Life Cycle of a Butterfly

Second Grade Science Unit

Meghan Bauer

TSL 518
Introduction
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Dr. Verplaetse
TSL 518

Title of Unit: Life Cycle of a Butterfly

Grade Level and Type: Second grade mainstream class with integrated ELL students

Source of reading materials: Hamden Public Schools Board of Education (2012 draft); Butterflies by Gallimard Jeunesse and Claude Delafosse *See attached

Source of Lessons: Hamden Public Schools Board of Education (2012 Draft) *See attached

Learning Goals:

• I want my students to know the miracle of the four different stages in the life of a butterfly.

• I want my students to know the importance and meaning of the vocabulary associated with the life cycle of a butterfly.

• I want my students to know how to learn from observation.
Lesson 1
The Life Cycle of a Butterfly: Lesson 1 – From Caterpillar to Chrysalis

<table>
<thead>
<tr>
<th>Content Objectives</th>
<th>Language Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The students will make observations as the caterpillar transforms into a chrysalis.</td>
<td>1. The students will work individually and use their science notebook to record what they notice about the caterpillar as it forms its chrysalis.</td>
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<tr>
<td>2. The students will show an understanding of the process the caterpillar goes through to form its chrysalis.</td>
<td>2. The students will respond orally to teacher questioning in whole group and take turns identifying the parts of a butterfly that form or disappear inside the chrysalis.</td>
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<tr>
<td>3. The students will be able to identify the parts of a butterfly that will form or disappear inside the chrysalis: 6 true legs, proboscis, 4 wings and muscles appear, eyes turn into compound eyes and prolegs disappear.</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Domain and Content/Topic</th>
<th>Level 5</th>
<th>Level 4</th>
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<tbody>
<tr>
<td>Writing: science note booking</td>
<td>The students will independently maintain a daily science journal of specific and varying observations of the caterpillars/chrysalis’ written in clear paragraphs. (5 sentences or more)</td>
<td>The students will independently maintain a daily science journal of general observations of the caterpillars/chrysalis’ written in paragraph form. (3-5 sentences)</td>
<td>The students will independently maintain a daily science journal of observations of the caterpillars/chrysalis’ written in clear sentences. (At least 2-3)</td>
<td>The students will independently maintain a daily science journal of observations of the caterpillars/chrysalis’ by writing at least one complete sentence, using science vocabulary posted in the classroom and providing an illustration to go with it.</td>
<td>The students will independently maintain a daily science journal of observations of the caterpillars/chrysalis’ by writing a few words, posted from a previous small group lesson, and drawing a detailed picture to go with it.</td>
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<tr>
<td>Listening and Speaking: responding to teacher questioning</td>
<td>The students will respond to teachers’ questioning about the parts of a butterfly that form or disappear inside the chrysalis in complete and meaningful sentences, using prior knowledge and supporting details.</td>
<td>The students will respond to teachers’ questioning about the parts of a butterfly that form or disappear inside the chrysalis in meaningful sentences, using prior knowledge and vocabulary posted.</td>
<td>The students will respond to teachers’ questioning about the parts of a butterfly that form or disappear inside the chrysalis in phrases, using language prompts (shown in functional language chart) provided by the teacher.</td>
<td>The students will respond to teachers’ questioning about the parts of a butterfly that form or disappear inside the chrysalis using one or two words taken from the science word wall.</td>
<td>The students will respond to teachers’ questioning about the parts of a butterfly that form or disappear inside the chrysalis by pointing to previously taught and appropriate depictions of them on the board.</td>
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</table>
## Functional Language Chart

<table>
<thead>
<tr>
<th>Function</th>
<th>Situation</th>
<th>Expression</th>
<th>Vocabulary</th>
<th>Grammar</th>
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<tbody>
<tr>
<td>Observe and Identify</td>
<td>Caterpillar’s transformation into a chrysalis</td>
<td>1. I notice that the caterpillar _____________.</td>
<td>1. disappeared, is in it’s J-Shape, is not moving 2. the silk threads, the caterpillar hanging, the silk button</td>
<td>Adjectives Verbs Nouns</td>
</tr>
</tbody>
</table>
Lesson 7: From Caterpillar to Chrysalis

Words in normal font are taken directly from the original lesson plans written by Hamden Public Schools and words in italics are the ELL modifications.

Building Background Knowledge:
Previous to this lesson, the teacher will meet in a small group with the ELs. They will review the vocabulary being used in the lesson. This vocabulary includes the following terms: silk button, j-shape, molt, caterpillar, chrysalis, pupa, nectar, proboscis, wings, muscles, lenses, and compound eye. The teacher may use the programs in translate or google translate to help translate the vocabulary into the students’ native language. The teacher will also use pictures (Diagrams A (pg. 9), B (pg. 10), and C (pg. 11) immediately following the modified lesson) and the actual caterpillars to show the different vocabulary words’ meaning in a real life context. The students will each be given a sheet with each vocabulary word in its own box (pg. 8). The students will draw a picture to show the meaning of the vocabulary word and these will be placed onto the science word wall in the classroom to be used as a reference in following lessons.

Procedure:
- Begin with a short period of observation. The students will notice the sizes, level of activity, silk or j-shape. *While the students are making their observations, the teacher will meet with the ELs and their caterpillars and ask questions. The teacher may ask: What do you notice about your caterpillar today? (pointing to your eyes and then the cup with the caterpillar); Do you see any changes in your caterpillar? After the observation period, students will go back to their seats and individually record their observations. ELs will write their observations using vocabulary they know and is posted in the classroom and will not be expected to write complete sentences. They will also be expected to draw pictures to go along with their observations to show they understand what they have written.* (10-15 minutes)

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<td>Writing: science note booking</td>
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- Explain that when the caterpillars are about 1 – 1 ½ inches (*show the length on a ruler to enhance meaning*), they will notice the caterpillar has stopped eating and crawls to the lid of the cup. They spin a silk button, and the pupa is
hanging head down in a j-shape. This means it will form a chrysalis in a few hours. Another name for this stage is pupa. *As the teacher goes through these changes they should be using several students’ caterpillars to show the changes.* Ask the students what they think will happen inside the chrysalis (the 6 true legs will become long and slender and the prolegs disappear. The leaf chewing jaw will become a nectar sucking organism called a proboscis. Four wings and muscles will develop. The eyes will be replaced with hundreds of lenses to become a compound eye – able to see well enough to fly.) During this part of the lesson, posters will be up of a caterpillar and a butterfly (Diagrams B (pg. 10) and C (pg. 11)) for the teacher to reference and to give the students a visual. *The teacher will display the pictures used during the pre-teach to promote ELL participation. The teacher will also give the ELs language prompts during the discussion to promote participation.* The teacher may say:

**Level 1:** Make sure you are in an area close to the science word wall so the students can use it to answer the questions. Examples of questions for Level 1 students: “Point to the wings on the butterfly” (show student pointer finger and demonstrate pointing to something on the board). When student has pointed to the wings, the teacher should then ask with hands up and shoulders shrugged “How many wings are there on the butterfly?” Repeat this same questioning for the prolegs and the compound eyes, having the student point to each part on the butterfly before asking them the question.

**Level 2:** Make sure you are in an area close to the science word wall so the students can use it to answer the questions. Examples of questions for Level 2 students: “How many wings (pointing to the wings) does the butterfly have?”, “How many true legs (pointing to the true legs) will the butterfly have?”, “What are the new eyes (pointing to the compound eyes) on the butterfly called?”

**Levels 3-5:** “How many wings does the butterfly have?”, “How many true legs will the butterfly have?”, “What are the new eyes on the butterfly called?” Once the students have answered each question, follow up with asking them, “How do you know?” This will allow the advanced students an opportunity to defend their answer and use relevant science vocabulary. (15-20 minutes)

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<td>Listening and Speaking: responding to teacher questioning</td>
<td>The students will respond to teachers’ questioning about the parts of a butterfly that form or disappear inside the chrysalis in complete and meaningful sentences, using prior knowledge and supporting details.</td>
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<td>The students will respond to teachers’ questioning about the parts of a butterfly that form or disappear inside the chrysalis by pointing to previously taught and appropriate depictions of them on the board.</td>
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Have the students complete Activity Sheet 6 (student handbook pg. 12) independently and read a book about butterflies with a partner. The teacher will meet with the ELs in a small group and complete Activity Sheet 6 (pg. 12). The teacher should read through each piece of the activity sheet with the students, taking questions and reviewing familiar vocabulary (silk button, j-shape, molt, chrysalis, and caterpillar). The teacher will observe the students as they draw the caterpillar in its J-shape. The teacher will then read the book Butterflies written by Gallimard Jeunesse and Claude Delatosse (pgs. 13-18). The book will be used as a pre-teaching strategy to prepare the ELs for the lessons to come the next two days. The teacher will pause after each page for questions and comments. The teacher will make sure to point out the familiar vocabulary words and check for meaning. For example, the page on page 16 of this document shows a picture of a butterfly and lists four pain parts; six legs, four wings, two antennae and a tongue. The students should be familiar with these parts from the pre-teach and previous lessons. To check for meaning, the teacher can ask the students to point to where each body part is located on the butterfly. The teacher can say, “Point to the four wings.”; “Point to the legs.”; “Point to the antennae.” (30-40 minutes)

**Closure:**
- Using the diagrams of the butterfly and caterpillar and the science word wall, ask students to volunteer and define at least one of the science vocabulary words. ELs may come up and point to the pictures of the caterpillar and butterfly and use one or two words to explain what that part is, while other students may want to give a formal definition of the word or part of the insect. The teacher will listen and make corrections where appropriate. If there are any students who still struggle with the vocabulary, this is the time the teacher can make that discovery and review with the struggling students. (10-15 minutes)

**Reflection:**
The changes I made in this lesson are imperative to the success of the ELs in your class. The first change is the pre-teaching method for vocabulary words. This strategy of pre-teaching the vocabulary will allow the students to understand the lesson more and will make it more manageable for the teacher when asking questions. Also, having the students make the vocabulary picture cards gives them a sense of ownership during the lessons because their cards are posted for everyone to use during lessons. I also added cues for gesturing. Using physical gestures during lessons has proven to be a very effective strategy to use with ELs. I made sure to add several different examples of questioning that would make it easier for ELs to understand what the teacher is saying. It is important to differentiate what you are saying as the teacher so that all children in the class have equal opportunities to succeed. There are several areas where I suggest using pictures and media to show ELs what is being said. The use of technology and visual cues is proven to be an effective strategy when teaching ELs because it provides them with a real life picture of what is being taught. The last modification I made was to have the ELs meet with the teacher in a small group during the final activity of the lesson. It is important to work with ELs when doing reading activities in order to assess understanding, build background knowledge and reinforce important vocabulary. Finally, the closure can serve as an informal assessment as well. The teacher may take the students who are not able to identify
and define a vocabulary word and individually work on meaning with them. I chose not to put the reading section of this lesson into the performance indicator because it was not included in my objectives. The students reading the worksheet and listening to a story were a supplement to the lesson.
<table>
<thead>
<tr>
<th><strong>Silk Button</strong></th>
<th><strong>J-shape</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Molt</strong></td>
<td><strong>Caterpillar</strong></td>
</tr>
<tr>
<td><strong>Chrysalis</strong></td>
<td><strong>Pupa</strong></td>
</tr>
<tr>
<td><strong>Nectar</strong></td>
<td><strong>Proboscis</strong></td>
</tr>
<tr>
<td><strong>Wings</strong></td>
<td><strong>Muscles</strong></td>
</tr>
<tr>
<td><strong>Compound Eye</strong></td>
<td><strong>Lenses</strong></td>
</tr>
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</table>
Diagram A
Diagram B

Directions: Use the word bank to help you label the parts of a butterfly.

Butterfly
antenna  eye  proboscis
abdomen  head  thorax
Diagram C

Directions: Use the word bank to help you label the parts of a caterpillar.

Caterpillar

eye      head      true legs
prolegs  bristles  spiracles
What Happens to the Caterpillar?

Name: __________________________

Date: __________________________

Watch your caterpillar carefully when it gets to be this big.

The caterpillar will crawl to the top of the cup and spin a strong silk button.

Then it will hang upside down from the button. It will hang in a J-shape.

Draw your caterpillar hanging in a J-shape.

Next, the silk splits along the caterpillar’s back. After the last molt, you will see the chrysalis.

Soon the chrysalis will become hard. Then it is time for you to put your chrysalis in a new cage. Write the date when the chrysalis appeared:
Butterflies by: Gallimard Jeunesse and Claude Delafosse
The butterfly has six legs, four wings, two antennae, and, almost always, a tongue.
The tongue is like a straw. It sucks up nectar.

The eyes have many sides that can see movement and color.

The butterfly uses its two antennae to smell.

The butterfly’s legs are attached at the chest. The butterfly uses its front legs to taste sugar.
The butterfly’s wing has colorful scales.
Look up close and see the scales!
Lesson 2
## The Life Cycle of a Butterfly: Lesson 8 – Observing the Chrysalis

<table>
<thead>
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<th>Content Objectives</th>
<th>Language Objectives</th>
</tr>
</thead>
</table>
| 1. The students will observe the chrysalis and discuss what they notice.  
2. The students will show an understanding of what the chrysalis looks like and what can be seen inside. | 1. The students will work in small groups to observe the chrysalis (while referring to a reference sheet depicting and labeling all of the parts of the chrysalis) and orally answer questions from the teacher about the physical characteristics of the chrysalis.  
2. The students will work in small groups to draw a picture of the chrysalis and complete a checklist of the parts of the butterfly they are able to see inside it. |

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</table>
| Listening and Speaking: Responding to teacher questioning | The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis in complete and detailed sentences that explain why.  

The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis in short phrases using appropriate science vocabulary posted on the science word wall.  

The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis using language prompts provided by the teacher.  

The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis using a few words while utilizing the science word wall posted in the classroom.  

The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis by pointing to pictures of the caterpillar, chrysalis and butterfly posted in the classroom. |
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</table>
| Observe and Explain    | The chrysalis has formed. | 1. I can see the _____ forming.  
2. The chrysalis looks _____. | 1. eyes, antennae, proboscis, wings, abdomen  
2. dark, light, black, brown, bumpy, small, see through | Adjectives  
Nouns |
Lesson 8: Observing the Chrysalis

Words in normal font are taken directly from the original lesson plans written by Hamden Public Schools and words in italics are the ELL modifications.

Building Background Knowledge:

Previous to the lesson, the teacher will meet in a small group with the ELs and review the vocabulary picture cards they made for the science word wall. This vocabulary includes the following terms: **silk button, j-shape, molt, caterpillar, chrysalis, pupa, nectar, proboscis, wings, muscles, lenses, and compound eye.**

Procedure:

Begin with a short period of observation. Review what the students observed the day before when the chrysalises formed.  *Level 1 and 2 ELs may use their observation journals from the day before as a reference. They may share the pictures they drew and use the science word wall for vocabulary.*

- **Cluster the children in small groups around the butterfly houses.** Remind them that the tail end of the chrysalis is attached to the silk button (*point to the silk button on Diagram A, pg.*), and the pupa is hanging head down.

- **Ask:** Are there any shapes that look like they are part of a head (*point to your head*)? (eyes, antennae, proboscis) Can they see other body parts forming? (wings, abdomen)

- **The teacher may ask the students questions to prompt responses.**
  - **Level 1:** Make sure you are in close vicinity to the science word wall during this observation period so the ELs can use it for reference.  “Can you point to the wings (*pointing to the picture vocabulary card that depicts wings on the science word wall*) inside the chrysalis?;” “Can you see the compound eyes (*pointing to your eyes*)?”
  - **Level 2:** Make sure you are in close vicinity to the science word wall during this observation period so the ELs can use it for reference “Point to the wings inside the chrysalis.;” “Can you show me the silk button?;” “Can you show me the compound eyes inside the chrysalis?;”
  - **Levels 3-5:** “Which parts of the butterfly can you see forming inside the chrysalis? How do you know that is what you are seeing;” “What parts of the butterfly are still forming inside the chrysalis? How do you know?”

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<tr>
<td>Speaking: Responding to teacher questioning</td>
<td>The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis in complete and detailed sentences that explain why.</td>
<td>The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis in short phrases using appropriate science vocabulary posted on the science word wall.</td>
<td>The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis using language prompts provided by the teacher.</td>
<td>The students will make observations of the chrysalis and respond to teacher questioning about the appearance of the chrysalis by pointing to pictures of the caterpillar, chrysalis and butterfly posted in the classroom.</td>
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</table>
• Can they describe the colors of the chrysalis? Tell them to look for color changes that occur in the next week (the chrysalis will get darker and you will be able to see the orange, black, and white wing pattern, shortly before emerging. For Level 1 and 2 ELs, have markers available so they can show the color they see. Say the color, then have them repeat it. (All observation and discussion should last 15-20 minutes)
  ❖ Reference for the teacher: Students will be able to see some butterfly structures forming under the protective shell. The pupa is hanging head down. Two dark bulges are visible where the compound eyes are forming. Between the eyes the shape of the long, straw-like mouth, called the proboscis, is also visible. On either side of the mouth parts, the black antennae may be evident. A generalized wing shape can also be seen. See chrysalis illustration, Diagram A on page 6.

• Have the students complete Activity Sheet 7 (page 9) independently. The teacher will meet with the ELs in a small group and complete Activity Sheet 7 (pg. 9). The teacher should read through each piece of the activity sheet with the students, taking questions and reviewing familiar vocabulary (antenna, proboscis, wing and abdomen). The teacher will observe the students as they draw the chrysalis. The teacher will ask the ELs questions about their illustrations to check for meaning. The teacher may repeat the questions from earlier in the lesson to check for meaning. Students may be more willing to answer teacher questioning in a small group setting. The teacher will ask the students questions to prompt responses. Make sure you are in close vicinity to the science word wall during this observation period so the ELs can use it for reference. “Can you point to the wings (pointing to the picture vocabulary card that depicts wings on the science word wall) inside the chrysalis?;” “Can you see the compound eyes (pointing to your eyes)?” The teacher will read through each science term on the checklist on Activity Sheet 7. They will make sure the students understand what each part is and where it is located by using Diagrams A, B, and C as learning tools. The students may use these diagrams to point to each part listed on the checklist and cross-reference them with their actual chrysalis. (20-25 minutes)

Closure:
- Using the diagrams of the butterfly, caterpillar, chrysalis (pgs. 6, 7 & 8) and the science word wall, ask students to volunteer and define at least one of the science vocabulary words. ELs may come up and point to the pictures of the caterpillar and butterfly and use one or two words to explain what that part is, while other students may want to give a formal definition of the word or part of the insect. The teacher will listen and make corrections where appropriate. If there are any students who still struggle with the vocabulary, this is the time the teacher can make that discovery and review with the struggling students. (10-15 minutes)

Reflection:
Many of the modifications and changes I made in this lesson are quite similar to those I made in the first lesson. I began this lesson plan with the same activity for building background knowledge because it is very important to constantly assess whether the ELs are understanding the vocabulary being used during the lesson. The vocabulary is the foundation of any lesson and if an EL doesn’t understand even one of the terms, they could struggle through the
rest of the lesson, or even the rest of the unit. Since there are so many observation periods during these lessons, I made sure to provide questioning for each level of language proficiency. Level one uses the word wall and gestures so that the students are provided with multiple visuals, making these words come to life. Level two is also provided with the word wall and more simplistic questioning, but the teacher should see if they can point or answer without the gesturing first. If they struggle then the teacher may use gestures to aide in comprehension. When asking the students about the colors they see it would helpful to have colored markers or crayons available so that the ELs have some kind of reference. You have been providing them with visuals and references up until this point, therefore one should be provided for a concept as seemingly simplistic as colors. All vocabulary is new to them, not just science vocabulary. We would be doing them an injustice if we did not provide them with equal opportunities for reference in all areas of language. I have the students working in the activity sheet with the teacher for a second day in a row because again, any opportunity for the teacher to check for understanding and promote vocabulary is essential to take advantage of. Finally I would like to add that the conclusion in this lesson serves the same purpose as the conclusion in lesson one. The teacher should make sure each student is able to give at least one new vocabulary word along with a definition or gesture to the appropriate depiction of it. If there are any students who are not able, the teacher will take those students individually and review vocabulary. This is a form of informal assessment and can be used in any lesson to check for student understanding.
Diagram A
Diagram B

Directions: Use the word bank to help you label the parts of a butterfly.

Butterfly

- antenna
- eye
- proboscis
- abdomen
- head
- thorax

---
Diagram C

Directions: Use the word bank to help you label the parts of a caterpillar.

- Caterpillar
  - eye
  - head
  - true legs
  - prolegs
  - bristles
  - spiracles
Observing the Chrysalis

Name: 

Date: 

Use your hand lens to observe a chrysalis. Draw what you see.

Did you see these parts? Check them off if you did.

___ Eyes
___ Antenna
___ Proboscis
___ Wing
___ Abdomen

STC* / The Life Cycle of Butterflies
Lesson 3
The Life Cycle of a Butterfly: Lesson 9: The Butterfly Emerges

<table>
<thead>
<tr>
<th>Content Objectives</th>
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<tbody>
<tr>
<td>1. The students will observe the butterflies emerging from the chrysalis.</td>
<td>1. The students will make oral observations of what they notice during the butterflies’ emergence in whole group.</td>
</tr>
<tr>
<td>2. The students will identify the signs that a butterfly is about to emerge from the chrysalis.</td>
<td>2. The students will work in whole group to orally identify the signs a butterfly is about to emerge from its chrysalis.</td>
</tr>
<tr>
<td>3. The students will describe the 4 stages of the life cycle of a butterfly.</td>
<td>3. The students will write the 4 stages of the life cycle of a butterfly in the correct order and give a fact to explain each stage.</td>
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<td>Speaking: observations of butterfly emerging from the chrysalis</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and orally share what they notice in a whole group setting using complete and detailed sentences.</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and orally share what they notice in a whole group setting using short phrases using appropriate science vocabulary posted on the science word wall.</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and orally share what they notice in a whole group setting using language prompts provided by the teacher.</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and orally share what they notice by pointing to pictures of the chrysalis and butterfly posted in the classroom.</td>
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<tr>
<td>Writing: 4 stages of the life cycle of a butterfly</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly and write 1-2 complete and detailed sentences on the supplied worksheet describing each stage with a partner.</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly and write 1 complete and detailed sentence on the supplied worksheet describing each stage with a partner.</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly, using the science word wall for help, and write a few words on the supplied worksheet describing each stage with assistance from the teacher in a small group.</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly, using the science word wall, and write at least 1-2 words on the supplied worksheet describing each stage with assistance from the teacher in a small group.</td>
<td></td>
</tr>
</tbody>
</table>
## Functional Language Chart

<table>
<thead>
<tr>
<th>Function</th>
<th>Situation</th>
<th>Expression</th>
<th>Vocabulary</th>
<th>Grammar</th>
</tr>
</thead>
</table>
| Observe and Identify      | The butterfly is emerging. | 1. I notice that the butterfly _____.
2. I know the butterfly is emerging because _____. | 1. is moving, is not flying, is hanging on to the side of it’s home, has crinkled wings
2. the chrysalis is cracked, the chrysalis is darker, I see a wing/the wings coming out, | Adjectives
Nouns
Verbs
Verbs ending in –ed and -ing |
Lesson 9: The Butterfly Emerges

Words in normal font are taken directly from the original lesson plans written by Hamden Public Schools and words in italics are the ELL modifications

Building Background Knowledge:
Previous to the lesson, the teacher will meet in a small group with the ELs and review the vocabulary picture cards they made for the science word wall. This vocabulary includes the following terms: silk button, j-shape, molt, caterpillar, chrysalis, pupa, nectar, proboscis, wings, muscles, lenses, and compound eye.

Procedure:
- Enjoy the wonder of this transformation with your class! There will be a lot of excitement when the butterfly emerges or is discovered.
- Ask if anyone observed where the butterfly came from. Use your hands and shoulders to show questioning and point to the butterfly while saying, “Where did the butterfly come from.” The empty chrysalis case is quite noticeable. Remove the empty chrysalis from the box and have your students observe how it split from end to end.
- Discuss the signs that the butterfly is about to emerge: The chrysalis has darkened, and the orange and black wing patterns are visible. When it finally happens, the emergence takes about 30 seconds. First a crack appears along the back, followed by another crack along the side. These openings free the butterfly’s back and six legs. Finally the butterfly steps out, pulling its wings and abdomen clear of its case (this information serves as a reference to the teacher, many students will not make these exact observations but it is to give the teacher an outline of what could possibly be said). These are some of the things the students may notice while the butterfly is emerging. The ELs may not know how to verbalize these observations so make sure to allow for gesturing and use of the science word wall. You may also want to prompt your ELs with basic questions such as; “What do you see (pointing to your eyes then to the butterfly)?” “What is different (displaying the pictures of the caterpillar, chrysalis and butterfly – Diagrams A (pg. 7), B (pg. 8) and C (pg. 9))? ”

<table>
<thead>
<tr>
<th>Domain and Content/Topic</th>
<th>Level 5</th>
<th>Level 4</th>
<th>Level 3</th>
<th>Level 2</th>
<th>Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking: observations of butterfly emerging from the chrysalis</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and orally share what they notice in a whole group setting using complete and detailed sentences.</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and orally share what they notice in a whole group setting using short phrases using appropriate science vocabulary posted on the science word wall.</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and orally share what they notice in a whole group setting using language prompts provided by the teacher.</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and orally share what they notice by pointing to pictures of the chrysalis and butterfly posted in the classroom.</td>
<td>The students will make observations of the butterfly emerging from the chrysalis and share what they notice by pointing to pictures of the chrysalis and butterfly posted in the classroom.</td>
</tr>
</tbody>
</table>
• Explain that when the butterfly first emerges (comes out of the chrysalis), the wings (pointing to the wings on Diagram C, pg98) are small (put pointer and thumb close together to indicate small), soft and slightly crumpled (crumple a piece of paper and point to the wings again). The butterfly will position (move) itself so that the wings hang downward (explain while pointing to a butterfly in this position). It then contracts its body (bring both hands from open to a closed fist then point to the body while talking) which forces fluids into the wings (pointing to the wings) and makes it expand (get bigger, bringing hands apart to show big). In about 2-3 hours (show the progression of time using a Judy clack) the wings will be fully expanded, hardened and ready to fly (have all the students stand up and spread their arms. They may take a lap around the room with their new wings). Sometimes the butterfly’s wing may be deformed and will not straighten out (the students have already been warned of this).

• Children will probably notice a red liquid coming from the tail end – it is not blood, this is meconium, waste tissue left over from metamorphosis (this too was explained from the beginning so that the students weren’t scared during the butterfly’s emergence). If you would like to remind your students of this and make sure your ELs understand you can simply say, “The red that you see (pointing to the red spots on the butterfly home) is the leftover food (gesture putting food to your mouth and chewing) the butterfly didn’t need inside the chrysalis.”

• An amazing thing happens when the butterfly is waiting for the wings to harden. It begins an important task of joining the two sections of the proboscis (point to the proboscis on Diagram C, pg.9) together (show your two pointer fingers coming together and touching) since it is still pliable (to show pliable you could snap a pencil in half and say ‘not’ pliable and then take a pipe cleaner and bend it and say ‘pliable’). Explain that the straw-like tongue (show an actual straw and again point to the proboscis) is used to siphon (suck – actually suck on the straw) nectar from flowers (use an artificial flower and model the whole process at once now, sucking on the straw while it is placed in the center of the flower). It moves its head from side to side (have all of the students move their heads from side to side and point to the butterfly) as a way to connect the spines (its back, point to your back, then the butterfly’s back). Then it quickly zips together the remainder of spines (pointing to your back, then the butterfly’s back again). Explain that for the first day or two the butterflies will not eat. (All observation and discussion above should take 25-30 minutes)

• Explain to the class that they will be completing a worksheet outlining the 4 stages of the butterfly life cycle and then they will complete a life cycle wheel. Read the directions on the worksheet out loud (while you are giving instructions to the class have your ELs sit in a small group and start to color the pictures at the bottom of their Butterfly Life Cycle worksheet, pg.10). Ask for any questions then go through the directions for the wheel. When you are done with directions tell the students they may choose a partner to work with quietly. (5-10 minutes of explanation – 30-40 minutes work time)

• Meet with your small group of ELs and have them put the Butterfly Life Cycle worksheet (pg. 9) in front of them. Tell them to first cut out the pictures while doing so yourself. Then ask, while pointing to the first circle on the worksheet, “Which one comes first (holding up one finger)?” Continue these steps until the
fourth and final picture is glued in the appropriate circle. The ELs will then use the science word wall to identify the title for each stage. They will not answer these out loud, they will simply write each title on the appropriate line. Then tell your ELs that they need to think of at least one or two words to describe this stage in the life cycle. Show them the science word wall again to make it clear that they may use it to help.

<table>
<thead>
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<th>Level 3</th>
<th>Level 2</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Writing: 4 stages of the life cycle of a butterfly</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly and write 1-2 complete and detailed sentences on the supplied worksheet describing each stage with a partner.</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly and write 1 complete and detailed sentence on the supplied worksheet describing each stage with a partner.</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly and write one phrase on the supplied worksheet describing each stage with a partner.</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly, using the science word wall for help, and write a few words on the supplied worksheet describing each stage with assistance from the teacher in a small group.</td>
<td>The students will identify and record all four stages of the life cycle of a butterfly, using the science word wall, and write at least 1-2 words on the supplied worksheet describing each stage with assistance from the teacher in a small group.</td>
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- When the ELs have finished the first worksheet, introduce the life cycle wheel. Show them the worksheet with the six pictures on it (pg. 11). Go through each picture and have them give you the science vocabulary word that describes each one. The students may write the word in the appropriate picture box so they do not forget the term. (Starting from the upper left hand corner of the worksheet and working straight down the three pictures then back to the top of the next three: **pupa**, **butterfly**, **eggs**, **j-shape**, **caterpillar** and **chrysalis**). When the group has finished going through all six pictures the teacher will demonstrate cutting them out. The teacher will then write the numbers 1-6 on a white board and will proceed to assist the students with putting the pictures in order. The teacher will ask the same questions as in the previous activity, starting with, “Which one comes first (**holding up one finger**)?” The teacher will put each picture under the appropriate number on the white board as the students answer which one comes next. The teacher will then show the students which section to start gluing their own shapes into, which will be the one with the handle looking shape sticking out of it, and will point to the one to its right, and then the one to that one’s right and so on. This will show the students that they are to glue the pictures counter clockwise. The teacher will monitor the students as they work. When the wheels are complete the teacher should model placing Section B (pg. 13) on top of Section A (pg.12) followed by sticking a brass fastener through the middle of both. They can now turn the handle and see all 6 phases of the butterfly. (30-40 minutes)

**Closure**

The teacher will invite the students to the whole group area and have them share their wheels. Students may explain them orally or simply turn through theirs, showing everyone they have the correct order and that they have colored them in neatly. (10-15 minutes)
Reflection
This lesson required quite a bit of modifications in what the teacher said and did because much of the lesson was the teacher explaining to the students what the final stage of the life cycle of a butterfly was. I put as much gesturing as possible into the modifications because it is the most effective way of getting the ELs to understand the vocabulary that is coming out of your mouth. Both gesturing to familiar pictures and diagrams and describing concepts with your hands are extremely important in ELs language development. I also gave simpler words to describe some advanced topics. This isn’t only important for the ELs rather it’s important for the entire class. The original lesson plans for this unit have some vocabulary in them that only a teacher would be able to understand, so when it came to simplifying dialogue I was doing it for the entire class, not just the ELs. I also spent a lot more time working with the ELs for the final assignment of this lesson plan because it would be the first time many of them have seen anything like the life cycle wheel. Your mainstream students would have studied different life cycles in years previous and would have done similar projects, so I felt comfortable allowing them to work in pairs. I wanted to focus my attention on the ELs to make sure they understood the task and carried out the assignment correctly and with as little struggle as possible.
Diagram B

Directions: Use the word bank to help you label the parts of a butterfly.

Butterfly
antenna  eye  proboscis
abdomen  head  thorax
Diagram C

Directions: Use the word bank to help you label the parts of a caterpillar.

Caterpillar

eye  head  true legs
prolegs  bristles  spiracles
Butterfly Life Cycle worksheet

Butterfly Life Cycle

Directions: Cut out the pictures. Glue them into the circles to show the correct order of the butterfly life cycle. Write one fact you learned about that stage in the box.

Stage 1: __________________________
Fact: __________________________

Stage 2: __________________________
Fact: __________________________

Stage 3: __________________________
Fact: __________________________

Stage 4: __________________________
Fact: __________________________
Life cycle wheel pictures
Section A Life Cycle Wheel
Section B Cover wheel and window
Original Lessons
Appendix

Original Lesson 7

Lesson 7: From Caterpillar to Chrysalis

Procedure:
- Begin with a short period of observation. Notice the sizes, level of activity, silk or j-shape (You will probably notice all stages)
- Explain that when the caterpillars are about 1-½ inches, they will notice the caterpillar has stopped eating and crawls to the lid of the cup. They spin a silk button, and have their head down in a j-shape. This means it will form into a chrysalis in a few hours. Another name for this stage is pupa.
- Ask what they think will happen inside the chrysalis (the 6 true legs will become long and slender and the prolegs disappear. The leaf chewing jaw will become a nectar-sucking organ called a proboscis. Wings and muscles will develop. The eyes will be replaced with hundreds of lenses to become a compound eye – able to see well enough to fly)
- After several days, the chrysalis will harden and will need to be placed carefully into the butterfly houses. Take the lids off and tape the tissue to the side of the box – the closer to the bottom the better, in case they fall. If the chrysalis breaks off the silk button you can tape it back to the wall of lay it on a paper towel near the side of the box, so it can grasp the side when emerging. (They will still emerge deformed.)
- Record observations on the class calendar
- Read a butterfly story (Bibliography)
- Activity Sheet 6 (student handbook)
Lesson 8: Observing the Chrysalis

Procedure:
- Begin with a short period of observation. Review what they observed when the chrysalises formed.
- Cluster the children in small groups around the butterfly houses. Remind them that the tail end of the chrysalis is attached to the silk button, and the pupa is hanging head down.
- Ask: Are there any shapes that look like they are part of a head? (eyes, antennae, proboscis) Can they see other body parts forming? (wings, abdomen)
- Can they describe the colors of the chrysalis? Tell them to look for color changes that occur in the next week (the chrysalis will get darker and you will be able to see the orange, black and white wing pattern, shortly before emerging)
  a. Students will be able to see some butterfly structures forming under the protective shell. The pupa is hanging head down. Two dark bulges are visible where the compound eyes are forming. Between the eyes the shape of the long straw-like mouth, called the proboscis, is also visible. On either side of the mouth parts, the black antennae may be evident. A generalized wing shape can also be seen. See chrysalis illustration (reference 4 – student handbook).
- Activity Sheet 7 (student handbook)
Lesson 9: The Butterfly Emerges

Procedure:
- Enjoy the wonder of this transformation with your class! There will be a lot of excitement when the first butterfly emerges or is discovered.
- Ask if anyone observed where the butterfly came from. The empty chrysalis case is quite noticeable. Remove the empty chrysalis from the box; have them observe how it split from end to end.
- Discuss the signs that a butterfly is about to emerge: The chrysalis has darkened, and the orange and black wing patterns are visible. When it finally happens, the emergence takes 30 seconds. First a crack appears along the back, followed by another crack along the side. These openings free the butterfly’s back and six legs. Finally the butterfly steps out, pulling its wings and abdomen clear of its case.
- Explain that when the butterfly first emerges, the wings are small, soft and slightly crumpled. The butterfly will position itself so that the wings hang downward. It then contracts its body which forces fluids into the wings and makes it expand. In about 2-3 hours the wings will be fully expanded, hardened and ready to fly. Sometimes the butterfly’s wing may be deformed and will not straighten out – use this as a teachable moment.
- Children will probably notice a red liquid coming from the tail end – it is not blood, this is meconium, waste tissue left over from metamorphosis.
- An amazing thing happens when the butterfly is waiting for the wings to harden. It begins an important task of joining the two sections of proboscis together since it is still pliable. (The coiled, straw-like tongue is used to sip honey nectar from flowers.) It moves its head from side to side as a way to connect the spines. Then it quickly zips together the remainder of spines down to the delicate tip. For the first day or two the butterflies do not require food and probably won’t accept any.
- Make a life cycle wheel. (student handbook)
- Add an interesting fact to the class calendar.
Checklists
TSL 518: Sheltered ELL Strategies Checklist

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><strong>I. Contextualize Lesson</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. A. Build and Activate Background Knowledge</td>
<td>4.5,6</td>
<td>3,4</td>
<td>3.4,5</td>
</tr>
<tr>
<td>I.B. Develop Vocabulary</td>
<td>4.5,6</td>
<td>3.4</td>
<td>3.4,5</td>
</tr>
<tr>
<td>I. C. Use extensive Visuals, Realia, Manipulatives, &amp; Gestures</td>
<td>4.5,6</td>
<td>3.4</td>
<td>3.4,5</td>
</tr>
<tr>
<td>I. D. Model (Instructions, Processes)</td>
<td>4.6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I. E. Create Opportunities To Negotiate Meaning</td>
<td>4.5,6</td>
<td>3,4</td>
<td>3.4,5</td>
</tr>
<tr>
<td><strong>II. Make Text Comprehensible</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.A. Intentional Use of Graphic Organizers</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>II.B. Modify Written Text</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>II.C. Amplify Number of Activities per Text</td>
<td>6</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>III. Make Talk Comprehensible</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.A. Pace Teacher’s Speech</td>
<td>4.5,6</td>
<td>3.4</td>
<td>3.4,5</td>
</tr>
<tr>
<td>III.B. Use of Listening Guides</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>III.C. Use of Word Walls</td>
<td>4.5,6</td>
<td>3.4</td>
<td>3.4,5</td>
</tr>
<tr>
<td>III.D. Frame Main Ideas</td>
<td>4.5,6</td>
<td>3.4</td>
<td>3.4,5</td>
</tr>
<tr>
<td>III.E. Check for Understanding</td>
<td>4.5,6</td>
<td>3.4</td>
<td>3.4,5</td>
</tr>
<tr>
<td><strong>IV. Change Traditional Classroom Talk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV.A. Use Teacher Question and Response Strategies</td>
<td>4.5,6</td>
<td>3,4</td>
<td>3.4,5</td>
</tr>
<tr>
<td>IV.B. Practice Instructional Conversations</td>
<td>4.5,6</td>
<td>3,4</td>
<td>3.4,5</td>
</tr>
<tr>
<td><strong>V. Engage at Appropriate Language Proficiency Levels</strong></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>5.6</td>
<td>3,4</td>
<td>3</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>4.5,6</td>
<td>3,4</td>
<td>3.4,5</td>
</tr>
<tr>
<td>VI. B. Model Language for Oral and Written Production</td>
<td>4.5,6</td>
<td>3,4</td>
<td>3,4,5</td>
</tr>
<tr>
<td>VI. C. Use Group/Pr. Work to Elicit Student Talk; Students as Researchers</td>
<td>6</td>
<td>4</td>
<td>4,5</td>
</tr>
<tr>
<td>VI. D. Respond to Student’s Voice – Writing and Error Correction</td>
<td>NA</td>
<td>NA</td>
<td>4.5</td>
</tr>
</tbody>
</table>
Function Checklist

<table>
<thead>
<tr>
<th>Functions</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe</td>
<td>4,5</td>
<td>3.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Identify</td>
<td>4,5,6</td>
<td>3.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Explain</td>
<td>4,5</td>
<td>3.4</td>
<td>3.4</td>
</tr>
</tbody>
</table>
### Grammar Checklist

<table>
<thead>
<tr>
<th>Area of Grammar</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nouns</td>
<td>4,5</td>
<td>3.4</td>
<td>3,4,5</td>
</tr>
<tr>
<td>Verbs</td>
<td>4</td>
<td>NA</td>
<td>3,4</td>
</tr>
<tr>
<td>Adjectives</td>
<td>4,5,6</td>
<td>3,4</td>
<td>3,4,5</td>
</tr>
<tr>
<td>Verbs ending in –ed and -ing</td>
<td>NA</td>
<td>NA</td>
<td>3</td>
</tr>
</tbody>
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