

# Remodeled Lessons: 4-6

The following links provide examples of remodeled lessons found in *The Critical Thinking Handbook: 4th - 6th Grades*.

The basic idea behind lesson plan remodeling as a strategy for staff development in critical thinking is simple. Every practicing teacher works daily with lesson plans of one kind or another. To remodel lesson plans is to critique one or more lesson plans and formulate one or more new lesson plans based on that critical process.

To help teachers generalize from specific remodeling moves, and so facilitate their grasp of strong sense critical thinking and how it can be taught, we have devised a list of teaching strategies, which are outlined in *Strategy List: 35 Dimensions of Critical Thought*. Each strategy highlights an aspect of critical thought. Each use of it illustrates how that aspect can be encouraged in students.

Complete remodeled lessons have three major components:

- 1)** an "Original Lesson", or statement of the "Standard Approach" (which describes the topic and how it is covered, including questions and activities);
- 2)** the "Critique" (which describes the significance of the topic and its value for the educated thinker, evaluates the original, and provides a general idea of how the lesson can be remodeled);
- 3)** "Remodeled Lesson" (which describes the new lesson, gives questions to be posed to students and student activities, and cites the critical thinking strategies by number).

The strategy number generally follows the questions or activities it represents. Complete remodel sets also include a list of "Objectives" which integrate the objectives of the original with the critical thinking goals; and the list of critical thinking "Strategies" applied in the remodel (listed in order of first appearance).

- [Writing Haiku](#)
  - [Myths](#)
  - [Sojourner Truth](#)
  - [Language](#)
  - [The Rise of Nations](#)
  - [Making Models: The Atom](#)
  - [Rubber Bands](#)
  - [The Human Skeleton](#)
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# Writing Haiku

## *Objectives of the Remodeled Lesson*

### **The Students Will:**

- explore the thoughts and feelings of another culture through critical reading of Haiku
- practice creative thinking and writing

Groundwork for the study of haiku poetry should begin with an understanding of the Japanese culture and the exploration of the underlying purposes of the poetry. Appreciation for another culture may be accomplished through the visit of a foreign exchange student, a film on current Japanese life, and a study of oriental art, especially with respect to nature. Students could research Haiku, Japan, and Japanese (and other Asian art) in dictionaries, art books, and encyclopedias, and read more examples of haiku in library books.

This overview of Japanese culture should discourage stereotypes and heighten the students' understanding of the people, their daily lives, and their art. With this background, the empathy of the students will develop so that the exploration of thoughts underlying feelings will naturally flow into the creativeness of haiku. S-17

During the discussion of the poetry, questions should be asked about the authors and how they felt and thought when writing the poems, and why they chose to express their feelings with poetry. Some study of Japanese literature may benefit the students' understanding of the authors' feelings. A background in other nature poems would contrast and give insight into the depths of feelings and ideas expressed in poetry. S-4

Students could evaluate the poems they read. "What do you think of this poem? How does it make you feel? What do you suppose the author was thinking and feeling? Why was it written? Is it well written? Do you like some of these more than others? Which? Why?" S-17

After the students have discussed the culture, the feelings of the authors, and their own responses to the poetry, brainstorming sessions may bring out ideas about nature and an awareness of how other students may express their thoughts through haiku. It is understood that the mechanics of haiku poetry have been taught during appropriate intervals. The instruction may fit in naturally in the discussion concerning other poetic forms and the teacher may draw attention to the number of syllables with questions about the students' comparison between the nature poetry and the haiku poems. During the brainstorming sessions, feelings may be identified through the use of colorful words

and their synonyms. Descriptive phrases may be listed around a central idea and synonyms substituted to balance the poetry with the correct number of syllables.

Thus, the students are well prepared to develop their rough drafts and then to revise and rewrite their haiku poems in an atmosphere loaded with expressed thoughts and rich cultural understanding.

### *Critique*

This lesson missed the opportunity to explore the cultural background of haiku poetry. The teacher is the main investigator and disseminator of information. It is the teacher's responsibility to research the facts and to give the information to the students. There is no attempt to contrast other poetic styles and little to guide the students' thought into creative imagination. Groundwork for the study of haiku is negligible with the exception of a previous lesson on synonyms. The students need to have an enriching, valuable personal experience of exploring the Japanese culture and thereby understanding the underlying purpose and background of haiku poetry. Although the basic facts are introduced in the lesson on haiku, other factors need to be established, such as the quality of emotions and how the feelings may be expressed most effectively. These feelings may be explored through the thoughts of the Japanese authors.

Students are asked to write rough drafts after viewing several poems correctly written, a beginning poem with one line, and two poems with an incorrect number of syllables. After reading aloud the first poems, finishing the one poem, and correcting the last poems, students were assigned haiku poetry on the seasons. At this point, discussion on background the students need, would be appropriate. That is, not only synonyms, syllables, and such, but the emotions, feelings, and thoughts of these would-be writers should be explored. The students would have a more complete understanding of not only the mechanics, but of their thoughts and feelings and how to best express them through haiku.

### *Strategies Used to Remodel*

These refer to subsections of *Strategy List: 35 Dimensions of Critical Thought*.

- S-21 reading critically: clarifying or critiquing texts
- S-17 questioning deeply: raising and pursuing root or significant questions
- S-4 exploring thoughts underlying feelings and feelings underlying thoughts

Groundwork for the study of haiku poetry should begin with an understanding of the Japanese culture and the exploration of the underlying purposes of the poetry. Appreciation for another culture may be accomplished through the visit of a foreign exchange student, a film on current Japanese life, and a study of oriental art, especially with respect to nature. Students could research Haiku, Japan, and Japanese (and other Asian art) in dictionaries, art books, and encyclopedias, and read more examples of haiku in library books. This overview of Japanese culture should discourage stereotypes

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Thus, the students are well prepared to develop their rough drafts and then to revise and rewrite their haiku poems in an atmosphere loaded with expressed thoughts and rich cultural understanding

## **Myths**

### *Objectives of the Remodeled Lesson*

#### **The Students Will:**

- deeply question the meaning of a particular myth

- discuss the literal meaning of the myth
- apply their understanding of the myth they have studied to myths of other cultures

### *Original Lesson Plan*

Skills Unit 31 focuses on myth and legend recognition. The children are directed to read a story about why Ra-wen-io, maker of all things on earth, gave Rabbit long back legs and long ears and why he gave Owl a short neck and big eyes. Upon finishing the story, children are asked to answer factual questions about the story and to consider the definition of 'myth' and 'legend'. They are then asked to read a Hawaiian story about Pele and how she became goddess of volcanoes. Again, factual questions are asked. In addition, children are asked to identify the story as myth or legend. The unit concludes with a lesson on legend identification.

### *Critique*

I will focus on the myth aspect of the lesson. Even though many sixth graders would be unable to recite definitions of 'myth' and 'legend' and identify a given story as one or the other, they have long been acquainted with myths and legends. Certainly, it is important that children have the language of literature and be able to recognize different forms of literature, but that is not enough. Skills Unit 31 has for its main task myth recognition, but it fails to consider the worthier task of myth and its relationship to reality, seen and unseen.

In the section titled "Introducing the Skill Lesson," the teacher is told the scope of the lesson and what to say and do:

"Read the title. Explain that in this lesson pupils will read about two very old types of literature - the myth and the legend. The lesson will help them understand the difference between the two and will help them recognize each when they read or hear such tales."

Such is the scope of the lesson. Not only does it fail to encourage critical thinking in the student, but it likewise discourages the teacher from thinking critically. Neither teacher nor student is called upon to become actively involved in this lesson; rather they are told to do trite, uninteresting tasks.

After reading the first myth, the children read the following in their text:

"The story you have just read is an American Indian myth. A myth is a very old story handed down among people. It may be about some gods or goddesses. It often explains something about nature, such as why there is thunder and lightning."

The children have been given a definition of 'myth'; they are not encouraged to explore for themselves the meaning of myth, an exercise more valuable because it engages their curiosity and taps their desire to know and understand. The lesson continues, and

children read another story about gods and goddesses, after which they are asked to identify the story as legend or myth, a task which children complete successfully as the definition of myth in the text uses the key words, gods and goddesses. Thus, the lesson of myths is completed without ever having explored myth and its meaning.

### ***Strategies Used to Remodel***

These refer to subsections of *Strategy List: 35 Dimensions of Critical Thought*.

- S-17 questioning deeply: raising and pursuing root or significant questions
- S-35 exploring implications and consequences
- S-14 clarifying and analyzing the meanings of words or phrases
- S-11 comparing analogous situations: transferring insights to new contexts
- S-9 developing confidence in reason
- S-23 making interdisciplinary connections

The remodeled lesson, by having students discuss root questions, would explore myth and its meaning. Instead of defining 'myth' for the children and having them apply that definition to stories they read, I would begin by telling them that they are going to read an Indian myth.

A discussion of the Indian myth in particular and of myth in general would follow. "What part of the myth seems unbelievable? Does the myth deal with reality? What reality does the myth explain? What are the obvious, seen realities that the myth explains and the less obvious but unseen realities that the myth implies? S-35 Why does the myth describe a creator and creatures? How is that relationship developed through the actions of Ra-wen-io, Rabbit, and Owl, and what is implied about their relationships? What is the point of this story? Do myths reveal reality as it is or as a society perceives it to be? Why do people tell myths? What do myths reveal about the tellers of myths and their beliefs?" The lesson would be extended over a period of time during which myths from other cultures would be read, discussed, and compared.

"How do the details of myths differ? Why do they differ? Are myths alike in any way? How? Why? How do myths compare to other kinds of stories? Why are myths an important part of the literature of many cultures?" S-14

The lesson would conclude with a written essay in which the children would be asked to compare and contrast two myths, one which had been discussed in class and one which they would read for the first time. S-11

**Editor's note:** After exploring the deeper meanings of myths, students could critique the superficial explanation in their text. "What does the text say myths are about, or what they are for? What did we say? What aspects of myths or what meaning do myths have that your text fails to mention? Why?" S-9 Students could read myths from other cultures they have studied, and discuss them. "What were their myths like? What do they tell us about those people, their lives, their culture?" S-23 Students could also

examine the personalities and characteristics of animals in myths, and compare them to their impressions of those animals and what zoologists know of their behavior. S-23

## Sojourner Truth

### *Objectives of the Remodeled Lesson*

#### **The Students Will:**

- understand Sojourner Truth's message in "Ain't I a Woman" by exploring thoughts underlying feelings, clarifying issues and claims, making inferences, and integrating critical vocabulary
- appreciate her personal qualities
- evaluate arguments in "Ain't I a Woman," supplying evidence for conclusions
- identify society's double standards, inconsistency, racism, and sexism as revealed in "Ain't I a Woman"
- Socratically explore inconsistencies and double standards in personal thought and behavior
- recognize the speech's dramatic and expressive qualities

### *Abstract*

Students read that Sojourner Truth gave a speech to the women's rights convention in Akron, Ohio. As men tried to shout her down, she went to the platform and said, That man over there says that women need to be helped into carriages and lifted over ditches, and to have the best place wherever. Nobody ever helps me into carriages or over mud puddles, or gives me any best place. And ain't I a woman? Look at me! I have ploughed and planted and gathered into barns and no man could head [do better than] me. And ain't I a woman? I could work as much and eat as much as a man - when I could get it - and bear the lash [whip] as well. And ain't I a woman? I have borne thirteen children and seen most all sold off to slavery, and when I cried out with my mother's grief, none but Jesus heard me. And ain't I a woman?...

Students are asked the following questions: a. About what two groups of people was Sojourner Truth speaking? (Blacks and women) b. What work did she do that men did? (Plowed, planted, and gathered crops) c. What could she do equal to a man? (Work, eat, and suffer punishment) d. What special sadness did Sojourner Truth have to bear because she was a black woman? (Her children were sold from her.) e. Why did she keep repeating the phrase, "And ain't I a woman?" (Answers will vary. Pupils may say to dramatize her speech, to emphasize women's abilities, to plead for women's rights.)

[From *The United States and Its Neighbors*, Timothy M. Helmus, Val E. Arnsdorf, Edgar A Toppin, and Norman J. G. Pounds. © 1984 by Silver Burdett Co. pp. 142-143.]

### ***Critique***

We chose this passage in part because it is representative of vignettes about famous people which are included within a lesson. This one, shorter than many, has little biographical information, though the text suggests Sojourner Truth as a subject for a biographical report. Too often texts gloss over stories of injustice and inhumanity; this piece is a laudable exception.

Even this short segment presents opportunities for understanding Sojourner Truth as a remarkable individual with a powerful message and an effective way of dramatizing it. The text, however, misses all opportunities by choosing to dissect the excerpt principally in terms of its factual data. Most of the questions ask students to pull information out of the speech and repeat it. In emphasizing questions such as "What work did she do that men did?" (questions a-d), the text entirely misses the important message and social criticism of the speech.

Questions such as this simply function to disassemble the speech into its parts and put them back together in chronological order. If supplementary biographical information were provided, the speech could more easily be considered on its own terms for the human qualities and important messages it expresses. In order to understand these things, students must do more than repeat information; they must infer meaning.

The text also fails to recognize the speech's dramatic and literary power, and its portrayal of Sojourner Truth as a passionate, courageous, multi-dimensional person. The text lists the recall questions under the heading, "Understanding Primary Sources." This is a useful skill, when understanding is achieved.

Here, however, students are simply asked to decode a primary source. Oddly enough, the only question out of five (question e) that might lead to a significant understanding of one aspect of the speech, ignores its passion and energy. In the teacher's notes about the answer, no allusion is made to the anguish Sojourner Truth felt at the injustices directed toward herself and all African-American women of the time, or the inconsistency between belief in women's delicacy and treatment of African-American women.

One of the important attributes of critical thinkers is the willingness to look at inconsistencies in their own thought, and discrepancies between their words and actions. Our thinking is often characterized by quite unconscious categories to which we apply different standards. That is, we treat our friends one way and family members another way, and we treat members of other racial, religious, ethnic, or social groups differently from members of our own.



Critical thinkers search for these categories and inconsistencies in their own thinking and behavior, evaluate them, and adjust accordingly. The speech, "Ain't I a Woman," provides an excellent model which reveals these sorts of thinking patterns, decries the inequities they create, and invites self-examination in the name of justice.

### ***Strategies Used to Remodel***

These refer to subsections of *Strategy List: 35 Dimensions of Critical Thought*.

- S-4 exploring thoughts underlying feelings and feelings underlying thoughts
- S-28 thinking precisely about thinking: using critical vocabulary
- S-20 analyzing or evaluating actions or policies
- S-27 comparing and contrasting ideals with actual practice
- S-7 developing intellectual good faith or integrity
- S-24 practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives
- S-13 clarifying issues, conclusions, or beliefs
- S-32 making plausible inferences, predictions, or interpretations
- S-18 analyzing or evaluating arguments, interpretations, beliefs, or theories
- S-23 making interdisciplinary connections

For our remodel, we have used the speech, "Ain't I a Woman," and have built a lesson around it emphasizing its message, what it tells us about Sojourner Truth as a person, its effectiveness as a dramatic piece, and one application students might make of it in their own lives. We have basically set aside the questions the textbook suggests.

#### ***1) The Messages of "Ain't I a Woman"***

In order to provide a context for understanding the excerpt from "Ain't I a Woman", the teacher could begin by assigning Sojourner Truth as a subject for a biographical report. After the presentation to the class, have students read the introduction and speech. You could then ask students what feelings they experienced as they read the speech. For example, "What did you think? What did you feel? Why? What do you think she was feeling as she spoke? How can you tell? Why did she feel this way?" S-4

You might guide this discussion to help students understand the theme of inconsistency or double standards in treatment of people based on race. Here are some sample questions: What words mean "saying one thing and doing something different"? (hypocrisy, inconsistency, double standard) What inconsistency or double standard was Sojourner Truth pointing out in her speech? (The treatment of white women vs. African-American women) What word do we use to describe when people are treated inconsistently because of the color of their skin? (Racism) Can you think of any other examples of this double standard of treatment based on race? S-28 What's wrong with double standards or inconsistency in the treatment of people? S-20 Have you ever experienced inconsistency in the way you were treated? How did you feel? Are we ever inconsistent in our treatment of others? How? S-27 How do people feel when they are

treated this way? Do we always know when we're applying double standards? What might help us to know? S-7 What might the people she was talking about have said in answer to her? How was the double standard Sojourner Truth talked about hidden or disguised in words? What did the word 'woman' mean to the men she was talking to? What did it mean to her? S-24

When students seem ready, you could develop the speech's theme of women's role with questions such as: What image of women was she criticizing? S-13 Do you think women then liked being thought of as helpless? Why or why not? Why might being thought of as helpless frustrate a person? What might be good about it? What does Sojourner Truth say about society's view of women? S-32 (The romantic ideal of women was false.) What proof does she offer that these ideas are false? Was she right? S-18 What did she want to change?

### **2) *Sojourner Truth as a Person* S-32**

The class could also discuss the following questions: What kind of woman was Sojourner Truth? How do you know? How strongly did she believe in what she was saying? How do you know? Do you understand how she felt about these issues? Paraphrase her feelings. Paraphrase her message. Do you think the way she expressed herself helped her message or hindered it? Why?

### **3) *"Ain't I a Woman" as a Dramatic, Expressive Piece* S-23**

A speech such as this provides an excellent opportunity for interdisciplinary work. The teacher could initiate a discussion of why the speech was (or wasn't) effective, from a poetic or dramatic point of view. Ask, "Was this a good speech? Why or why not? What do you think about the use of the word 'ain't'? Does it help her get her point across, or distract? Would the speech be improved by substituting 'Am I not?' How do her examples help her get her point across? Why doesn't she simply say that she doesn't get a cold if she sits in a draft, and doesn't care if her feet get wet, or that women aren't delicate? Why didn't she just say, "You keep talking about women, but you mean "white women," what about all women?" What effect would that have had? What effect did her words have?"

## **Language**

### ***Objectives of the Remodeled Lesson***

#### **The Students Will:**

- clarify the concepts, 'communication' and 'language,' and clarify the text's use of these words
- understand some advantages of verbal over non-verbal communication, supporting conclusions with evidence
- infer some advantages and disadvantages of using symbols
- understand language as a human system and situate particular languages within that system
- develop awareness of and tolerance for diversity in language (dialects, accents, archaic forms), thereby thinking fairmindedly
- engage in Socratic discussion to discover and develop their own thinking about language

### ***Abstract***

This lesson on language occurs in a unit on culture. In the first two paragraphs, students read that the previously blank page was changed by having words printed on it; that "human culture is printed on the natural system"; that human culture helps us meet our needs. The student text introduces the term 'communicate'. Students discuss gestures and symbols as forms of communication. The teachers' notes foster the insight that for communication to take place, both sender and receiver must understand the gestures and symbols. Advantages of maps and universal symbols are suggested. Human and animal communication are compared. The text mentions the use of "human language" to communicate facts, information, preferences, values, feelings, ideas, and beliefs (such as, "I think it's wrong to litter."). It also stresses how language enables us to speak of the past and the future, as well as how the written word helps us preserve human experience. Students name feelings of pictured people (happiness, fear, anger, etc.), discuss things they feel strongly about, and identify the needs that specific examples of communication help meet. [From *Planet Earth*, James M. Oswald. © 1976 by Houghton Mifflin. pp. T80-87.]

### ***Critique***

#### **Focusing the Goal**

We chose this lesson because it deals with an important topic which seems to present some organizational and conceptual problems for the textbook writers. The lesson contains some important material and some good, creative suggestions for student activities. However, it suffers from lack of logical cohesion, fragmentation, and confusion in terminology. "The fact/opinion distinction" underlies this lesson. One of the main problems is that the lesson tries to combine and link up very tenuously related goals.

The teacher's notes identify some of the goals as, "Conceptualize language, by giving examples of the sounds, symbols, and gestures people use to communicate... Demonstrate tolerance of diversity by investigating food preferences and pointing out that people's likes and dislikes vary." If the authors felt the need to include a discussion on tolerance, why not use tolerance for other languages, dialects, accents, etc. as the

focus? Another stated goal is, "Demonstrate self-awareness by expressing her or his feelings in response to certain situations or objects."

Here again, the focus is deflected from language to feelings - quite another topic. The last listed goal, "Cite evidence to support the hypothesis that humans use language to meet their needs." seems like an attempt to unite the very fragmented preceding goals, but in fact only baffles the reader and trivializes the subject of language.

It is important for critical thinkers to be able to recognize systems of thinking within which they operate mentally, and to step back and examine how those systems operate, how they compare to similar systems, and what their role is in influencing thought and behavior.

This lesson points in the right direction by inviting students to examine language as such a system, identifying its important features, comparing it to other systems of communication, etc. It shows weakness by not clearly delineating and distinguishing aspects of the system (conceptual problems) and by digressing from considering language as a system to discussing some of the subjects of language (food preferences, feelings).

In the remodel, we hope to show how, by clarifying key concepts, eliminating extraneous material, and extending discussion through Socratic questioning, the lesson can be made to foster some of the goals of critical thinking.

### **Clarifying Terms, Correcting Misconceptions, Maintaining Focus**

Given the illogical mix of goals, it is not surprising that the first two paragraphs of the student text are confusing and directionless. At this stage it is enough to simply say that language is an important aspect of culture, and then directly address the topic of language itself.

A second problem arises in that, although the text says that "language is human communication", it keeps using the redundancy 'human language', (by its definition, "human human communication"). We suggest using the distinction between verbal and non-verbal communication (mentioned in the last section of notes to the teacher), to help organize the lesson content in clear categories. Gesture, expression, and body language could then be seen as aspects of non-verbal communication, written and spoken language as aspects of verbal communication (language proper). Symbols could be discussed as a bridge between verbal and non-verbal communication.

We advise dropping the parts of the lesson that wrest the focus away from language and center instead on feelings, preferences and needs. Instead, we suggest that you emphasize the range of possibilities of expression that language offers, thus keeping the attention on language.

Although it is alluded to, the precision and efficiency of language in expressing oneself are not sufficiently clarified and stressed. The only differences between human and animal communication mentioned in the text are, 1) people have more choice about how they can communicate something, 2) people, unlike animals, can also talk about the past and future.

The lesson veers off course in another instance (p. 47) by asking students, "Where do you get information about movies that are playing? About the weather? About holidays? etc." This is now a lesson on reference skills rather than language. The lesson fosters a common misconception about the relationship of language and symbol on p. 45. The text states, "The symbols you probably know best are numbers and letters.

Letters are put together to make words. And words are grouped together to make sentences. The sounds, gestures, and symbols that people use make up language." This scenario implies that language is constructed from letters and words, when, in fact, oral language preceded the written symbols by millennia. The primacy of oral expression is not only ignored, but implicitly denied.

### **Extending the Lesson**

The text wisely emphasizes that both sender and receiver must have a common system of communication to achieve mutual understanding. The student text then mentions that international symbols (such as those common at airports) are useful when people don't speak the same language. This is fine as far as it goes, but the possibility of learning other languages is never mentioned.

There is excellent potential here to discuss different languages, how they are constructed, how they are not word for word structural equivalents of ours, how they reflect and enhance a particular culture, how they influence each other, etc. It would be an excellent opportunity to help students identify ethnocentric notions they hold about language, and to move beyond them.

The question of tolerance would fit nicely here. It would also be an opportune moment to discuss regional or ethnic dialects; how they arose, how they meet the needs of their speakers, how they enrich the "standard" dialect, etc. A sense of various points of view and perspectives could be incorporated into this discussion, including a consideration of language prejudice and conflict.

On p. T85, students are directed to identify feelings and possible reasons for those feelings by looking at some pictures. This is a good way to illustrate how facial expression communicates, but there is no emphasis on how interpretation of such communication is very general. One cannot learn much from looking at expressions in pictures. This activity could be a good introduction to discussing the advantages of words to express more precisely and completely what we are thinking, feeling, experiencing.

An advantage of the written language that is hinted at but not made explicit, is in the section on Erasmus. All that is conveyed by the text is that written language extends forward into time. The implications of that very important fact are not explored at all. The notes to the teacher on p. T87 likewise introduce an important concept only to let it drop immediately. "Language is not only a part of culture; in some ways it shapes culture." How does it shape culture? Students will not understand this unless it is discussed and made clear and concrete.

### ***Strategies Used to Remodel***

These refer to subsections of *Strategy List: 35 Dimensions of Critical Thought*.

- S-24 practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives
- S-14 clarifying and analyzing the meanings of words or phrases
- S-21 reading critically: clarifying or critiquing texts
- S-32 making plausible inferences, predictions, or interpretations
- S-5 developing intellectual humility and suspending judgment
- S-10 refining generalizations and avoiding oversimplifications
- S-23 making interdisciplinary connections
- S-3 exercising fairmindedness

The original lesson has three principal parts: 1) Introduction of key vocabulary and concepts, 2) Identification of some characteristics and advantages of human communication (language) and 3) Consideration of some of the subjects' language can talk about (food preferences, feelings) and how these capabilities help us meet our needs. Our remodel begins with an optional lead-in, a Socratic discussion of 'language'. Then incorporates the first two parts of the original, drops the third, and finally provides a section suggesting several alternatives for broadening and extending the lesson.

#### ***1) Optional Socratic Discussion/Lead-In S-24***

One way to begin the study of language would be to initiate a Socratic discussion of the topic with questions such as: How did I learn my language? What is language like? Do animals have language? How is human language different from animal communication? What is language for? What makes language work? How do I know when it's working or not working? Why doesn't everyone speak the same language? Where did language come from? Can I think without language?" These and questions like them can be extended as interest warrants. The primary purpose of this type of introduction is to help students to see language as a whole, a system, and their own language as one of many manifestations of that system.

#### ***2) Introduction of Key Vocabulary and Concepts***

One possibility for beginning this phase of the lesson is to discuss the meaning of the term 'communication'. (p. 44, paragraph 3, "the way we send and get messages.") You



might use the suggested activity on page T81, paragraphs 1 and 2, to emphasize the importance of comprehension in communication. You could help students to clarify further by asking, "Can animals communicate? How do they communicate? S-14 (If students don't mention them, share the examples of honey bees and dolphins on p. T87, or other examples you can provide.) In what ways do human beings communicate? About what do humans communicate? How does human communication differ from animal communication?" At this point, you could introduce the term 'language' and distinguish it from 'communication' by saying that it refers to spoken and written words. It is what we refer to as 'verbal communication'. The other ways of communicating are called 'non-verbal'. To have students clarify the way in which the text uses the word 'language', have them clarify in what way 'language' is used each time it occurs throughout the lesson. S-21

It would be appropriate to incorporate the activities suggested on p. T82, paragraph 4, here. (Identify the symbols on student text p. 45, name some other symbols they know, make up original symbols, discuss and improve on them, and note their limitations.) If you choose not to do this, you might ask, "In what circumstances would symbols be especially useful? What are some limitations symbols have?" Discuss the section on symbols by emphasizing that they are based on words and concepts. Have students read p. 45 and ask, "In our language, what do letters represent? What do words represent? What about sentences? Which do you suppose came first, symbols or spoken language? Explain your reasons." S-32 Emphasize that the symbols all represent the spoken language, which preceded them.

### **3) Characteristics and Advantages of Language**

At this point, you might talk about some of the things language can do that non-verbal communication can't do as well. You could ask students what they think some of those advantages might be. As they read pp. 46-49 they could list the advantages on the board. (We suggest dropping all the information on feelings, food preferences, etc. on pp. T84-5.) An important insight that you might want to clarify is that the power to preserve ideas, discoveries, etc., helps subsequent generations to build on a broad knowledge base without having to "start from scratch". Another is emphasizing the range of possibilities of expression (nuance, precision) that language allows. One way to do this might be to have students look at the pictures on pp. 48 and 49 and make up a sentence or two describing what they think the people are communicating. Have them read their interpretations to the class. You could then ask questions such as, "Did we all agree what the people were communicating? What were some of the differences in our interpretations? Why were there differences? How could we know which version was right? If we can't ask the people exactly what they meant, how sure can we be of our interpretation?" S-5 The discussion should lead to the insight that although we can identify general feelings from gestures and facial expressions, we can't be sure of the details of the experience or the depth of the feeling being expressed. If the people in the pictures were able to speak to us, they could clarify what they meant much more precisely.

The range of expression language offers could be explored by having students write something like, "I love to swim." and "I hate to swim." on opposite sides of the blackboard, and then list a range of expressions in between. (I like to swim sometimes. I like to swim when the weather's warm. I'm afraid to swim in deep water. I don't like to swim often.) The purpose here is to illustrate the power of language to express nuance and a broad range of feeling. S-10

Another way to extend this discussion and to cultivate a global perspective about language (seeing it as a whole, a system) would be to consider with your students the fact that language changes. There are many ways to approach this idea in discussion. One might be to cite a brief passage from Shakespeare or the King James Bible (with some 'thee's' and 'thou's'). Or, have students list slang terms from old television shows, e.g., "Oh, golly." You could then ask, "Is this standard English? What's different about it? When was it written/recorded? Why don't we speak/write this way now? Will our language change in 100 years? What changes in our language are taking place now? Why does language change? Are changes good, bad, or neither?" S-23

#### ***4) Alternatives for Broadening and Extending the Lesson***

If interest and background warrant, the teacher could conclude the lesson with a discussion of attitudes toward language. You might begin by asking students to name some languages other than English. If there are any children in the class who speak other languages they will be a good resource as the discussion proceeds. Note that other languages are not word for word equivalents of English, but have their own structure.

(If you are familiar with another language you could illustrate, say, differences in word order, by contrasting simple equivalents in English and the other language.) Note also that they meet the needs of their people just as our language meets ours. You might ask, "What might be important to an Eskimo that is not as important to us? What in our culture might not be important for an Eskimo to know? How do you think this would show up in languages? (Eskimos have many more words for 'snow' than we, because it is such an important part of their environment. We, on the other hand, have developed a computer vocabulary that reflects our interest in computers.

Another example of culture influencing language is in Peru. Peruvians have many words for 'potato', reflecting the importance of potatoes as a food staple in that culture.) Another question might be, "How many students know someone who has learned a foreign language? How can a person learn another language? How long does it take? Is it hard? What would be some of the frustrations? Why would it be desirable to learn another language? What would be some problems of living in another country and not knowing the language?"

If you want to explore another aspect of language which invites a discussion of diversity and tolerance, you might consider the dialects that exist within a language. English is a good example because of its dialects in North America, Australia, New Zealand,



Scotland, Malta, Jamaica, South Africa. "Why are there so many forms of a single language? Is one form better than another? Why or why not? What do we mean by 'standard English'? Does 'standard' mean better?" S-5

You might extend this discussion in several ways, encouraging students to see and develop tolerance for perspectives other than their own. Consider asking, "Have you ever heard someone speak English with an accent? Was it hard or easy to understand them? How did they learn their way of pronunciation? Would they think you had an accent? S-3 Why are there differences in pronunciation? Is one form of English better than the others? Why or why not?"

## The Rise of Nations

### *Objectives of the remodeled Lesson*

#### **The Students Will:**

- explain how France, Spain, and England became unified as individual nations
- identify and understand the different factors that contributed to a nation forming
- discuss the future implications of these nations and their relationships
- clarify the concept of nations rising by critiquing the simplified version of the text
- assume another point of view to help understand national pride
- compare different nations' origins

### *Abstract*

This lesson describes how France, Spain and England emerged during the later part of the Middle Ages. The main idea is that strong rulers helped people think of themselves as part of a nation. The lesson briefly describes how William of Normandy united the English, how Princess Isabella and Prince Ferdinand united Spain, and how Joan of Arc helped save France from English rule, thereby uniting the French.

The teaching suggestions ask students to recall that people at this time were living in small communities and had no feelings of nationality. During the Renaissance, people were becoming more interested in events outside their communities. Also, after reading about Joan of Arc, the students are asked to write a story in which they describe how Joan of Arc helped the French.

As a reinforcement, they are asked to recall how Egypt was united (struggled against the Nile and had strong leaders). [From *The World Past and Present*, Barbara Radner Reque, D. C. Heath Social Studies, 1985, pp. 208-209.]

## ***Critique***

This two-page lesson contains so much information that much of it is simplified. Although the main idea of rulers forming a nation is an important one, many other concepts need to be considered. The text simply omits the idea of people and their beliefs forming a unified country.

The lesson ties the past events to the emergence of these nations. The text wants the students to understand the relationship between the preceding events (life on a manor, crusades, the Renaissance) and the progression towards unity. However, the text does not mention the future implications of these unified states. The students are not asked to speculate about why these events are important and what this has to do with Europe today.

The text misses another important idea, that of point of view. The students have an opportunity to think about national pride and what a citizen in another nation might feel about the beginnings of their nation. Asking them to reflect on that idea might prove to be a valuable part of the lesson.

Finally, the reinforcement suggestion connecting ancient Egypt to the rising of modern Europe is confusing. Many factors contributed to Egypt's unity and to try and simplify this idea so it will fit with the lesson is absurd. Therefore, this part of the lesson will be omitted in the remodel.

**Editor's note:** It may not be a bad idea to have students compare the emergence of these three nations with that of other countries they have studied if such a discussion avoids oversimplification. Such an important and basic topic deserves more than brief treatment. It is worth spending more time to put the crucial conceptual understandings in place.

## ***Strategies Used to Remodel***

These refer to subsections of *Strategy List: 35 Dimensions of Critical Thought*.

- S-14 clarifying and analyzing the meanings of words or phrases
- S-10 refining generalizations and avoiding oversimplifications
- S-5 developing intellectual humility and suspending judgment
- S-3 exercising fairmindedness
- S-11 comparing analogous situations: transferring insights to new contexts
- S-12 developing one's perspective: creating or exploring beliefs, arguments, or theories

The lesson will begin as the text suggests, asking students to recall how people lived during this time and if they thought of themselves as part of a nation. It might be necessary to review the idea that people lived in their communities without needing to leave. Once the crusades and Renaissance came about, people were more interested

in leaving their communities. However, before assigning the text, the students should discuss the concept of nationality and unity in a nation.

Questions that might clarify these ideas include: What makes a nation a nation? What is the difference between a nation and a community? What is the difference between the U.S. and the U.S.S.R.? the U.S. and California? What keeps a nation united? S-14

Reading the text pages can follow, with a reminder to students to think about the concept of nationality while they read. After reading, ask the students to recap the main points. Discuss each nation one at a time, and ask how that nation was united. To avoid oversimplification, be sure to include: Was that individual the only one responsible for uniting the nation? What other people might help form a nation? What other factors might be considered? Do the people and their beliefs play a role? Why? Let them discover that although the text's version is important to understand, there are many ideas the text left out. S-10 Did the text leave out relevant information about how these nations emerged? What kind of information? S-5

Asking students to imagine being an English, French, or Spanish citizen during this period in history could prove to be worthwhile as well as fun. For example: Write a newspaper editorial about Joan of Arc for an English paper or for a French paper. Describe Ferdinand and Isabella's wedding as if you were a Spanish citizen. The teacher should encourage the writing to be full of national pride. S-3

The ideas of nationality and unity should not be left without discussing the future. Ask the students to think about modern Europe and the foundation that was laid in the 1400's. Discuss if they can see any implications of the French and English relationships when their developments were so closely tied. Also ask about the Spanish and the Muslims and the Spanish kingdoms being united by a marriage. The relationships between each of these countries in the past might have some effect on their future. Also ask the students if a nation were being formed today, in Africa or the Middle East for example, what kinds of considerations should be made? Are there any important leaders? What are the views of the people? What about the surrounding nations? What could they learn from the past to help them in their struggle to become a nation? S-11

**Editor's note:** The teacher could make the whole lesson an exploration of the concept 'nation'. Initial discussion (as above), then, while reading, note any points made regarding the concept. Students can compare the three stories of emerging nationhood. "What was different about these areas after they became nations? What had changed? What does it mean for a place to become a nation? S-14 What other countries' beginnings do you know about? When (roughly) did it become a nation? How? Why? How does that nation's beginnings compare with these three? Did it become a nation for the same reasons or from the same causes? When did New England colonists become "Americans"? Why? What effect did that have on the birth of our nation? S-11 Would any of the people of the time have resisted these changes? What might they have said? Why did this happen then, and not before? S-12

# Making Models: The Atom

## *Objectives of the Remodeled Lesson*

### **The Students Will:**

- analyze the concept 'model' by discussing models they have seen and discussing the purposes of models
- develop criteria for evaluating models
- design and make models of an atom
- discuss the strengths and weaknesses of their models of atoms, noting significant similarities and differences

### *Abstract*

Students examine pictures of models of atoms, are provided with materials, and are asked to make their own models of oxygen, carbon, or sodium atoms. They are asked if they can make the electrons revolve. [From **Concepts in Science: 6th Grade** by Paul F. Brandwein, Elizabeth K. Cooper, Paul E. Blackwood, Elizabeth B. Hone. p. 293.]

### *Critique*

This lesson fragment offers an opportunity for students to discuss the purposes of models in general and the specific benefits of making models of atoms. Students can also practice assessing models, in light of those purposes. By examining their models at length and in great detail, students can develop their clarity of thought and expression, and review what they know about atoms.

### *Strategies Used to Remodel*

These refer to subsections of *Strategy List: 35 Dimensions of Critical Thought*.

- S-29 noting significant similarities and differences
- S-15 developing criteria for evaluation: clarifying values and standards
- S-14 clarifying and analyzing the meanings of words or phrases
- S-1 thinking independently
- S-8 developing intellectual perseverance
- S-10 refining generalizations and avoiding oversimplifications
- S-31 distinguishing relevant from irrelevant facts
- S-23 making interdisciplinary connections

The class could begin by discussing models in general and analyzing the concept. "What does 'model' mean? What models have you seen or made? Did they help you understand what they modeled? How? Why? How can you tell a good model from a poor model? What's an example of a good model? Why? A poor one? Why? S-15 What differences were there between models you have seen and the things they modeled? (Ask this of several of the examples previously given.) Why make models? What purpose do they serve?" S-14

Tell students that they are going to make models of atoms. Have students discuss what they know about atoms, and ask, "How could models of atoms help us? How could we make a model of an atom?" You might ask them what parts they would need, and how they could put them together. S-1 Students could make and evaluate various models of atoms and engage in an extended process of designing, making, discussing, and improving models of atoms. S-8

Students could be led in a discussion of the strengths and weaknesses of various models, with questions like the following: (Of each proposed model ask,) What parts does it have? What parts do atoms have? Does the model have any extra parts? Does it leave out parts? How is each part of this model like the part of the atom? (Continue for each part, including the connectors.) Unlike? (Encourage multiple responses.) Could this model be improved? How? How do these models help us? How could they mislead us? How can we avoid being misled? S-10 Do these models help you understand atoms? How, or why not? Do any of these models suggest questions about atoms? What? Do the models help you find answers to those questions? Why or why not? Are the differences between the model and the atom relevant to the question you asked? Why or why not? S-31 How could this model be improved? Why would that improve it?

The teacher could use the idea of models to clarify the concept 'analogy'. Have students recall analogies. Have them compare models and analogies. (A model is a thing, analogies are words. Both have similarities and differences to the originals. Both can be evaluated in terms of their purposes and whether relevant features are similar or different.) S-23

## Rubber Bands

### *Objectives of the Remodeled Lesson*

#### **The Students Will:**

- engage in Socratic discussion about their observations of and speculations about rubber bands

- design and conduct tests about how much different rubber bands stretch and how far they shoot, thus exercising independent thought
- clarify the concept of 'stretch'
- apply their new insights to other stretchy and rubbery things

### ***Abstract***

The first lesson, "Rubber Band Stretch", focuses on the key question, "How much does a rubber band stretch?" Students suspend paper cups from different kinds of rubber bands attached to boards by means of tape and paper clips. They add pennies to the cups and measure how much the different rubber bands stretch. They graph their data and develop a formula relating stretch to mass. The extension has students compare rubber bands of different characteristics.

The second lesson, "Rubber Band Shoot", has students discuss the key question, "How does a rubber band shoot?" Students then stretch the rubber bands measured amounts, and let go. They graph their data and discuss the results. In the extensions, students compare the behavior of different rubber bands, and devise a formula combining stretch and shoot formulas. [From *Introductory Investigations*, Fresno Pacific College - Project Aims. Arthur Wiebe and Larry Ecklund, editors pp. 33-35.]

### ***Critique***

These lessons offer a number of exciting opportunities. Both lessons, however, put too much emphasis on measuring and recording. Students could make fuller observations, begin to develop a sense of what goes on when rubber bands stretch, and discuss the relationship of stretch to shoot qualitatively.

"Rubber Band Stretch" is unnecessarily confusing. Mass doesn't make rubber bands stretch, force does. Students should understand more clearly the reason for the design of this experiment. As given, the purpose of the test design is unclear. Nor does either lesson ask students to consider any application of what they have learned. No attempt is made to tie the information to other objects. Discussions of muscles, elastic, gum, and other stretchy things belong in this unit.

"Rubber Band Shoot" does not answer the question it purports to: "How does a rubber band shoot?" It succeeds in answering how far a rubber band shoots, and therefore confuses two distinct and very different questions.

### ***Strategies Used to Remodel***

These refer to subsections of *Strategy List: 35 Dimensions of Critical Thought*.

- S-24 practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives
- S-14 clarifying and analyzing the meanings of words or phrases

- S-29 noting significant similarities and differences
- S-13 clarifying issues, conclusions, or beliefs
- S-3 evaluating evidence and alleged facts
- S-1 thinking independently
- S-11 comparing analogous situations: transferring insights to new contexts
- S-21 reading critically: clarifying or critiquing text

Before beginning the study of rubber bands, the teacher may want to lead students in a discussion regarding safety. Students could mention possible dangers and the best ways of avoiding them. We suggest an introductory lesson, since children love to play with rubber bands. This first lesson should be a chance for the children to manipulate and share observations about rubber bands. The teacher could record their findings and save them.

To begin the science unit, remind the class of their rubber band play. Ask them if they remember any of the ideas they mentioned. Discussion could be extended with questions like the following: What did you notice about rubber bands? (When necessary, elicit clarification.) What kind of rubber band was it? What, exactly, did you do? How did it look? Feel? Sound? Which of these things that you found, could we study? (Some students may want to explore ideas other than amount of stretch.) What differences did you find between rubber bands? Do you think the differences were related? How? Why? S-24

The class could discuss the idea of stretch and clarify it. What is stretch? What things stretch? How are all of these things alike? Different? S-14 Are there different kinds of stretch? S-29 How could we measure stretch? What might affect the measurements? What characteristics of rubber bands affect the amount of stretch? What kinds of rubber bands stretch the most? The least? How could we find out? What, exactly, should we measure? How? What do we need to record? How? Why?" S-13

At this point, the teacher could have students split into groups to design and conduct tests. The tests could then be discussed and evaluated. Students could then suggest and assess solutions to any problems they experienced while conducting or interpreting their tests. (For example, if students stretched a large and a small rubber band and simply measured the lengths, they wouldn't be able to distinguish later how much of the difference was due to stretchiness opposed to the original difference in length. Or different students may have gotten vastly different results, due to different amounts of force applied.) Such an experience would graphically illustrate the requirements of a well-thought-out experiment. S-33

Or, the teacher could elicit design of a test similar to that in the book. "To stretch a rubber band, you need a force. To make accurate measurements, you need a way to control the force, so that results are due only to differences in the rubber bands, not to differences in force. What force can we use? If we pull, how can we be sure results won't vary because of different amounts of pull? We can't control or measure how much pull we use. Etc." Or students could analyze the original experiment. The teacher may

want to have a wider variety of materials available than those mentioned in the original lesson.

Students could also decide on a reasonable method of presenting the data. S-1 Some may also demonstrate or reproduce their experiments. Students could write a paper describing their question, experiments, hypotheses, data, observations, inferences, assumptions and conclusions.

Ask if this experiment suggests any important issues or questions and how we might go about settling them. They might think of ways to apply what they've learned about stretch. The teacher could bring out the list of stretchy things made earlier in the lesson, and have students discuss the items in terms of what they learned about rubber bands. They could elucidate similarities to and differences from rubber bands and try to predict the effects the differences might have in a similar study. "What does it imply about muscles and exercises, fitted sheets, pants with elastic waists, and pennies in your pockets?" S-11

For the second lesson, you could ask students to share their questions about rubber band shooting. Each group or person selects one or more related questions and designs an experiment or study. Have students solve the questions of safety. Each study needs to address shooting method, means of observation, means of recording and presenting data.

Ask students to read the original lesson, and to do what they are asked in the lesson. Ask them the question, "How does a rubber band shoot?" If they answer with distances, ask them to consider their answer and decide what question they are really answering. S-13 They should see, or you can point out, that distances answer the question "how far" not "how" rubber bands shoot. S-21

Discuss the relationship of stretch to shoot. "Were the stretchiest rubber bands the best shooters? Worst? Neither? Why do you think so? What were the best stretchers and shooters like?" It is interesting that the concept developed and measured in the first study became a variable in the second.

Relate rubber band "twanging" to musical instruments. What affects the sound the rubber bands make? What makes it hit a higher note? A lower note? Why? How is this like or unlike guitar strings and piano strings? (Interested students could research and report back to the class.) S-11

Relate rubber band behavior to rubber balls (what kinds bounce better?) and air-filled balls (relate stretchiness to bounciness). S-11

## **The Human Skeleton**



## *Objectives of the Remodeled Lesson*

### **The Students Will:**

- make their preconceptions about the skeleton explicit by drawing it
- draw another skeleton after learning more about it, thereby examining, evaluating, and modifying their preconceptions

The students' text has a brief discussion of the human skeleton with the names of the different bones.

### *Critique*

Children in the elementary grades have certain ideas about the human body. Some of these ideas are correct and some are not. We must give children the opportunity to correct those which are incorrect by comparing what they do know with what they do not know and actively make their own modifications.

### *Strategies used to remodel*

These refer to subsections of *Strategy List: 35 Dimensions of Critical Thought*.

- S-1 thinking independently
- S-30 examining or evaluating assumptions
- S-33 evaluating evidence and alleged facts

The students will be divided into partners and will take turns drawing each other's body outline as the person lies on the paper. After drawing the outlines, the students will exchange papers with their partners so that everyone will have an outline of his or her body. Without referring to a text book, each student will draw his or her skeleton in the outline. These drawings will hang in the room while the students gather information about their bodies, comparing it to other animals, machines, and artificial parts.

As students gather the information, they will record and map it out on a second body outline. By critiquing their initial ideas, the students will have a better understanding of the process of expanding their information base. S-30

The students will construct a model of a 5' skeleton using plaster of paris, old sheets, and cardboard tubes. The students will work in groups of 2, 3, or 4 to construct some part of the skeleton. After constructing the parts of the skeleton in proportion to the whole, they will assemble the skeleton.

With the modified knowledge about the human skeleton and the interest and humor engendered by making the models, students will be asked to write some creative response: a short comedy, a mystery, or perhaps a poem.

**Editor's note:** What were you right about? How did you know those things? What were you wrong about? Why did you think that? How could you have been wrong? S-33