Table of Contents

➢ Introduction

➢ Lesson 1 The Parts of a Caterpillar

➢ Lesson 2 The Butterfly Emerges
   o Part 1
   o Part 2

➢ Lesson 3 The Butterfly's Body

➢ Appendix A

➢ Appendix B
Introduction
Title: The Life Cycle of Butterflies

Grade Level: Second Grade

Target Group: Mainstream class with integrated ELL students

(English Component of a Dual Language Program)

Source of Written Materials:


Source of Lessons:

Science and Technology for Children: *The Life Cycle of Butterflies*

Goals:

I want my students to know living things change their forms and behaviors as part of their life cycles.

I want my students to know that butterflies, like all living things, have basic needs.

I want my students to know butterflies go through several changes during their life cycle.

I want my students to know the different parts of caterpillars and butterflies.

I want my students to know the different stages of a butterfly’s life cycle.
### Lesson 1: Objectives and Performance Indicators

**Content Objectives:**
1. Label the body parts of a caterpillar.
2. Predict what will happen to the caterpillar.

**Language Objectives:**
1. In pairs, students will discuss together, read body part terms, and match these written words to a visual of body parts.
2. In pairs, students will turn and talk with partners and then share out their thoughts to the whole group.

<table>
<thead>
<tr>
<th>Domain/Topic</th>
<th>Fluent Bridging Level 5</th>
<th>Expanding Fluency Level 4</th>
<th>Speech Emerging Level 3</th>
<th>Early Production Level 2</th>
<th>Preproduction Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking- Discuss and identify body part terms.</td>
<td>Lead conversation with partner identifying the parts of a caterpillar using complete sentences.</td>
<td>Participate in a discussion about the parts of a caterpillar using phrases and short sentences</td>
<td>Participate in a discussion about the parts of a caterpillar using language prompts provided by the teacher.</td>
<td>Participate in a discussion about the parts of a caterpillar by generating one or two word responses with the support of a word bank with visuals.</td>
<td>Participate in a discussion with a partner by pointing to pictures and repeating vocabulary words.</td>
</tr>
<tr>
<td>Reading/Writing- Label the parts of a caterpillar</td>
<td>Label the parts of a caterpillar by writing the name of each body part in the appropriate place on the diagram. Match statements to show the function of each part.</td>
<td>Label the parts of a caterpillar by writing the name of each body part in the appropriate place on the diagram with the support of a word bank.</td>
<td>Label the parts of a caterpillar by completing the name of each body part, given the first letter, in the appropriate place on the diagram with the support of a word bank.</td>
<td>Label the parts of a caterpillar by completing the name of each body part, given the first letter, in the appropriate place on the diagram with the support of a word bank while repeating each body par term.</td>
<td>Identify the parts of a caterpillar by pointing to the appropriate part of the diagram and tracing over the body part label.</td>
</tr>
<tr>
<td>Speaking- Make predictions</td>
<td>Lead conversation and discuss predictions with a partner, using full sentences, and share out predictions with the whole group.</td>
<td>Discuss predictions with a partner, using phrases and short sentences, and share out predictions with the whole group.</td>
<td>Discuss predictions with a partner using language prompts provided by the teacher.</td>
<td>Discuss predictions with partner by generating one or two word responses and repeating short phrases.</td>
<td>Draw a prediction and participate in a partner discussion by sharing the picture using L1 support from peer.</td>
</tr>
<tr>
<td>Function</td>
<td>Situation</td>
<td>Expressions</td>
<td>Words</td>
<td>Grammar</td>
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<tr>
<td>Predict</td>
<td>What will happen to the caterpillar?</td>
<td>I predict the (1) ________ will (2) ________.</td>
<td>1. Caterpillar</td>
<td>*Nouns</td>
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<td></td>
<td></td>
<td></td>
<td>2. Eat</td>
<td>*Verbs</td>
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<td></td>
<td>Grow</td>
<td>*Future tense</td>
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<td></td>
<td>Change</td>
<td></td>
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<td></td>
<td>Hatch</td>
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<td>Fly</td>
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<td></td>
<td>Have wings</td>
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<td></td>
<td></td>
<td></td>
<td>Turn into a butterfly</td>
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<tr>
<td>Identify</td>
<td>Identify parts of a caterpillar's body.</td>
<td>This is the caterpillar's (1) ________.</td>
<td>1. Head</td>
<td>*Demonstrative</td>
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<td></td>
<td></td>
<td></td>
<td>Mouth</td>
<td>Pronouns</td>
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<tr>
<td></td>
<td></td>
<td>These are the caterpillar's (2) ________.</td>
<td>2. Eyes</td>
<td>*Possessives</td>
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<td></td>
<td></td>
<td></td>
<td>Bristles</td>
<td>*Plurals</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Legs</td>
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</tbody>
</table>
### Lesson 1: The parts of a caterpillar – modified lesson

**Materials**
- Live caterpillars in food cups (1 per student), 1 hand lens per student, picture cards for review, copies of student activity sheet 3, copies of prediction worksheet, chart paper, markers

**Vocabulary**
- Parts, body parts, legs, bristles, head, eyes, mouth, caterpillar

**Explanation**
- Today we will learn about and label the parts of a caterpillar. Then we will make predictions (say what we think will happen) about what will happen to the caterpillar.

**Review/Motivation**
- Say yesterday, we learned what caterpillars need to live. Let’s review.
- Hold up and refer to picture cards (pg.7) while saying caterpillars need air, food, and water.
- Now let’s look at our caterpillars.
- Distribute caterpillars and hand lenses.
- Students observe caterpillars freely for 5 minutes.

**Initiation**
- Direct students’ attention back to teacher.
- Leave caterpillars and hand lenses on desks.
- **Students will move to the rug for explanation.**
- Explain to students that caterpillars have different body parts just like we do. Demonstrate by saying head while pointing to (the teacher’s) head. Students will repeat the teacher.
- Repeat with legs, eyes, and mouth.
- Say these are our body parts.

*Additional Modifications throughout the Unit:
*Pair students with low English language proficiency students with students who are more advanced in terms of language proficiency or turn and talk and partner/group work
*Pause (3 seconds) after each sentence.
- The teacher will display a diagram of a caterpillar (see pg. 8).
- Say the caterpillar has different body parts.
- Point to and label each target body part.
- Explain that now we will return to our seats and look for the different body parts on the caterpillar.

<table>
<thead>
<tr>
<th>Activity</th>
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</thead>
</table>
| - Students return to their seats to observe the caterpillars for 5 minutes. The teacher will circulate the room and help focus the observations by asking questions such as:
  - Which end is the head? How can you tell? *(Do you see the head? Refer to diagram)*
  - How many legs can you count? *(Do you see the legs? Refer to diagram)*
  - How do you think the bristles feel? *(Do you see the bristles? Refer to diagram)*
  - Direct students' attention back to teacher. Write the sentence starter "I saw the caterpillar's _________ on the board, next to diagram and list of body parts.
  - Tell students to turn to their partner and tell what they saw. While students turn and talk collect caterpillars and hand lenses.
  - Distribute Activity sheet 3 (pgs. 9-13) to students based on level of language proficiency.
  - Ask 3-4 students to share out what they saw. Invite students to answer orally or by pointing to the diagram on Activity Sheet 3.
  - Read blurb on top of activity sheet 3 aloud to students while referring to the caterpillar diagram on the board and gesturing. Students act out each function (move- run in place, eat – pretend to eat, etc.)
  - Say now we are going to label or write the names of the
parts on our pictures.

- Model by pointing again to the bristles of the caterpillar diagram while saying and writing bristles on the line.

- Ask a student to repeat the direction. Ask students to give a "thumbs up" if you know what do and "thumbs down" if you do not understand.

- Remind students that they can ask their partners if they have a question.

- Students complete activity sheet 3. Teacher circulates room and provides support as needed (10-15 minutes)

- Direct students' attention back to the teacher. Ask students to turn to their partner and tell them about their diagrams. Provide sentence starters for each table of students (Page).

- Call students back to the rug.

- Review the parts of the caterpillar by pointing to the caterpillar diagram and saying "This is the caterpillar's_______ and have students orally fill in the blank.

- Point to the diagram again and say this is what our caterpillar looks like now. Do you think the caterpillar will change? (students answer yes or no) What do you predict (or think) will happen? Show timeline of a caterpillar's life (pg. 15), referring to the missing parts.

- Show and read the sentence starter "I predict the caterpillar will______".

- Say please turn to your neighbor and tell them what you predict will happen to the caterpillar.

- Call on 3-4 students to share out their predictions with the whole group. List predictions on chart paper.

- Say now you will have time to write and draw (gesture)
what you predict will happen to the caterpillar

- Distribute predictions worksheets (pgs. 16-18)
- Students return to their seats and write and draw (depending on ELPL) their predictions.

**Closure**

- Say today we learned the different parts of the caterpillar.
- Point to the caterpillar diagram and ask students (as a group) to name parts.
- Add picture/word (pg. 19) cards to class word wall.
- We also made predictions about what will happen to the caterpillars.
- Read some of the predictions.
- In the next week we will watch our caterpillars to see how they change and to find out if whether our predictions were right.

**Extension Activities**

Vocabulary work station- Students will create personal life cycle dictionaries using vocabulary from this lesson. (See page 20)
Caterpillar Diagram for Display
A caterpillar has many parts. Each part helps the caterpillar. The special legs help it move and hold onto leaves. The special mouth is perfect for eating leaves. The bristles make it hard for a bird to swallow a caterpillar.

Can you label the caterpillar? Use the word bank to help you.

| legs | head | eyes | mouth | bristles |

Write the letter of the caterpillar part next to what the part does.

A. Mouth
   ___ keep birds from eating it

B. Eyes
   ___ chews food and spins silk

C. Bristles
   ___ look for food

D. Legs
   ___ help the caterpillar move
A caterpillar has many parts. Each part helps the caterpillar. The special legs help it move and hold onto leaves. The special mouth is perfect for eating leaves. The bristles make it hard for a bird to swallow a caterpillar.

Can you label the caterpillar? Use the word bank to help you.

| legs | head | eyes | mouth | bristles |

Write the letter of the caterpillar part next to what the part does.

A. Mouth

B. Eyes

C. Bristles

D. Legs

___ keep birds from eating it

___ chews food

___ look for food

___ move
Activity Sheet 3 Level 3

Name: ___________________         Date: _______________

A caterpillar has many parts. Each part helps the caterpillar. The special legs help it move and hold onto leaves. The special mouth is perfect for eating leaves. The bristles make it hard for a bird to swallow a caterpillar.

Can you label the caterpillar? Use the word bank to help you.

<table>
<thead>
<tr>
<th>legs</th>
<th>head</th>
<th>eyes</th>
<th>mouth</th>
<th>bristles</th>
</tr>
</thead>
</table>

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Can you label the caterpillar? Use the word bank to help you.

<table>
<thead>
<tr>
<th>e</th>
<th>b</th>
<th>h</th>
<th>m</th>
<th>l</th>
</tr>
</thead>
</table>

11
Activity Sheet 3 Level 2

Name: ____________ Date: ____________

A caterpillar has many parts. Each part helps the caterpillar. The special legs help it move and hold onto leaves. The special mouth is perfect for eating leaves. The bristles make it hard for a bird to swallow (eat) a caterpillar.

Can you label the caterpillar? Use the word bank to help you.

<table>
<thead>
<tr>
<th>legs</th>
<th>head</th>
<th>eyes</th>
<th>mouth</th>
<th>bristles</th>
</tr>
</thead>
</table>

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e___

h___
m___

b___

l___
Activity Sheet 3 Level 1

Name: ___________________  Date: ________________

A caterpillar has many parts. Each part helps the caterpillar. The legs help it move. The mouth is for eating leaves. The bristles make it hard for a bird to swallow (eat) a caterpillar.

Can you label the caterpillar? Use the word bank to help you.

| legs | head | eyes | mouth | bristles |

---

- eyes
- head
- mouth
- bristles
- legs
Sentence Starters

This is the caterpillar’s _______________.

I see the ________.

The caterpillar has _______________.

The ____________ help the caterpillar _______________.

Prediction worksheet B Level 3

Name:____________________  Date:____________________

I predict the caterpillar will ____________________________

________________________

________________________

________________________
Prediction Worksheet Level 1-2

Name:_________________________  Date:_____________________

I predict the caterpillar will....
Bristles
Narrative: Explanation of Modifications

I added some extensive modifications to this lesson in order to make the content comprehensible for students at all levels of English Language proficiency. I took some time in the beginning of this lesson to create some shared background by discussing the parts of the human body that children are familiar with either in the L1 or L2 and then connecting this concept to the parts of the caterpillar. This lesson already had some realia (the live caterpillar) however the lesson also involves the mastery of many vocabulary words. In order to make this information comprehensible for my second language learners I included more visuals. These visuals include: picture cards to review the previous lesson’s content, a large diagram of a caterpillar that is displayed and referred to throughout the lesson, and a making predictions graphic to be displayed during the making prediction portion of the lesson.

I also modified the original worksheet in order to all students with differing levels of English proficiency to participate fully. Activity sheet 3- a is designed for a mainstream student and activity sheet 3- e is designed for a student at the preproduction level. It contains the same content but lessons the language demands placed upon the student. I also created three worksheets for making predictions so that mainstream students would write, draw, and explain their predictions, students in the middle of the spectrum could draw and complete a sentence starter and students who are in the beginning stages of acquiring English could draw their predictions. I also included multiple opportunities for to interact and student to negotiate meaning. In turn and talks, students with low proficiency are placed with students of high proficiency who can also provide L1 support. The original lesson included some teacher questions but they were not questions all students would be able to answer so I included other types of questions as well. I included the use of gestures and used repetition to emphasize the content I wanted my students to learn. The original lesson seemed to focus on students working independently with little guidance from the teacher. I created more opportunities for teacher modeling and peer interaction, while still allowing students to explore and investigate independently.
Lesson 2
**Lesson 2: Objectives and Performance Indicators**

<table>
<thead>
<tr>
<th>Content Objectives:</th>
<th>Language Objectives:</th>
</tr>
</thead>
</table>
| 1. Students observe butterflies closely with hand lens in order to discover different body parts.  
2. Students will identify and sequence the different stages of a butterfly’s life cycle. | 1. In pairs, students will discuss together the life cycle of a butterfly using transition words, read life cycle terms, and match these written words to a visual of a butterfly’s life cycle.  
2. Students will write about the life cycle of a butterfly using transition words.  
3. In pairs, students will turn and talk with partners and then share out their thoughts to the whole group. |

<table>
<thead>
<tr>
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<th>Speech Emerging Level 3</th>
<th>Early Production Level 2</th>
<th>Preproduction Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking- Discuss observations of a newly emerged butterfly.</td>
<td>Lead conversation with partner sharing observations using key vocabulary and complete sentences.</td>
<td>Share observations with a partner using phrases or short sentences and key vocabulary.</td>
<td>Share observations with a partner using language prompts provided by the teacher.</td>
<td>Share observations with a partner by generating one or two word responses with the support of a word bank with visuals.</td>
<td>Share observations with a partner by pointing to pictures and repeating vocabulary words.</td>
</tr>
<tr>
<td>Speaking-Use transition words to sequence ideas.</td>
<td>Describe the life cycle of a butterfly in sequence, using transition words, as well as complete and detailed sentences.</td>
<td>Describe the life cycle of a butterfly in sequence, using transition words, in short sentences.</td>
<td>Describe the life cycle of a butterfly using language prompts provided by the teacher.</td>
<td>Describe the life cycle of a butterfly with partner by generating one or two word responses and repeating short phrases.</td>
<td>Participate in a discussion about the life cycle of a butterfly with a partner by pointing to pictures, repeating vocabulary words, and using L1 support from peer.</td>
</tr>
<tr>
<td>Writing-</td>
<td>Write short paragraph describing the life cycle of a butterfly using complete and detailed sentences, vocabulary and transition words.</td>
<td>Write a short paragraph describing the life cycle of a butterfly using short sentences, vocabulary, and transition words.</td>
<td>Write a short paragraph describing the life cycle of a butterfly with the support of an answer frame and word bank.</td>
<td>Draw the life cycle of a butterfly and complete sentence starters describing it with the support of a word bank.</td>
<td>Draw the life cycle of a butterfly and complete sentence starters describing it with the support of a word bank with visuals and L1 support.</td>
</tr>
<tr>
<td>Function</td>
<td>Situation</td>
<td>Expressions</td>
<td>Words</td>
<td>Grammar</td>
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<tr>
<td>Describe</td>
<td>Describe newly emerged butterflies.</td>
<td>I noticed there is an (1) ____ (2) ____.</td>
<td>1. Empty Red</td>
<td>*Nouns</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>A butterfly was (3) __________.</td>
<td>2. Chrysalis Liquid</td>
<td>*Adjectives</td>
<td></td>
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<tr>
<td></td>
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<td>The butterflies were (4) __________.</td>
<td>3. Flying Pumping its wings Drinking</td>
<td>*Verbs</td>
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<td></td>
<td>4. Flying Drinking Pumping their wings</td>
<td>*Present tense</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>*Past tense</td>
<td></td>
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<tr>
<td>Sequence</td>
<td>Sequence the life cycle of the butterfly.</td>
<td>First, there is an (1) _______</td>
<td>1. egg</td>
<td>*Nouns</td>
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<tr>
<td></td>
<td></td>
<td>Then, a (2) (3) _______.</td>
<td>2. caterpillar</td>
<td>*Verbs</td>
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<td></td>
<td>Next the (2) _______ becomes a (4) _______ and forms a (5) _______.</td>
<td>3. emerges</td>
<td>*Transition words/Conjunctions</td>
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<td></td>
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<td>Finally, (6) (3) _______.</td>
<td>4. pupa</td>
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<td>5. chrysalis</td>
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<td></td>
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<td>6. butterfly</td>
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<tr>
<td>Compare and contrast</td>
<td>Contrast the caterpillar and the butterfly.</td>
<td>The caterpillar had (1) _______ but the butterfly has (2) _________.</td>
<td>1. bristles many legs</td>
<td>*Nouns</td>
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<td></td>
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<td>The butterfly has (3) _______ but the caterpillar (4) _________.</td>
<td>2. does not</td>
<td>*Adjectives</td>
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<td></td>
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<td></td>
<td>3. Wings Antenae Proboscis</td>
<td>*Verbs</td>
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<td></td>
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<td></td>
<td>4. did not</td>
<td>*Past tense</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>*Conjunctions</td>
<td></td>
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<tr>
<td>Lesson 2</td>
<td>The Butterfly Emerges—modified lesson part 1</td>
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<tr>
<td><strong>Materials</strong></td>
<td>Activity sheet 8 (The Life Cycle of a Butterfly), butterflies, butterfly flight cage, glue, scissors, precut construction paper strips, butterfly observation checklist, vocabulary picture cards</td>
<td></td>
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<tr>
<td><strong>Vocabulary</strong></td>
<td>Emerge, life cycle, sequence, stage, butterfly</td>
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<tr>
<td><strong>Explanation</strong></td>
<td>Explain to students that today we will closely observe our butterflies and put the stages of a butterfly’s life cycle in order.</td>
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</tbody>
</table>
| **Review/Motivation** | - Say “Earlier we learned that caterpillars have different body parts”.
  - Review the parts of the caterpillar learned previously.
  - Hold up and refer to previously used diagram of caterpillar (pg. 8) with labels and say “Caterpillars have a head.” while pointing to the head on the diagram.
  - Students repeat.
  - Repeat this process with bristles, legs, eyes, and mouth. |
| **Initiation** | - Say the butterflies have started to emerge or come out from the chrysalis. Display picture card (pg. 33) for the word emerge.
  - Allow students to observe butterfly cages freely for two minutes.
  - Call students back to the rug.
  - Ask where did the butterflies come from? (Allow preproduction students to point)
  - Say they came from the chrysalis. They emerged from the chrysalis. Display picture card for the word chrysalis (pg. 33). |
- Say:
  - "Do the butterflies look different from the caterpillars?"
  - "The butterflies look different from the caterpillars. Some of their body parts changed. They have some new body parts."
  - "How do the butterflies look different from the caterpillars?"
  - Display a diagram of a butterfly (pg 32). Ask: What new parts do you see?"
  - As students answer refer to the appropriate part of the diagram and repeat important vocabulary.
  - Point to and label each target body part (wings, proboscis, legs, and antennae).
  - Say: "Now we are going to observe the butterflies more closely. Here is a list (pgs. 30-31) of things we will be looking for."
  - Display large list on chart paper.
  - Read and point to each item on the list.
  - Explain that if we observe an item on the list we will make a check mark (model making a check mark) in this column (point).
  - If we do not see an item we will not (gesture) make a check mark.

<table>
<thead>
<tr>
<th>Activity</th>
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<tbody>
<tr>
<td>Provide each student with an observation guide (list- pg. 30-31). Divide students into two groups and assign each group to one of the two butterfly cages.</td>
</tr>
<tr>
<td>Allow students to observe the butterfly cages.</td>
</tr>
<tr>
<td>Call students back to the rug. Assign students to a partner from the opposite group. Students turn and talk to share what they observed.</td>
</tr>
<tr>
<td>Call students attention back to the teacher and ask questions such as:</td>
</tr>
<tr>
<td>Did you see newly emerged butterflies pumping their wings?</td>
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<td>----------------------------------------------------------</td>
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<tr>
<td>Butterflies joining the two parts of their proboscis?</td>
</tr>
<tr>
<td>Empty chrysalises?</td>
</tr>
<tr>
<td>Differences in the colors of their wings?</td>
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<tr>
<td>Meconium (red liquid waste)</td>
</tr>
<tr>
<td>How did the butterfly use its legs? Wings? Antennae?</td>
</tr>
<tr>
<td>Proboscis?</td>
</tr>
<tr>
<td>Direct students’ attention back to teacher. Say what we are observing is a new stage in the butterfly’s life cycle.</td>
</tr>
<tr>
<td>Display a large circle with “Life Cycle of a Butterfly” written in the middle.</td>
</tr>
<tr>
<td>Explain the life cycle adding a picture to the circle in the appropriate place as each stage is mentioned.</td>
</tr>
</tbody>
</table>
| Say "In the first stage there was an __________. Then, there was a __________. Then it changed into a pupa and formed a __________. Finally a __________ emerged."
| Repeat and have students repeat after the teacher.       |
| Ask "Why do you think it is called a cycle?"             |
| Students turn and talk to discuss their answers.         |
| The teacher will call on 2-3 students to share their answers. |
| Students will return to their seats and the teacher will distribute activity sheet 8 (pg.35) and a long strip of construction paper. |
| Students will cut out the pictures, work in pairs to put them in order, and glue them to the strip of construction paper. |

<table>
<thead>
<tr>
<th>Closure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Say “Today we observed our newly emerged butterflies”.</td>
</tr>
<tr>
<td>We learned about butterfly’s body. Point to the caterpillar diagram and the butterfly diagram.</td>
</tr>
<tr>
<td>Say the butterfly is different from a caterpillar because it has wings, antennae, and a proboscis. Students repeat.</td>
</tr>
<tr>
<td>Say we also learned about different stages of the butterfly’s</td>
</tr>
</tbody>
</table>
| Extension Activities | life cycle.  
| | • Together with students review the sequenced pictures on their paper strips.  
| | • Refer back to the lesson's content objective. Read it aloud.  
| | • Ask did we meet our objective? Students answer with a "thumbs up" or a "thumbs down".  
| | • Repeat with the language objective.  
| | • Collect the paper strips for future use.  
<p>| Vocabulary work station- Students will add to their personal life cycle dictionaries using vocabulary from this lesson. |</p>
<table>
<thead>
<tr>
<th>Lesson 2</th>
<th>The Butterfly Emerges—modified lesson part 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocabulary</td>
<td>Emerge, life cycle, sequence, stage, butterfly, egg, caterpillar, pupa, chrysalis</td>
</tr>
<tr>
<td>Explanation</td>
<td>Today we will read about the life cycle of a butterfly. After we read we will talk and write about the butterfly’s life cycle.</td>
</tr>
</tbody>
</table>
| Review/Motivation| • Explain that earlier we learned that there are different stages in the butterfly’s life cycle.  
• Distribute the life cycle strips (created in Lesson 2 part 1) to students.  
• Together review each stage pointing to the appropriate image. Say “In the first stage there was an ________. Then, there was a __________. Then it changed into a __________. Finally a __________ emerged.”  
• Collect the paper strips. |
| Initiation| • Say this book is called the Life of a Butterfly.  
• Ask: What do you think we will read about?  
• Distribute listening guide (pgs. 41-42)  
• As I read, listen for each stage. Mark each stage you hear  
• Write or check (gesture) new information about each stage as you hear it. |
| Activity | • Read the entire text, rephrasing and clarifying new words as needed.  
• Ask students: What did you learn about butterflies?  
• Ask- How do butterflies change as they grow? How are caterpillars and butterflies related? Students turn and talk to answer the questions with a partner. Provide and display sentence starters.  
• Call on 2-3 students to share out.  
• Praise students for explaining the life cycle of the butterfly.  
• Explain that now it is time for students to write about the life cycle of the butterfly.  
• Model using the answer frame and graphic organizer to summarize the life cycle of a butterfly.  
• Students return to their seats. Distribute written response worksheets (pgs. 36-40)  
• Students work independently or in pairs to complete the written response.  
• Allow time for students to share their writing with members of their group. |
|---|---|
| Closure | Say today we read and wrote about the life cycle of the butterfly.  
We learned to use transition words in order to show sequence.  
Remember that you can use transition words to show the order in which things happen. |
<p>| Extension Activities | Vocabulary work station- Students will add to their personal life cycle dictionaries using vocabulary from this lesson. (See pg 43) |</p>
<table>
<thead>
<tr>
<th>I am looking for...</th>
<th>I found... (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New butterflies pumping their wings</td>
<td></td>
</tr>
<tr>
<td>Empty chrysalis</td>
<td></td>
</tr>
<tr>
<td>Legs</td>
<td></td>
</tr>
<tr>
<td>Wings</td>
<td></td>
</tr>
<tr>
<td>Antennae</td>
<td></td>
</tr>
<tr>
<td>Proboscis</td>
<td></td>
</tr>
<tr>
<td>Meconium (red liquid)</td>
<td></td>
</tr>
<tr>
<td>I am looking for...</td>
<td>I found... (✔)</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>New butterflies pumping their wings</td>
<td></td>
</tr>
<tr>
<td>Empty chrysalis</td>
<td></td>
</tr>
<tr>
<td>Legs</td>
<td></td>
</tr>
<tr>
<td>Wings</td>
<td></td>
</tr>
<tr>
<td>Antennae</td>
<td></td>
</tr>
<tr>
<td>Proboscis</td>
<td></td>
</tr>
<tr>
<td>Meconium</td>
<td></td>
</tr>
<tr>
<td>New butterflies pumping their wings</td>
<td>Meconium</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td><img src="image1" alt="New butterflies pumping their wings" /></td>
<td><img src="image2" alt="Meconium" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Empty chrysalis</th>
<th>Emerge</th>
<th>Break out of Hatch</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3" alt="Empty chrysalis" /></td>
<td><img src="image4" alt="Emerge" /></td>
<td><img src="image5" alt="Break out of Hatch" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Legs</th>
<th>Pupa</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image6" alt="Legs" /></td>
<td><img src="image7" alt="Pupa" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wings</th>
<th>Chrysalis</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image8" alt="Wings" /></td>
<td><img src="image9" alt="Chrysalis" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antennae</th>
<th>Egg</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image10" alt="Antennae" /></td>
<td><img src="image11" alt="Egg" /></td>
</tr>
<tr>
<td>Proboscis</td>
<td>Butterfly</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td><img src="image.jpg" alt="Proboscis Image" /></td>
<td><img src="image2.jpg" alt="Butterfly Image" /></td>
</tr>
</tbody>
</table>
LESSON 9
Activity Sheet 8 - All levels

62 / The Butterfly Emerges
Write a paragraph explaining the life cycle of a butterfly.
Write a paragraph explaining the life cycle of a butterfly.

The life cycle of a butterfly ____________________________________________

First, ______________________________________________________________

Next, ______________________________________________________________

After that, __________________________________________________________

Finally, _____________________________________________________________
Use the answer frame to write a paragraph about the life cycle of a butterfly. Then draw a picture.

The _____________ of a butterfly has ______ stages. First there is an ______________. Then there is a _________________. The __________________ makes a _________________. Finally there is a _________________.

Word bank

<table>
<thead>
<tr>
<th>4</th>
<th>caterpillar</th>
<th>butterfly</th>
<th>chrysalis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>life cycle</td>
<td>egg</td>
<td></td>
</tr>
</tbody>
</table>
Draw the stages of a butterfly's life cycle.

First, Next, Then Finally

Word Bank

- caterpillar
- egg
- butterfly
- chrysalis
Level 1

Name____________________ Date:__________________

Draw the stages of a butterfly's life cycle. Write the name of each stage.

First, Next, Then, Finally

____________________  ______________________  ______________________  ______________________

Stages:
Caterpillar (oruga)  egg (ovo)  butterfly (mariposa)  chrysalis (crisalida)

[Images of each stage]
The Life of a Butterfly

Write the name of each stage. Write 1-2 facts about each stage

<table>
<thead>
<tr>
<th>Stage:</th>
<th>Stage:</th>
<th>Stage:</th>
<th>Stage:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Life of a Butterfly

Put a check (v) next to these words when you hear them.

<table>
<thead>
<tr>
<th>Eggs</th>
<th>Caterpillar</th>
<th>Pupa</th>
<th>Butterfly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>Hatch</td>
<td>Chrysalis</td>
<td>Breaks out</td>
</tr>
<tr>
<td>Plants</td>
<td>Eat</td>
<td>Turning into</td>
<td>Wings</td>
</tr>
</tbody>
</table>

| Shed | | | Dry |
|------| | | Fly |

[Image of butterfly life cycle stages]
<table>
<thead>
<tr>
<th>DEFINITION</th>
<th>Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Illustration</td>
<td>NON-EXAMPLES</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Explanation of Modifications

I began each lesson by reviewing previously learned content and connecting it to the new learning. I broke this lesson into two parts so that I could better amplify the learning objectives. The original lesson plans did not provide enough opportunities for practice and peer interaction so I added activities and structured the interactions.

I incorporated more visuals in both the whole group portion of the lesson and the individual worksheets. I created an observation guide to help focus student learning while observing the butterflies and an anticipation guide to make the literacy portion of the lesson more comprehensible. Portions of this lesson may seem redundant at times but that is done intentionally in order to provide many opportunities for listening and speaking about the content.
Lesson 3
Kristin Mariano

TSL 518

Lessons 3: Objectives and Performance Indicators

<table>
<thead>
<tr>
<th>Content Objectives:</th>
<th>Language Objectives:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Observe the physical characteristics and the behavior of butterflies.</td>
<td>1. In pairs, students will discuss together the similarities and differences between themselves and the butterfly.</td>
</tr>
<tr>
<td>2. Compare the butterflies to themselves.</td>
<td>2. In pairs, students will turn and talk with partners and then share out their thoughts to the whole group.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Domain/Topic</th>
<th>Fluent Bridging Level 5</th>
<th>Expanding Fluency Level 4</th>
<th>Speech Emerging Level 3</th>
<th>Early Production Level 2</th>
<th>Preproduction Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking- Compare and contrast butterfly and human bodies.</td>
<td>Lead conversation with partner explaining similarities and differences between the butterfly and self, using complete sentences.</td>
<td>Participate in a discussion explaining similarities and differences between the butterfly and self, using short sentences.</td>
<td>Participate in a discussion explaining similarities and differences between the butterfly and self, using language prompts provided by the teacher.</td>
<td>Participate in a discussion explaining similarities and differences between the butterfly and self by generating one or two word responses with the support of a word bank with visuals.</td>
<td></td>
</tr>
<tr>
<td>Reading/Label the number of body parts on a butterfly and human.</td>
<td>Label the number of body parts on caterpillar and self</td>
<td>Label the number of body parts on caterpillar and self</td>
<td>Label the number of body parts on caterpillar and self with the support of visuals.</td>
<td>Label the number of body parts on caterpillar and self with the support of visuals and L1.</td>
<td></td>
</tr>
<tr>
<td>Writing- Explain</td>
<td>Write a complete sentence in response to written question.</td>
<td>Write a short sentence in response to written question.</td>
<td>Respond to a written question by filling in a blank with the support of a word bank.</td>
<td>Respond to a multiple choice question by circling the correct answer with the support of visuals and L1.</td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td>Situation</td>
<td>Expressions</td>
<td>Words</td>
<td>Grammar</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>Compare and contrast</td>
<td>Compare and contrast the butterfly’s body with a human body.</td>
<td>I have <strong>(1)</strong> _______ but the butterfly has <strong>(1)</strong> _______.</td>
<td>1. one</td>
<td><em>Nouns</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I have _______ but the caterpillar does not.</td>
<td>2. two</td>
<td><em>Verbs</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The caterpillar has _______ but I do not.</td>
<td>3. three</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I have _______ and so does the caterpillar.</td>
<td>4. four</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The caterpillar has _______ and so do I.</td>
<td>5. five</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify</td>
<td>Identify parts of a butterfly’s body.</td>
<td>This is the butterfly’s <strong>(1)</strong> _______.</td>
<td>6. six</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>These are the butterfly’s <strong>(2)</strong> _______.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. wings</td>
<td></td>
<td><em>Demonstrative</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. legs</td>
<td></td>
<td><em>Pronouns</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. eyes</td>
<td></td>
<td><em>Possessives</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. antennae</td>
<td></td>
<td><em>Plurals</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. antennae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. legs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Lesson 3

#### The Butterfly's Body—modified lesson

<table>
<thead>
<tr>
<th>Materials</th>
<th>Activity sheet 10 &quot;My Butterfly and Me,&quot; butterflies, butterfly flight cages, markers, chart paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocabulary</td>
<td>Parts, body parts, wings, antennae, eye, proboscis, legs, head, thorax, abdomen, insect</td>
</tr>
</tbody>
</table>

**Explanation**

Today we will learn about the different parts of a butterfly and discuss what they are used for. Then we will compare butterflies with ourselves *(say how we are the same or different)*

**Review/Motivation**

*We've already learned about the parts of a caterpillar. Review caterpillar parts referring to picture cards as needed. And we learned how a butterfly changes through its life. Review butterfly life cycle using life cycle visual from previous lesson.* Now we are going to look more closely at the butterfly's body.

**Initiation**

1. Allow students sufficient time to observe the adult butterflies before conducting this lesson. During the observation periods direct student attention to the butterfly body parts and how they are used.

2. Hold a class discussion about what students have observed about butterfly body parts and how they are used. Say we have noticed that the butterflies look very different from the way they looked as caterpillars, but they also have body parts that help them survive.

3. **Display a diagram of a butterfly next to the diagram of a caterpillar (from lesson 1). Explain that the butterfly has different body parts. Ask students to share body parts they have noticed. Point to and label each target body part.**

4. Ask the following questions in order to help children identify the parts
and recognize how they are useful to the butterfly in the real world.

- Look at the butterfly's head. **(Point)** What other body parts do you find on the head? (Eyes, antennae, and proboscis)
- What do you think the butterfly uses these parts for? (Eyes: to see color well, to find food, to find a mate. Antennae: for touch and smell. Proboscis: to reach nectar deep inside the flowers)
- Count the wings. How many are there? (four)
- What does a butterfly use its wings for? (To fly to food and to the plants it lays its eggs on; to fly away from predators, for camouflage)
- How many legs are there? (6 but only 4 are clearly visible)
- What does a butterfly use its legs for?

<table>
<thead>
<tr>
<th><strong>Activity</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>5. <strong>Allow time for students to observe the butterflies again</strong> – this time with looking carefully for the target body parts.</td>
</tr>
<tr>
<td>6. <strong>Tell students to turn to their partner and tell what they saw.</strong> Provide students with sentence starters and word banks with visuals to facilitate discussion.</td>
</tr>
<tr>
<td>7. Ask students to compare their own bodies with those of the butterflies.</td>
</tr>
</tbody>
</table>
| 8. **Say:** You are different from your butterfly in some ways.  
  - How are you different from the butterfly?  
  - What do you have that the butterfly does not?  
  - Or what does the butterfly have that you do not? |
| 9. **Choose 2 student volunteers to model the language.** Student A is different from Student B because Student A has ________ but Student B has ________. Display sentence frames. |
| 10. **Ask students to turn and talk about ways they are different from the butterfly.** |
| 11. **Display a Venn diagram (see page 47).** Ask students to share out |
their ideas.

12. Add student ideas about how they are different from the butterflies to appropriate sides of the Venn diagram.

13. Ask are you like the butterfly? That means how are you the same as the butterfly? Choose 2 student volunteers to model the language. Student A is like Student be because they both ____.

14. Ask students to turn and talk about ways they are like the butterfly.

15. Refer again to the Venn Diagram. Ask students to share out their ideas.

16. Add student ideas about how they are like the butterflies to the center of the Venn diagram.

17. Summarize what has been stated again modeling the language use to compare and contrast.

18. Distribute Activity sheet 10 (pgs.42-46) and preview the activity with the students. Allow students sufficient time to complete the activity sheet.

**Closure**

19. Today we learned the different parts of the butterfly. **Point to the butterfly diagram and ask students (as a group) to name parts.**

20. We also discussed how we are the different from the butterfly. Tell your partner one way you are different from the butterfly.

21. We learned that we are also like the butterfly in some ways. Tell your partner one way you are like the butterfly.

22. **Refer back to the lesson’s content objective. Read it aloud.**

23. **Ask did we meet our objective? Students answer with a “thumbs up” or a “thumbs down.”**

24. **Repeat with the language objective.**

**Extension Activities**

- Vocabulary work station- Students will create personal life cycle dictionaries using vocabulary from this lesson.
My Butterfly and Me

Answer these questions:

I have how many?

____ legs
____ eyes
____ wings
____ arms
____ antennae

What does a butterfly use its wings for?

________________________________________
________________________________________

What parts of its body does a butterfly use to find food?

________________________________________
________________________________________

Think about this: How is your butterfly like you? How is it different?

My Butterfly and Me

Date:____________________

Activity Sheet 10 Levels 4-5

My butterfly has how many?

____ legs
____ eyes
____ wings
____ arms
____ antennae
Name: ____________________

Answer these questions:

I have how many?

___ legs

___ eyes

___ wings

___ arms

___ antennae

Date: ____________________

My butterfly has how many?

___ legs

___ eyes

___ wings

___ arms

___ antennae
My Butterfly and Me

Name: ___________________  Date: ___________________

Fill in the blank.

What does a butterfly use its wings for?

A butterfly uses its wings to ____________________.

walk      swim      fly      run

What parts of its body does a butterfly use to find food?

A butterfly uses its __________________ and ___________ to find food.

Eyes; antenae      legs; wings      legs; eyes

Think about this:

How is your butterfly like you? How is it different?
My Butterfly and Me

Answer these questions:

I have how many?

____ legs

____ eyes

____ wings

____ arms

____ antennae

My butterfly has how many?

____ legs

____ eyes

____ wings

____ arms

____ antennae

Date: ____________________
My Butterfly and Me

Name: ____________________

Date: ____________________

Multiple choice

1. A butterfly uses its wings to ___________.

   a. walk       b. fly

   c. swim       d. run

2. Circle 2 body parts the butterfly uses to find food.

   a. antennae
   b. proboscis
   c. wings
   d. legs
<table>
<thead>
<tr>
<th>New butterflies pumping their wings</th>
<th>Meconium</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
<tr>
<td>Empty chrysalis</td>
<td>Emerge</td>
</tr>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
<tr>
<td>Legs</td>
<td>Pupa</td>
</tr>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
<tr>
<td>Wings</td>
<td>Chrysalis</td>
</tr>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
<tr>
<td>Antennae</td>
<td>Egg</td>
</tr>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
</tbody>
</table>
Explanation of Modifications

I added several modifications to this lesson in order to make the content comprehensible for students at all levels of English Language proficiency. Again, I took some time in the beginning connect and build on previous learning. This whole unit already had some realia (the live caterpillars/ butterflies) however the lesson also involves the mastery of many vocabulary words. In order to make this information comprehensible for my second language learners I included more visuals. These visuals include: picture cards to review the previous lesson's content, a large diagram of a butterfly that is displayed and referred to throughout the lesson, and graphics added to differentiated worksheets.

I modified the original worksheet in order to all students with differing levels of English proficiency to participate fully. I also included multiple opportunities for to interact and student to negotiate meaning. In turn and talks, students with low proficiency are placed with students of high proficiency who can also provide L1 support. I incorporated the use of a graphic organizer, the Venn Diagram, in order to organize student ideas.
Checklists
## Life Cycle of Butterflies
Grammar and Functions Checklist

<table>
<thead>
<tr>
<th>Grammar</th>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nouns</td>
<td>3, 2, 1</td>
</tr>
<tr>
<td>Verbs (simple past)</td>
<td>2</td>
</tr>
<tr>
<td>Verbs (present)</td>
<td>3, 2</td>
</tr>
<tr>
<td>Future tense</td>
<td>1</td>
</tr>
<tr>
<td>Adjectives</td>
<td>2</td>
</tr>
<tr>
<td>Possessives</td>
<td>3,1</td>
</tr>
<tr>
<td>Plurals</td>
<td>3,1</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Functions</th>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Label</td>
<td>1, 3</td>
</tr>
<tr>
<td>Predict</td>
<td>1</td>
</tr>
<tr>
<td>Compare &amp; Contrast</td>
<td>2,3</td>
</tr>
<tr>
<td>Sequence</td>
<td>2</td>
</tr>
<tr>
<td>Describe</td>
<td>2</td>
</tr>
</tbody>
</table>
TSL 518: Sheltered ELL Strategies Checklist

The Life Cycle of Butterflies

Write the page numbers and any other identifying features to identify those parts of your lessons that employ the following strategies.

<table>
<thead>
<tr>
<th>SHELTERED STRATEGIES</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Contextualize Lesson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.A. Build and Activate Background Knowledge</td>
<td>3</td>
<td>24</td>
<td>47</td>
</tr>
<tr>
<td>I.B. Develop Vocabulary</td>
<td>3,4,6</td>
<td>24,25</td>
<td>47, 48</td>
</tr>
<tr>
<td>I.C. Use extensive Visuals, Realia, Manipulatives, &amp; Gestures</td>
<td>3,4,5</td>
<td>24, 25, 26,</td>
<td>47,48</td>
</tr>
<tr>
<td>I.D. Model (Instructions, Processes)</td>
<td>5</td>
<td>25, 26</td>
<td>47, 48</td>
</tr>
<tr>
<td>I.E. Create Opportunities To Negotiate Meaning</td>
<td>4</td>
<td>26</td>
<td>49</td>
</tr>
<tr>
<td>II. Make Text Comprehensible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.A. Intentional Use of Graphic Organizers</td>
<td>5</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>II.B. Modify Written Text</td>
<td></td>
<td>12, 13</td>
<td></td>
</tr>
<tr>
<td>II.C. Amplify Number of Activities per Text</td>
<td>5,6</td>
<td>28, 29</td>
<td>49</td>
</tr>
<tr>
<td>III. Make Talk Comprehensible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.A. Pace Teacher’s Speech</td>
<td>3,4,5,6</td>
<td>24-29</td>
<td>47-49</td>
</tr>
<tr>
<td>III.B. Use of Listening Guides</td>
<td></td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>III.C. Use of Word Walls</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.D. Frame Main Ideas</td>
<td>3, 6</td>
<td>27</td>
<td>49</td>
</tr>
<tr>
<td>III.E. Check for Understanding</td>
<td>5</td>
<td>27</td>
<td>49</td>
</tr>
<tr>
<td>IV. Change Traditional Classroom Talk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV.A. Use Teacher Question and Response Strategies</td>
<td>4</td>
<td>24, 25</td>
<td>49</td>
</tr>
<tr>
<td>IV.B. Practice Instructional Conversations</td>
<td>4, 5</td>
<td>25, 26, 28</td>
<td></td>
</tr>
<tr>
<td>V. Engage at Appropriate Language Proficiency Levels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V.A. Vary Question Techniques based on Student’s Language Proficiency level-- in conversations, activities, and assessments</td>
<td>9-13, 16-18</td>
<td>36-40</td>
<td>48</td>
</tr>
<tr>
<td>VI. Give Students Voice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI.A. Challenge students to produce extended academic talk</td>
<td>4</td>
<td>26</td>
<td>48</td>
</tr>
<tr>
<td>VI.B. Model Language for Oral and Written Production</td>
<td>3, 4, 5</td>
<td>26</td>
<td>47, 48</td>
</tr>
<tr>
<td>VI.C. Use Group/Pr. Work to Elicit Student Talk; Students as Researchers</td>
<td>4, 5</td>
<td>25, 26</td>
<td>48, 49</td>
</tr>
<tr>
<td>VI.D. Respond to Student’s Voice – Writing and Error Correction</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Original Lessons
Prior to unit lessons:

Review what students know about living things and their needs.

Read page 2 of Plant and Animal Life Cycles.

Complete k and w part of KWL chart for the life cycle of a butterfly.

Existing curriculum lesson 2 activities: prepare food and observe live caterpillars for the first time.

Lesson 1:

Students observe caterpillars with hand lens.

Present different body parts and names.

Students identify different body parts on their caterpillars.

Student complete recording sheet – existing curriculum lesson 4.

Lesson 2:

Students observe butterflies with hand lens.

Explain different body parts.

Students look closely to discover body parts on their butterflies.

Lesson 9 of existing curriculum activities.

Students cut and paste to put the life cycle of a butterfly in order.

Read The Life of a Butterfly.

Lesson 3:

Existing curriculum lesson 11 activities

Students observe butterflies with hand lens.

Explain different body parts.

Students look closely to discover body parts on their butterflies. Students compare themselves to the butterflies.
LESSON 4

Observing the Caterpillars

Overview

Students began the unit by listing their questions about caterpillars. Today, they will seek answers to some of these questions by observing the caterpillars more closely.

Plan to teach Lessons 4, 5, and 6 during the second week that the caterpillars are in your classroom. These three lessons involve observing the caterpillar, with Lesson 5 emphasizing molting and Lesson 6 focusing on silk spinning. The sequence in which you teach these lessons depends in large part on the caterpillar structures or activities that are most in evidence that day.

Objectives

- Students observe the structures and activities of caterpillars more closely.
- Students predict what changes may occur next.

Background

A lot is happening inside the little cup. Over the next few days, the children will observe a wide range of activities and changes in the caterpillars. In the coming week, the caterpillars will grow rapidly, shed their skins—molt—several times, and become quietly encased as a pupa, or chrysalis.

Some general background necessary for teaching this lesson as well as the next two lessons is included in this section.

Caterpillar Body Parts

The caterpillar's head is covered by a dark, shiny capsule containing 12 small eyes, 6 on each side of the head. Although a butterfly has excellent eyesight, a caterpillar has simple eyes that can only distinguish between light and dark. Not all of the caterpillar's eyes are easily visible. Using a hand lens, students should be able to see some of them.

The chewing mouth is located on the underside of the head. The jaws do not chew up and down like ours; rather, they move back and forth from the sides of the head toward the middle. The eyes and mouth parts are most easily seen immediately after a molt, when the rest of the caterpillar body is pale and these structures are darker by comparison. It is likely that the children will not be able to see the eyes, mouth parts, or the silk spinners, which are located on the underside of the head, behind the mouth. Figure 4-1 shows an enlarged view of the silkworm caterpillar's head. The Painted Lady caterpillar's head is basically the same as this.
Behind the head, the caterpillar's body is divided into thirteen parts called **segments**. On each of the first three body segments, there is a pair of **legs**, which will become the butterfly's long slender legs. These first three segments of the caterpillar's body will become the **thorax**, or midsection, of the adult insect.

Five segments toward the rear of the caterpillar have pairs of "false legs" known as **prolegs**. The caterpillar does most of its walking on the first pair of prolegs, which act as suction cups when the insect crawls on a smooth surface. The prolegs are versatile. Across the bottom of each foot are microscopic bristles shaped like crochet hooks. These hooks can cling to plant leaves and stems or to the threads of silk the caterpillar spins. The caterpillar uses the last pair of prolegs as an anchor when shedding its skin. All of these prolegs will disappear during the next stage of development. The rear body segments will become the **abdomen**, or hind section, of the adult caterpillar.

The body is covered with **bristles** so that it reflects minimal light and is less visible to birds. The bristles also make it more difficult for a predator to swallow a caterpillar. Along each side of the body is a line of small holes, called **spiracles** (SPEAR-uh-kahls), which will be noticed by the most observant. They appear as light-colored rings with dark centers. Air is drawn in and stale air is expelled through these spiracles.

---

**Figure 4-2**

**Growth and Molting** (See Lesson 5 for more details)

Caterpillars spend a great deal of time eating. As food disappears from cups, the children will begin to notice increased amounts of yellow pellets of waste eliminated by the caterpillars. The children may notice small, black, wrinkled wads in the cups. These are shell remains from molting. If students are asking questions about these shells, you may want to refer them to Lesson 5. They can also be shown to Lesson 4 later.

**Silk Spinning** (See Lesson 6 for more details)

When a caterpillar sways its head back and forth in a rhythmic motion as it is spinning silk, the children will notice the fine and may not be aware of the process. Over a few days, each caterpillar will spin a cocoon and then become a **chrysalis**.

---

28 / Observing the Caterpillars
The caterpillar's body

head

simple eyes

true legs

prolegs

spiracles

hooks on prolegs

bristles

For each student
1. caterpillar in a cup
2. hand lens
3. Activity Sheet 3, Observing the Caterpillar

For the class
Photocopy or overhead of illustration of caterpillar from pg. 118
Newsprint pad or overhead transparency from Lesson 1
Overhead projector (if needed)
Class Calendar (on bulletin board)
Art materials for constructing caterpillar models (optional)

1. Spend a few minutes observing the caterpillars yourself to determine the order in which you want to teach the next three lessons.
2. Hang on the bulletin board the illustration of the caterpillar on pg. 118, or reproduce it to use as an overhead transparency.

Observing the Caterpillars / 29
3. If you are going to construct any of the caterpillar models suggested in the Extensions section, collect the needed art materials.

Procedure

1. Begin the lesson by allowing students time to observe the caterpillars closely with the hand lenses. Tell them that the discussion today will be about the caterpillar’s body parts and that they should try to learn as much as they can about their caterpillar’s body.

2. During the observation period, circulate and help students focus by asking them specific questions. You might ask, for example:
   - What color is the caterpillar? How big is it? How would you describe its shape?
   - Which end is the head? How can you tell?
   - How many legs can you count?
   - Describe how the caterpillar moves. Can it walk on the smooth sides of the plastic cup? On the lid? On the food? On the silk?
   - What kind of body covering does it have?

As the children observe, encourage them to talk with each other about what they are seeing. A student with a caterpillar that is resting should compare observations with someone watching an active caterpillar.

3. Ask children to put their caterpillars aside for a moment. Hold a class discussion about what they have learned by observing their caterpillars. You may use the illustration on pg. 116 either on the bulletin board or as an overhead projection to help focus the discussion. At the end of the discussion, return to the list of questions that students generated in Lesson 1 and have students note which ones they have answered through their observations.

4. Distribute Activity Sheet 3 and preview it with the class. Allow sufficient time for students to complete the sheet.

Final Activities

1. Ask students to dictate statements for you to record on the Class Calendar on their observations about the caterpillar’s body during this lesson.

2. Invite students to make predictions about how the caterpillars may be different by tomorrow.

3. Collect the caterpillar cups and return them to the storage place. Collect Student Notebooks or student work.

Extensions

Students can learn a great deal about caterpillar anatomy by constructing caterpillar models. Encourage them to create their own models based on what they have observed.

One idea to keep in mind is that a caterpillar can bend and turn because its body is made up of thirteen segments plus a head. This gives you a basic body plan to work from. Here are a few ideas of how to make models based on that plan:
   - Make a paper chain caterpillar of thirteen links plus a round chain for the head.
A caterpillar has many parts. Each part helps the caterpillar.
The special legs help it move and hold onto leaves.
The special mouth is perfect for eating leaves.
The bristles make it hard for a bird to swallow a caterpillar.

Can you label the caterpillar? Look at the number next to each part. Then put the correct number in each box.

1. Two kinds of legs
2. Head
3. Eyes
4. Mouth
5. Bristles

Write the letter of the caterpillar part next to what the part does.

A. Mouth
   ___ Keep birds from eating
B. Eyes
   ___ Chews food and spins
C. Bristles
   ___ Look for food
D. Legs
   ___ Help the caterpillar
The Butterfly Emerges

Overview

An exciting event heralds the opening of this lesson. After 7 to 10 days in the chrysalis, the butterflies finally emerge. First, they "pump up" their wings and hang them out to dry and harden. Then they are ready for flight.

Objectives

- Students observe the butterflies emerging from the chrysalis (or discover the butterfly and empty chrysalis case).
- Students observe some distinct butterfly body parts.

Background

There have been signs that the butterfly is about to emerge: each chrysalis has darkened, and the orange and black wing patterns have become visible through the chrysalis. When it finally happens, the emergence takes only about 30 seconds. First, a small crack appears along the back of the chrysalis, followed by another crack along the side; these openings free the butterfly's back and six legs. Finally, the butterfly steps out of its chrysalis, pulling its wings and abdomen clear of its case.

When the butterfly first emerges, the wings are small and soft and slightly crumpled. The butterfly positions itself so that the wings hang downward. It then contracts its body, which forces fluids into the wings and makes them expand. In about 2 to 3 hours, the wings will be fully expanded and hardened and ready to fly. The drawings in Figure 9-1 show the butterfly emerging and expanding its wings.

While the wings are hardening, the butterfly begins the important task of joining the two sections of its proboscis—the coiled, straw-like tongue used to siphon nectar from flowers. While the proboscis is still soft and pliable, the butterfly rhythmically works the two halves from side to side as a way to connect the interlocking spines. Once a connection has been made at the head, the butterfly quickly zips together the remainder of the spines, down to the tiny delicate tip. For the first day or two after emerging, the butterflies do not require food and probably won't accept any. (See Lesson 10 for complete information on feeding.)
**Preparation**

1. Duplicate *Activity Sheet 8.*
2. Obtain any art supplies you may need.
3. If you decide to have the students make a life cycle wheel as described in No. 6 of the Procedures section below, duplicate one set of the black line masters on pgs. 61, 62, and 63 for each student. (This optional activity is not in the Student Notebook.)

**Procedure**

1. Enjoy the wonder of this miraculous transformation along with your class! There will be considerable excitement when the first butterfly is discovered, and all the children will rush to see it. Because of the high level of excitement, the children probably will be unable to make any careful observations right now, but listen for any comments they make or the mention of any body parts. This will tell you the vocabulary they already know and pave the way for a more formal study of butterfly parts in Lesson 11.

2. Next, ask if anyone observed where the butterfly came from. The empty chrysalis case is quite noticeable. Often the newly emerged butterfly will be hanging from the case or will be nearby. Later, remove the empty chrysalis from the box for the children to see. Have them observe how it is split from end to end.

3. As butterflies emerge over the next several days, encourage your students to continue making frequent observations. Specifically, ask them to look for:
   - newly emerged butterflies pumping up their wings
   - butterflies in the process of joining the two halves of the proboscis
   - empty chrysalises
   - differences in coloration between the tops of the wings and their undersides
   - how the butterfly uses its feet, wings, antennae, and proboscis

   This also will help prepare them for the closer observations of butterfly body parts and their functions that will be discussed in Lesson 11.

4. Pass out copies of *Activity Sheet 8, The Life Cycle of a Butterfly,* and let students conduct a sequencing activity with the pictures of the butterfly in various stages of its life cycle.

5. Students also can use *Activity Sheet 8* to make headbands or necklaces that they can wear home to explain the life cycle of the butterfly to their families. Or, save the headbands for your class to wear during the release of the butterflies ceremony in Lesson 12.

   Below are the directions for making these ornaments.
   - To make a headband, glue the pictures from *Activity Sheet 8* to a long (3' x 20') strip of paper.
   - To make a necklace, punch a hole at the top of each picture and string the pictures on a piece of yarn.

6. Another way to use the pictures from *Activity Sheet 8* is in a life cycle wheel. The following illustrations and instructions will help students make the wheel.
LESSON 9

Instructions for making the Life Cycle Wheel:

1. Cut out Section A, the life cycle wheel, from pg. 61. Cut out the life cycle pictures from pg. 62.
2. Paste the life cycle pictures in the correct sequence to the life cycle wheel.
3. Cut out Section B, the cover wheel, from pg. 63. Then cut out the window on the cover wheel.
4. Assemble the two wheels by pushing a brass fastener through the dot marked in the center of each wheel (Figure 9-2).
5. Rotate the handles. You should see each stage of the butterfly's life cycle through the window on the cover wheel.

Figure 9-2

How to make a life cycle wheel

Final Activities

1. Hold a brief class discussion about what students observed today.
2. Record the important observations on the Class Calendar. Draw a box around this date. You will need this information again in Lesson 13.

Extensions

Some classes have enjoyed handing out butterfly-shaped crackers as "emergence announcements" to the principal, other teachers, or other classes in the school.

Evaluation

The life cycle headband may be used to evaluate a student's ability to sequentially order the life stages of the butterfly. If you choose to help students make the life cycle wheel, it too may be used for this purpose.
The Butterfly's Body

Overview

After the excitement of watching the butterflies emerge from the chrysalises and take their first nourishment, students are ready to make closer observations of the butterfly body parts. They will relate the butterfly parts to their own body parts and compare their relative functions.

Objectives

- Students observe the physical characteristics and the behavior of their butterflies.
- Students compare the butterflies to themselves.
- The teacher further prepares students for the release of the butterflies by helping them see how butterflies are equipped to survive in the natural world.

Background

The butterfly's body is quite complex and very well adapted for survival. Like all insects, its body is divided into three main parts: the head, the thorax (or midsection), and the abdomen. Below is a discussion of these three parts and their functions.

The head has a pair of sensitive antennae that are used for both touch and smell. A pair of compound eyes that are large and rounded see color well. Together, the eyes and the antennae give the butterfly the ability to find food, to recognize a potential mate, and to select the appropriate plant material on which to lay its eggs. The long sucking mouth tube, the proboscis, remains coiled when not in use. Uncoiled, it is nearly as long as the adult's body and can reach into the deep recesses of a flower to drink nectar.

The thorax, or midsection, holds both the two pairs of wings and the three pairs of jointed legs. Besides providing mobility, the Painted Lady's wings display a distinctive pattern that can be recognized by others of its kind. Wings also protect the butterfly in two ways: by giving it a way to escape from predators and by camouflaging it. The two sides of the wings have different colors and different patterns. While the underside is a muted combination of white, brown, tan, black, blue, and purple, the top side is a more vivid combination of white, orange, black, and brown.

The butterfly, like all insects, has six jointed legs, but because the Painted Lady's first pair of legs is very small, only four are easily visible. Surprisingly, the butterfly tastes with its second and third pairs of feet.
The abdomen is the last body section. In females, it is somewhat more rounded. At the tip of this section are the sexual organs. You may see pairs of butterflies copulating, joined end to end. Figure 11-1 shows two views of a butterfly. In both pictures, the parts have been labeled.

Materials

For each student
1. Activity Sheet 10, My Butterfly and Me

For the class
Butterfly flight cages
Class Calendar
Overhead projector or bulletin board display

Preparation
1. Duplicate Activity Sheet 10.
2. Display the illustrations of the two views of the butterfly on pg. 121 either on the bulletin board or as an overhead transparency.
1. Allow students sufficient time to observe the adult Painted Ladies before conducting this lesson. During the observation periods, direct student attention to the butterfly body parts and how they are used.

2. Hold a class discussion about what students have observed about butterfly body parts and how they are used. You may want to use the illustrations on pg. 121 either as a bulletin board display or as an overhead projection to help focus the discussion. Try to listen for some of the words students have used when they were making informal observations. The following questions may help children identify the parts and recognize how they are useful to the butterfly in the real world:
   - Look at the butterfly's head. What other body parts do you find on the head? (Eyes, antennae, and proboscis.)
   - What do you think the butterfly uses these parts for? (Eyes: to see color well, to find food, to find a mate. Antennae: for touch and smell. Proboscis: to reach nectar deep inside the flowers.)
   - Count the wings. How many are there? (Four.)
   - What does a butterfly use its wings for? (To fly to food and to the plants that it lays its eggs on; to fly away from predators; for camouflage.)
   - How many legs are there? (Six, but only four are clearly visible.)
   - What does a butterfly use its legs for? (To walk and to taste.)
   - Have you noticed any butterflies mating? What parts of their bodies were joined? (The ends of the abdomens.)

3. Distribute Activity Sheet 10 (or the student booklets, if you are using them). Preview the activity sheet with the class. Allow students sufficient time to complete the sheet.

**Final Activities**

1. As a follow-up to the activity sheet, ask students to compare their bodies and the butterflies' bodies. How are the two alike? How are they different?

2. Record today's important observations on the Class Calendar.

**Extensions**

1. If a butterfly dies, gently remove it from the cage and have children look at it closely with a hand lens.

2. As an art project, ask children to illustrate the different ways a butterfly uses its wings: to fly to food, to find a mate, to escape enemies, for camouflage.

3. Make butterfly kites. See the directions on the pg. 76.

The next lesson is the release ceremony. You probably will find it useful to arrange for several other adults to help you manage the class outdoors.

Plan ahead for the release ceremony to make it a real celebration. You may want to invite parents, recite a farewell poem, decorate T-shirts, dramatize the life cycle, or enjoy some butterfly cookies. See the Extensions section in Lesson 12 for additional suggestions.
My Butterfly and Me

Activity Sheet 10

Name: ____________________________

Date: ____________________________

Answer these questions:
I have how many?
  Legs
  Eyes
  Wings
  Arms
  Antennae

My butterfly has how many?
  Legs
  Eyes
  Wings
  Arms
  Antennae

What does a butterfly use its wings for?

What parts of its body does a butterfly use to find food?

Think about this:
How is your butterfly like you? How is it different?
Plants and animals are living things. They grow and change. Plants need air, water, light, space, and nutrients. Nutrients are materials in soil and water. Animals need air, water, food, shelter, and space to live.

Living things reproduce, making others of their kind. A pea plant starts as a seed. The seed sprouts and grows into a seedling. The seedling grows into a mature plant that has its own seeds. The life cycle begins again when one of these seeds grows into a new plant.

A life span is the time from the beginning to the end of a living thing's life. The life span of a pea plant is a few months. The life span of a desert tortoise is more than 80 years.
Insects

More than half the animals on Earth are insects! **Insects** have six legs. Their bodies have three sections. These are called the head, thorax, and abdomen. Most insects have wings for flying. They often have two antennae on their heads for feeling, hearing, and tasting.

When a cricket hatches from an egg, it is called a **nymph**. The nymph looks very much like an adult cricket, only smaller. Then the nymph grows into an adult.

Other insects, like butterflies or fruit flies, have young called larva. **Larvae** hatch from eggs but look very different from the adult. A butterfly larva is called a caterpillar. It crawls and eats leaves. When the caterpillar gets big enough, it becomes a **pupa**. The insect's body changes. The insect becomes an adult butterfly. This change in form is called **metamorphosis**.

---

**Life Cycle of a Butterfly**

- **Egg**
- **Larva**
- **Adult**
- **Pupa**
Butterflies go through many changes as they grow.
Butterflies start life as eggs on plants.

Caterpillars hatch out of the eggs.

Caterpillars don't look like butterflies.
Butterflies eat leaves
grow fast!

They shed their skin
as they grow.
After a while, the caterpillar turns into a pupa and makes a chrysalis.

The pupa doesn't look like a butterfly.

But inside its chrysalis, the pupa is turning into a butterfly.
It last the butterfly breaks out of its chrysalis.

It waits for its wings to dry.
Then it flies away.
In the fall, some butterflies fly south. They want to stay warm in the winter. Then they fly back again in the spring.
on the female
butterflies will lay
eggs on plants.

And new butterflies
will begin life.
The Life Cycle of a Butterfly

- Butterfly: The adult butterfly with wings.
- Eggs: The stage where the butterfly lays eggs.
- Caterpillar: The larval stage of the butterfly, resembling a worm.
- Pupa: The transitional stage between the larval and adult stages.
- Chrysalis: The protective case around the pupa.
- Female: The gender that produces eggs.

Fun Facts about Butterflies

- Did you know that butterflies taste with their feet?
- Butterflies actually have four wings, not two.
- A caterpillar is a larva, the newly hatched form of a butterfly or moth. The caterpillar's first meal is often the eggshell out of which it came.
- After a caterpillar sheds its skin, it eats! The skin is full of nutrition.
- A butterfly larva makes a chrysalis. A moth larva makes a cocoon.
- Butterflies cannot fly if their body temperature drops below 86 degrees Fahrenheit (30 degrees Celsius).
- Every year, Monarch butterflies migrate from the Great Lakes to Mexico and back again. The round trip is about 4,000 miles long!
- The Monarch butterfly lays its eggs only on poisonous milkweed plants. If a caterpillar eats the plant without getting sick from the poison, another animal or insect eats the caterpillar, it will get sick.

Index and Glossary

- caterpillar: The larval stage of a butterfly.
- chrysalis: The protective case around the pupa.
- egg: The first stage of life before it becomes an insect.
- female: The gender that gives birth or produces eggs.
- life cycle: The sequence of changes a living thing goes through during its life.
- pupa: The stage of a butterfly insect after it is a larva, before it becomes an adult butterfly.