

## Introduction:

This task, administered as a summative transfer task as part of the unit NextGen Storylines unit “[Why don’t antibiotics work like they used to?](#)” asks students to consider a phenomenon observed in Nebraska: a dramatic change in the number of swallows killed along a highway [roadkill]. Throughout the course of the task, students are asked to consider the interplay between environmental pressures—in the form of building of highways and cars driving quickly—and population changes in trait, specifically around wing span, to explain why the proportion of local swallow populations impacted by car-related deaths has changed over a multi-decade period. Through this lens, students are asked to demonstrate their understanding of adaptation to interpret data about swallow traits and population changes, and to connect evidence presented in the task with their conceptual understanding of natural selection to posit and support a possible explanation for the observed phenomenon.

## STANDARDS:

This task is intended to assess the NGSS Performance Expectation:

**HS-LS4-3:** Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.

## ANNOTATION KEY

| EQUITY                                       | SCENARIOS                                    | SEPs  | DCIs   | CCCs   | SENSE-MAKING  | ASSESSMENT PURPOSE   |
|--|--|---|--|--|---|--|
| Supporting a wide range of diverse students. | Information provided to elicit performances. | Opportunities to demonstrate science and engineering practices. | Opportunities to demonstrate understanding of disciplinary core ideas. | Opportunities to demonstrate understanding of crosscutting concepts. | Opportunities for reasoning about phenomena and problems. | Highlights how the task features connect to intended assessment use. |

## ✓ STRENGTHS

This task is centered around a **robust phenomenon** that is specific, intriguing, and made comprehensible to a wide range of students through the inclusion of sufficient detail and multiple modes of representation. Importantly, the phenomenon-based scenario enables students to make visible their use of the dimensions that are assessed. ■■

The task routinely asks students to **engage in sense-making using multiple dimensions**. ■■

Throughout the task, there are many opportunities for students to demonstrate their understanding of SEPs and DCIs, and some opportunities that **require students to use grade-appropriate DCIs and SEPs together to make sense** of various aspects of the phenomenon presented. Importantly, there are opportunities for students to use multiple aspects of the SEPs, and routine opportunities for students to not only use parts of DCIs and SEPs, but to use them in service of sense-making. ■■■■

The task includes many opportunities to reveal facets of student thinking by giving students multiple ways to make their thinking visible, including multiple choice, short answer, and predictions. ■■

This task provides a number of **opportunities for students to understand and connect** to the task scenario without limiting the sense-making expected of students. This includes many questions intended to on-ramp/scaffold student thinking. ■■

## ! OPPORTUNITIES FOR IMPROVEMENT

The task often requires the use of **MS-level SEP and DCI elements** without this being explicitly acknowledged in the scoring guidance. ■■

While CCCs might be involved, this task does not **explicitly evaluate students’ understanding and use of the CCCs**. ■■

The task is somewhat dependent on students’ using **written language** to convey their thinking in open-ended questions, which might obscure some students’ science understanding and abilities. ■■

While the task offers many opportunities for students to make their thinking visible, the scoring guidance often **emphasizes right answers over focusing teachers’ attention on student thinking** and connecting those artifacts back to the assessment target. ■■

## How does this task support all students?

✓ This task is focused on a specific, observable phenomenon and includes multiple modalities to help students understand and connect to the phenomenon. The task is rather scaffolded, supporting students in their sense-making process, and allowing individual questions to specifically target sophisticated uses of the DCIs and SEPs that all students can reasonably be expected to interpret and respond to. The task also regularly includes explanatory notes and guidance to help ensure all students understand the presented scenario and task demands.

! The task relies heavily on language—while the built-in scaffolding ensures that no single question requires long written responses, the questions within this task do not easily allow students with more limited English language abilities to show their thinking in other ways (e.g., diagrams, discourse, etc). Additionally, the task provides limited opportunities for students to connect to why the task is relevant beyond swallow nests or to engage students' ideas about the phenomenon aside from the sole correct answer provide.

## What are the major takeaways?



### SUMMARY POINTS:

Overall, this task balances requiring students to [make sense of phenomena](#) using multiple dimensions together while still [providing students with scaffolding and support to progressively figure something out](#). This results in individual questions that often foreground or background individual dimensions, but these are connected as a set such that as a whole, students have to use multiple dimensions together in many different ways.



### SUGGESTED IMPROVEMENTS

1. The task—including both the questions and scoring guidance—could focus more on the distinguishing aspects of the HS-level expectations for student understanding of natural selection and adaptation. This is largely a matter of ensuring that the sophistication of ideas as a whole is on grade-level to support appropriate interpretations of student performance relative to standards.
2. The scoring guidance could be modified to include notes about MS-level targets (or modified to reflect the expectation of HS-level DCIs and SEPs), and provided more explicit guidance around interpreting student thinking and its connections back to the dimensions and PE targeted.
3. The task—through prompts and/or scoring guidance—could emphasize alternative ways for students to make their thinking visible.
4. The task could provide some additional or modified supports for students to understand swallow flight and their current environment.

## How should this task be used?

This task can be used as intended—a classroom summative assessment after students have completed instruction on HS-LS-4-1, knowing that additional assessments or questions may be needed to fully address the HS expectations—especially if the unit is taught either relatively early in high school when it is expected that they will be developing increasingly sophisticated ideas and abilities with analyzing and interpreting data and statistical analyses. In high school, the task will certainly help teachers and students determine if students understand the major concepts and practices associated with the PE. It could also be used with some slight modifications after a unit that covers MS.LS.4B and MS.LS.4C, provided that students have had sufficient experience with both the DCIs and SEP targeted. Teachers using this task in HS should note that many performances will align more closely with the MS-level elements, and that this task will not fully assess a unit that includes other bundled standards—and should make sure those standards are also assessed.

Educators using this task should also note the degree of transfer expected. This task was intended to provide evidence that students could generalize their learning from a unit focused on antibiotic resistance to a very different life science context. If teachers use this in a different context, the inferences they can make about student performance should be adjusted accordingly.