Extinction Evidence Lab

Name _____

Date _____

Period _____

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Do Now A honeybee collects pollen. Each winter, U.S. beekeepers open their hives and find 30 to 45 out of every 100 colonies gone. The bees just vanish. 2 minutes, before you open the lab

A. Predict: what is most likely making the bees vanish?

☐ Something in their environment changed ☐ Bees always die in winter

☐ The bees flew to another country

B. Name one food you eat that needs bees.

_____

☐ I can explain how a change in conditions can drive a species to extinction.

☐ I can compare the background extinction rate with the rate since 1900.

☐ I can tell endangered from threatened and name traits that put a species at risk.

Part 1. The Big Five (Tab 1)

SEP 4 Analyzing and Interpreting Data · CCC Cause and Effect

Tap all five mass extinctions on the timeline. Copy each one from **Your extinction log**.

1. Your extinction log.

Mass extinction	Millions of years ago	Species lost (%)	What changed
End-Ordovician			
Late Devonian			
End-Permian			
End-Triassic			
End-Cretaceous			

2. The biggest one was the ☐ End-Ordovician ☐ End-Permian ☐ End-Cretaceous It killed about _____ % of species.

3. Cause and effect. In all five, what came first? ☐ a change in Earth's conditions ☐ the species dying out

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 4 to 6.

WORD BANK. extinction · mass extinction · adapt · reproduce · mammals

4. When every member of a species is gone from Earth, that is _____. When many species die out in a short time, that is a _____.

5. A species goes extinct when its members cannot _____ and _____ after the conditions change.

6. After the dinosaurs died, which group spread out into many new kinds?

☐ mammals ☐ trilobites ☐ armored fish

How long did each recovery take? ☐ a few years ☐ about 1,000 years ☐ several million years

Part 2. How fast now? (Tab 2)

SEP 5 Mathematics · CCC Scale, Proportion and Quantity

Tap all five animal groups. Copy each one from **Your group log**.

7. Animals with a backbone, extinct since 1900.

Group	Mammals	Birds	Reptiles	Amphibians	Fishes	All five
Lost since 1900						
Expected at the background rate						

8. The group that lost the most species: ☐ mammals ☐ birds ☐ fishes In every group, the real number lost is ☐ bigger ☐ smaller than expected.

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

Example. Mammals: 35 lost ÷ 1.3 expected = about 27 times faster. Now do birds and all five.

9. Birds: _____ ÷ _____ = about _____ times faster. All five: _____ ÷ _____ = about _____ times faster.

WORD BANK. background extinction rate · sixth mass extinction · 800 · 10,000

10. The slow, natural rate of species dying out is the _____. At that rate, the losses since 1900 should have taken _____ to _____ years.

11. A friend says, "Extinction is a thing of the past, like the dinosaurs." ☐ true ☐ false Since 1900, _____ animal species are gone. Many scientists say a _____ is starting.

Part 3. Who wins, who loses? (Tab 3)

SEP 2 Developing and Using Models · CCC Stability and Change

Pick **40%** and run the model. Then pick **60%** and run it again. Copy both from **Your run log**.

12. Population after 30 years (start = 100).

Species	40% lost	60% lost
Bornean orangutan		
Florida panther		
Giant panda		
Karner blue butterfly		
White-tailed deer		
Raccoon		

13. Two species went **up** instead of down:
☐ orangutan ☐ deer ☐ panda
☐ raccoon

At 60%, which species were gone (0)?
☐ orangutan ☐ panther ☐ panda

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

WORD BANK. endangered · threatened

14. Enough to survive for now, but numbers are falling: _____ species. So few left that it could soon be extinct: _____ species.

15. Karner blue caterpillars eat only wild lupine. That trait is a
☐ low reproductive rate ☐ specialized niche ☐ large territory

An orangutan has one baby about every 8 years. That trait is a
☐ low reproductive rate ☐ specialized niche ☐ large territory

16. Model check. This model is simpler than real life because
☐ it uses real species ☐ every species loses the same share of habitat ☐ it shows a graph In real life, _____

Wrap it up

SEP 7 Engaging in Argument from Evidence · CCC Stability and Change

17. Evaluate the evidence. Claim: "A change in environmental conditions can drive species toward extinction." Use one example from Part 1 or Part 3.

What changed? _____ What happened to the species? _____

Did the change come first? ☐ yes ☐ no So the evidence ☐ supports the claim ☐ does not support the claim

NYSSLS: building toward HS-LS4-5, HS-LS2-7 and HS-ESS3-3 (DCI LS4.C, LS4.D, LS2.C). Environmental Science, Chapter 7 Case Study and Lesson 7.1: What Causes Extinction and What Are Its Impacts? (pp. 212-220). SEP = Science and Engineering Practice, CCC = Crosscutting Concept. Data: Ceballos and others, 2015, Science Advances, from the IUCN Red List; Bambach, 2006 (Big Five).