Partners for a Species Lab: NYSSLS Alignment

Teacher guide for the student worksheet at mrsajdak.com/partners (two pages, 15 questions; a low-write version has the same numbering). Environmental Science, Special Feature 2: Partners in Sustainability, Nature Museums and Preserves (SE pp. 196-205). The answer key is a separate file, kept off the public site.

Performance expectations

> **HS-ESS3-3**
> Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. *"Students run a turtle model built on real survival numbers and see how two kinds of management (protecting habitat and head-starting) change whether a species lasts."*

> **HS-LS2-7**
> Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. *"A road is the human impact; students compare a fence, a head-start program and both, then check the ideas against 85 years of real crane counts."*

Practices and concepts, where students do them

Practice or concept	Questions	What students do
SEP 8 Obtaining, Evaluating and Communicating Information	1, 3, 14, 15	Read eight short partner cards and pull out each job; judge a claim; write a museum caption with a number in it (the district's Compose Captions strategy).
SEP 2 Developing and Using Models	6, 7, 10	Run the turtle model; say what the fence, the eggs and the road stand for; name what the model leaves out.
SEP 4 Analyzing and Interpreting Data	12	Read real winter counts of the wild whooping crane flock, 1941 to 2025, with partner events marked.
SEP 5 Using Mathematics and Computational Thinking	2, 8, 13	Count jobs; percent lost (68%); a ratio (540 ÷ 16, about 34 times).
SEP 7 Engaging in Argument from Evidence	9, 14	Pick the one job that helps most, with both numbers; answer "a zoo saved the crane by itself".
CCC Systems and System Models	5, 9, 14, 15	No partner does all four jobs; the partners work as parts of one system, and the turtle and crane both needed more than one part.
CCC Stability and Change	7, 11	A long-lived turtle changes slowly: head-starting shows no change for 10 years because young turtles need 14 years to grow up.

Opening: pick a phenomenon

The slideshow's first slides offer three openers. Pick one per class. Driving question: **Why would scientists dress up as birds, and keep dead birds in drawers?**

Opener	What happens	Notes
Video: Raised by a Costume	Nat Geo Animals, Raising Baby Whoopers, 2:49: whooping crane chicks fed by a person in a white crane costume with a puppet head. Backup: Operation Migration, Whooping Crane Imprinting, 0:48; Smithsonian golden frog breeding, 2:34.	Mute the narration at first and ask why anyone would hide their face from a baby bird. Answer it in Part 3.
Activity: Label It	4 minutes. Each pair gets a leaf, pinecone, acorn or pebble from the schoolyard and writes a museum label for it: what, where, when, who found it.	Ask: why would a scientist in 100 years want your leaf? Bring it back with the Buffalo Museum of Science card.

Photos: Drawer or Marsh?	A museum drawer of birds with tags on their legs, next to a living bird at a Buffalo marsh.	Ask which one is helping birds more. Most say the live one; the lab shows both do a job.

Part by part

Part 1, Meet the partners (Tab 1). Explore: Q1 to Q3. Students must check all 8 partners before the Learn It opens; a wrong check says how many jobs were missed and how many ticks are extra, without saying which. Learn It on biodiversity, the four jobs, the vocabulary (preserve, specimen, natural history, captive breeding, citizen science) and partners as a system sits between Q3 and Q4. Apply: Q4 and Q5.

Part 2, Save a Blanding's turtle (Tab 2). Explore: Q6 to Q8. The Learn It (adults are the key; head-starting buys time; both together work best; what the model leaves out) opens after all six runs and sits between Q8 and Q9. Apply: Q9 to Q11. The Model check is Q10.

Part 3, The crane comeback (Tab 3). Explore: Q12 and Q13. Learn It on the partners behind the comeback, why the crane is still endangered, and the golden frog misconception sits between Q13 and Q14. Apply: Q14. Q15 closes the lab.

What is real and what is a model

Tab 2's survival numbers come from a 15-year study of Blanding's turtles at the E. S. George Reserve in Michigan: about 10 eggs a nest in 4 years out of 5; 26 in 100 eggs survive the nest; 78 in 100 young turtles live through each year; 14 years to grow up; 96 in 100 adults live through each year. Two numbers are model choices: the road (4 more adults in 100 die each year) and the museum (90 in 100 head-started babies live through their first year). The model counts females only and has no bad luck, so every run gives the same answer. Tab 3's counts are real winter counts of the Aransas to Wood Buffalo flock. Winters 2020, 2023 and 2024 had no survey, so the graph line has gaps there; since 2011 the number is an estimate from a sample, and in 2015 the survey changed to a new method (hierarchical distance sampling), so part of the jump from 304 to 463 is the new way of counting. Say so if a student spots the jump.

The district section

BPS Environmental Science Unit 3, Special Feature 2: Partners in Sustainability (pacing 10/26 to 11/13). The lab uses all eight partners from SE pp. 196-205 and adds three in Western New York: the Buffalo Museum of Science, Tifft Nature Preserve and Reinstein Woods (the district's Explore Local Treasures and Get Involved: Become a Partner). It takes Spotlight: Specimen Collections into the Do Now and Tab 1, the Misconception: Natural History into Tab 1's Learn It, and Read With Purpose: Compose Captions into Q15. **Additions, beyond the district list:** the turtle model and the crane data set.

Sources. Congdon, J. D., Dunham, A. E. and van Loben Sels, R. C. (1993). Delayed sexual maturity and demographics of Blanding's turtles (Emydoidea blandingii): implications for conservation and management of long-lived organisms. Conservation Biology 7: 826-833. International Crane Foundation, Historic Whooping Crane Numbers (2015), from Whooping Crane Recovery Team data. U.S. Fish and Wildlife Service, Aransas-Wood Buffalo whooping crane aerial survey reports, winters 2015-16 to 2025-26. U.S. Fish and Wildlife Service, Whooping Crane 5-Year Review (2023). Buffalo Museum of Science and Tifft Nature Preserve; NYS DEC, Reinstein Woods Nature Preserve. Environmental Science (National Geographic Learning / Cengage), Special Feature 2. Images are listed on the lab page.