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!