Lesson 1.1
Pre-Unit Assessment
Lesson Overview

Students’ Initial Explanations

Students are introduced to the *Inheritance and Traits* unit and are invited to think about what wildlife biologists study. Then, students write their initial explanations about similarities and differences between fish. Students’ written explanations serve as a Pre-Unit Assessment for formative purposes, designed to reveal students’ initial understanding of the unit’s core content, both unit-specific science concepts and the crosscutting concept of Patterns, prior to instruction. As such, students’ explanations offer a baseline from which to measure growth of understanding over the course of the unit. These explanations can also provide the teacher with insight into students’ thinking as they begin this unit. This three-dimensional assessment will allow the teacher to draw connections to students’ experiences and to watch for preconceptions that might get in the way of students’ understanding. In this lesson, students also receive their Investigation Notebooks and learn some of the ways that scientists use notebooks. Finally, students review the unit’s reference book, *Handbook of Traits*, which they will be using throughout the unit. The purpose of this lesson is to introduce the unit and allow students to demonstrate their current understanding of inheritance and traits.

**Investigative Phenomenon:** Fish have similarities and differences.

**Students learn:**

- Wildlife biologists study living things in order to learn more about them.
- Reflecting on what you understand and don’t understand allows you to prepare for learning new things.
- Living things have life cycles that are unique and diverse.
Previewing the Reference Book

Students preview the unit’s reference book, *Handbook of Traits*, as they complete a scavenger hunt notebook page.

**Instructional Guide**

1. **Introduce the first Investigation Question.** Point to the question written on the board.

   - Scientists such as wildlife biologists ask questions to guide their investigations. To begin, you’ll be investigating the question *What are some ways that organisms can be similar or different?*

2. **Explain to students that wildlife biologists research organisms.**

   - Sometimes, wildlife biologists look up information that is already written by other scientists to help them learn more. This is one way that wildlife biologists learn about organisms.

   - Just like wildlife biologists do, you will investigate many different things about organisms.

3. **Hold up a copy of the unit’s reference book, *Handbook of Traits*.** Let students know that this is a reference book. Explain that reference books are useful places to look for information about a particular topic. Point out that the word *traits* in the title may be unfamiliar; students should use clues in the book to get ideas about what a trait is.

4. **Introduce the Partner Reading Guidelines.** Let students know that they will read the book with a partner. Point out the guidelines that you posted on the wall and review them with the class. If Partner Reading is an unfamiliar activity for your students, let them know they can refer to the guidelines as they read.

5. **Designate partners and distribute books.** Give students a couple of minutes to browse through the book.

6. **Project notebook page.** Have students turn to page 3, *Handbook of Traits* Scavenger Hunt, in their notebooks. Read the directions aloud. Let students know that they’ll need to refer to the reference book to look for the information that will help them complete the information in each square.

7. **Model completing a square and introduce life cycle.** Point out the middle square in the second row and read aloud what is written.
We need to find an organism with an interesting life cycle.

The changes that happen in the life of an organism—such as birth, growth, and reproduction—are its life cycle.

Ask students to share any ideas they have about cycles, or any other uses of the word cycle with which they are familiar. Point out that a cycle is an event that happens again and again.

Let’s look together in our books and see if we can find an organism with a life cycle.

Model using the contents page (page 3) to find an organism. After you choose an organism, turn to that section in the book. Skim the section to locate the life cycle of the organism and discuss the life cycle with the class. Repeat this for the life cycles of two more organisms.

How are the life cycles the same between the three organisms? How are the life cycles different?

Accept all responses.

8. Partners complete the scavenger hunt. If needed, provide guidance to students who are unfamiliar with how to use the Table of Contents to find information.

9. Have students share their findings. Go through each box on the notebook page, calling on partners to share their responses.

10. Refer back to the Investigation Question and conclude the lesson. Ask students to share the ideas they have so far about how organisms can be similar or different. Let students know that in the next lesson, they will continue to investigate this question.

Teacher Support

Background

About the Book: Handbook of Traits

Handbook of Traits is the reference book for this unit, providing students with information and examples that build their understanding of traits, variation, inheritance, and environmental influences. The book profiles 20 species of plants and animals, with detailed information on traits and variations within the species, inherited and environmentally influenced traits, and life cycles. Each entry includes many photographs that allow students to see traits and variation, plus a diagram that helps students understand the diversity of life cycles. This reference book supports students’ firsthand investigations as they find images that show variation within a species, observe the traits of parents and offspring, and discover traits that are influenced by both inheritance and environmental factors.

Background

Literacy Note: About Reference Books

Reference books provide in-depth information about specific topics and are typically read for particular purposes. For this reason, students do not read every section in reference books, nor do they read reference books from beginning to
end. Rather, they search for the information they need and then read the relevant sections carefully. In this lesson, students will be introduced to the table of contents and will be given the opportunity to explore the book. You may wish to provide instruction around the table of contents, glossary, and index if students are not familiar with these features. This will prepare students to use the reference book in later lessons in this unit, as a scientist might, and it encourages students to read complex text both purposefully and carefully.

Rationale

Pedagogical Goals: Time for Exploration
The first time students are introduced to Handbook of Traits, they have a few minutes to look through the text and the images. Providing this time can aid students in becoming familiar with helpful text features, give them clues for where to find information, and spark interest in reading about the various species in the book. This type of open-ended exploration enhances student interest as well as provides students with the opportunity to share their thinking and learn from their peers. Giving students time for this exploration can reduce distractions, helping them to subsequently read the text with focused goals. Note that the scavenger hunt activity is meant to give students a structured way to explore the text but that students may not complete all the items in the allotted time. Encourage students to complete as much as they can and to select items that interest them. Students can return to the scavenger hunt to complete it at a later time (e.g., if they finish other unit activities early).

Rationale

Literacy Note: Partner Reading
Throughout this unit, we suggest that students read the books with a partner. This allows students time to apply and practice the reading strategies they’re learning, keeps them focused on the task at hand, and provides opportunities for them to assist each other with reading. Of course, you can use any effective reading procedures you’ve already established with your class. Before reading this first book in the unit, you may need to provide instruction on how to read with a partner by using the Partner Reading Guidelines (provided in Digital Resources) or your own guidelines. Establishing procedures takes time at first but will pay off in terms of student learning and management of the lessons. Over time, students gain practice working together and will need fewer reminders about reading together effectively.

Rationale

Pedagogical Goals: Investigation Questions
Every lesson or two, you will write an Investigation Question on the board. These questions are more specific than the Unit Question or Chapter Questions and correlate directly with what students will try to figure out during the lesson. Investigation Questions help highlight what students should be focused on as they investigate.

Possible Responses

Investigation Notebook
*Handbook of Traits* Scavenger Hunt (page 3)
All answers will vary except the following:

An organism that builds a web: Giant Golden Orb-Weaving Spider
Page 14

An organism that is poisonous: Harlequin Poison Frog
Page 20

An organism that has fruit: Tomato Plant
Page 40
Image Credits

Shutterstock (Pre-Unit Writing: Explaining Similarities and Differences Between Fish copymaster).
# Handbook of Traits Scavenger Hunt

**Directions:**
1. Refer to *Handbook of Traits* to help you to complete the scavenger hunt below.
2. In each box, write about one organism.

<table>
<thead>
<tr>
<th>an organism that builds a web</th>
<th>an organism you think is interesting</th>
<th>an organism that lives in a group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page:</td>
<td>Page:</td>
<td>Page:</td>
</tr>
<tr>
<td>What is it?</td>
<td>What is it?</td>
<td>What is it?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>an organism that lives in the ocean</th>
<th>an organism with an interesting life cycle</th>
<th>an organism that is poisonous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page:</td>
<td>Page:</td>
<td>Page:</td>
</tr>
<tr>
<td>What is it?</td>
<td>What is it?</td>
<td>What is it?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>an organism with four legs</th>
<th>an organism that can have a lot of different colors</th>
<th>an organism that has fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page:</td>
<td>Page:</td>
<td>Page:</td>
</tr>
<tr>
<td>What is it?</td>
<td>What is it?</td>
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</tbody>
</table>
Inheritance and Traits
Lesson Guides

Previewing the Reference Book

Students preview the unit’s reference book, *Handbook of Traits*, as they complete a scavenger hunt notebook page.

Instructional Guide

1. **Introduce the first Investigation Question.** Point to the question written on the board.

   Los científicos como los biólogos de la vida silvestre hacen preguntas para guiar sus investigaciones. Para empezar, investigarán la pregunta ¿Cuáles son algunas maneras en las que los organismos pueden ser similares o diferentes?

2. **Explain to students that wildlife biologists research organisms.**

   A veces, los biólogos de la vida silvestre consultan información que ya ha sido escrita por otros científicos para ayudarles a aprender más. Esta es una manera en la que los biólogos de la vida silvestre aprenden acerca de los organismos.

   Tal como lo hacen los biólogos de la vida silvestre, ustedes investigarán muchas cosas diferentes acerca de los organismos.

3. **Hold up a copy of the unit’s reference book, *Handbook of Traits*.** Let students know that this is a reference book. Explain that reference books are useful places to look for information about a particular topic. Point out that the word *traits* in the title may be unfamiliar; students should use clues in the book to get ideas about what a trait is.

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7. **Model completing a square and introduce life cycle.** Point out the middle square in the second row and read aloud what is written.

- Necesitamos encontrar un organismo con un ciclo de vida interesante.
- Los cambios que suceden en la vida de un organismo, como el nacimiento, el crecimiento y la reproducción, son su ciclo de vida.

Ask students to share any ideas they have about cycles, or any other uses of the word cycle with which they are familiar. Point out that a cycle is an event that happens again and again.

- Miremos juntos en nuestros libros y veamos si podemos encontrar un organismo con un ciclo de vida.

Model using the contents page (page 3) to find an organism. After you choose an organism, turn to that section in the book. Skim the section to locate the life cycle of the organism and discuss the life cycle with the class. Repeat this for the life cycles of two more organisms.

- ¿De qué manera son iguales los ciclos de vida entre los tres organismos? ¿De qué manera son diferentes los ciclos de vida?

Accept all responses.

8. **Partners complete the scavenger hunt.** If needed, provide guidance to students who are unfamiliar with how to use the Table of Contents to find information.

9. **Have students share their findings.** Go through each box on the notebook page, calling on partners to share their responses.

10. **Refer back to the Investigation Question and conclude the lesson.** Ask students to share the ideas they have so far about how organisms can be similar or different. Let students know that in the next lesson, they will continue to investigate this question.

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Image Credits

Shutterstock (Pre-Unit Writing: Explaining Similarities and Differences Between Fish copymaster).
Búsqueda del tesoro en el Manual de rasgos

Instrucciones:
1. Consulta el Manual de rasgos para ayudarte a completar la búsqueda del tesoro debajo.
2. En cada cuadro, escribe acerca de un organismo.

<table>
<thead>
<tr>
<th>un organismo que construye una tela</th>
<th>un organismo que tú piensas que es interesante</th>
<th>un organismo que vive en un grupo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Página:</td>
<td>Página:</td>
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<td>¿Cuál es?</td>
<td>¿Cuál es?</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>un organismo que vive en el océano</th>
<th>un organismo con un ciclo de vida interesante</th>
<th>un organismo que es venenoso</th>
</tr>
</thead>
<tbody>
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<td>Página:</td>
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</table>

<table>
<thead>
<tr>
<th>un organismo con cuatro patas</th>
<th>un organismo que puede tener muchos colores</th>
<th>un organismo que tiene fruto</th>
</tr>
</thead>
<tbody>
<tr>
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