Module 5

Summarizing

Summarizing is a process we do almost automatically. When we read, hear, or see information, we don't take it in exactly as we experience it. We pick and choose what is most important and then restate that information in a brief, synthesized fashion. In a sense, we find the main pattern running through the story or event and make connections among important pieces of information. Summarizing involves at least two highly related elements: (1) filling in missing parts and (2) translating information into a synthesized form. The first aspect of summarizing (filling in the missing information) can be illustrated using this scenario:

> Two card players stared at each other from across the table. Both appeared tense, although the man smoking the cigar seemed to have a slight smile on his face. He laid down his cards in a fanning motion that displayed one card at a time. When each new card was shown, his opponent in the silk shirt seemed to sink lower and lower into his chair. When the cigar-smoking antagonist finally had shown all of his cards, the silk-shirted man got up and left the table without showing his cards and without saying a word.

As you read these sentences, your mind naturally fills in many unstated elements. For example, you probably inferred that both men had bet substantial amounts of money on the hand; the cigar-smoking man knew he had a winning hand as soon as it was dealt him; the silk-shirted man lost the hand; and so on. Inferences like these might be thought of as *default inferences*. Unless explicitly stated otherwise, we expect certain things to occur in certain situations.

A few hours from now, if you were asked to retell what you had read in the passage, you would most likely engage in the second aspect of summarizing—translating information into a synthesized form. In your retelling, you probably would not give a verbatim account of the passage. Rather, you might provide a brief, synthesized version like the following:

> Two men had a large bet on a single hand of poker. As soon as the cards were all out, one of the men knew he had won the hand. After he showed his hand, his opponent silently got up and left, knowing he had lost.

The synthesized version of information we read or hear is sometimes referred to as a *macrostructure* (see Kintsch, 1979; van Dijk, 1980). Human beings tend to generate macrostructures for information they read, hear, or even see. This tendency explains why we are likely to remember the gist of movies we see rather than a scene-by-scene account.

Before reading "Recommendations for Classroom Practice," take some time to reflect on your current practices and beliefs related to

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using summarizing by completing the Reflecting on My Current Beliefs and Practices—Summarizing worksheet in Figure 5.1 (p. 59). This will give you a basis of comparison as you read about the strategies in the module.

Recommendations for Classroom Practice

We summarize all the time—the weather report on the morning news, a conversation with a colleague in the hallway, the happenings at the afternoon staff meeting, Thursday night's episode of our favorite show. Although we engage in summarizing daily, much of the mental processing involved is unconscious. We are not deliberately applying a summarizing strategy to Thursday night's episode. But we do not need to systematically summarize the information because we are not writing an essay about the plot intricacies in that episode or answering questions about heart surgery in class the next day. When we want students to summarize important elements of a lecture or a chapter from a reading assignment, we should give them specific summarizing strategies to help them apply this complex process to classroom content. In this module, we discuss several approaches to use in the classroom:

- teaching students the rule-based summarizing strategy,
- using summary frames, and
- teaching students reciprocal teaching and the group-enhanced summary.

Teach Students the Rule-Based Summarizing Strategy

Many students understand the basic idea of summarizing: you take a lot of information, pick out the main points, and make it shorter. Drawing from their understanding of the summarizing process, an effective summarizing strategy you can teach students is the *rule-based summarizing strategy* (Brown, Campione, & Day, 1981). The strategy involves a set of rules or steps that students use to construct a summary (Figure 5.2, p. 60).

To make these rules come alive for students, you can demonstrate them in some detail. You might present students with a passage such as the sample in Figure 5.3 (p. 61), and then walk them through the rules by thinking aloud as you summarize the passage.

Think Aloud As Presented by the Teacher. "I'll think aloud as I use the rules of the strategy. See if my thinking makes sense to you.

"The rules say to 'delete trivial material, delete redundant material, and substitute superordinate terms for more specific terms.'

"Let's see, the comment in parentheses, 'and maybe a bit of their childhood left in them,' seems trivial, so I can delete that. I'll also delete 'when you think about it, it is easy to understand the importance of models in science' because it doesn't give me any new information. Neither does the very last sentence, 'you may think of additional reasons why it would be necessary for scientists to develop models as they probe the secrets of nature,' so I'll get rid of that sentence too. Now, I see some lists. 'Models' covers 'model cars, tinker toys, model houses, and so on,' so I can delete that list. The list 'gravity, magnetism, or energy' seems important, and I can't think of a term that encompasses all three, so I'll leave that list. But, it's repeated, so I can delete the list once. Now here's my first paragraph: (see p. 60)

FIGURE 5.1

Reflecting on My Current Beliefs and Practices—Summarizing

In what situations is it important for my students to summarize?

What does summarizing help my students do?

What do I do to help students understand and use the process of summarizing?

What questions do I have about using summarizing in my classroom?

Most children like to play with models, ~~including model cars, tinker toys, model houses, and so on~~. Likewise, most scientists interact with models. However, their model interaction is out of necessity ~~(and maybe a bit of their childhood left in them!)~~, as the forging of new science is frequently dependent on the development of models. ~~When you think about it, it is easy to understand the importance of models in science~~. Many times the objects of a scientist's attention are too small to be observed directly, or they may be inaccessible for direct visual study, as would be the case for the center of the Earth or the surface of a distant galactic object. Other topics of study, such as gravity, magnetism, or energy, can be studied through their effects on matter. But ~~gravity, magnetism, and energy~~ [they] cannot be seen directly, so they too are modeled. ~~You may think of additional reasons why it would be necessary for scientists to develop models as they probe the secrets of nature~~.

"Those changes leave me with the following paragraph:

> Most children like to play with models. Likewise, most scientists interact with models. However, their model interaction is out of necessity, as the forging of new science is frequently dependent on the development of models. Many times the objects of a scientist's attention are too small to be observed directly, or they may be inaccessible for direct visual study, as would be the case for the center of the Earth or the surface of a distant galactic object. Other topics of study, such as gravity, magnetism, or energy, can be studied through their effects on matter, but they cannot be seen directly, so they too are modeled.

"Now I'll apply the rules to the second paragraph. A few phrases seem trivial to me—'in such a way as,' 'nothing more than,' 'in an effort,' 'often often used by beginning chemistry students,' and 'in great detail.' Since they don't add anything to my understanding of the content, I'll

FIGURE 5.2

Model for Summarizing

Steps for Rule-Based Summarizing

1. Delete trivial material that is unnecessary to understanding.
2. Delete redundant material.
3. Substitute superordinate terms for more specific terms (e.g., use fish for rainbow trout, salmon, and halibut).
4. Select a topic sentence, or invent one if it is missing.

Steps in Rule-Based Summarizing for Younger Students

1. Take out material that is not important for your understanding.
2. Take out words that repeat information.
3. Replace a list of things with a word that describes the things in the list (e.g., use trees for elm, oak, and maple).
4. Find a topic sentence. If you cannot find a topic sentence, make one up.

Adapted from Brown, Campione, & Day (1981).

FIGURE 5.3

Summarizing Strategy—Sample Passage

Most children like to play with models, including model cars, tinker toys, model houses, and so on. Likewise, most scientists interact with models. However, their model interaction is out of necessity (and maybe a bit of their childhood left in them!), as the forging of new science is frequently dependent on the development of models. When you think about it, it is easy to understand the importance of models in science. Many times the objects of a scientist's attention are too small to be observed directly, or they may be inaccessible for direct visual study, as would be the case for the center of the Earth or the surface of a distant galactic object. Other topics of study, such as gravity, magnetism, or energy, can be studied through their effects on matter. But gravity, magnetism, and energy cannot be seen directly, so they too are modeled. You may think of additional reasons why it would be necessary for scientists to develop models as they probe the secrets of nature.

The models that scientists develop take many different forms. In some cases they are actual physical constructions. A good example of this kind of model would be one that represents the Earth, moon, and sun as small wooden spheres that are mechanically moved in such a way as to illustrate the phases of the moon, eclipses, and so forth. Other models may be nothing more than mental images that are developed in an effort to picture something unseen. A good example would be the Bohr solar system model of the atom that is often used by beginning chemistry students. In this model the nucleus is imagined to be like the sun and the electrons are visualized as whirling around the nucleus analogous to the planets orbiting the sun. Other models are mathematical in nature and depend on algebraic or other kinds of statements to describe a phenomenon or object. Rays of light are good examples, as these can be treated as waves and equations can be developed that describe the properties of waves in great detail.

Models usually evolve and are improved as scientific advances are made. Not infrequently, a model is thrown out completely based on new findings that prove it to be misleading or fatally incorrect. It is also the case that different models often are used to describe the same thing, and the choice of models depends on the goal of the scientific investigation or perhaps the scientific sophistication of the individual conducting the work. A good example once again is models of the atom. The solar system model is adequate for many purposes, but a highly mathematical model based on the field of quantum mechanics is necessary for rationalizing other aspects of an atom's behavior. In a fundamental way, models are developed in an effort to explain how things work in nature.

Source: From "Models in Science: Student Text" in *The Sun and Solar Wind*, by Bogner, D., McCormick, B. J., & Fox, L. R., 2001 [Online]. http://www.genesismission.org/educate/scimodule/topics.html

delete these phrases. I don't see any lists, but there is some redundant material. I can delete 'a good example of this kind of model would be one that.' Then I'll reword what's left of the third sentence and combine it with sentence two like this: 'In some cases they are actual physical constructions, such as small wooden spheres representing the Earth, moon, and sun that are mechanically moved to illustrate the phases of the moon, eclipses, and so on.'

"Now I think I'll delete the last part of the sentence that begins 'Other models are mathematical.' 'In nature' doesn't add anything to my understanding and 'depend on algebraic or other kinds of statements to describe a phenomenon or object' is really covered by the very last sentence that provides an example. Now, my second paragraph reads like this:

> The models that scientists develop take many different forms. In some cases they are actual physical constructions, [such as small wooden spheres representing the Earth, moon, and sun that are mechanically moved] ~~A good example of this kind of model would be one that represents the Earth, moon, and sun as small wooden~~

> ~~spheres that are mechanically moved in such a way as~~ to illustrate the phases of the moon, eclipses, and so forth. Other models may be ~~nothing more than~~ mental images that are developed in an effort to picture something unseen. A good example would be the Bohr solar system model of the atom ~~that is often used by beginning chemistry students~~. In this model the nucleus is imagined to be like the sun and the electrons are visualized as whirling around the nucleus analogous to the planets orbiting the sun. Other models are mathematical in nature ~~and depend on algebraic or other kinds of statements to describe a phenomenon or object~~. Rays of light are good examples, as these can be treated as waves and equations can be developed that describe the properties of waves in great detail.

"My new paragraph is as follows:

> The models that scientists develop take many different forms. In some cases they are actual physical constructions, such as small wooden spheres representing Earth, moon, and sun that are mechanically moved to illustrate the phases of the moon, eclipses, and so forth. Other models may be mental images that are developed to picture something unseen. A good example would be the Bohr solar system model of the atom. In this model the nucleus is imagined to be like the sun and the electrons are visualized as whirling around the nucleus analogous to the planets orbiting the sun. Other models are mathematical in nature. Rays of light are good examples, as these can be treated as waves and equations can be developed that describe the properties of waves in great detail.

"Now for the last paragraph. This paragraph contains a lot of important information, but I'll still try to apply the rules. Does anything seem trivial? I can delete 'It is also the case that,' 'perhaps,' and 'once again.' Since I know we are talking about science here, I can delete 'scientific' in two places in the third sentence. I'll also replace 'the individual conducting the work' with 'scientist.' There are no lists, so now my paragraph reads:

> Models usually evolve and are improved as scientific advances are made. Not infrequently, a model is thrown out completely based on new findings that prove it to be misleading or fatally incorrect. ~~It is also the case that~~ different models often are used to describe the same thing, and the choice of models depends on the goal of the ~~scientific~~ investigation or ~~perhaps~~ the ~~scientific~~ sophistication of the ~~individual conducting the work~~ [scientist]. A good example ~~once again~~ is models of the atom. The solar system model is adequate for many purposes, but a highly mathematical model based on the field of quantum mechanics is necessary for rationalizing other aspects of an atom's behavior. In a fundamental way, models are developed in an effort to explain how things work in nature.

"My results are as follows:

> Models usually evolve and are improved as scientific advances are made. Not infrequently, a model is thrown out completely based on new findings that prove it to be misleading or fatally incorrect. Different models often are used to describe the same thing, and the choice of models depends on the goal of the investigation or the sophistication of the scientist. A good