Seven Reefs and a Heat Wave Lab

Name _____
Date _____
Period _____

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Do Now Two coral reefs sit in the same warm ocean. One is full of fish and colorful coral. The other is white, and most of its coral is dead. 2 minutes, before you open the lab

A. What is your first idea about why the second reef is dying?

☐ Warmer water ☐ Fishing and people ☐ Not sure yet

B. How could a scientist find out if warmer water is hurting a reef? Write one thing they could measure.

_____

Part 1. Survey the reefs (Tab 1)

SEP 4 · CCC Patterns

Pick a card. Click each ring on the pink coral. Press **Check my count**. Do all 7 cards. **Example:** 7 coral points × 4 = 28% coral cover.

1. Copy from **Your survey** .

Card	Heat weeks	Fishing? (circle)	Coral points	Coral cover
A		yes no		
B		yes no		
C		yes no		
D		yes no		
E		yes no		
F		yes no		
G		yes no		

2. Look at the graph. The hottest reefs (A, D, G) have: ☐ the least coral ☐ a lot of coral

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 3 to 5.

3. 9 coral points × 4 = _____% coral cover. Each point is worth 4% because:
☐ 100 ÷ 25 = 4 ☐ there are 4 photos

4. Heat weeks measure extra ☐ ocean heat ☐ fish, from ☐ satellites ☐ divers. Corals start to bleach at about
☐ 1 ☐ 4 ☐ 10

5. The two reefs with the least coral are B and E. On both cards, people ☐ fish ☐ do not fish

Part 2. A fair comparison (Tab 2)

SEP 3 · CCC Stability and Change

Do Steps 1, 2 and 3. In Step 2, compare **C and E**, then **C and A**.

CLUE. A fair test changes only **one** thing.

6. People fish at: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

7. Tick what is different, and if it is a fair test of heat.

Pair	What is different?	A fair test of heat?
C and E	☐ heat ☐ fishing	☐ yes ☐ no
C and A	☐ heat ☐ fishing	☐ yes ☐ no

8. Open the strips. 1997 to 2005, Kingman (C): ☐ fell ☐ stayed the same B and E: ☐ fell ☐ stayed the same

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 9 to 11.

Word bank algae · white · starve · fish · bounce back · fair

9. Coral bleaching: the water gets too hot. The _____ leave the coral. The coral turns _____. If it lasts, the coral can _____.

10. The most coral died on reefs where people _____. Unfished reefs could _____. That is **resilience** .

11. "C and E prove heat kills coral." ☐ agree ☐ disagree because C and E are different in ☐ one thing ☐ two things. A _____ test of heat is C and _____.

Part 3. Sixty years in a coral (Tab 3)

SEP 4 · CCC Stability and Change

Move along the core. Mark every bright stress band. Find all 10. Copy from **Bands you found**.

12. Heat waves that bleached the reef: _____ Biggest before 2015: _____ (years), _____% 2015-16: _____% bleached, then _____% of corals died.

13. Was 2015-16 the first big bleaching at Jarvis? ☐ yes ☐ no, there were others, like 1997-98

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 14 to 16.

14. "One record-hot summer proves the climate has changed." ☐ true ☐ false One hot summer is ☐ weather ☐ climate. Climate is the pattern over about ☐ 1 year ☐ 30 years

15. Scientists knew 2015-16 was the biggest because they had: ☐ one year of data ☐ many years of data

Wrap it up: plan it like Enric Sala

SEP 3 · CCC Cause and Effect

16. Tick one question.

☐ Is Lake Erie freezing less? ☐ Are park leaves coming out earlier? ☐ Are brook trout losing cold streams?

Word bank ice days · date leaves open · number of trout · water temperature · every day · every spring · every summer · 30 years · near Buffalo · a cooler place

I will measure	
at two places	
how often, for how long	

NYSSLS: HS-ESS2-7, touching HS-ESS2-5. Environmental Science, Chapter 6, Explorers at Work (pp. 158–159). Data: Sandin, Sala and others (2008); Barkley, Cohen and others (2018).