



Hello Everybody,

This week is everything biodiverse!

The definition of Biodiversity is:

‘The variety of plant and animal life in the world or in a particular habitat,

‘**Biodiversity** is the shortened form of two words "biological" and "diversity". It refers to all the variety of life that can be found on Earth (plants, animals, fungi and micro-organisms) as well as to the communities that they form and the habitats in which they live.’

We hope you enjoy this pack! If anyone has any themes, you’d like us to make an activity pack on, please let us know on 9727 2222!

Have a great week!

Take care,

The Caladenia Team

# Biodiversity

## What is biodiversity?

It is the variety of life on Earth, in all its forms and all its interactions. If that sounds bewilderingly broad, that is because it is. Biodiversity is the most complex feature of our planet and it is the most vital. “Without biodiversity, there is no future for humanity,” says Prof David Macdonald, at Oxford University.

The term was coined in 1985 – a contraction of “biological diversity” – but the huge global biodiversity losses now becoming apparent represent a crisis equalling – or quite possibly surpassing – climate change.

More formally, biodiversity is comprised of several levels, starting with genes, then individual species, then communities of creatures and finally entire ecosystems, such as forests or coral reefs, where life interplays with the physical environment. These myriad interactions have made Earth habitable for billions of years.

A more philosophical way of viewing biodiversity is this: it represents the knowledge learned by evolving species over millions of years about how to survive through the vastly varying environmental conditions Earth has experienced. Seen like that, experts warn, humanity is currently “burning the library of life”.



Bugs are the base of the many wild food chains that support ecosystems. Illustration: Frances Marriott

## Do animals and bugs really matter to me?

For many people living in towns and cities, wildlife is often something you watch on television. But the reality is that the air you breathe, the water you drink and the food you eat all ultimately rely on biodiversity. Some examples are obvious: without plants there would be no oxygen and without bees to pollinate there would be no fruit or nuts.

Others are less obvious – coral reefs and mangrove swamps provide invaluable protection from cyclones and tsunamis for those living on coasts, while trees can absorb air pollution in urban areas.

Others appear bizarre – tropical tortoises and spider monkeys seemingly have little to do with maintaining a stable climate. But the dense, hardwood trees that are most effective in removing carbon dioxide from the atmosphere rely on their seeds being dispersed by these large fruit-eaters.

When scientists explore each ecosystem, they find countless such interactions, all honed by millions of years of evolution. If undamaged, this produces a balanced, healthy system which contributes to a healthy sustainable planet.

The sheer richness of biodiversity also has human benefits. Many new medicines are harvested from nature, such as a fungi that grows on the fur of sloths and can fight cancer. Wild varieties of domesticated animals and crops are also crucial as some will have already solved the challenge of, for example, coping with drought or salty soils.

If money is a measure, the services provided by ecosystems are estimated to be worth trillions of dollars – double the world’s GDP. Biodiversity loss in Europe alone costs the continent about 3% of its GDP, or €450m (\$720m), a year.

From an aesthetic point of view, every one of the millions of species is unique, a natural work of art that cannot be recreated once lost. “Each higher organism is richer in information than a Caravaggio painting, a Bach fugue, or any other great work,” wrote Prof Edward O Wilson, often called the “father of biodiversity”, in a seminal paper in 1985.



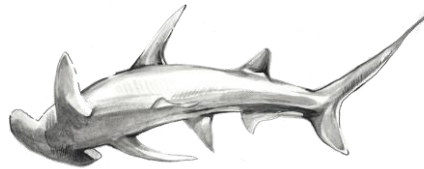
75% of flying insects were lost in the last 25 years in Germany, according to a recent study. Illustration: Frances Marriott

### Just how diverse is biodiversity?

Mind-bogglingly diverse. The simplest aspect to consider is species. About 1.7 million species of animals, plants and fungi have been recorded, but there are likely to be 8-9 million and possibly up to 100 million. The heartland of biodiversity is the tropics, which teems with species. In 15 hectares (37 acres) of Borneo forest, for example, there are 700 species of tree – the same number as the whole of North America.

Recent work considering diversity at a genetic level has suggested that creatures thought to be a single species could in some cases be dozens. Then add in bacteria and viruses, and the number of distinct organisms may well be in the billions. A single spoonful of soil – which ultimately provides 90% of all food – contains 10,000 to 50,000 different types of bacteria.

The concern is that many species are being lost before we are even aware of them, or the role they play in the circle of life.



More than half the ocean is now industrially fished. Illustration: Frances Marriott

### What about under the sea?

Humans may lack gills but that has not protected marine life. The situation is no better – and perhaps even less understood – in the two-thirds of the planet covered by oceans. Seafood is the critical source of protein for more than 2.5 billion people but rampant overfishing has caused catches to fall steadily since their peak in 1996 and now more than half the ocean is industrially fished.

### What about bugs – don't cockroaches survive anything?

More than 95% of known species lack a backbone – there are about as many species in the staphylinidae family of beetles alone as there are total vertebrates, such as mammals, fish and birds. Altogether, there are at least a million species of insect and another 300,000 spiders, molluscs and crustaceans.

But the recent revelation that 75% of flying insects were lost in the last 25 years in Germany – and likely elsewhere – indicates the massacre of biodiversity is not sparing creepy crawlies. And insects really matter, not just as pollinators but as predators of pests, decomposers of waste and, crucially, as the base of the many wild food chains that support ecosystems.

“If we lose the insects then everything is going to collapse,” says Prof Dave Goulson of Sussex University, UK. “We are currently on course for ecological Armageddon.”

Even much-loathed parasites are important. One-third could be wiped out by climate change, making them among the most threatened groups on Earth. But scientists warn this could destabilise ecosystems, unleashing unpredictable invasions of surviving parasites into new areas.



A single spoonful of soil contains 10,000 to 50,000 different types of bacteria. Illustration: Frances Marriott



1. There are seven species of sea turtles, six of which can be found throughout most oceans, they are: Green, Hawksbill, Kemp's Ridley, Leatherback, Loggerhead, and Olive Ridley. The seventh species is the Flatback and can be found only in Australia.
2. A female Leatherback was recorded as swimming 12,000 miles over 647 days from Indonesia to the west coast of America!
3. Marine turtles vary in weight: some are 40 kg whilst other, like the Leatherback, can reach 700 kg.
4. Turtles have a built-in GPS! Adult turtles return to the nesting grounds they were born in to lay their eggs, regardless of where in the world they are.
5. Unlike tortoises, sea turtles cannot retract their heads and flippers. This makes them more vulnerable to predators and entanglement in plastic bags and marine debris.
6. The ratio of turtle hatchlings that reach adulthood is one in a thousand. Their predators include birds, raccoons, crabs, and other fish.
7. Nobody knows where hatchlings go once they leave their sandy nest. It is difficult for biologists to study them because the 'lost year' can be up to 20 years.
8. Turtle shells are made of 50 bones fused together - they wear their bones outside their bodies.
9. Sea turtles have no teeth, instead they have very sharp beaks which they use to bite with.
10. Jellyfish and plastic bags all look like food to a hungry turtle. Over 100 million marine animals die each year due to eating or getting entangled in marine debris, especially plastic.

# Meet the Amazon Rainforest Creatures

World Forestry Day



## Amazon River Dolphin

Very different from its oceanic cousins, the River Dolphin has survived mainly because traditionally native tribes believe they are magical creatures.



## Capybara

The sweetest, social rodents of the Amazons; 120cm / 4 feet in length and weighing up to 65 kg / 140 lbs. The name means 'grass-eater' in the Tupi language; capybaras eat up to 3.5kg / 8 lbs of grass per day.



## Giant Armadillo

Only found in the Amazon, the nocturnal Armadillo grows to 5 feet/1.5 metres in length and weighs up to 55 kg / 120 lbs.



# Meet the Amazon Rainforest Creatures

World Forestry Day



## Giant River Otter

Growing around 1.5 meters / 5 feet in length plus a 91cm / 3 feet tail, River Otters are common sights in the Amazon rivers.



## Jaguar

The largest cat of the jungle, known locally as "Onca" (on-sah), are rarely seen through the dense canopy. Weighing 45 to / 115 kgs / 100 to 250 lbs, they hunt anything from frogs, fish, reptiles, to live-stock and deer.



## Ocelot

Known also as 'dwarf leopard' the Ocelot is a little larger than the average domestic cat. They hunt at night and sleep during the day.

# Meet the Amazon Rainforest Creatures

World Forestry Day



## South American Tapir

Favourite food of Jaguars! Tapirs grow up to 2 meters / 6.5 feet long and weigh up to 250kg / 550 lbs . Quick on land and excellent swimmers. (endangered species

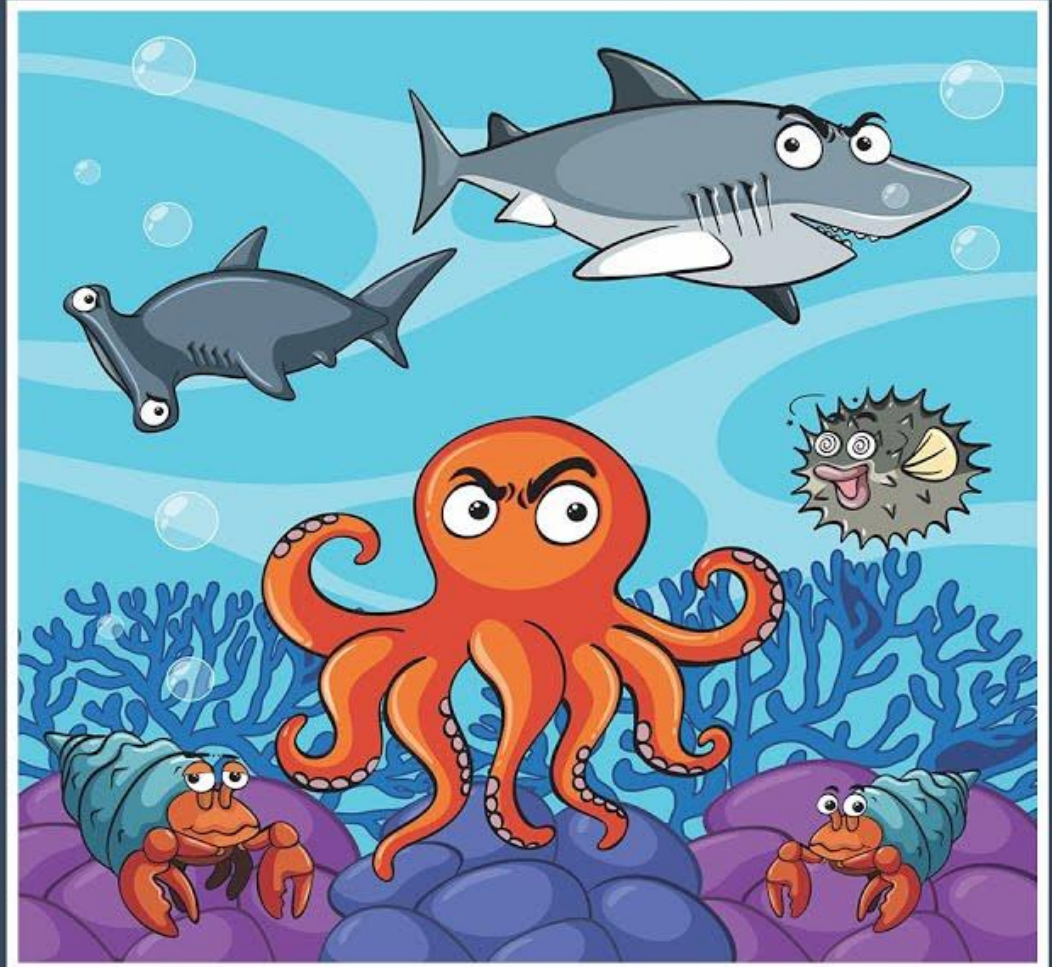
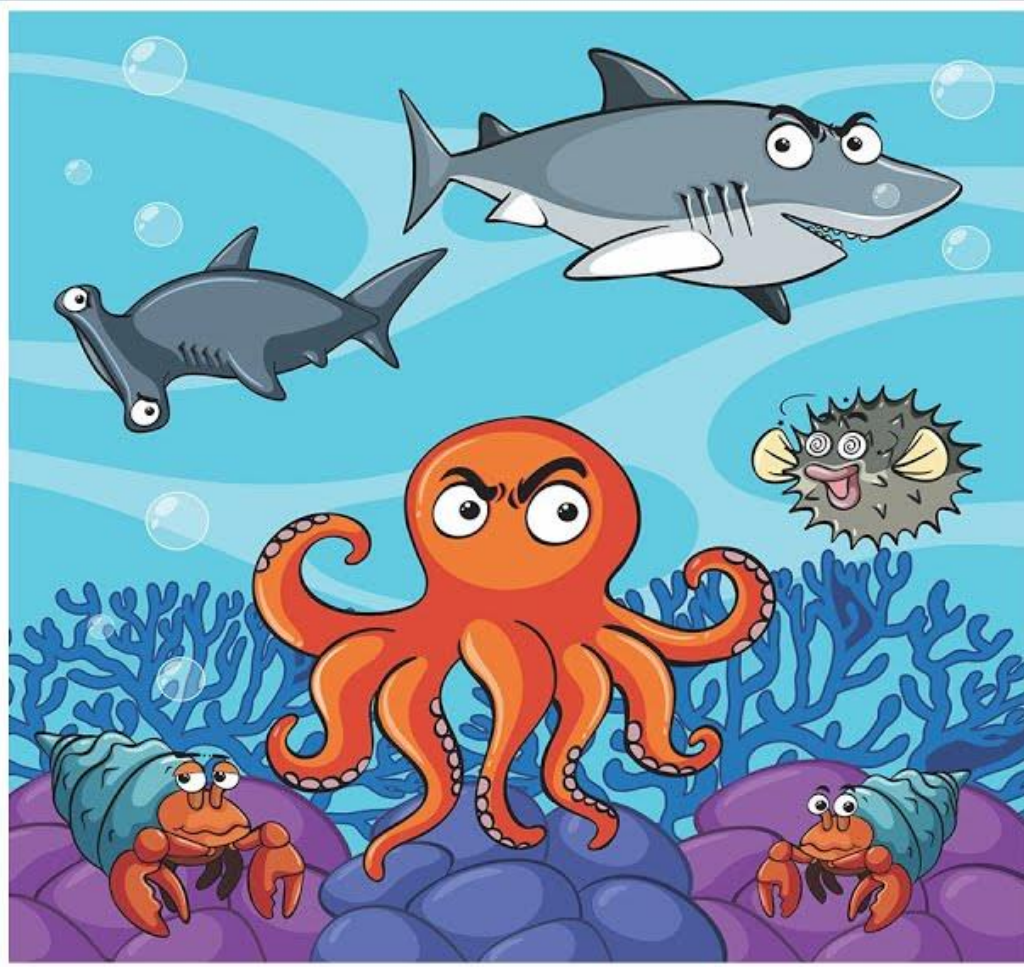


## King Vulture

Measuring up to 80cm / 32 inches, with a wingspan of up to 2 meters / 7 the King Vulture is the second largest bird in South America after the Condor.



# SPOT THE 5 DIFFERENCES







### **The Turtle that Got Tangled in Church Politics**

In 1857, a French priest uncovered an impressive shell of a prehistoric turtle. Found in the Jura Mountains range on the border of France and Switzerland, the priest took the shell to the vicar general Célestin Girod, of the Saint-Claude diocese.

Vicar Girod in turn passed the prehistoric specimen to Swiss palaeontologists for identification. Upon examining the Jurassic shell, the palaeontologists designated the turtle as a new species - *Emys Etalloni*.

They also established how the 150-million-year-old turtle had perished; he had got entangled in a tug-of-war! Seeing that the turtle shell was scientifically significant, a Bishop above Vicar Girod hearing of the case, suggested donating the fossil to a scientific society. The turtle shell got as far as the Natural History Museum of Besançon before Vicar Girod decided that he did not want to part with the turtle.

So, the turtle was returned to him, but no one knew what became of the fossil after Vicar Girod passed away in 1863. A century and a half after Vicar Girod's death, a palaeontologist found the turtle shell among the collections of France's Musée d'archéologie du Jura.

Tracing back the story they found that Vicar Girod had sold the fossil to a private collector who kept it in his family for over a century. In 1994, the family donated it to the Museum, and it was another decade still before palaeontologists rediscovered the turtle.

### **Charles Darwin's Long-Lost Galapagos Tortoise**

After the expedition of the Beagle to the Galapagos Islands, Charles Darwin added small tortoises to the boat on his return to England. According to captain Robert Fitzroy, several of the tortoises made it to England.

One of the tortoises belonged to Darwin, he collected it himself in Santiago (or James Island, as it was then known). The little creature used to plod around his cramped cabin while he set about cataloguing his Galapagos specimens.

However, the fate of Darwin's tortoise in England is shrouded in myth. The tortoise is supposed to have become Harriet, a giant tortoise that lived at the Australia Zoo in Queensland until her death in 2006. This theory was debunked when scientist Paul Chambers proved that the tortoise in the Australia Zoo was from Santa Cruz island - an island not visited by Darwin.

A few years after Chambers' investigation, Darwin's tortoise - missing for over 170 years - finally turned up at the Natural History Museum in London. Darwin, upon his return, had visited South Kensington in August 1837 and presented the tortoise to the Zoology Museum.

Unfortunately, when the creature was catalogued, they failed to mention Darwin's name and thus it lay dormant in the basement of the Museum for decades.

## How did Harriet, the Galapagos Tortoise get to Australia?

If Harriet, the Galapagos tortoise was not Darwin's, how did she get to Australia? It seems she was transported down under by John Clements Wickham, the Beagle's first Lieutenant.

After the return of the Beagle to England, the ship set off for Australia with Wickham as a skipper. However, there is no evidence that the ship carried tortoises on board. But then again? The tortoise at the time was the size of a dinner plate and could have been hidden inside a cabin!

## The Hare and the Tortoise - Jeffreys Taylor's version

Said a hare to a tortoise, "Good sir, what a while  
You have been only crossing the way;  
Why I really believe that to go half a mile  
You must travel two nights and a day!"  
"I am very content," the creature replied,  
"Though I walk but a tortoise's pace;  
But if you think proper the point to decide  
We will run half a mile in a race."  
"Very good," said the hare; said the tortoise, 'Proceed,  
And the fox shall decide who has won.'  
Then the hare started off with incredible speed;  
But the tortoise walked leisurely on.  
"Com, tortoise, friend tortoise, walk on," said the hare;  
'Well, I shall stay here for my dinner;  
Why, 'twill take you a month at that rate to get there,  
Then how can you hope to be the winner?"  
So, at last this slow walker came up with the hare,  
And there fast asleep he did spy her;  
And cunningly crept with such caution and care,  
That she woke not, although he passed by her.  
"Well no," thought the hare when she opened her eyes,  
"For the race, - and I soon shall have done it"  
But who can describe her chagrin and surprise,  
When she found that the tortoise had won it!  
Thus plain plodding people, we often shall find,  
Will leave hasty confident people behind!`

# Word Search

## TurtleS



T M E R L O G G E R H E A D  
V W H A T C H L I N G S G T  
C G T K Q V R F T P H C H S  
A R E B I G V E F O Z F X N  
S E R E N D A N G E R E D H  
P E R L E A T H E R B A C K  
I N A K N B T O R T O I S E  
A K P Z R C H E L O N I A N  
N M I S S I S S I P P I B A  
P F N D F L A T B A C K B B  
F S L I D E R U S S I A N F  
C G A L A P A G O S J B T J  
U T E G G S O F T S H E L L

Loggerhead  
Eggs  
Green  
Terrapin

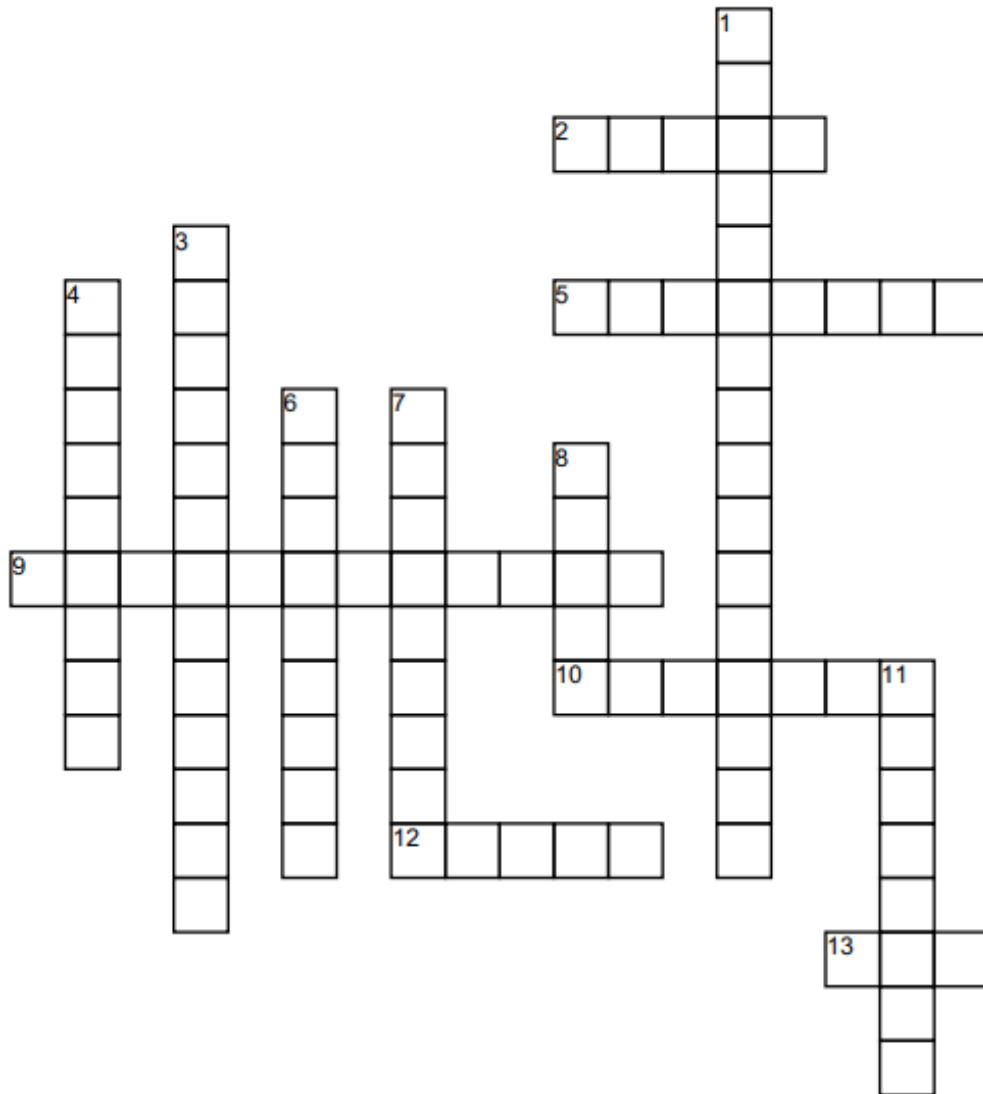
Chelonian  
Hatchlings  
Softshell  
Mississippi

Galapagos  
Tortoise  
Caspian  
Russian

Endangered  
Leatherback  
Flatback  
Slider



# The Sea



## Across

- 2. When a wave breaks and rushes up the beach
- 5. Process in which rocks such as chalk are dissolved
- 9. C\_\_\_\_\_ waves are formed when material is deposited
- 10. Arch shaped tunnel that stretches through the headland
- 12. A pillar of rock cut from the headland
- 13. Curved area where waves have eroded the coast

## Down

- 1. D\_\_\_\_\_ w\_\_\_\_ are formed when material is eroded
- 3. When waves crash against cliff and air gets trapped and compressed. Shatters rocks
- 4. Passage that links the surface of the cliff and the roof of the sea cave
- 6. Stones are carried by water constantly hitting off each other
- 7. Vertical or steep slope on the coast
- 8. \_\_\_\_\_ are formed by wind moving on the surface of water
- 11. an area of hard rock jutting out

# Name the Insect Quiz



1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_



4. \_\_\_\_\_



5. \_\_\_\_\_



6. \_\_\_\_\_



7. \_\_\_\_\_



8. \_\_\_\_\_



9. \_\_\_\_\_



10. \_\_\_\_\_



11. \_\_\_\_\_



12. \_\_\_\_\_

A green, multi-pointed star-shaped logo with a white border. Inside the star, the words "Biology" and "Trivia" are written in a bold, white, sans-serif font, stacked vertically.

## Biology Trivia

The biggest seed in the world is the 'Coco de mer', weighing up to 18 kilos or 39 pounds. It is found in the wild only in the Seychelles in the Indian Ocean.

A 600-pound (270kg) octopus can escape from captivity wriggling through an opening one inch in size.

Willow bark, from which aspirin was originally synthesized has been a pain remedy for 2,500 years, when the Greeks first discovered it.

You can tell the age of a whale by looking at the wax plug in its ear. This plug has a pattern of layers when cut lengthwise that scientists can count to estimate the age of the whale.

Hawaii is moving towards Japan at the speed of 4 inches a year. The reason for this is because they are on different tectonic plates.

Botox is made from a deadly bacterial toxin which is used in very small doses to remove wrinkles.

Rocks found at the bottom of the Grand Canyon in the USA are around 2 billion years old.

Bamboo can grow very rapidly; some types grow 3 feet (almost a meter) in one day!

The liver of a Polar Bear has so much vitamin A that if a human eats it, he/she will die.

Honey can last up to 3000 years without spoiling.

Oak trees do not have acorns until they are 50 years old.

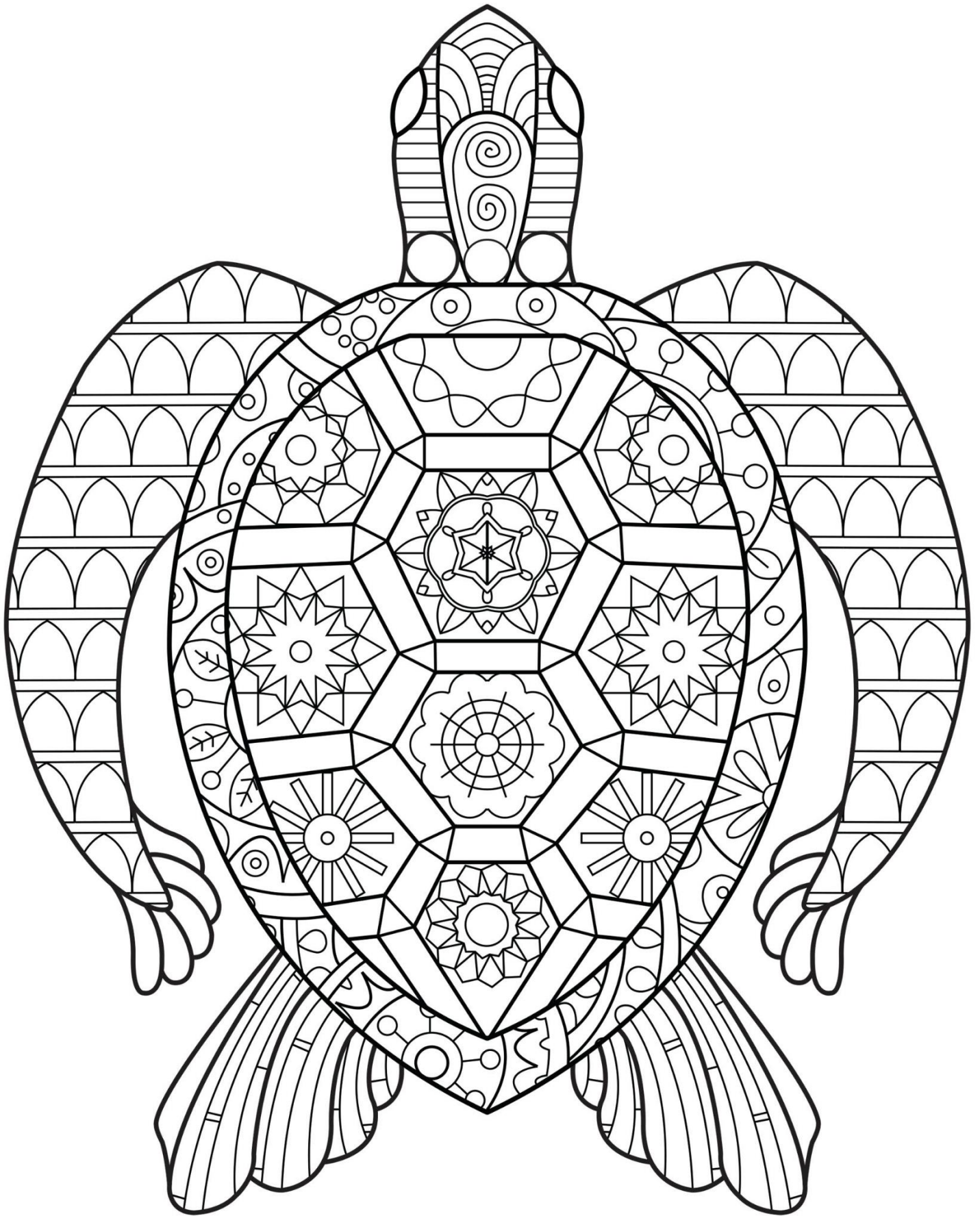
There are several types of Biology degrees: Wildlife Biologists, Forensic Biologists, Microbiologists, and Biological Engineers, to name a few.

It is estimated that 2,500 men lost their lives building the Panama Canal.

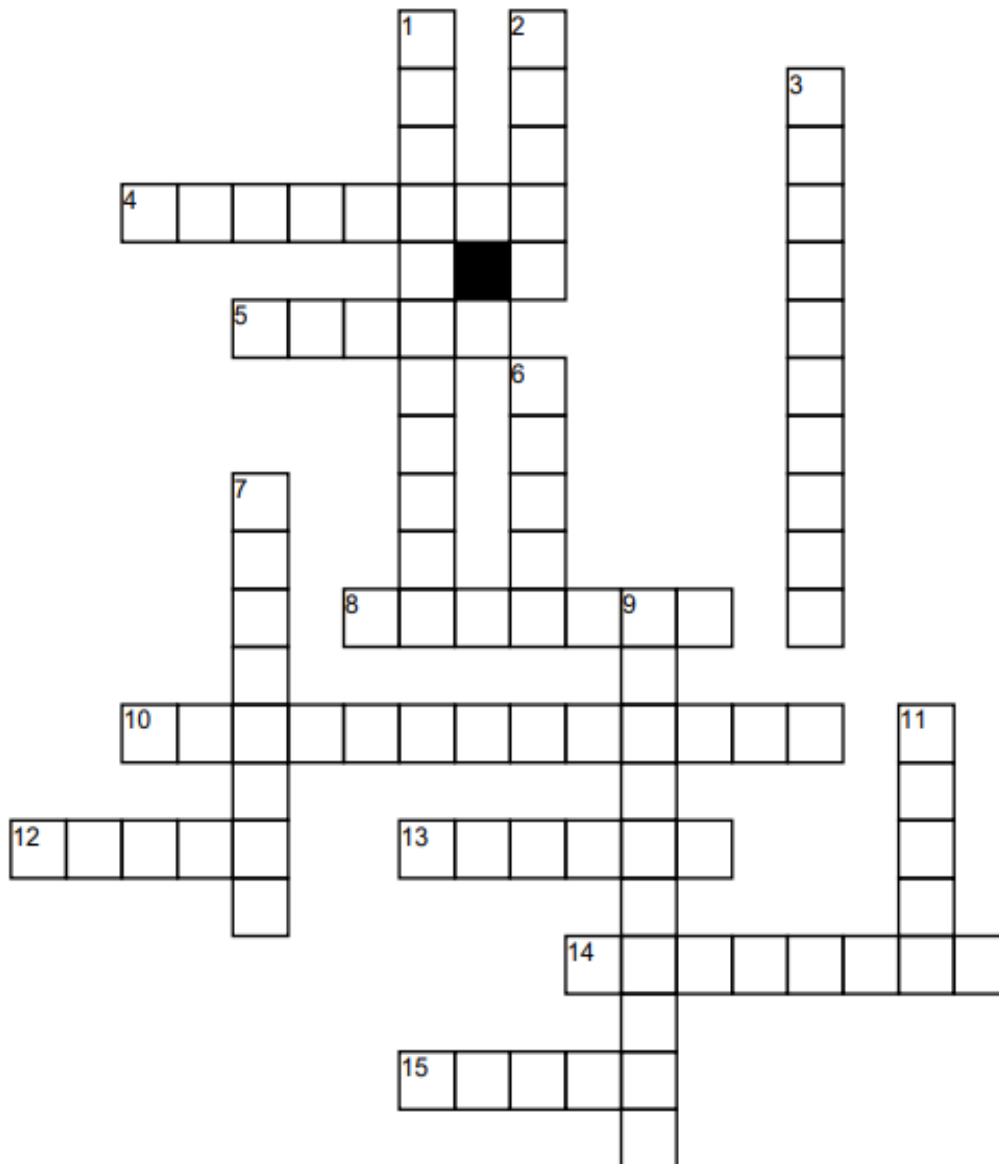
If you pick up a handful of garden soil you will be holding hundreds if not thousands of different kinds of microbes.



## Art for Relaxation



# Ocean Crossword Puzzle



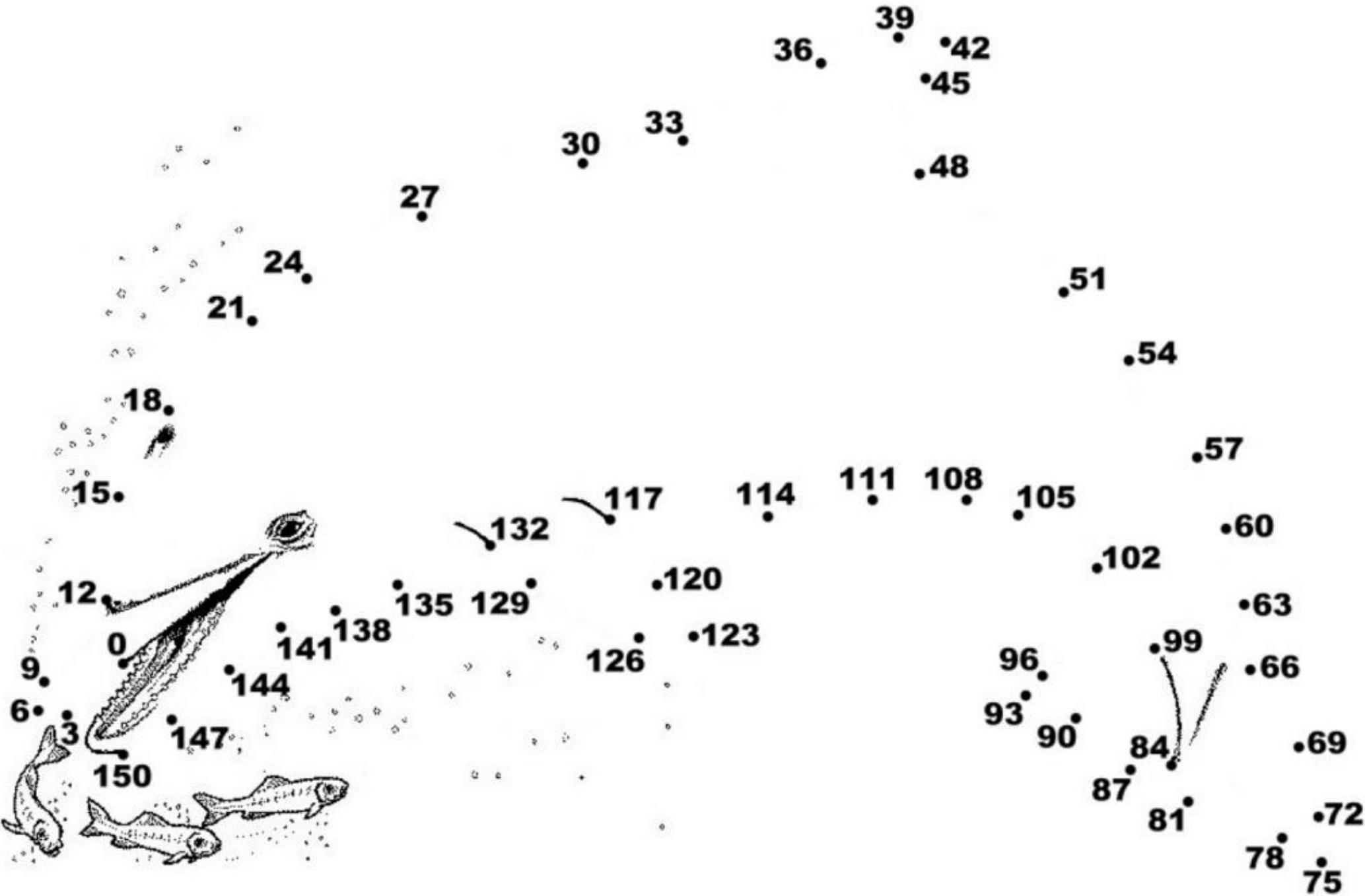
## Across

4. Place not explored/ where no life is found  
 5. What is a series of waves called?  
 8.  $D=m/V$   
 10. Someone who studies the ocean  
 12. Highest point of a wave  
 13. Lowest point of a wave  
 14. Dissolved salts in water  
 15. Foaming sheets of water that roll up and down the are called...

## Down

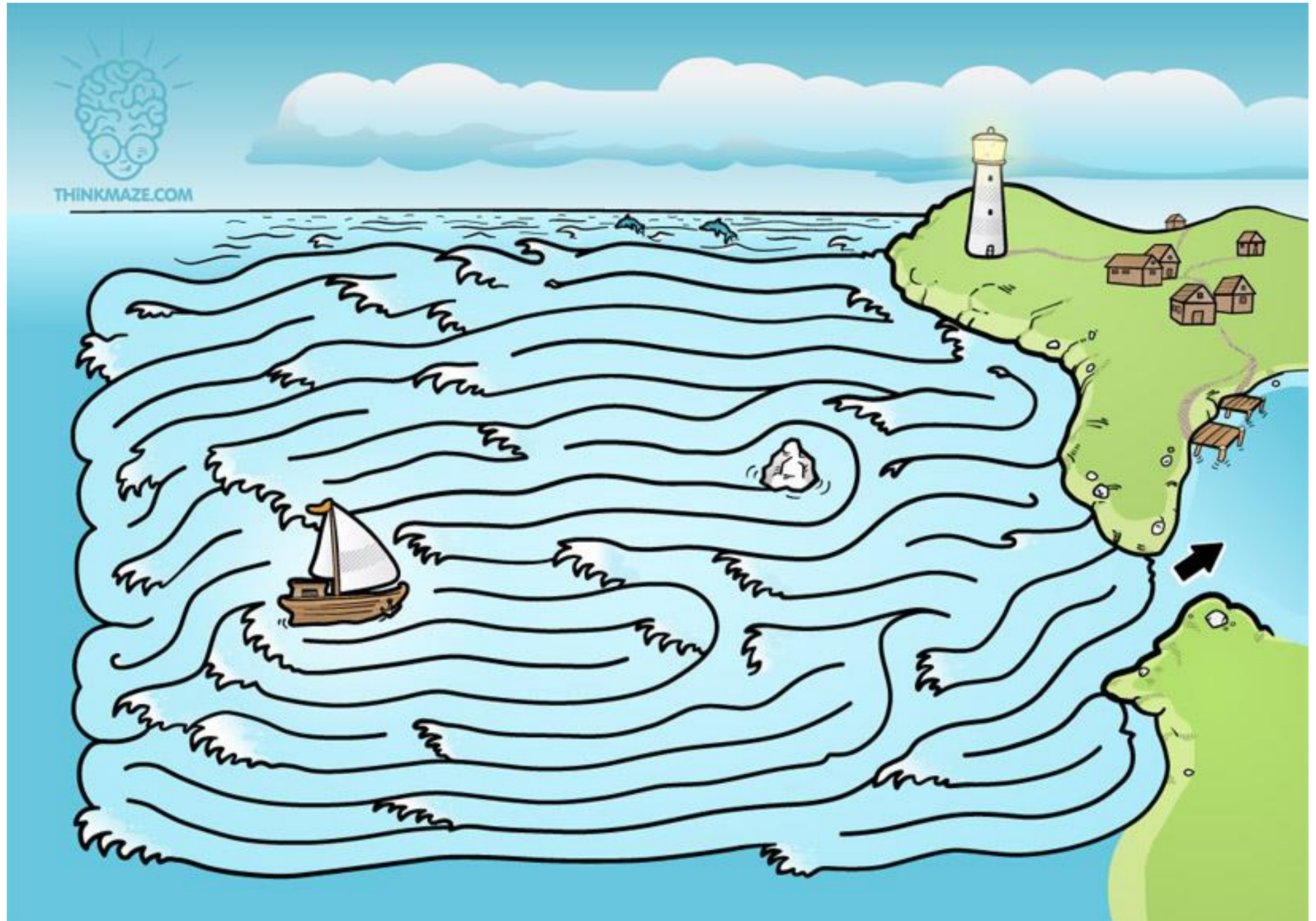
1. Layer of the ocean that does not receive sunlight  
 2. periodic rise and fall of the sea level  
 3. Surface layer of the ocean that receives sunlight  
 6. Transferred energy and wind causes...  
 7. Body of water or air moving in a definit direction  
 9. Arrangement of the natural and artificial physical features of an area.  
 11. The shore of a sea or ocean

Dot – to - Dot





Can you get the boat to safety?



# Trivia Turtle

Turtles are reptiles that need to breathe air to survive. There are seven species of marine turtles. Six out of the seven species are found in the waters of the USA.

Sea turtles live from 70 to 80 years.

There are sea turtle fossils dating back 150 million years, making them some of the oldest creatures ever found. Just for some context, dinosaurs became extinct 65 million years ago!

Male sea turtles spend their entire lives at sea, since they do not have to return to land to lay eggs.

Unlike other sea turtles, Green Turtles are vegetarians, feeding on sea grasses and algae. They are among the largest turtles in the world weighing 700 pounds (317 kilograms). They are listed as endangered and continue to be killed for their meat and eggs.

Unlike land turtles, many sea turtles cannot hide their necks to protect themselves.

Raine Island on the remote northern tip of the Great Barrier Reef in Australia is the breeding ground for the world's largest population of green turtles. In the nesting season, over 30 thousand females swim all the way from Indonesia, Papua New Guinea, and the Torres Strait Islands, to this tiny island to breed.

Turtles' eggs look like ping pong balls.

Only one hatchling in one thousand survives to adulthood. Hatchlings are totally adorable!

The collective name for turtles is Bale.

The Leatherback turtle is the largest of all living turtles. Unlike other turtles they do not have a hard shell, instead they have an oily-skin flesh. They feed almost exclusively on jellyfish and play an important role in the control of jellyfish populations. They migrate from Indonesia to eat Californian jellyfish! (over 6000 miles or 9,700 km). Sea turtles eat plastic because they think it is jellyfish.

Despite being able to stay underwater for up to five hours, turtles may drown if forced to be underwater for too long.

Turtles do not have visible ears, but they are not deaf. They have internal ears covered by flaps of skin.

Most turtle shells are made up of 60 bones that are all fused together.

## Marine Word Search

L W E G I L L S R J S R U L I H I I W S  
 T Q F A S M F Y L X S O J E D Q V A K J  
 B Q B R L V H V U J T T C K C W J X O K  
 C R U S T A C E A N I Z E C O C H S W C  
 H O M H O R L G D S N Q T O R T O I S E  
 O S I R A E J V N T G Y O G A O V L V Y  
 J I R O C E A N I C R Z A N L Q H T G X  
 Z E W G Y X R T X O A S A R D I N E S N  
 Y A B X L M H W U F Y H E B B U K Q C E  
 F V Y O S S I F I C A T I O N W T O A J  
 S T H E R M A L N D V O U D M B R R V E  
 A S L M O L L U S C F F E B W S O G E L  
 L C W O J B K O E E N B Y N F S P A N L  
 T J E I Z U R C H I N S K L N F I N G Y  
 W J T M A Y B T L D N E U F H G C I E F  
 A T L U R U V O X Z U A Z X R B A S R I  
 T O A E D W R P O T Z W N N W R L M S S  
 E R N R K M N U N G Y E O V A H N N K H  
 R B D L E S T S I R J E L X S O E Y S T  
 E Y S F O S S I L V Q D P Y Z U N T Y Q

Mollusc  
 Octopus  
 Organism  
 Tropical  
 Ossification

Crustacean  
 Tortoise  
 Saltwater  
 Scavengers  
 Oceanic

Jellyfish  
 Stingray  
 Wetlands  
 Fossil  
 Thermal

Urchins  
 Sardine  
 Coral  
 Gills  
 Seaweed



Can you find 8 differences?







### Dolphin Jokes!

Why was the dolphin so grumpy?

He ate too many crabs.

Did you know that dolphins sometimes eat cephalopods like an octopus?

Seriously, I am not squidding.

If dolphins did not live in the ocean and lived on land instead, which country would they live in?

Finland.

What do you call a person from Finland who is extremely boring?

A dolphin.

What did the dolphin say when it broke its neighbour's window?

"It wasn't on porpoise!"

Why don't dolphins ever play tennis?

Because they are too scared of the net.

Why do dolphins enjoy living in salt water?

Because pepper water makes them sneeze.

What is a dolphin's favourite TV show?

Whale of Fortune!

What does a dolphin ask when he does not understand?

"Can you be more Pacific?"

What did the Mama dolphin say when the Baby dolphin was late for dinner?

Nothing, she just flipped!

What is the best way to hear what dolphins have to say?

Listen to their podcast.

How do dolphins make decisions?

They flipper coin.

What did people say when the dolphin walked on water?

"It's just a fluke!" (Fluke = a dolphin's tail.)

What did the dolphin say when the priest tossed him a fish?

"Holy mackerel!"

Where do dolphin races end?

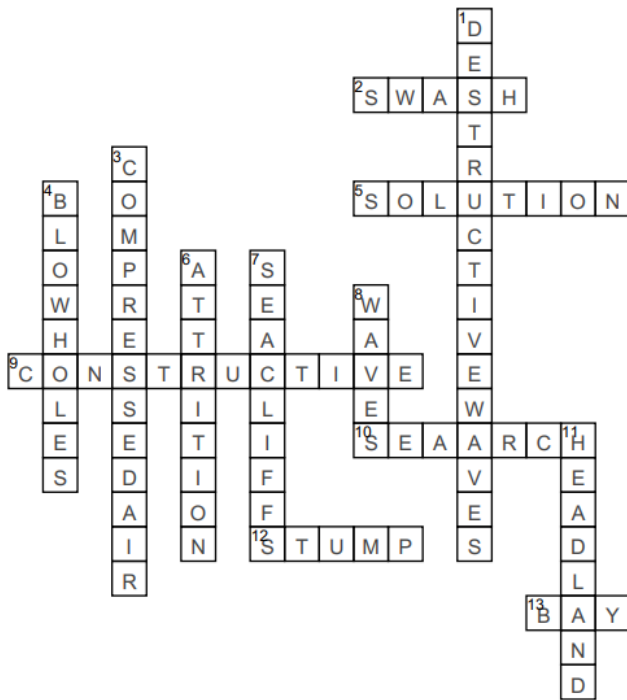
At dol-phinish line!

# Turtles

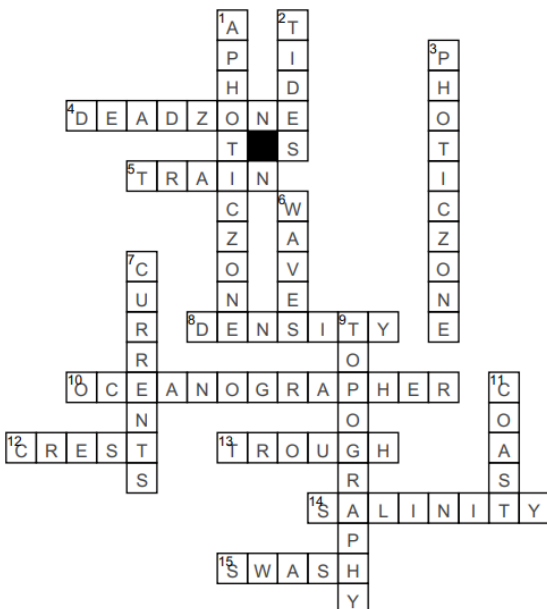


T M E R L O G G E R H E A D  
V W H A T C H I N G S G T  
C G T K Q V R F T P H C H S  
A R E B I G V E F O Z F X N  
S E R E N D A N G E R E D H  
P E R L E A T H E R B A C K  
N A K N B T O R T O I S E  
A K P Z R C H E L O N I A N  
N M S S I S S I P P I B A  
P F N D F L A T B A C K B B  
F S L I D E R U S S I A N F  
C G A L A P A G O S J B T J  
U T E G G S O F T S H E L L

## The Sea



## Ocean Crossword Puzzle



## Insect quiz Answers

1. Ant / Bull ant
2. Flea
3. Grasshopper
4. Aphid
5. Cicadas
6. Stick Insect
7. Wasp
8. Dragonfly
9. Termite
10. Cricket
11. Moth / Spanish Moth
12. Beetle / Rhinoceros Beetle

## Marine Word Search

L W E G I L L S R J S R U L I H I I W S  
T Q F A S M F Y L X S O J E D Q V A K J  
B Q B R L V H V U J T C K C W J X O K  
C R U S T A C E A N I Z E C O C H S W C  
H O M H O R L G D S N Q T O R T O I S E  
O S I R A E J V N T G Y O G A O V L V Y  
J I R O C E A N I C R Z A N I Q H T G X  
Z E W G Y X R T X O A S A R D I N E S N  
Y A B X L M H W U F Y H E B B U K Q C E  
F V Y O S S I F I C A T I O N W T O A J  
S T H E R M A L N D V O U D M B R R V E  
A S L M O L L U S C F F E B W S O G E L  
L C W O J B K O E E N B Y N F S P A N I  
J E I Z U R C H I N S K L N F I N G Y  
W J T M A Y B T L D N E U F H G C I E F  
A T L U R U V O X Z U A Z X R B A S R I  
T O A E D W R P O T Z W N N W R I M S S  
E R N R K M N U N G Y E O V A H N N K H  
R B D L E S T S I R J E L X S O E Y S T  
E Y S F O S S I L V Q D P Y Z U N T Y Q

