

OpenUpScience

Issue 22



She Speaks Science
Issue

Pull out Grumpy
Gary's Adventures
Comic

Can you spot the
difference in the
Corals?

Can you clean up
an ocean?

Welcome to
OpenUpScience,
the magazine from Cambridge
Science Centre.

In this issue, we've collaborated
with She Speaks Science.

Find out more with the
fun activities and
puzzles inside!

Welcome to OpenUpScience

from Cambridge Science Centre.

This issue is in collaboration with She Speaks Science.



She Speaks Science

(www.shespeaksscience.com)

At She Speaks Science, we aim to increase active engagement with science by inspiring young people into Science, Technology, Engineering and Maths (STEM), and to make STEM inclusive by

promoting women and minority scientists.

Our vision is a world where all scientists are valued, and where science is at the heart of society not a luxury or accessory.

We do this through the power of story.

Each storyteller *owns her story* and shares it with the world, once a month. We also run fun and engaging **storytelling workshops** at schools in the UK so that the youth can also *own their story* and take up STEM if they want to.

She Speaks Science is supported by the University of Cambridge and the International Astronomical Union.

These stories originally appeared on She Speaks Science. If you like them and would like to read more check out www.shespeaksscience.com or follow us on social media

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 SheSpeaksScience

Spark, Ignite, Fuel, Illuminate

Are fish LOUD!?

That's not a trick question - in fact, most are!
Have you ever been woken up by birds in the morning?
Or heard them singing as the sun is setting?

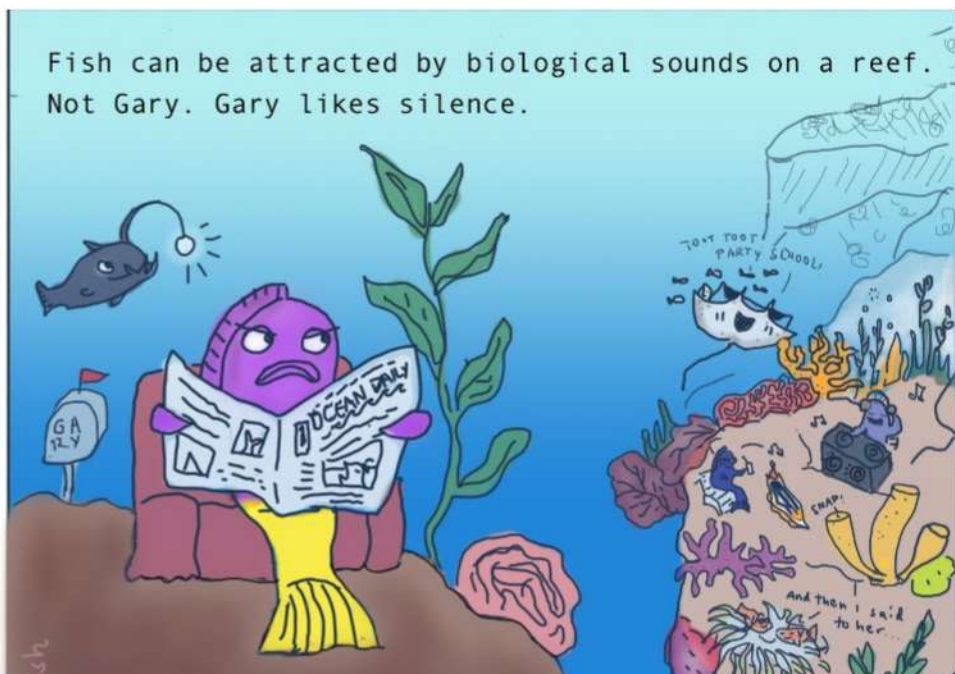


Well the same is absolutely true for a lot of fish! These patterns of "singing" are called the Dawn and Dusk choruses

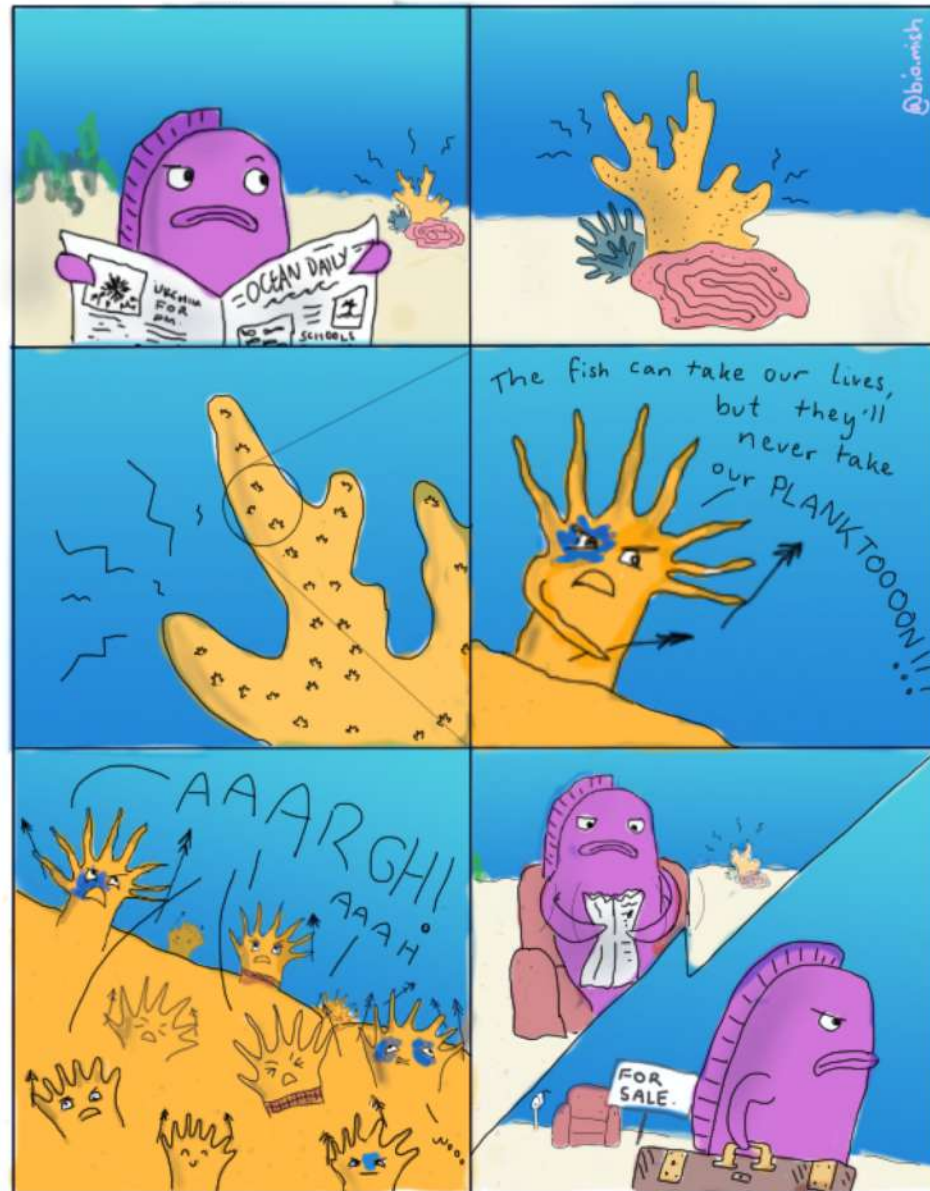
Other marine animals make noises too, so the healthiest reefs are the LOUDEST ones! They attract more fish and marine life.



Fish can be attracted by biological sounds on a reef.
Not Gary. Gary likes silence.

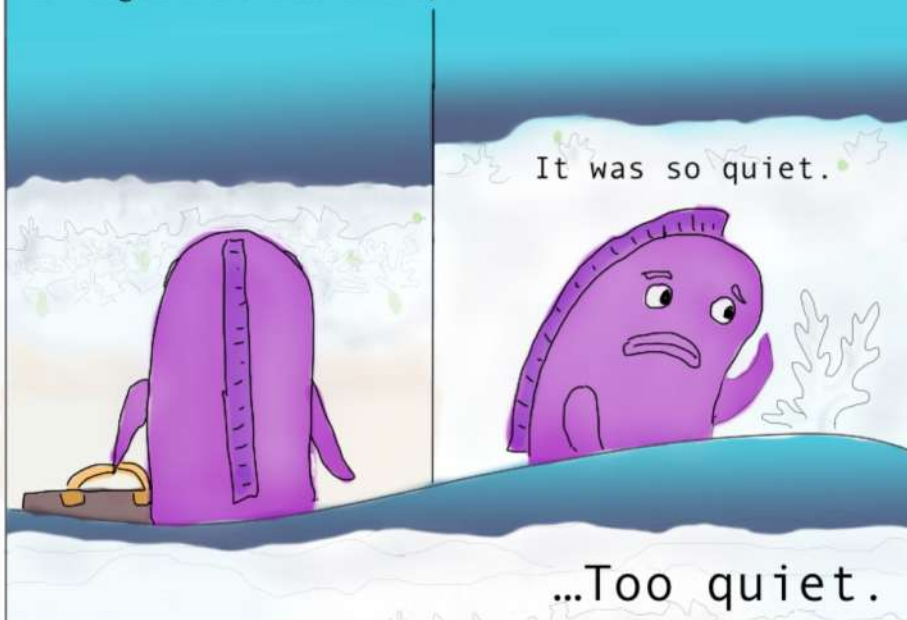


The next day on the reef.



Looking for a new home

The first new place Gary found, was a ghostly white, bleached, dead reef (except for a few wisps of algae here and there).



It was so quiet.

...Too quiet.

Gary looked over the white coral walls into...

*a dark
abyss*

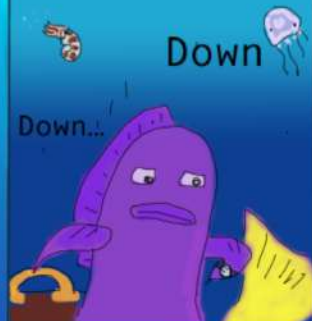
By the weight
of his luggage,
Gary
descended...

Down

Down

Down...

How bad can it be?
thought Gary.



At the bottom, there were
many strange creatures.
But they kept to
themselves, unlike his
reef neighbours -
and were quiet.

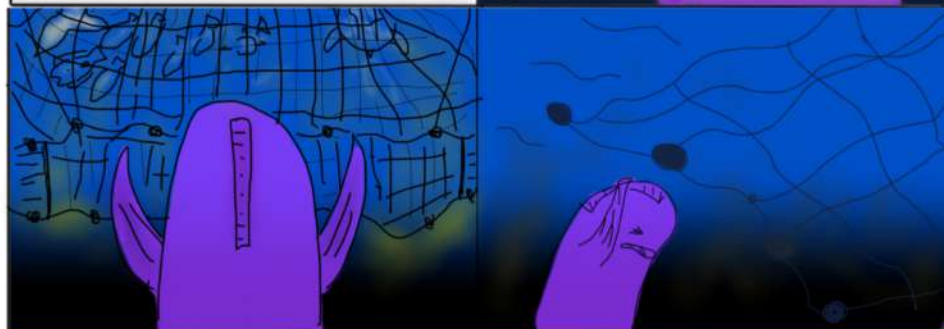


Just how Gary liked it.

But wait...
what was
THAT noise?



@bio.wish



All of Gary's new friends were gone.
Alone amongst the rubble & dark clouds of sand,
Gary decided it was time to go home.

Finally back home, Gary sighed with relief.



Poor Gary, what an ordeal! Just to fully appreciate the fact he lives in one of the most beautiful reefs in the ocean, with all his diverse neighbours and their sounds in his special Protected Marine Reserve - remember, a healthy reef is one with lots of fish, and fish are loud!

Sadly, out of the whole ocean, only 2% is like Gary's Marine Reserve, protected from human activity - that's like taking a football field and only protecting an area the size of the goal area! That's nothing! And because humans have taken too many fish, we need many, many more of these areas to make the oceans healthy and full of fish again.

So, let's be grumpy for him! And demand more no-take reserves where marine critters, coral and algae can be just that.

These seatoons are created by Michelle Havlik. Michelle is a Masters student in Marine Science at KAUST university from Sydney, Australia, studying underwater noise and whether fish like it or not. In her spare time, she loves to climb, dive & freelance, draw Seatoons and play music!

Can you guess the answers to these questions?

In the comic, what do you think happens to Gary in the Deep Sea? Does it look like it's something good or bad? Can you guess what it was?

How much of the sea should we protect to make it really healthy?

Spot the difference



Puzzle solutions

Answers:

What you see in the comic is deep sea fishing, or trawling. It is very bad because it destroys everything on the bottom of the ocean. It is very destructive to the fragile Deep Sea! Scientists say that it shouldn't be allowed. We need to protect more than a third of the sea to make it healthy!

Spot the difference!



What do these differences mean?

1. Purple branching coral bleaching

Corals are tiny animals which live together and form a colony that grows in different shapes like these branching tree-like shapes. Corals have lots of microalgae inside, which are algae the size of a microbe, giving corals their brilliant colours. Harmful human activities can cause the reef environment to change, such as the temperature, nutrient levels, and the amount of oxygen or light. This can make the coral expel the algae and lose its nice colour. We call this coral bleaching and it is very dangerous for reefs because corals cannot live without the algae inside them.

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2. Sea cucumber standing upright

Some animals such as corals, starfish and sea cucumbers release larvae and spawn into the water to reproduce. To make the spawn travel long distances, sea cucumbers and starfish sometimes stand up to release it!

3. Pearl missing from shell

Pearls are made by animals such as oysters in the sea, when a grain of sand gets inside the shell and irritates it. The oyster puts layers of a substance called nacre onto the grain of sand which, over time, makes a shiny pearl.

4. Algae on table coral

Sometimes algae, like seaweeds, grows on corals and damages them. This is why it is important for people not to catch too many fish that eat algae from the reefs, such as parrotfish and butterfly fish.

5. Orange fish backwards

Some reef fish make big groups called shoals. They do this to protect themselves and confuse predators for example by rapidly changing direction, forming different shapes and reflecting light off their shiny scales.

6. Mushroom coral moved

Some coral species called *Fungia* can move around the reef to places which are better for them. If something turns them over, they can flip themselves back the right way up!

7. Plastic bag

Turtles eat jellyfish but sometimes they mistake a plastic bag for a jellyfish. If they eat it, it can kill them. We need to stop putting plastic trash in the ocean so that the lovely turtles and other animals do not die because of it.

8. Eagle ray spot pattern different

Eagle rays are fish similar to sharks and sting rays. Each eagle ray has a unique pattern of white spots on its back, like a fingerprint! Marine biologists use this pattern to identify each ray.

This activity is by Jess Menzies, a marine biologist in the making. She loves scuba diving and studies the genetics of corals in the Red Sea. Eagle rays are her favourite, alongside seahorses and tiny shrimp. One day, she would like to live in Australia next to the great barrier reef. Also, she would really like to see a kangaroo!

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Ocean clean up

Show how our oceans can become polluted, and then try to clean up your ocean in a basin.

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What you'll need

- A large basin
- Clean water
- Plastic or plasticine ocean animals
- Toy boats (optional)
- Vegetable oil
- Cocoa powder
- Instant coffee
- Pieces of plastic bag
- Spoon or scoop
- Cotton wool
- Kitchen towel
- Sponge
- Dish soap



What to do

1. Fill the basin half full with clean water.
2. Add some ocean animals and boats and have a bit of a play!
3. Mix a spoonful of vegetable oil with a spoonful of cocoa powder and dribble the mixture into the basin.

The water is no longer clear and clean

4. Drop a spoonful of instant coffee into the basin and mix.
5. Add some pieces of plastic bag.

The water is even more polluted.

Now to clean it up!

6. Remove the bits of plastic with a spoon.
7. Can you scoop out the oil with a spoon?
8. Use cotton wool, kitchen towel, or sponge to try to absorb the oil that has spilled into the water.

What do the animals feel like?

9. Use dish soap to clean the oil from the animals.

Scientists are working on solutions to clean up our oceans.

Technologies include a barrier that slowly moves with the ocean currents and collects plastic waste; a vacuum pump to collect floating waste from calm water; a water wheel that collects oil and debris from rivers and magnetic coils that will be used to break down microplastics using a chemical reaction.

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Tell us what you think!
We always want to improve, so let us know what you liked – or didn't like – about this issue!

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Email us your pictures and questions

Cambridge Science Centre

is all about empowering children and young people to discover science for themselves through hands-on activities. While the centre isn't open as normal at the moment, we're finding new ways to reach the families that need us most – like this magazine!



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