

Reading Strategies

Suggested Grade Level(s): All Grade levels from 7-12

Estimated class time: 45 minutes

Summary

The students will use different strategies from the Reading Apprenticeship philosophy in order to read and understand the concepts presented to them in *Cosmic Times*. The first one, called “Talking to the Text” (T2T), is an independent strategy in which the students write down their thoughts as they are reading the material. In the second strategy, the students pair up and help each other read and understand the concepts they are reading through reciprocal teaching.

Objectives

- The students will use Reading Apprenticeship strategies in order to identify and describe the content of the *Cosmic Times* newspaper articles.

National Standards

National Science Standards

- NS.5-8.7 HISTORY AND NATURE OF SCIENCE
As a result of activities in grades 5-8, all students should develop understanding of
 - Nature of science
 - History of science
- NS.9-12.7 HISTORY AND NATURE OF SCIENCE
As a result of activities in grades 9-12, all students should develop understanding of
 - Nature of scientific knowledge
 - Historical perspectives

National Language Arts Standards

(From the National Counsel of Teachers of English)

- NL-ENG.K-12.3 EVALUATION STRATEGIES
Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics).

Knowledge Prerequisites

The students should be able to summarize reading material.

Teacher Background

The teacher should have experience working with Reading Apprenticeship strategies. They can access ideas and concepts from Reading Apprenticeship through educational resources online, in textbooks, or through materials from the administration. Some of these include:

- *Reading For Understanding: A Guide to Improving Reading in Middle and High School Classrooms*. (Editors) Ruth Schoenbach, Cynthia Greenleaf, Christine Cziko, Lori Hurwitz; 1999, Jossey- Bass. <http://www.wested.org/cs/sli/print/docs/sli/home.htm>; <http://www.wested.org/cs/sli/query/q/1351>
- *Building Academic Literacy: An Anthology for Reading Apprenticeship*. Audrey Fielding (Editor), Ruth Schoenbach (Editor), April 2003, Jossey-Bass.
- <http://www.mciu.org/mciu23/cwp/view.asp?a=620&Q=436817&PM=1&mciu23Nav=%7C6509%7C>
- <http://www.bucksiu.org/profdev/apprenticeship/index.cfm>
- <http://www.pdkintl.org/kappan/k0310sch.htm>

Materials

- “*Cosmic Times*” newspapers; sticky notes for talking to the text (if needed)

Procedure:

I. Engagement

Ask the students some strategies that they use to help them understand the material they read for class. Students may be familiar with formal strategies such as SQ3R (Survey, Question, Read, Recite, Review). Students may have simple suggestions such as rereading the material or highlighting important information. Suggest those strategies.

II. Exploration

Explain to the students that they are going to learn some different reading strategies to help them understand the material presented in *Cosmic Times*.

Ask the students who the best person is to teach them reading. They may respond with the English/Language Arts teacher. Then ask them who is the best person to teach them how to read science, for example, the content in their science book. The answer is the science teacher. Explain to them that because they are in *Science Class*, the best person to teach them how to read *Science* is their science teacher because they are experienced in this subject. Once they make this connection, they will understand why sometimes it is easier to read literature in English than to read about scientific concepts such as energy and motion in a physics textbook or dark energy in an astronomy textbook.

III. Explanation

- 1) Introduce the **Reciprocal Teaching*** strategy first. Use the attached explanation for reciprocal teaching to explain this to the students. Tell the students that they are to pair up when they read by reciprocal teaching. Students should be paired as partner A and partner B for reading their content and follow the directions as explained.

- 2) Now introduce the second strategy – **Talking to the Text (TttT)**. This is an individual experience in which the students are invited to write their thoughts on the text as they read. For *Cosmic Times* they should have copies so that they are free to make comments in the margins and free spaces. They should write down questions, connections, puzzlements, and responses on the text. Please see the attached sheet for an example.

Students may need help getting started. If so, you may make an overhead of a sample article. Give the students unmarked copies of the same article. Ask the students to read the article, and mark their own copy. When they are finished, display your marked copy and discuss with students how their article compares with yours.

It is important to provide the students with an opportunity to share their reading experiences with others. Put them in pairs or small groups to share their different markings, debrief the experience, and discuss the text itself.

(These strategies are used all over the world in a variety of ways. If you are not sure how to implement specific parts of each strategy, then test it in your classroom to see what works best for YOUR students. For example, teachers and students often ask during reciprocal teaching if they should have the students read the same paragraph out loud or silently when doing this strategy. The answer to that question depends upon the teacher. If the students can handle reading out loud in the classroom and it works better for them, then go with that. If it is a Friday afternoon and the students are filled with too much energy, have them read the paragraphs silently before summarizing and checking together.)

These strategies can be used for any of the *Cosmic Times* articles, not just the 1965 edition.

IV. Evaluation

Check the students' newspaper articles to make sure that they are making comments as they "talk to the text." You can grade the students based on how well they are able to make connections through their comments on their articles.

Reciprocal Teaching

1. Assign pairs as partner A and partner B.
2. Tell them to read so that they are prepared to summarize and/or connect.
3. Both partners read the same paragraph.
4. One student summarizes and/or connects.
5. Other student “checks and perfects.” For example:
 - I agree with you because....
 - I can add...,
 - A question I have...,
 - This also connects to...
6. Students individually summarize their understanding. (Optional)
7. Switch roles. Repeat steps 3, 4, 5, & 6.

*Palincsar (1986): Reciprocal Teaching.

The following pages are examples of **Talking to the Text** in the Science and English Classroom.

WEIRD SCIENCE

Talking to the text

MUTANT MUSTARD

The tiny mustard flowers grown by Elliot Meyerowitz are horribly deformed. You may think they are the result of a terrible accident, but Meyerowitz created these mutants on purpose. In fact, he is very proud of these flowers because they may help him solve an important biological mystery.

points to just three classes of genes that determine what happens to the various parts of a flower as it develops. He learned that if one or more of those gene classes is inactivated, a mutant mustard plant results.

Pieces of an Old Puzzle

By understanding how genes shape the growth of flowers, Meyerowitz hopes to add pieces to a long-standing puzzle involving the origin of flowering plants. Scientists estimate that flowering plants first appeared on Earth about 125 million years ago and that they quickly spread to become the dominant plants on Earth. By studying which genes produce flowers in present-day plants, Meyerowitz and his colleagues hope to learn how flowering plants evolved in the first place.

Meyerowitz's mutant plants are well qualified to add to our understanding of plant genetics. But don't look for these mutant plants in your local flower shop. These strange mutants won't win any prizes for beauty!

Meyerowitz alters the genes of a mustard plant so that it develops a mutant flower. The inset shows a normal flower.

Think About It

It is possible to genetically change a plant. What are some possible risks of such a practice?

Normal and Abnormal Flowers

Normally, mustard flowers have four distinct parts that are arranged in a specific way. Many of the plants grown by Meyerowitz and his colleagues, however, are far from normal. Some have leaves in the center of their flowers. Others have seed-producing ovaries where the petals should be. At first glance, the arrangement of the parts seems random, but the structure of each flower has actually been determined by a small number of genes.

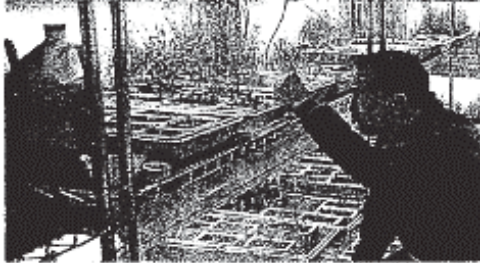
A Simple Model

After many years of careful studies, Meyerowitz and his colleagues have identified most of the genes that control the mustard flower's development. With this information, Meyerowitz has discovered patterns that have led to a surprisingly simple model. The model


Handwritten notes: Science, college, mad scientist, data, made up, roots, different, stem, ew, Scientist, Yeah, gene, slot, college Scientist, cell, ya, title, #

Handwritten notes on right margin: rainbow, about your, le of cott, n cotton, They mus, nes-to ci, e and oth, c chemic, ox had a, tton dre, rning, n fibers, /s. Bolls, open at r, and ser, bers car, o many l, er as, on while, t of the, rent sh, relative A, otton s, -fibers, istry, in, proce, of cott, oled, ed unc, rmed h, oluti, probl, ne text, environ, yes us, estic, these

Handwritten note: Nancy Drew



▲ Elliot Meyerowitz, shown here in his laboratory, has raised about a million individual specimens of a mustard variety known as *Arabidopsis thaliana*.



Examples of → Reading Process Analyses

Old Man Poem - Text

of pueblos,³
san juan, santa clara, *four names*
and even santo domingo,
and his family, he would say,
came from there:
some of our blood was here, *bloodshed - violence*
he would say,
before the coming of coronado,⁴
other of our blood *↳ crowned as Español*
came with los españoles,⁵ *Spanish*
and the mixture
was rich,
though often painful ... *- mixing of cultures by reproduction,
some forced*
old man,
who knew earth
by its awesome aromas
and who felt
the heated sweetness *- chiles are so prevalent in this culture*
of chile verde⁶
by his supple touch,
gone into dust is your body *- images of cremated ashes*
with its stoic look and resolution,
but your reality, old man, lives on
in a mindsoul touched by you ... *passing on legacy of grand father*

Old Man ...

↳ Neil Young

3. pueblos (PWEHB-loh-z) *n. pl.* towns, villages; also people or nations. The reference here is to Native American pueblos in central and northern New Mexico.
4. coronado (koh-roh-NAH-doh) Francisco Vázquez de Coronado, Spanish explorer in the 1500s who led an expedition into what is now Arizona and New Mexico
5. los españoles (loh-s ays-pahn-NYOHL-ays) *n. pl.* the Spaniards
6. chile verde (CHEE-lay VAIR-day) green pepper

Mexican American Literature, edited by Virginia Scely, Globe Book Company, NJ, 1993.
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The following are some additional reading strategies that can be used in the classroom in addition to the Talking to the Text and Reciprocal Teaching.

1 Sentence, 1 Paragraph

- Read a passage identifying (underlining if possible) the main ideas
- Teacher summarizes the first paragraph in one sentence, modeling metacognitively how she did it
- Develop groups to share what they think is important in the next paragraph.
- The group develops a consensus by talking about the main ideas and looking for similarities.
- Hear as many sentences as time allows and place a group's sentence under your sentence.
- Repeat until all paragraphs are covered.
- Read the paragraph created by appending each sentence and discuss if this is an effective summary. Return to group and share abstract that they have done.

25 Word Abstract

- Read a passage highlighting in one color, the main ideas
- Mark up unknown words in another color or pencil/pen
- Develop groups to share words they don't know and to help one another.
- Teacher may want to step in here and do a check on key vocabulary pieces. Don't allow negative transfer.
- Then the group develops a consensus by talking about the main ideas and looking for similarities.
- Individually construct 25 word abstract.
- Return to group and share abstract each student has done. As an individual, edit the 25 word abstract.

SQ3R

Survey, Question, Read, Recite and Review (Robinson, 1970)

- Survey (1 minute): Before beginning reading, look through the whole chapter. See what the headings are -- the major ones and the subheadings; hierarchical structures seem to be particularly easy for our brains to latch onto -- check for introductory and summary paragraphs, references, etc. Resist reading at this point, but see if you can identify 3 to 6 major ideas in the chapter.
- Question (usually less than 30 seconds): Ask yourself what this chapter is about: What is the question that this chapter is trying to answer? Or -- along the curiosity lines -- What question do I have that this chapter might help answer? Repeat this process with each subsection of the chapter, as well, turning each heading into a question.
- Read (slower for some of us than others!): Read one section at a time looking for the answer to the question proposed by the heading! This is active reading and requires concentration, so find yourself a place and time where you can concentrate.
- Recite/write (about a minute): Say to yourself (I do this out loud, so I have to study where I don't embarrass myself) or write down (I sometimes do this in the margins of the book itself) a key phrase that sums up the major point of the section and answers the question. It is important to use your own words, not to just copy a phrase from the book. Research shows that we remember our own (active) connections better than ones given to us

(passive), indeed that our own hierarchies are generally better than the best prefab hierarchies.

- Review (less than 5 minutes): After repeating steps 2-4 for each section you have a list of key phrases that provides a sort of outline for the chapter. Test yourself by covering up the key phrases and seeing if you can recall them. Do this right after you finish reading the chapter. If you can't recall one of your major points, that's a section you need to reread.