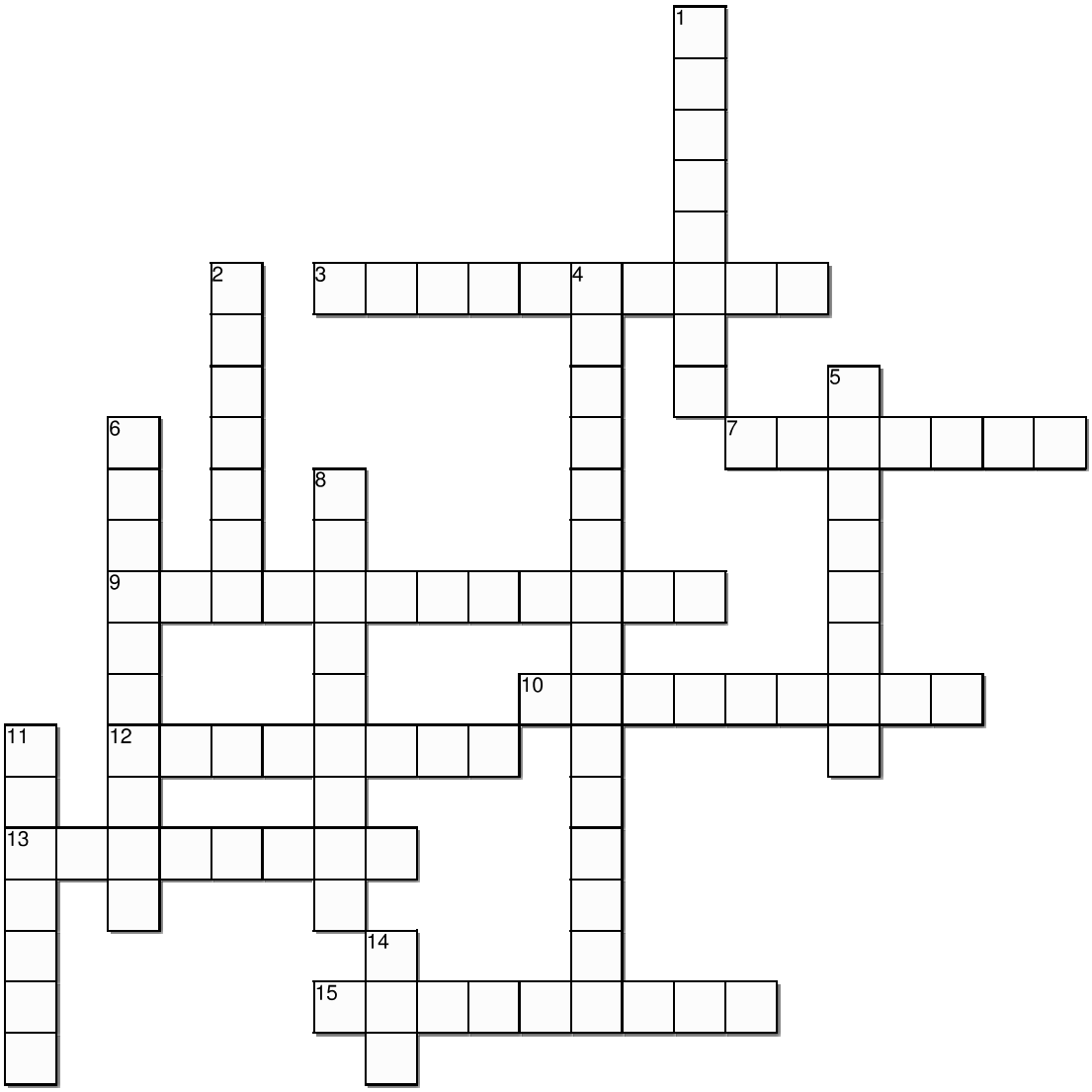
SCUBA equipment has allowed humans to explore more of the oceans allowing people such as Jacques Cousteau to learn and protect it.

He left behind a legacy which is upheld by many including the Cousteau Society.

Fun and Games

What have you seen today?

Complete the crossword below



Created on TheTeachersCorner.net Crossword Maker

Across

3. 8 tentacled masters of disguise that can change their colour instantly.
7. A fish many people eat that lurks in our fish forest. Big and silver they shoal together.
9. The big model hanging above the shark pool.
10. The largest breed of skate in the Shark Pool.
12. Orange coloured lobsters.
13. These echinoderms love eating mussels and other molluscs for dinner.
15. A big blue 3 meter beast likes hiding in its tunnels amongst shipwrecks.

Down

1. Relatives of the seahorse that are difficult to see in amongst the seaweed.
2. Sneaky tentacled animals have a beak that dictates how large a hole they can fit through.
4. e house these here at the zoo as part of a breeding programme, then release them back into the sea once they've grown.
5. An egg laying shark thats brown in colour.
6. This pie topped looking crustacean is a favourite of restaurants.
8. Odd looking pink fish that feed with their long noses downwards, are keeping the Undulate rays company.
11. Rockpool inhabitants that hide in a hard blue shell.
14. Cold water fish we like to eat with chips.