# 4

# English in the Content Areas

# 1. Introduction

The aim of school is to teach students the **content** of everyday living, (e.g., math, science, social studies, literature). The language of that content is the focus of this chapter. A child who possesses the skills in social language, (e.g., the language of the playground or the grocery store) does not necessarily possess academic language. BICS (Basic Interpersonal Communication Skills) is the language most students use for face-to-face social communication. By the time they exit ESL class, they should have this language. CALP (Cognitive/Academic Language Proficiency) is the language necessary for success in academic or cognitive domains.

In Pre-K through second grade, vocabulary and language development (both social and academic) is the main focus of instruction. In their study of academic language, Collier and Thomas say if Pre-K through second grade is taught with big books and music, with an emphasis on what things mean, students have a good head start toward gaining academic language.

It is in the primary grades 3-5 (6) where there is a divergence. Vocabulary, the most common aspect of the language of these domains, gives good examples. For instance, ***math has many ways to say the same thing.*** Students must know that addition can be signaled by **any** of these words: add, plus, combine, sum, and increased by. Similarly subtraction can be signaled by these words: subtract from, decrease by, less, take away, minus, differ, or less than.

***In science,*** logical connectors such as "because," "however," "consequently," and "for example," indicate the nature of the relationship between the parts of a text or experiment. An experiment itself is formulaic, and language is used to express it: hypothesis, experiment, conclusion.

***For social studies*** it is not only the vocabulary, but all the background knowledge many migrant students do not possess. For instance, one mentions the Fourth of July to an American student and it conjures up thoughts of the founding of this country, the Declaration of Independence, the Revolutionary War, etc. For a migrant student it may mean very little.

This is a very quick overview of just one aspect of what makes subject matter so hard for LEP students. Added to this are the semantics and discourse features of language, and the use of vocabulary in differing contexts. (Think of the word "power" as in the "powers of the president"; or "power" as in "the electric power company"; or "power" as in "4 to the highest power.") These vocabulary differences are bewildering to many LEP students.

Research shows that language is effectively learned when it is a vehicle of instruction, not the object; students reach a high level of second language development while mastering subject matter. Input is made comprehensible through a variety of means: demonstrations, visual aids, graphic organizers, hands-on materials, and manipulation of the content. Schema, or background knowledge, is built before a topic is introduced, so students are able to process material from the "top down," i.e. having general knowledge of the broad picture before studying the details.

**The following lessons should give you, the teacher, a start on integrating language and content.**

## 2. Basic Principles

Students are still learning English and the style of the American educational system, so teachers should present information as clearly and systematically as possible. Remember to:

### Announce the lesson's objectives and activities

It is important to write the objectives on the board and review them orally before class begins. It is also helpful to place the lesson in the context of its broader theme and preview upcoming lessons.

### Write legibly

Teachers need to remember that some students have low levels of literacy or are unaccustomed to the Roman alphabet.

### Develop and maintain routines

Routines will help LEP students anticipate what will happen (e.g., types of assignments, ways of giving instructions) without relying solely on language cues.

### List instructions step-by-step

It helps to familiarize the students with each step individually and not require them to find the answer or complete the whole process from the start. This procedure is ideal for teaching students to solve math and science word problems.

### Present information in varied ways

By using multiple media in the classroom, teachers reduce the reliance on language and place the information in a context that is more comprehensible to the students.

### Provide frequent summations of the salient points of the lesson

Teachers should

- try to use visual reviews with lists and charts;
- paraphrase the points where appropriate; and
- have students provide oral summaries themselves.

# 3. Mathematics

## Purpose

The set of activities presented below shows how mathematical concepts and skills can be integrated into language learning so that students learn the academic language necessary for mathematics instruction.

The activities presented here deal with the mathematical topic I**dentifying Geometric Shapes and their Attributes**.

### Grades 1-2

**content focus:** identifying shapes
**language focus:** labeling shapes

## Materials

You'll need a class set of attribute blocks, or sets of cardboard shapes that differ by size, color, and shape.

## The Basic Approach

1. Divide students into small groups, each with a set of attribute blocks or cardboard shapes. Ask students to divide the blocks into 3 groups. (Students should discover on their own that the attributes are color, shape, size).
2. Leave each student with a set of blocks that differ only in shape (not in color or size). Name the shapes: "This is a circle. What is this?" Have the students answer until they learn the names of the various shapes. "This is a _____."
3. Provide additional practice by giving simple commands: "Put the square on your head. Hold the triangle in your left hand."

## Extensions and Variations

1. Provide written labels on cards. Have the students match attribute blocks to word cards. Students can work in pairs.
2. Have students write the word for each shape their partners show them.
3. Have students practice with worksheets that require them to draw or label shapes: "Draw a red circle. Label the square."

### Grades 3-6

**content focus:** identifying common attributes through set intersection
**language focus:** describing, giving reasons

## Materials

Sets of attribute blocks or cardboard shapes
Flannel graph with construction paper shapes

## The Basic Approach

1. Divide students into small groups. Have the students divide their attribute blocks into two groups, (e.g., all shapes that are squares and all shapes that are blue). Illustrate what they have found on flannel graph.
2. Ask students if some of the blocks could belong to both groups or sets, (e.g., the squares that are blue). "Are there some blocks that can belong to both sets? What are they? Why can they belong to the first set? To the second set?"
3. Explain the meaning of mathematical terms such as

**set**, **intersection**, and **complement**. Have students give their reasons for the intersection of the sets, (e.g., "Because these are squares and they are blue").

4. Ask students other questions about the elements of the sets. "How many yellow elements are there in the complement? What squares are not in the intersection?"

5. Illustrate the intersection of the two sets with a Venn Diagram or a Carroll Diagram.

## Extensions and Variations

1. Have the students make attribute chains with a set of blocks. For example: "Put a small blue circle on the table. Find a shape that is different in only one way." Have the student put his/her choice next to the blue circle, e.g., a small red circle. Have the other students state whether they agree that this choice is different in one way or not. "Yes, because they are both small circles; the only difference is color." Continue the chain, with students providing reasons for their choices.

2. Then change the chain pattern to two different (e.g., medium red triangle, then a small blue triangle), and finally three different (e.g., small yellow circle, then a big red square). In each case, have students provide the reasons for the various sequences of shapes (e.g., "The second element matches the first in color and shape; the third matches the second in shape and size"). This activity can become a game for small groups, and students may try to "trick" each other by putting down a wrong block to get rid of theirs first or by giving a wrong reason.

---

Lesson adapted from Gilbert J. Cuervas, Theresa Corasanti Dale, Richard Tokar, Gina Richardson, and Karen Willetts

# 4. Science

## Purpose

This strategy can be used to integrate language and content instruction in science classes with a laboratory focus. The approach takes standard laboratory experiments and integrates language learning. The following activity illustrates the implementation of the strategy at the primary school level for a specific scientific concept: *Air has pressure because it weighs something*.

## Materials

water
pencils and paper
towels
medium-size glasses (glass or plastic - styrofoam doesn't work)
pans or sinks
stiff cards of various sizes, (e.g., index cards)

## The Basic Approach

For students at **beginning proficiency levels**, conduct the following experiment (Steps 1-7). The steps for the basic experiment are appropriate at the elementary school level. The primary cognitive focus is observation, which can be expressed linguistically through simple unstructured discussion and/or note-taking activities, and by asking yes-no questions or giving imperatives.

Step 1: Write on the board and state orally: "Air has pressure because it weighs something."

Step 2: Put water in the glass until it comes to the top.

Step 3: Push the card over the top of the glass.

Step 4: Hold your hand over the card. Turn the glass of water upside down. Be sure to leave your hand on the card.

Step 5: Remove hand and ask students to comment on what they have observed, eliciting relevant vocabulary and concepts.

Step 6: Divide class into small groups (2-3 students each). Each group is asked to reenact the experiment, keeping a record of when it does and doesn't work.

Step 7: Reconvene class and have group members relate results.

## Extensions

The instructor may want to incorporate some higher level cognitive focuses at the **intermediate proficiency level.** In that case, the following steps may be added to the basic experiment. (Refer to steps 1-7 on p. 64.)

4b. Ask them to predict what will happen.

6b. Tell groups to record results on a prepared form that classifies what happens under different conditions. For example:

glass not filled to the top with water _____

_____

card not large enough to fit over rim _____

_____

hand removed too quickly _____

_____

card not stiff enough _____

_____

7b. Ask students to relate what happened under the varying conditions and to provide an explanation.

At the **advanced proficiency level**, the experiment can be expanded to include the following steps:

6c. Have students write their own conclusions.

6d. Assign a group recorder the task of collecting all the conclusions, writing down, and reporting to the group the various conclusions. Students in each group then add hypotheses and conclusions.

7c. Have each group make a report to the class. This may be structured according to a standard reporting format.

7d. Collect written group reports and return them at a later date with comments and perhaps allow for further discussion.

## Variations

A related activity would be to take an empty clear glass, turn it upside down, and push it down into a pan of water. Demonstrate that the water doesn't go in to the glass (or only slightly), because air pressure prevents it. Use similar steps as above, eliciting verbal responses and explanations from the students at the appropriate level of proficiency. Variations will, of course, depend upon whether the class is an ESL class or a mainstream class, as well as upon the nature of the specific experiment being used.

---

Lesson adapted from Patricia Chamberlain, Mary Ellen Quinn, and George Spanos

# 5. Social Studies 1

## Purpose

This strategy introduces and reviews important events, people, dates, and concepts in the social studies content area using color-coded sentence strips. By manipulating sentence fragments, the teacher can focus on both content information and language development. Examples of language development objectives may include:

- develop sentence structure and vocabulary
- review WH-questions
- promote oral language proficiency and the transition to reading/writing

## Language Level

Beginning to Intermediate

## Educational Level

Grade one or higher

## Materials

Strips of colored paper and colored cards
Colored markers
Pocket chart (optional) for visual display
Magnetic tape (optional) for display of cards/sentences on magnetic chalkboard or thumbtacks for display on bulletin board.

## The Basic Approach

This strategy involves the use of color-coded sentence strips to present content information and develop a variety of language skills.

Step 1: Prepare the following materials:

- color-coded strips with content information
- color-coded WH-question cards that correspond to specific sentence parts on the colored strips
- color-coded word cards that contain key words/phrases from the target sentences

Example:

| Cortez | went from Cuba | to Mexico | in 1519 | to look for gold. |
|---|---|---|---|---|
| blue | red | green | purple | orange |

| Who | from Where | Where | When | Why |
|---|---|---|---|---|
| blue | red | green | purple | orange |

Alternate question cards:

| What was his name? | What country was he from? | What place? |
|---|---|---|
| blue | red | green |

| What year? | What reason? |
|---|---|
| purple | orange |

Step 2: Introduce content information on "World Explorers" to students by:

a. Separating target sentences into fragments; building up sentences by taping or tacking strips to board as they are added; having students repeat or read fragments as they are added.

b. Eliciting appropriate responses to WH-questions about the contents; asking questions about each segment as it is added; **then** reviewing by asking basic questions.

c. Eliciting appropriate WH-questions to correspond with given content information; and pointing to the answer and having students supply the question.

d. Distributing question cards and word cards to students for physical response drills; having student with question card stand up and ask; **then** student with appropriate answer stand up and respond.

e. Distributing word cards to students so they can reconstruct target sentences by standing up in correct order.

Step 3: Encourage student interaction with color-coded cards and sentence strips. Have students pair up to practice with each other.

Step 4: Move from oral practice into writing activities:

a. Have students write appropriate content information or WH-question following an oral cue.

b. Have students write target sentences when given a word or phrase as an oral stimulus.

c. Have students create new sentences (following the structural pattern) when given additional content information.

## Extension

Model other similar sentences for an oral and/or written review. For example:

- Cabot went from England to America in 1497 to find a trade route.
- Cartier went from France to Canada in 1534 to find a trade route.

Ask questions: who? what country? where? when? why?

### Other Uses

This strategy could be easily adapted to other social studies units as well as other content area subjects.

---

Lesson adapted from Melissa King, Stephen Mathiessen, and Joseph Bellino

# 6. Social Studies 2

## Purpose

This strategy uses visual representations known as "semantic webs" to portray the relationships among various components of a content lesson. Presentation of content via semantic webs helps students develop the skills of organizing information and comparing/contrasting information as related to key concepts. At the same time, language development occurs through:

- vocabulary development
- practice in clarifying and describing relationships

## Language Level

Intermediate to advanced

## Educational Level

Grade 2 or higher

## Materials

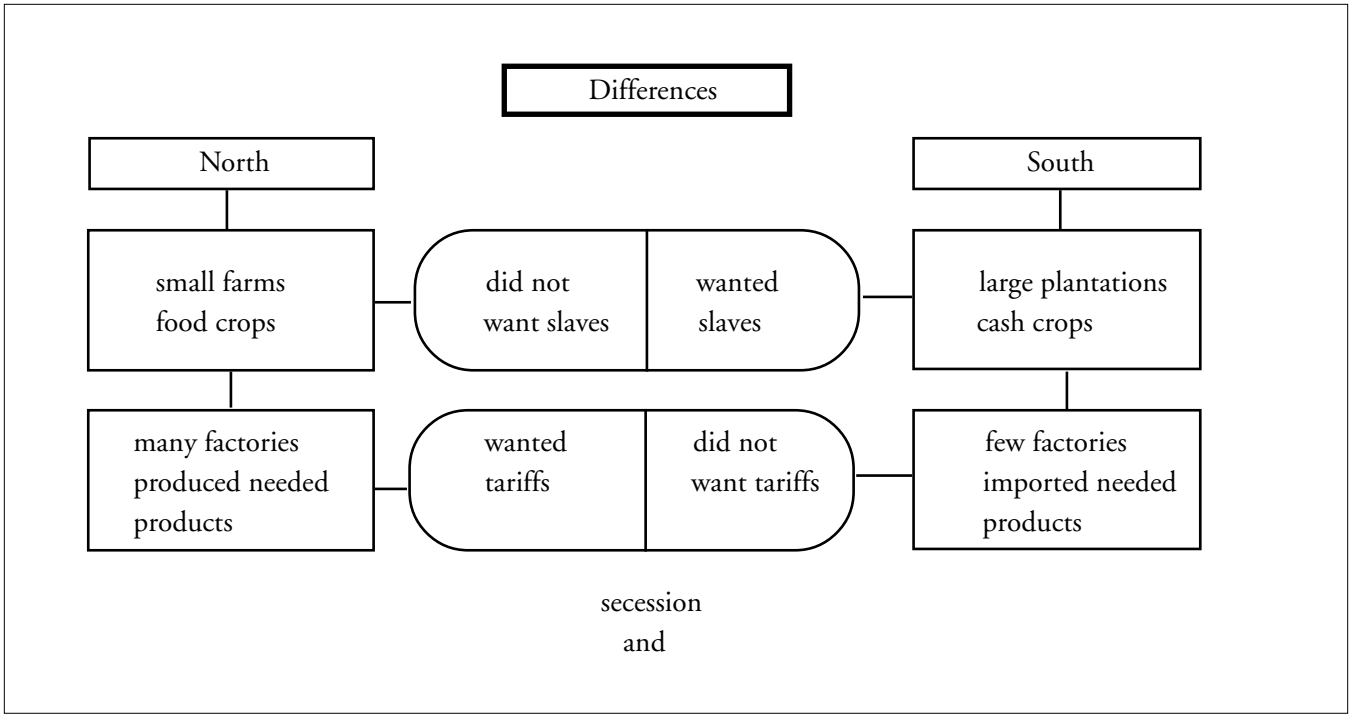
Paper and pencil
Ruler
Templates with shapes/configurations (optional)

## The Basic Approach

This strategy uses a visual scheme to represent relationships among important events, people, or other historical facts and concepts; for example, the following content focus can be considered:

DIFFERENCES between the North and the South led to disagreement over socioeconomic policies and eventually led to the secession of the Confederate states.

Step 1: Review the unit to be studied and identify key concept(s).
Determine important relationship(s) in the unit and list the target categories.



Step 2: Present this semantic web to students.

Encourage student discussion of content and concepts represented.

Ask such questions as:

- What states are in the North? in the South?
- Where are there small farms? large plantations?
- What are crops? goods? tariffs?
- Who wanted slaves but did not want tariffs?
- If appropriate to student level, ask them to generate sentences and/or a paragraph to explain relationships illustrated in the web, or to read a related text.

Step 3: Ask for elaboration of ideas represented in web. For example, ask students which major differences between the North and South led to war.

If a related reading has been assigned, present a blank web or one with gaps and ask students in groups to fill in details based on this reading.

## Other Uses

This strategy could easily be adapted to other social studies units as well as other content area subjects. It can serve as a prereading as well as a review activity. This strategy is excellent for developing pros and cons, for clarification, and for analyzing paragraphs for major ideas and supporting ideas.

# 7. Integrated Content Lesson

## The Very Hungry Caterpillar

This lesson may take two or three days. Possible break points are suggested in the text.

### Age/Grade Level

Ages 6-8
Grades 1-2

### Content Objectives

**Science:**
Identify some common foods
Recognize stages of life of a butterfly

**Social Studies:**
State and sequence days of the week

**Math:**
Sequence pictures using the numbers 1-5

**Art:**
Draw favorite foods

**Thinking:**
Sequence stages of life of a butterfly
Solve a word puzzle

### Language Objectives

**Listening/Speaking:**
Listen to a story
Respond to oral commands
Retell a story
Repeat choral parts of a story

**Reading/Writing:**
Dictate a story similar to *The Very Hungry Caterpillar* using favorite foods
Read number words (one to five)
Read/recognize days of the week

**Language structures:**
Monday, he ate..., Tuesday he ate...
First, next, then, last
Did he...?
Yes, he did. No, he didn't.

**Vocabulary:**
Review food words
Egg, caterpillar, cocoon, butterfly
first, next, then, last
ate, crawl

### Materials

*The Very Hungry Caterpillar* by Eric Carle (NY: Crowell, 1987)
picture cards of life cycle of a butterfly
vocabulary pictures of foods
magic markers, crayons, glue
word cards for days of the week
cotton ball sprayed with hair spray (optional)

## A. Motivation

1. Show students the cover of the book, *The Very Hungry Caterpillar.* Ask:
   What is this?
   If the students don't respond correctly, say,
   This is a caterpillar.
   Tell them they will make caterpillars now.

2. Have students make an accordion fold caterpillar.
   Have students color the face. Show students how to accordion fold the strip to make the caterpillar. Paste the heads on the caterpillar bodies.

Hold up your finished caterpillar and say:
   Look at my caterpillar.
   Show me your caterpillar.
   Make your caterpillar move.
   How does the caterpillar move?
   If the students don't know, say, **"He crawls."**

## B. Presentation

1. Show students the cover of *The Very Hungry Caterpillar.* Tell students this is a caterpillar, pointing to the word on the cover. Ask:
   What do you know about the caterpillar?
   Where can you see a caterpillar?
   Tell the students **caterpillars come from eggs.**

2. Show students a picture (from the picture cards) or model of an egg.
   What is this?
   (If students don't say, tell them, **"This is an egg**.")
   Ask Levels I and II (beginning):
   **Is something inside?**
   Ask Levels III and IV (intermediate):
   **What is inside?**

3. Read the title of the book. Ask students to predict what the story will be about. (Check to see if students know the word **"hungry**.")

4. Read the story *The Very Hungry Caterpillar*, showing students the pictures. When finished, ask students, **Did you guess the story? Were you right?**

5. Reread the story, encouraging students to join in chorally in the patterned parts. Use a cotton ball sprayed with hair spray (if available) to demonstrate what a cocoon looks and feels like.

6. Ask comprehension questions with **did**. Try to elicit short answers with **did** and **didn't**. Model if necessary.

   **Did he eat an apple?**

   **Did he eat a pencil?**

   **Did he eat pears?**

   Level I: Nods yes or no
   Level II: Yes or No
   Levels III, IV: Yes, he did. No, he didn't. Or number.
   Level IV: Yes, he ate....**How many did he eat?**

7. Focus on the past tense of **eat**. Point to pictures and say:

   **What does the caterpillar eat?**

   **He eats plums.**

   **What did the caterpillar eat yesterday?**

   **Yesterday, he ate plums.**

Use the pattern with some other food items (review) and have students repeat and/or create their own sentences

(continue pointing to pictures and/or use other food picture cards).

**Did the caterpillar eat bananas? pears? strawberries?**

Level I, II: Nods, says yes or no.

**What did the caterpillar eat?**

Level III, IV: He ate bananas... pears... strawberries.

**Did the caterpillar grow big?**

Level I: Nods yes

Level II: Yes.

**Why did the caterpillar grow big?**

Level III: He ate.

Level IV: He ate (a lot of ) food.

8. Point to each picture in order and say:

   **First, it's an egg.**

   **Next, it's a caterpillar.**

   **Then, it's a cocoon.**

   **Last, it's a butterfly.**

9. Repeat this procedure, having students point to each picture and repeat the sequence aloud.

   Level I: Points

   Level II: Repeats key vocabulary

   Level III, IV: Repeats sentences

(If you are using this lesson over two days, this would be a good break point. At the beginning of the next class, ask the students to retell the story briefly, reviewing the key vocabulary.)

## C. Application

1. Distribute pictures of the egg, caterpillar, cocoon, and butterfly to students. As the students respond to questions, have the students come to the front of the room and stand in the correct sequence.
   Ask:
   **Who has the butterfly?**
   **Who has the caterpillar?**
   **Who has the egg?**
   **Who has the cocoon?**

   Ask the remaining students:
   **What is first?**
   **What is next?**
   **What is next?**
   **What is last?**
   Level I: Points to correct student
   Level II, III: Says egg, caterpillar, etc.
   Level IV: First, it is an egg, etc.

2. Number five areas of the blackboard to represent the days of the week (Monday through Friday). Ask students to repeat the days of the week. Distribute word cards for Monday through Friday; ask students to place the word cards under the appropriate number on the blackboard (make sure Monday is #1).

3. Distribute to students the picture cards showing the foods the caterpillar ate. Tell students:
   **Find all the students who have the same food. Stand together.**
   (Give students time to group themselves).
   **Count the number of students in your group. Match the number of students in your group to the numbers on the board. Stand in front of the correct number or day of the week.**

Have the students retell the story by looking at their classmates. Model the first sentence:
**Monday he ate one apple.**

4. Say:
   **Who can tell me something the caterpillar ate?**
   **Do you eat...?**
   **What do you eat?**
   **What food do you like best?**

Have students draw their favorite food for the caterpillar to eat. Give students the art materials. After the pictures are complete, have students (with assistance, if necessary) label or dictate food labels or sentences for the pictures, *He ate....* Have students retell the story with their favorite foods.

## D. Review/Assessment

1. Make a ladder chart on the blackboard like this.

   Monday, he ate _____.
   Tuesday, he ate _____.
   Wednesday, he ate _____.
   Thursday, he ate _____.
   Friday, he ate _____.
   Saturday, he ate _____.
   Sunday, he ate _____.

Distribute to students picture cards showing the foods the caterpillar ate. Have students place pictures on blackboard in blanks. When the chart is complete, ask questions like:

**Did the caterpillar eat ....?**

**What did he eat first?**

**What did he eat next?**

**What did he eat last?**

Level I: Nods yes or no; points to the picture.
Level II: Says yes or no; names the food.
Level III, IV: Yes, he did. No, he didn't. He ate _____.

2. Use ladder chart to assess knowledge of numbers.

   Ask questions like:

   **Did the caterpillar eat two plums?**

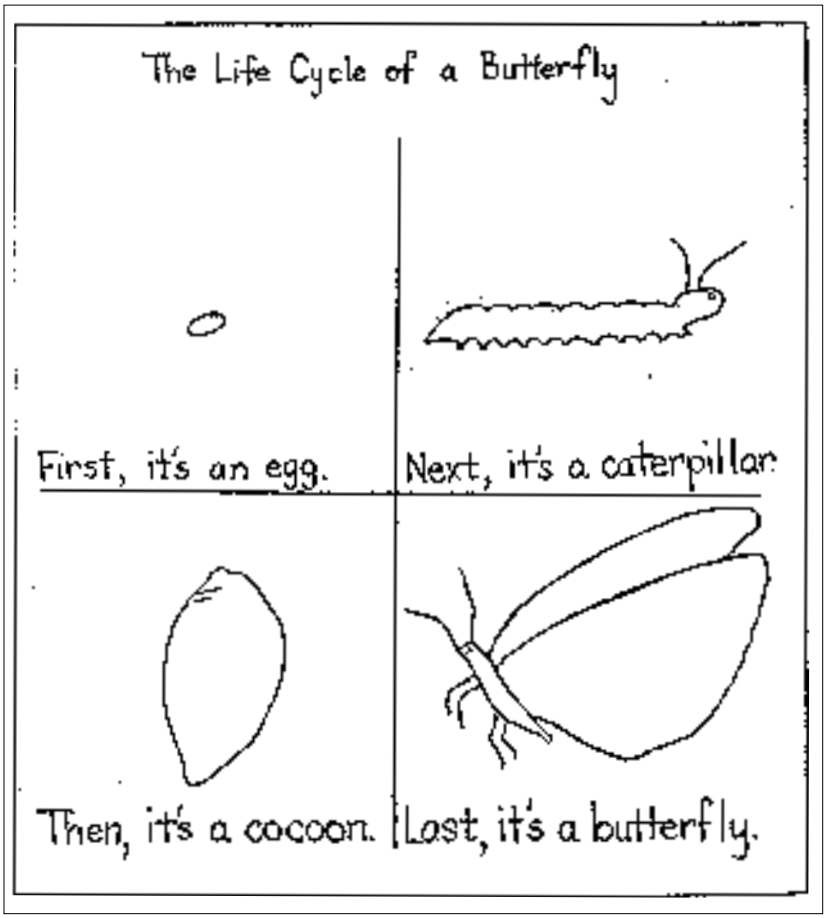
   Level I: Nods, says yes or no.

   **How many plums did the caterpillar eat?**

   Level II: Two.

   Level III, IV: He ate two plums.

3. Ask students to sequence the picture cards showing the life cycle of a butterfly.




Lesson adapted from Center for Applied Linguistics

# 8. Adapting Materials

Sometimes, written materials need to be adapted before students can comprehend them. If you are the ESL teacher, make sure to collaborate with your content colleagues to identify the language and/or academic difficulties that particular subjects or courses may present for the migrant students. Make sure each paragraph begins with a topic sentence to help students orient to the subject matter. Use shorter paragraphs that eliminate relative clauses, and the passive voice, if possible. Replace potentially ambiguous pronouns, ("it," "he/she") with the noun to which they refer ("Plymouth Rock," "Mr. Mustard"). Below are some guidelines for rewriting and adapting, as well as one social studies and one science adaptation.

- Put the topic sentence first, with supporting detail in the following sentences.
- Reduce the number of words in a sentence and the number of sentences in a paragraph.
- Consider word order. There is no need to be fancy with the position of clauses and phrases. Use the subject-verb-object pattern for most sentences.
- Simplify the vocabulary that will be used, but retain the key concepts and technical terms.
- Do not use a lot of synonyms in the body of the text.
- Introduce new vocabulary with clear definitions and repeat those new words as frequently as possible within the text passage. Try to help students connect new vocabulary with known vocabulary.
- Use the simpler verb tenses such as the present, simple past, and simple future.
- Use imperatives in materials that require following directions, such as a laboratory assignment.
- Write in the active voice, not the passive. For example, instead of writing "*The Declaration of Independence* was signed by John Hancock," write, "John Hancock signed *The Declaration of Independence."*
- Use pronouns judiciously, only in cases where their antecedents are obvious.
- Be careful with indefinite words like "it," "there," and "that" at the beginning of sentences. Instead of writing "There are many children working on computers," simply write, "Many children are working on computers."
- Eliminate relative clauses with "who," "which," or "whom" wherever possible. Make the clause into a separate sentence.
- Minimize the use of negatives, especially in test questions (e.g., "Which of the following is *not* an example of ..."). If negation is necessary, use the negative with verbs (e.g., *don't go*), rather than negations like *no longer* or *hardly.*
- Preserve the features of the text that convey meaning. For example, it is important to familiarize the students with sequence markers (e.g., *first, second*), transition words (*e.g., although, however*), and prioritizing terms (*e.g., most important*), since they need to learn how to recognize and use them. The degree of sophistication for these features, however, should reflect the students' language proficiency.

# 9. Sample Adaptations

## A. Upper Elementary Social Studies

The following is an original passage from *United States History 1600-1987* (INS, 1987: 6).

### Virginia

The first permanent colony was Jamestown, Virginia (1607). These colonists came from England to try to make money by trading with Europe. They believed they would find gold and silver as the Spanish had found in South America, and then they would be rich. When they got to Jamestown, most of the men tried to find gold. They did not want to do the difficult jobs of building, planting food crops, and cutting firewood. One of the colonists, John Smith, saw how dangerous this could be. He took charge and made everyone work to survive. He is remembered for his good practical leadership. Still, less than half of the colonists survived the first few years. Only new settlers and supplies from England made it possible for the colony to survive. The discovery of tobacco as a cash crop to be traded in Europe guaranteed that the colony would do well.

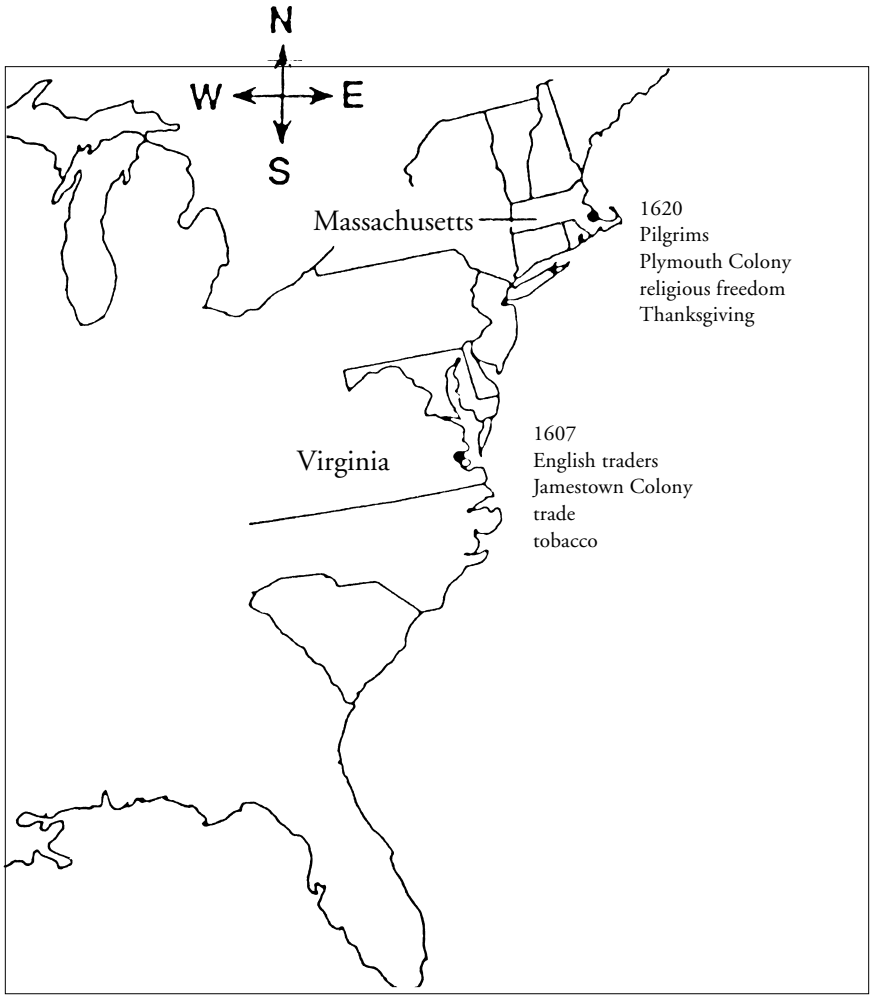
---

The adaptation of the above passage was developed for advanced beginner/low intermediate-level LEP students.

### Massachusetts

Many of the colonists came to America to try to find religious freedom. The Catholics had troubles in England and other parts of Europe. The rulers of these countries told their citizens that they must go to a specific church and worship in a certain way. Some people believed differently than their rulers and wanted to have their own churches. The first group to come to America for religious freedom was the Pilgrims in 1620. They sailed across the ocean in the *Mayflower* and landed at Plymouth, Massachusetts. Before landing at Plymouth, the Pilgrims agreed on the government they wanted. The agreement was called the Mayflower Compact. It had two important principles:

- the people would vote about the government and laws; and
- the people would accept whatever the majority chose.




**The First Two Colonies**

This map shows the first two permanent English colonies in North America.

This layout, using a map and organizing the information about each colony in a comparable manner, offers the LEP students access to the pertinent details of the passage. The map places the colony names in context. The inclusion of the compass symbol can lead to a class activity on map skills.

Both a language and a social studies teacher could use this adaptation in the classroom. The language teacher may ask students to use the information to write sentences comparing the two colonies or may encourage predictions about the seasons according to the different latitudes of the colonies. The social studies teacher may expand on this material by having groups of students research one of the colonies in more detail. Since the students will have already been presented with this background information, they have a schema upon which to add and link more facts and impressions.

## B. Using Outlines

The outline can be used by a language or a content teacher in a pre-reading activity. Students may be asked to discuss their knowledge of fossils first. Then the information they discuss could be referred to as the class reviews the outline. The pictorial adaptation can help explain key vocabulary. It also organizes the fossil sources into two categories—water and land. After a class discussion, the students may be asked to read the original passage.

The outline is a useful model for teaching study skills and students will become familiar with it if outlines are used regularly. As a post-reading activity, a teacher may ask students to create their own outline. This process should be introduced slowly. For example, the teacher may provide a partially completed outline the first time and ask students to finish it. The next time, students may work in pairs or small groups to create an outline. At a later date, students might write an outline on their own.

## C. Elementary Science

The following is an original passage from *Science 3* (Scott, Foresman, 1986: 129).

### Do You Know?

### Some Buildings Contain Fossils

Buildings made of limestone or marble might contain fossils. You might find fossils in rock cut to make space for new houses. When a road is cut through a hill of rock, fossils can sometimes be found. Broken pieces of rock and stone that you find on the ground might contain fossils. You might also find fossils if you walk along a stream, a river, a lake, or an ocean.

If you go fossil hunting, like the people in the picture, watch for shapes that look like pieces of plants, animals, or shells. These shapes were formed from animals or plants that once were alive. You might even find the shape of an animal's footprints as a fossil. But you will probably not find many complete fossils. They get broken in the earth over time.

What can you do if you find fossils, such as those in the picture? First, record the place where you found your fossils. Then, find out the names of your fossils. You might find a book which will help you label the fossils that you find.

In some parts of the country, fossils are very common. If you observe carefully, you might find fossils that can help you learn how some animals and plants might have looked years ago.

The adaptation that follows is designed for third and fourth graders. It shows an outline of the original passage and a pictorial representation.

**Fossils**

I. Types of Fossils

A. Plants
B. Animals
C. Shells

II. Places where fossils are found

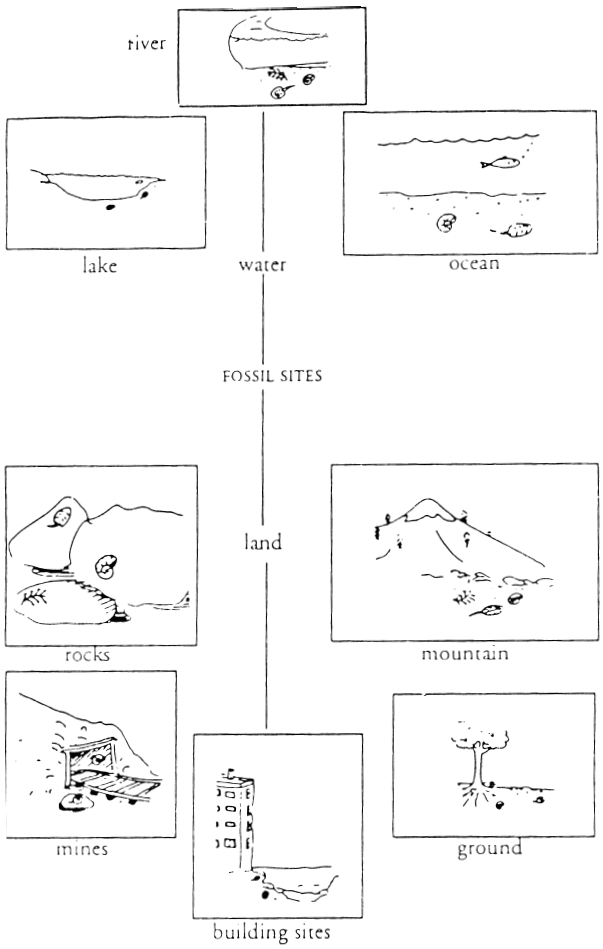
A. Water
1. streams
2. rivers
3. lakes
4. oceans

B. Land
1. rocks
2. fields
3. mines
4. building sites

III. Ways to identify types of fossils

A. Record the place you find a fossil
B. Look in reference and library books
C. Take fossil to a museum

WHERE FOSSILS ARE FOUND




## References


Chamot, Anna Uhl and O'Malley, Michael J. (1987). The Cognitive Academic Language Learning Approach: A Bridge to the Mainstream. ***TESOL Quarterly,*** 21 (2), 227-249.

Crandall, Jo Ann. (Ed.) (1987). ESL Through Content Area Instruction: Mathematics, Science, Social Studies. Washington, DC: Center for Applied Linguistics.

Crandall, Jo Ann. (1987). Integrating Language and Content Instruction for Language Minority Students-Teacher Resource Guidelines (No. 4). National Clearinghouse for Bilingual Education.

Cummins, Jim. (1979). Linguistic Interdependence and Educational Development of Bilingual Children. *Review of Educational Research*, *49*(2), 222-251.

Short, Deborah J. (1991). How to Integrate Language and Content Instruction. Washington, DC: Center for Applied Linguistics.