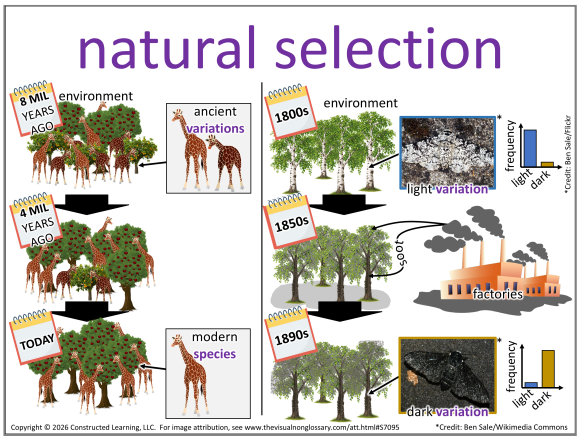
Teacher Guide for the Lesson on **natural selection**



Standard:
8.13(C)

Content Objective:
We can explain how **natural selection** leads to adaptations that improve survival and reproduction over generations.

Language Objective: Answer the following question in complete sentences using the sentence stem and the key vocabulary of the lesson:

> How does the environment contribute to **natural selection**?
>
> *The environment contributes to **natural selection** in that...*

Other key vocabulary: variations

By studying this visual, students might:

Notice	Wonder
• Giraffes with longer necks could reach more food.	• Why did some giraffes survive and others did not?
• Some giraffes in the past had shorter necks.	• How did the variations first appear?
• The trees are part of the environment.	• Could other animals experience natural selection the same way?
• Over time, only giraffes with long necks remain.	• How long does it take for a new descendant species to form?
• The timeline shows changes across millions of years.	• Does the environment always determine which traits are helpful?

EXTENDING THE DISCUSSION

- After randomly calling on students, if there is anything from this list that was not mentioned, then ask the class, "Did anyone notice...?"
- After students have shared what they notice, ask the class, "Did anyone wonder...?" using the suggestions above or anything else you might think is interesting or relevant to the lesson.

Structured Conversation Prompts

OBSERVATIONAL	RELATIONAL	INFERENTIAL
What occurs in **natural selection**? In **natural selection**, ...	How is **natural selection** related to **variations**? **Natural selection** is related to **variations** because...	How does the environment contribute to **natural selection**? The environment contributes to **natural selection** in that...

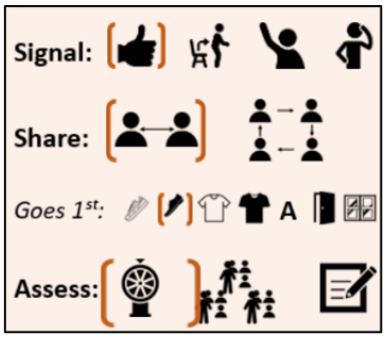
Example Student Responses to the Observational Question

Low-Level	High-Level
In **natural selection**, some organisms survive and others do not.	In **natural selection**, individuals with traits better suited to the **environment** survive and reproduce, passing on those traits to future generations.

RESPONDING TO RESPONSES

Emphasize and celebrate each student's use of the key vocabulary to support a culture of "no wrong answers."

STRUCTURING STUDENT CONVERSATIONS



Have students list observations from the visual as a warm-up, then use the Q-SSS-A process to guide small-group conversations. In the slide decks, brackets can be moved to prepare the structured conversation. In the example to the right, students will be instructed: Q-SSS-A.

- To put a thumb up, then lower their hand when they are ready to answer the question
- To share with their elbow/shoulder partner, and that the student with the darkest shoe will share first
- That they will be randomly called on after the conversation

Here is an example of structuring a conversation with Q-SSS-A.

Note: the inferential question is the same as the language objective. It is recommended that students answer the inferential question in a small-group discussion before answering it individually as the closure or exit ticket of the lesson.

Structured Reading

READING PURPOSE	PAT LIST	POST-READING DISCUSSION
The purpose for reading is to understand how **natural selection** changes a population when the **environment** changes.	• The different variations of the moths • How the environment changed over time • Which moths survived and reproduced • How natural selection worked in this story • The difference between the ancestral species and the descendant species	Why did one moth **variation** become the common **descendant species** over time? *One moth **variation** became the common **descendant species** over time because...*

STRUCTURING THE READING

Communicate the purpose of reading to the students and instruct them to make a note every time they see something on the PAT ("Pay Attention To") list. How you have students note items on the

PAT list is up to you. This could include:

- Putting an asterisk in the margin
- Underlining text that supports the PAT list
- Putting a comment in the margin

Follow the reading with the post-reading discussion. Structure this discussion using the Q-SSS-A process just like the structured conversations in this lesson.

Note: you might find the relational question is better discussed before or after the reading. This depends on whether the relational question is directly related to the reading or might make connections across units.

DIFFERENTIATING THE READING

You will notice that three different reading passages are provided with this lesson. Look at the shapes in the top-left of each passage to determine the grade level.

BELOW GRADE LEVEL	ON GRADE LEVEL	ABOVE GRADE LEVEL
Triangle is bottom-left	*Square is bottom-left*	*Circle is bottom-left*

In a class with students at diverse reading level proficiencies, you can give the appropriate reading passage to different students, while having all students follow the same PAT list and post-reading discussion.