Who Took Them? Lab

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Name _____

Date _____

Period _____



Do Now This shiny green beetle is the emerald ash borer. It is from Asia. It is about as long as a grain of rice. It was found in Buffalo in 2011. 2 minutes, before you open the lab

A. Predict: what happened to the ash trees in Buffalo after this beetle came?

☐ Most of them died ☐ Nothing changed ☐ They grew bigger

B. How could a beetle from Asia get all the way to Buffalo?

_____

☐ I can name the six human causes of species loss (HIPPCO).

☐ I can explain how DDT built up in a food chain.

☐ I can explain how habitat fragmentation and invasive species push species toward extinction.

☐ I can build an explanation with a claim, evidence and reasoning.

Part 1. Break up the forest (Tab 1)

SEP 4 Analyzing Data · SEP 2 Models · CCC Cause and Effect

Pick all four plans. Copy each one from **Your plan log**.

1. Your plan log. The forest starts with 81 squares.

Plan	Forest squares	Interior squares	Patches	Ovenbird can nest?
A: no road				
B: road along the edge				
C: road through the middle				
D: two roads cross				

2. Plans B and C each cut 9 squares of forest. Interior squares lost, compared with Plan A:

Plan B: 49 – _____ = _____ lost. Plan C: 49 – _____ = _____ lost. Plan C loses _____ times as much interior.

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

3. Breaking a big habitat into small, separated patches is called _____.

4. Plans B and C cut the same amount of forest. Why is Plan C worse for the ovenbird? Use the words **edge** and **interior** .

_____

_____

5. Model check. What does each piece stand for? Then name one thing the model leaves out.

In the lab	Stands for
a square	
a hatched square	

One thing the model leaves out: _____

Part 2. Up the food chain (Tab 2)

SEP 5 Mathematics · CCC Scale, Proportion and Quantity

Tap all five steps. Copy each one from **Your food chain log**. Then use **How many times more?**

6. DDT at each step of a New York food chain, in parts per million (ppm).

Step	Water	Zooplankton	Minnows	Needlefish	Ospreys
DDT (ppm)					

7. How many times more DDT is in an osprey than in a minnow? Show the division. _____ ÷ _____ = _____ times

8. How many times more DDT is in an osprey than in the water? _____ times. In the water, DDT is

☐ too small to matter ☐ small, but it builds up

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

9. Write **bioaccumulation** or **biomagnification** .

DDT builds up inside one minnow's body over its life: _____

DDT gets more concentrated at each step up the food chain: _____

10. Cause and effect. Number the steps 1 to 4 to show how DDT hurt ospreys.

_____ eggs crack before they hatch _____ DDT is sprayed and washes into the water _____ ospreys eat many DDT-filled fish _____ shells are thin

11. Stability and change. Use the **After the ban** card. Bald eagle pairs in the lower 48 states: _____ in 1963 and _____ in 2007. What changed, and what does that show about the cause?

Part 3. Case files (Tab 3)

SEP 6 Explanations · SEP 7 Argument · CCC Stability and Change

Open all six files. Copy the two numbers from each file. Leave the last column for after the Learn It box.

12. Your case log.

Case	First number	Second number	HIPPCO cause (Q13)
1. Wild tigers			
2. Ash trees			
3. Native mussels			
4. Ospreys			
5. Polar bears			
6. Black rhinos			

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 13 to 15.

13. Fill the last column of your case log: H, I, P (population), P (pollution), C or O. Check each one with the letter buttons in the lab.

14. The graph shows the first P, population growth. People in 1800: _____ billion. Today: about _____ billion. Pick one other HIPPCO cause. How does more people make it worse?

Argue it

SEP 6 Constructing Explanations · SEP 7 Argument from Evidence · CCC Cause and Effect

15. Pick one case file. Build an explanation for why that species declined.

My case: _____

Claim the human cause	
Evidence 2 numbers or clues	
Reasoning the science that links them	

NYSSLS: building toward HS-LS4-5, HS-LS2-7 and HS-ESS3-3 (DCI LS4.C, LS4.D, ESS3.C). Environmental Science, Chapter 7, Lesson 7.2: What Role Do Humans Play in the Loss of Species and Ecosystem Services? (pp. 221-231). SEP = Science and Engineering Practice, CCC = Crosscutting Concept. Data: the student book (Figure 7-14; Woodwell and others, 1967), U.S. Fish and Wildlife Service, NYS DEC, Cornell University.