# Species Interactions Lab

Name _____

Date _____

Period _____

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Code: **+** more with the other one · **−** fewer with the other one · **0** the same

☐ I can name the five ways species interact, with their signs and an example of each.

☐ I can use a model's numbers to explain how predators, prey and competitors change each other's populations.

## Part 1. Take one away (Tab 1)

**SEP 3 Investigating · CCC Cause and Effect**

Pick a pair. **Skip to the end** with both checked. Then uncheck one and run. Then swap. **Your runs** keeps the numbers.

**CLUE: With the other** is bigger: **+**. Smaller: **−**. The same: **0**. Example: 10 alone, 30 with the other, so **+**.

**1.** Write the numbers. Circle one sign. Leave the Name column for later.

| Pair | Species | Alone | With the other | Circle a sign | Name (after Learn It) |
|---|---|---|---|---|---|
| **Lady beetles + aphids** | Lady beetles | | | **+ − 0** | |
| | Aphids | | | **+ − 0** | |
| **Bumblebees + coneflowers** | Bumblebees | | | **+ − 0** | |
| | Coneflowers | | | **+ − 0** | |
| **Sea lampreys + lake trout** | Sea lampreys | | | **+ − 0** | |
| | Lake trout | | | **+ − 0** | |
| **Robins + street maples** | Robins | | | **+ − 0** | |
| | Street maples | | | **+ − 0** | |
| **Purple loosestrife + cattails** | Loosestrife | | | **+ − 0** | |
| | Cattails | | | **+ − 0** | |

**2.** The maples got a 0. The robins: ☐ help them ☐ harm them ☐ do not help or harm them

**3.** Which was hurt more? ☐ loosestrife ☐ cattails It went from _____ alone to _____ with the other.

**READ FIRST.** In the lab, find the green **Learn It** box and read it. Then write the names in Q1 and answer 4.

**WORD BANK** mutualism (+ +) · commensalism (+ 0) · predation (+ −) · parasitism (+ −) · competition (− −) · succession · coevolution

**4.** Press **Run** and watch the habitat. Tick one box on each line.

**A lady beetle** ☐ eats the whole aphid ☐ feeds on a living aphid for weeks

**A sea lamprey** ☐ eats the whole trout ☐ feeds on a living trout for weeks

So lady beetles and aphids are _____, and sea lampreys and trout are _____.

## Part 2. Boom and crash (Tab 1)

**SEP 5 Using Math · CCC Stability and Change**

Check both. Press **Run** and watch the graph. Dashed lines are runs with one species gone.

**5.** Aphid peak: _____ on day _____. Lady beetle peak: _____ on day _____. First: ☐ aphids ☐ lady beetles

**6.** Lake trout alone: _____ With sea lampreys: _____

**Example:** 200 alone, 150 with. Lost 200 − 150 = 50. Then 50 ÷ 200 = 0.25, so 25% lost.

Lost: _____ − _____ = _____. Then _____ ÷ _____ = _____, so _____% of the trout were lost.

**READ FIRST.** In the lab, find the green **Learn It: boom and crash** box and read it. Then answer 7 and 8.

**7.** Lady beetles are the predator. Aphids are the prey. Why do the beetles go up **after** the aphids? Tick one.

☐ They need lots of aphids to eat before they can make more beetles. ☐ Both eat milkweed. ☐ Beetles hatch late.

**8.** Aphids alone stop at _____. That is their **carrying capacity** . With lady beetles, they stay

☐ above it ☐ below it ☐ at it

## Part 3. Mystery pairs (Tab 2)

**SEP 7 Argument from Evidence · CCC Patterns**

Two real species with their names hidden. Do all three runs: both together, X alone, Y alone. Make your call before you press **Reveal**. Then press **New mystery pair** for trial 2.

**9.** Write the numbers. Circle the signs. Write the real names after Reveal.

| Trial | X alone | X with Y | Y alone | Y with X | Sign for X | Sign for Y | It was (names) |
|---|---|---|---|---|---|---|---|
| 1 | | | | | + − 0 | + − 0 | |
| 2 | | | | | + − 0 | + − 0 | |

**10.** Pick trial 1 or 2. Finish each line.

**Claim:** The interaction was _____.

**WORD BANK** mutualism · commensalism · predation · parasitism · competition

**Evidence:** X had _____ alone and _____ with Y. Y had _____ alone and _____ with X.

**Reasoning:** This proves it because _____

**11.** Predation and parasitism both have the signs + and –. Can the numbers alone tell them apart?

☐ Yes ☐ No

A scientist would also need to watch whether one species _____ the other or _____ on it while it is alive. **WORD BANK** eats · feeds · helps · ignores

## Part 4. Sharing a tree (Tab 3)

**SEP 6 Constructing Explanations · CCC Structure and Function**

Three kinds of warbler eat insects in the same spruce trees. Keep all three checked. Press **Skip to the end** with **Anywhere in the tree**. Then do it again with **Each in its own part**.

**12.** Write the numbers at year 50.

| How they feed | Cape May warblers | Bay-breasted warblers | Yellow-rumped warblers |
|---|---|---|---|
| **Anywhere in the tree** | | | |
| **Each in its own part** | | | |

**READ FIRST.** In the lab, find the green **Learn It** box and read it. Then answer 13 and 14.

**13.** When all three feed anywhere, two kinds of warbler _____. They lose the _____ for the same food. **WORD BANK** die out · grow · competition · mutualism

**14.** With **resource partitioning** , why can all three live in the tree? Tick one.

☐ Each kind eats insects in a different part, so they compete less.
☐ The tree grows more insects when birds split it up.
☐ The birds help each other find food.

## Wrap it up

**SEP 2 Developing and Using Models · CCC Cause and Effect**

**15.** Since 1958, crews have treated the streams where sea lampreys hatch. If all the lampreys are gone, I predict the lake trout will

☐ go up ☐ go down ☐ stay the same

Test it: uncheck sea lampreys and run. The trout end at _____. Was your prediction right? ☐ yes ☐ no

**16.** A classmate says, "In every interaction, one species wins and one species loses." Tick **two** pairs that prove this is wrong.

☐ bumblebees + coneflowers ☐ lady beetles + aphids ☐ robins + street maples ☐ sea lampreys + lake trout

These prove it wrong because _____

NYSSLS: building toward HS-LS2-1, HS-LS2-2 and HS-LS2-6 (DCI LS2.A Interdependent Relationships in Ecosystems; LS2.C Ecosystem Dynamics). Environmental Science, Chapter 5, Lesson 5.1: How Do Species Interact? SEP = Science and Engineering Practice, CCC = Crosscutting Concept.