Pink Sea Fan

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Pink sea fans are a type of soft coral and one of the most beautiful creatures found in Welsh waters. These corals are not a single organism but rather a colony of tiny animals called polyps, which resemble small anemones.

Found at depths of 10–50 metres, pink sea fans can be pink, orange, or even white, despite their name! They grow on rocks and hard surfaces in mostly flat, two-dimensional structures. Many align at right angles to the sea current to maximise the flow of nutrients passing by.

Like humans, pink sea fans grow faster when young, slowing down as they mature, but unlike us, they continue growing throughout their lives. They grow at a rate of just 1cm per year, with the largest recorded individual standing an impressive 50cm tall and 100cm wide, estimated to be over 100 years old. However, most pink sea fans in the UK are typically around 20cm in size. These corals are fragile and rare, making them a protected species due to their vulnerability to human impacts. They also support other rare species, such as the sea fan anemone and the sea fan sea slug. Remarkably, one species of sea slug not only feeds on pink sea fans but also camouflages itself to look like them.

Although we still know little about how pink sea fans reproduce, genetic studies reveal that Welsh pink sea fans are connected to populations as far away as France, suggesting their young can drift hundreds of miles across the ocean. Pink sea fans even serve as anchors for the eggs of small sharks like catsharks, though this can sometimes backfire. The added weight from the eggs and attached sea life can tangle branches and damage the sea fan.

Overall, pink sea fan populations are declining. In the Skomer Marine Conservation Zone, records show a loss of 50 pink sea fans since 1994, with 40 lost since 2015, and only 12 new recruits have been recorded. The main causes of their decline are believed to include:

- Entanglement of catshark eggs, which can damage branches.
- Changes in sea temperatures as a result of climate change.
- Physical damage from boat anchors and fishing.
- Entanglement in discarded fishing nets or lost fishing and angling gear, and marine litter.
- Accidental damage by scuba divers.
- Increased storm activity.

Pink sea fans thrive in warm waters and are more abundant in the Mediterranean.

Further research keywords
Eunicella verrucosa, soft coral, coral reefs, gorgonian, benthic ecosystems, epifauna, polyp-bearing, habitat-forming octocoral, three-dimensionality, ecological substrate, scallop dredging.

15–20 mins

Bubble Munchers

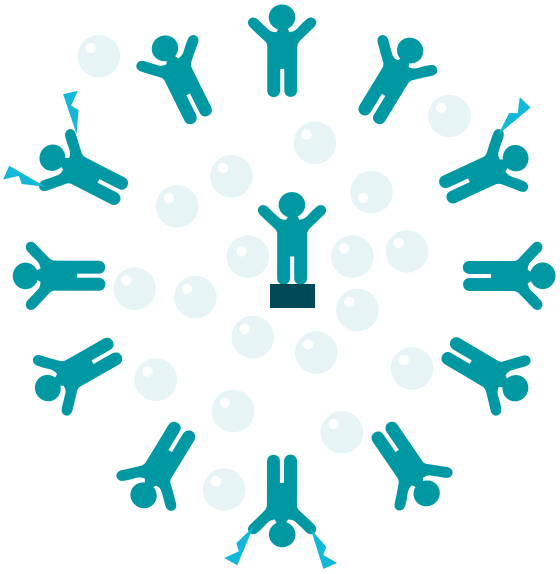
Equipment required

- Bubbles (machine/bubble wands)
- Newspaper (optional)

To complete the activity

1. Ask learners to consider how and where they find their food. In pairs, ask learners to discuss how they would catch food if they were stranded on a desert island? Discuss how different animals in the wild find and catch their food. Encourage them to consider the different adaptations they have to help them. Explain that in the sea, many animals pursue their prey (e.g. sharks and dolphins). How about animals that don't move, e.g. sea anemones and barnacles? Explain that these animals attach to hard rocks and need to capture food which is swimming or drifting past them in the water.

2. In an open play area, ask learners to sit on the floor in a circle with the bubble machine or volunteer/s blowing bubbles in the centre. The learners are sea anemones, and the bubbles are prey (tiny particles of food in the water). With the bubble machine/volunteer blowing bubbles around the circle, encourage learners to catch as many as possible, while remaining seated in one place.



After a few minutes, ask the learners how they found the activity and what they needed to do to catch the bubbles. They may realise that to catch food, they need to stretch out their arms and wave them about, just as sea anemones do with their tentacles, to take in plankton and minerals.

3. As an addition to this activity, if space allows, offer learners rolled up or fanned out newspaper to 'extend their limbs'. Ask them to work out which is most effective and consider how these compare to the feeding adaptations of real animals.

4. Next, ask the learners to become dolphins and explain that the bubbles are fish. This time, the learners can 'swim' around chasing their prey. After a few minutes ask the learners if this was an easier way to feed. Did they catch more? Did they get tired? This may prompt a discussion about energy gained and lost, and the balance needed between energy used and energy consumed. Is actively chasing food always worth the energy spent?

Bubble Munchers is adapted from Life around the Turbines, an outreach project developed by the Marine Biological Association of the UK (MBA) funded by charity COWRIE (Collaborative Offshore Wind Research into the Environment). COWRIE was set up by the Crown Estate but the collaboration has ended.

60 mins

12

Build your Own Edible Pink Sea Fan

Equipment required (per learner)

- 'Build your Own Edible Pink Sea Fan' worksheet, one per learner, or shared digitally
- 1 paper plate
- 1 large marshmallow
- 2 strawberry laces – cut into 8 pieces
- 1 straw
- 1 toothpick
- 1 spoonful of jam (any flavour)
- 1 teaspoon
- 2 round biscuits (e.g. rich tea)
- Green, pink, or red sugar sprinkles

To complete the activity

1. Share the 'Wales Best of the West' video with the learners – www.tiramor.cymru/pinkseafan (Resource 1).

2. Ask learners to share some examples of marine life they noticed in the video. How might these organisms be connected to each other within their environment? At 0:42 in the video, ask learners to identify what the scuba diver is looking at. Do they think it is a plant or an animal?

3. Correct any misconceptions. It's easy to think that coral is a plant, but they're in fact small animals. Each coral colony contains many individual coral animals, each known as a coral polyp. They share a hard skeleton made of protein and calcium carbonate.

4. Share the 'Build your own edible pink sea fan' worksheet and support learners to create their own coral polyp.

5. After completing their model, ask learners to reflect on what they learned about coral polyps. Discuss how the model represents real-life features and why these features, like tentacles, are important for survival.

ADDITIONAL TASK

Encourage learners to use The Marine Life Information Network website to view where pink sea fans are found: www.tiramor.cymru/pinkseafan (Resource 2). Ask them to identify the areas around the UK where pink sea fans are located and describe the types of habitats they prefer.

Important Note: Always check for allergies beforehand and follow your school's guidelines for handling food during activities.

Build your Own Edible Pink Sea Fan

What you will need

- 1 paper plate
- 1 large marshmallow
- 2 strawberry laces
- 1 straw
- 1 toothpick
- 1 spoonful of jam
- 1 teaspoon
- 2 round biscuits
- Green, pink or red sugar sprinkles

STEP 1: Prepare for the experiment

A. Wash your hands before starting.

B. Ensure all your equipment is clean and ready to use.

STEP 2: Create the polyp body

A. Place your marshmallow in the centre of your paper plate.

B. This represents the body of your coral polyp.

STEP 3: Make the mouth and stomach

A. Take a straw and carefully poke a hole in the centre of the marshmallow.

B. Remove the straw, leaving the hole behind. This represents the mouth and stomach of your coral polyp.

Coral polyps use this hole to eat and digest food, with their tentacles helping to catch tiny food pieces and guide them inside. Pink sea fans have just one hole that they use for both.

STEP 4: Add tentacles

A. Use a toothpick to create 8 small holes around the marshmallow.

B. Cut your strawberry laces into 8 small pieces (about 3cm each).

C. Insert the strawberry lace pieces into the holes. These represent the tentacles of your coral polyp.

STEP 5: Attach your polyp to its base

A. Use a spoon to spread a small amount of jam onto one of your round biscuits.

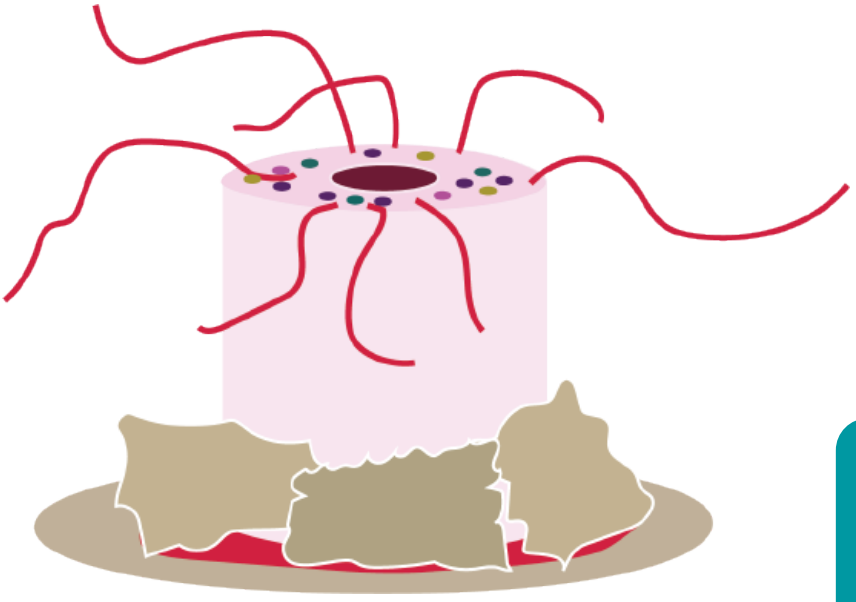
B. Stick the marshmallow onto the jam. This represents the coral polyp gluing itself to a rock.

STEP 6: Add skeleton protection

A. Break the second biscuit into 4 pieces.

B. Arrange these pieces around the marshmallow. These represent the coral skeleton, which provides protection and structure to the polyp.

Build your Own Edible Pink Sea Fan



STEP 7: Add algae
A. Sprinkle some sugar (green, pink, or red) on the marshmallow. This represents the algae that live inside the coral.

Some corals produce food by teaming up with tiny algae that live inside their bodies. These algae use sunlight to create energy through photosynthesis, similar to how plants make food. The algae shares this energy with the coral, while the coral provides nutrients and a safe home for the algae.

STEP 8: Form a coral colony
A. Work with 2 other learners.
B. Place your marshmallows (coral polyps) close together on one plate to represent a coral colony.
C. If you have permission, you can eat your coral polyp creation!

Pink sea fan coral is made of colonies of tiny animals called polyps. These polyps live together, working as a team to form the coral!

ADDITIONAL **TASK**

Encourage learners to use the Marine Life Information Network website to view where pink sea fans are found: www.tiramor.cymru/pinkseafan (Resource 2).
Where along the the Welsh coast are pink sea fans located? What types of habitats do pink sea fans prefer?

A coral polyp with 8 tentacles is called an octocoral, as "octo" means eight.

60 mins

Acidification vs Pink Sea Fan

Equipment required

- Measuring jug
- Funnel
- Water
- Salt (2 tablespoons)
- Tablespoon
- 1 litre container
- Sour sweet (optional)

Equipment required (per group)

- 'Acidification vs Pink Sea Fan' worksheet
- 75cm^3 brown vinegar (avoid white vinegar lest learners think it is water)
- 2 Beakers/Containers (minimum capacity of 75cm^3)
- Measuring cylinder
- 2 raw eggs

To complete the activity

1. Start by sharing a sour sweet with learners or asking if they've ever tasted something sour. Use this to introduce the idea of acidity and ask, "What makes sour things taste this way?" Briefly explain acids and how they interact with certain materials.

2. Show or pass around a piece of chalk and ask learners what they think it's made of. Explain that coral skeletons, like those of the pink sea fan, are made of the same material: calcium carbonate.

3. Engage learners by asking them to predict what might happen to chalk if it were placed in an acidic liquid (e.g., vinegar).

4. Connect this to the ocean: Ask,"If sea water becomes more acidic, how might that affect the calcium carbonate skeleton of the pink sea fan?" Encourage discussion and hypotheses before explaining the potential impacts of ocean acidification.

5. Explain that you need to create a simple sea water solution. Invite learners to join in as you prepare the solution.

6. Use a measuring jug to measure 1 litre of tap water and pour it into a large container.

7. Add 2 level tablespoons of salt to the water, approximately 36 grams, which is close to the 35 grams per litre concentration found in seawater.

8. Stir the water until the salt is fully dissolved. Explain to the learners that this solution represents seawater. The 1–litre solution is sufficient for the whole class.

9. Provide each group with the 'Acidification vs Pink Sea Fan' worksheet, and support groups as required to conduct the experiment.

10. Encourage learners to carefully observe the experiment, noting bubbles or changes in the shells over time. Prompt them to think about the bubbles forming around the shells, by asking "What do you think these bubbles are?"

11. Support learners to remove the raw eggs from the containers and encourage them to gently bounce the eggs. The egg in pure vinegar will bounce better due to the reaction.

12. Provide an opportunity for learners to research other organisms with calcium carbonate shells and explore how ocean acidity affects them.

Acidification vs Pink Sea Fan

What you will need

- 25cm^3 Seawater solution
- 75cm^3 Brown vinegar
- 2 Beakers/Containers (minimum capacity of 75cm^3)
- Measuring cylinder
- 2 Raw eggs

STEP 1
Label your containers as 'Vinegar Solution' and 'Pure Vinegar'.

STEP 2
Use your measuring cylinder to measure 25cm^3 of the seawater solution and pour it into the container labelled 'Vinegar Solution'.

STEP 3
Add 25cm^3 of vinegar to the same container to create a 1:1 ratio of seawater and vinegar.

This represents water with low acidity.

STEP 4
Carefully place one egg into the 'Vinegar Solution' container.

STEP 5
In the container labelled 'Pure Vinegar', measure 50cm^3 of brown vinegar and carefully place the second egg into this container.

STEP 6
After 1 hour, observe both containers and record your findings in the table.

STEP 7
Check the containers again after 24 hours and write down your observations.

STEP 8
Finally, observe the eggs after 48 hours and note the changes in the table.

You may gently touch the eggshells during your observations but handle them carefully as they are raw eggs and can easily break.

Remember!
Wash your hands thoroughly after handling the eggs to maintain cleanliness and avoid contamination.

Acidification vs Pink Sea Fan

Egg 1 - Vinegar Solution

TIME (hours)	OBSERVATIONS
1 hour	
24 hours	
48 hours	

Egg 2 - Pure Vinegar

TIME (hours)	OBSERVATIONS
1 hour	
24 hours	
48 hours	

Conclusion

- *After 48 hours, what differences did you notice between the two eggshells?*
- *What have you learned from this experiment about how water acidity impacts the pink sea fan?*
- *Did you notice bubbles forming around the shells? What do you think these bubbles are?*

STEP 9

Before removing the raw eggs from their containers, make a prediction: Which egg do you think will bounce better? Then, carefully take the eggs out and gently try bouncing them. Compare your results to your prediction!

ADDITIONAL **TASK** Optional

Research other organisms that have a shell containing Calcium Carbonate? How might increased acidity in their environment affect these organisms?

The largest pink sea fan on record is 50cm tall and 100cm wide and is believed to be over 100 years old!

60 mins

12

Pink Sea Fan Meditation Music

Equipment required

- Print out the 'Pink Sea Fan Meditation Music' worksheet, one per group (2 pages)
- Recording devices (e.g. tablets), one per group
- Internet enabled devices and internet access

To complete the activity

1. Share examples of relaxing ocean music and/or guided meditation with learners, e.g.
   - 'Wales 4k Benar Beach' - www.tiramor.cymru/pinkseafan (Resource 3)
   - 'Beautiful 4K Scenery' - www.tiramor.cymru/pinkseafan (Resource 4)
   - '10-minute guided meditation' - www.tiramor.cymru/pinkseafan (Resource 5)
   - 'Eco Anxiety: Guided Meditation' - www.tiramor.cymru/pinkseafan (Resource 6).

2. Explain the goal: Each group will create a 1-minute relaxing sound piece inspired by the peaceful, rhythmic flow of pink sea fans.

3. Provide each group with the 'Pink Sea Fan Meditation Music' worksheet and recording device (e.g. tablet), before moving to an outdoor space. Let learners pause and listen to the sounds around them. Discuss how pink sea fans gently sway underwater, move slowly, depend on ocean currents, and live in calm, undisturbed environments. How does the environment make them feel when they listen?

4. Challenge learners to use the outdoor environment to inspire calm, ocean-like sounds. Options may include rustling leaves to mimic ocean currents, tapping sticks softly on tree trunks for more rhythmic sounds, splashing or tapping gently in water puddles to reflect the movement and sound of waves, or using their own voices, humming or breathing.

5. Support learners to record sounds separately (e.g. one recording for ocean currents, another for bubbles or swaying sounds). Remind learners to keep recordings short (e.g. 10–15 seconds).

6. When learners have completed their ocean sound recordings, return indoors, and using audio editing tools (e.g. GarageBand, Audacity or BandLab), provide time for learners to put their piece together. Ensure learners can import each recorded sound file into the editing app, and support to arrange the tracks, considering carefully how they layer sounds, add fades or pauses for a meditative feel, and adjust volume to ensure a gentle, flowing balance.

7. When learners have completed their 1-minute piece, encourage each group to export their final recordings as MP3 or WAV files.

8. Finally, play each group's soundscape in a calm, quiet space. Guide learners to sit comfortably, close their eyes, and focus on the sounds, as they would in a meditation session. Encourage slow, deep breathing as they listen, imagining the gentle movement of pink sea fans swaying with ocean currents. Afterward, reflect together on how the music makes them feel - does it help them feel calm, relaxed or focused?

Pink Sea Fan Meditation Music

Welcome to my world!

I need your help to create a beautiful, relaxing soundscape that captures the gentle, flowing rhythm of my underwater home. Picture the soft swaying of pink sea fans, the quiet currents of the ocean, and bubbles drifting peacefully by.

- Gill Bell

Use the outdoor environment - like rustling leaves, splashing in puddles, or your own soft humming - to bring this serene world to life. Work together to create a 1-minute piece of music that's as calming and tranquil as the ocean itself. Let your creativity flow!

Sounds to include

What underwater sounds do you want to include in your piece? (e.g. ocean currents, bubbles, swaying movements)

What will you use to create the sounds above? (e.g. rustling leaves)

Decide on your sounds, and plan how you will record them.
Remember to keep each sound recording short (10-15 seconds).

Sound to record	Length	Who will record?

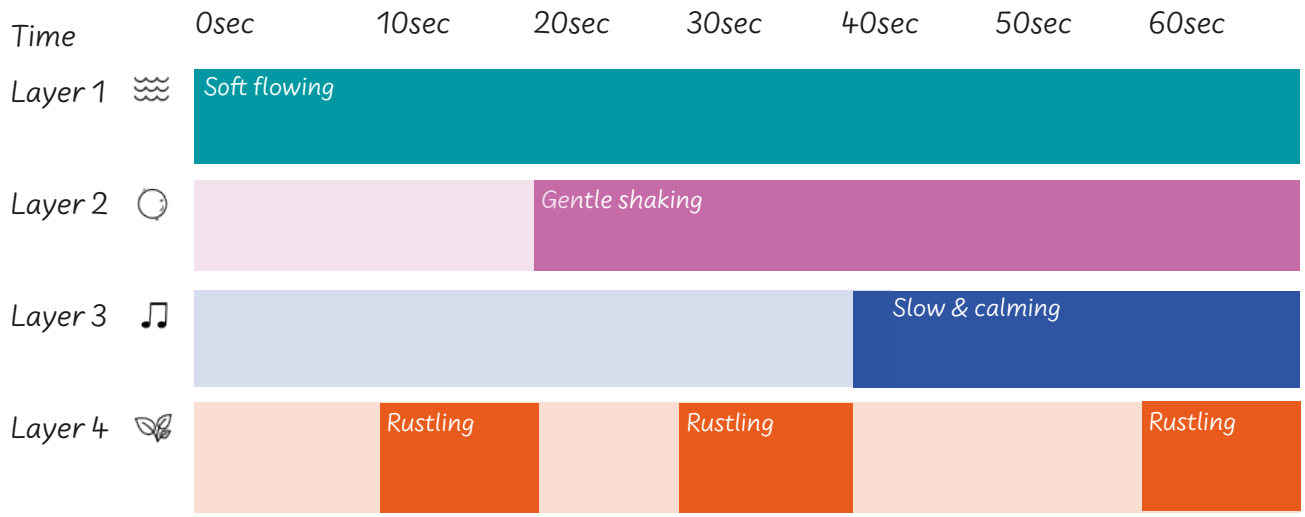
Pink Sea Fan Meditation Music

Think carefully about how you will arrange your sounds to create a relaxing, flowing piece of music.

Create a simple timeline to note the order of your sounds, for example:

Waves *Bubbles* *Humming* *Leaves*

If you would like sounds playing together, create a 'layered' timeline.



Once you've completed your piece, reflect on the following:

1. How does your music reflect the gentle, flowing movements of the pink sea fan?

2. How did listening to your finished piece make you feel?

In Ireland, all pink sea fans are white, and scientists don't yet know why!

Share your 1-minute soundscape with the class!