NORTHERN ILLINOIS UNIVERSITY

TEACHING CHILDREN TO UNDERSTAND AND REMEMBER INFORMATION THEY CAME TO USE NOW AND LATER

A Thesis Submitted to the

University Honors Program

In Partial Fulfillment of the

Requirements of the Baccalaureate Degree

With Upper Division Honors

Department Of Language Arts

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May 2002
Table of Contents

ABSTRACT

SETTING AND PURPOSE

THREE INSTRUCTIONAL METHODS USING ILLUSTRATIONS TO INCREASE COMPREHENSION

DATA COLLECTION AND PROCEDURES

ANALYSIS AND EVALUATIONS OF LESSONS

THEORY AND RESEARCH

CONCLUSION AND FUTURE GOALS

APPENDIX
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Courses I have taken and experiences and activities that provide a background for this study.

My major is Elementary Education. I also have an Associate in Art degree in Elementary Education from Rock Valley College. I home-schooled two of our four children for six years and became more interested in how and what children learn. I have been a volunteer tutor in a grade school also and worked with children as a volunteer at church.

CIEE 362 - CHILDREN’S LITERATURE
CIRE 340 - EL SCH DEV READ PROG
LTLA 341 - LANG. ART IN ELEM. SCH
LTRE 350 - ORG. EFF. EL. READ INST
ETR 430 - TESTS & MEAS (ELEM)
TEDU 344 - TCHG SCI ELEM SCHL
TEDU 342 - TCHG SOC STD EL SCHL
TEDU 383 - EL SCH CUR INS FIELD
TEDU 457 - SYS INTE EXC STD CLS
ART 383 - TEACH ART ELEM
EPSY 304 - DEV ELEM SCHL CHILD
EPSY 419 - MIDDLE SCHOOL CIDLD
LEFE 321 - HISTORY OF AMER EDUC
ETT 429 - COMPUTERS IN CLASSROOM
CIEE 292 - EDUC PART CLIN EXPER
TEDU 465 - SEM EL SCH STD TCHG
TEDU 487 - STUDENT TEACHING
TEDU 483 - OTED EDUC/LAB EXPER
LTRE 497 - INDEPENDENT STUDY
ABSTRACT

In the United States elementary school children are doing poorly on science tests. Tracking, poor teacher knowledge, and teaching methods are blamed. (Yerrick, R. & Ross, D. (2001). While reforms, goals and high standards have addressed many of these concerns, they don't always provide real ideas and strategies for how to accomplish and assess achievement. We live in an information society and educators must be continually learning ourselves, helping students learn and assessing their learning.

Through a research study approach three different instructional methods were explored in one kindergarten classroom over a period of eight weeks. The purpose was to examine how using simple illustrations enhance kindergarten students understanding and comprehension of expository texts? Six science trade books by Gail Gibbons were read to 22 kindergarten students. During the reading time in the morning sketches were used to introduce each book that was partially read. In the afternoon during science, the sketches were reviewed and the book finished. Then students drew a picture and other factual things they remembered from the book.

The kindergarten teacher, a Para-professional and the student teacher assisted students by writing the words students dictated to go with their pictures. The top portion of the students' paper was blank for drawing, and the bottom portion was lined for writing. Students were also encouraged to write if they wanted and were given help in spelling. Their drawings were later made into books so students could use their new information, and it could be reinforced again and again through retelling using their drawings, sharing books with others, and having someone else read the new words to them.
The purpose of researching various methods is to plan for future instruction. Children listen to learn language, and their listening vocabulary is far greater than their speaking or writing (Farris, 2001,p.13). Listening to expository science books with new words encourages new vocabulary. Adults and children use drawings and symbols to communicate a variety of information effectively. I wanted to see how much information students comprehended, and also if they preferred drawing or writing to communicate it. Since they could do either or both in the same time frame, comparisons could be made as to which they preferred. I also wanted to see if they were able to recall and communicate more information by drawing or writing. Using sketches to teach combined drawing and listening and also provided a place for students to focus while listening to new words, or knowledge. Students of all ages seem to enjoy drawing, tracing, and making designs on notebooks while listening to teachers, writing their names or answers on worksheets or reading independently.

Using expository science books by the same author helped insure there were no differences among texts. All the books were about animals, were illustrated and had similar non-fiction conventions such as bold print, captions, labeled illustrations, and comparisons to a similar animal. Familiar shapes such as oval, triangle, square and circle were used to sketch animals. This was done so students could more easily form the basic shape and add new data from the book.

Quantitative analyses were made of the number of items students recalled using both drawing and dictating to others. Results revealed the majority of students were able to draw more items than they verbalized revealing a stronger reliance on drawing than writing. Some illustrated and dictated new information from the books. Some lower achieving students outsored high achieving students when drawing was used as a means of instruction and assessment. Findings revealed more students recalled items from lessons using muraling than KWL or a game using clues. Not all students were present for all lessons. Therefore, some comparisons of results of
various instructional methods were limited to those present. Pictures transcend vocabulary and are helpful for English language learners, those with hearing limitations, and those who have different learning styles or disabilities. Using them to teach also benefits the teacher by organizing instruction, outlining important information and remembering new information.

PURPOSE AND SETTING

The purpose of this study is to explore instructional methods using expository trade books in a kindergarten classroom of twenty-two students. I wanted to create interest in content learning and implement strategies for remembering information so it could also be recalled and used later. The teacher said she had not read books about science to the students and mainly used storybooks. While students seemed to enjoy this group reading time and settled down quickly, I wondered if students could also be learning and understanding more factual information about the world around them by reading some expository texts. The teacher's preferences for fictional books was evident in the many fictional books on a two sided bookshelf, books on tapes that students could check out from the teacher, and a listening center for students that contained more story books.

Many teachers are reading fictional stories to students even in content area classes (Teale, & Shanahan, 2001, p. 5). This was not always the case in school. In the past basal readers only allowed about 15% of pages to non-literary texts. Many schools no longer use basal readers exclusively and use novels to teach even content area classes. With the decline of the basal, the meager 15% allotment for expository texts has shrank even more. More teachers are using novels even in content area classes replacing or pushing aside math, science and history textbooks (p. 5).
Students get little exposure or opportunity to read expository texts at school, and many schools have stopped purchasing science books because of a commitment to "hands-on science".

The setting was a self-contained urban elementary magnet school (K-5) in an all day kindergarten class of 22 students. There were two teachers (one a student teacher) and one Para-professional in the room. Reading instruction was done daily primarily in the morning after calendar and opening activities. The kindergarteners were midway through the year and had some phonemic awareness, and alphabetic awareness and letter sound ability. Most wrote their first names and some wrote their last names legible. The class consisted of fourteen boys and eight girls. The class had 16 African American children, one Hispanic child, one Native American child and four children of European American descent. The school is located in a disadvantaged area and many children are considered high-risk. Many children ride one of eight busses and some live nearby and walk to school or are driven. It is a magnet school with a global studies theme.

Kindergarten students have a variety of special classes such as foreign language, art, music, physical education, library and computers for thirty minutes a week with the exception of music and physical education, which they have twice a week. Lessons are typically expository using direct instruction. Students wear uniforms and the majority of the instruction I observed was direct.

Students had not been using expository books in the classroom and I wanted to see if they enjoyed them as much as their storybooks. I also want to see how much they comprehended and were able to communicate to others after hearing them read aloud. Reading aloud expository books benefits students in many ways: "It builds children's prior knowledge and natural curiosity, provides a context that enhances literacy instruction by expanding experiences and science vocabulary, stimulating creative writing, developing knowledge of literary genres and fosters student expression and knowledge" (Yerrick, R & Ross, D. p.1).
Using well-written expository trade books at the kindergarten level exposes young students to scientific language and text formats that could provide background knowledge and understanding that would prepare them for topics they would be reading about later in the upper grades.

**DATA COLLECTION AND PROCEDURES**

The six books used were written by Gail Gibbons and are all expository science trade books about various animals. They are approximately the same length and level of difficulty. They contain a variety of nonfiction conventions such as labels, captions, comparisons, diagrams, graphics, and illustrations, various sizes of fonts for headings that signal importance. The books are high quality elementary trade books. Students were pre-readers, so the books were read aloud to them as a whole group activity. The purpose was to discover how adding simple drawings of some of the factual material could aid the students' comprehension. The teacher made sketches in advance in anticipation of ideas students might have. By drawing them ahead of time, less time was needed, the lesson moved quickly and the teacher could model how to draw things students would be hearing soon. Familiar shapes such as triangles, circles, rectangles and squares were used for animals so students could easily draw the animal and use time to add more details. Shapes were also displayed in the room. Using shapes for drawing animals also gave students more practice drawing with patterns they were using in math.

The first book was about *Bats* and the book was introduced as a game where students tried to guess what animal the book was about. Students were told the animal's name rhymes with cat. The teacher gave a clue and sketched a picture on a white board. (See appendix) After each clue was given, the teacher asked for ideas. Some students guessed lion, dog, bat, tiger, and bird. Even when the correct answer was given, the clue game was continued to get more ideas and information sketched. The teacher continued asking students, saying, "What do you think it is now? The first
Patricia Vespa
May 2002

The drawing was of a big tree, tall house, and cave habitats of bats. Then stars and a moon were drawn to show it is nocturnal. Next a mouse, fish, flower and blood for food it eats. Last its body shape and features. The objective (appendix) of the lesson was to draw and label parts of a bat, its habitat and describe unique characteristics or terms such as it has wings, but no feathers and its young are called pups.

This continued for a short period followed by showing the book and reading it for approximately ten minutes. The time spent in the morning amounted to approximately fifteen minutes. The time allotted for in the afternoon was thirty minutes. The book was again taken out in the afternoon. Students were asked to tell what they remembered about the drawings. Next, the rest of the book was read and students were given a large sheet of paper. The top half was unlined for drawing and the bottom half was lined for writing. The students were to first draw a page using things they remembered from the book we read. As they drew, the teachers went around the room asking students to tell about their pictures and what they wanted written. At the end of the thirty-minute period, the papers were collected.

The second book read aloud was Cats. The book was introduced as a game just the same as the book on bats. Students tried to guess what animal the book was about and were told the animal's name rhymes with bat. The teacher gave a clue and sketched a picture on a white board. (See appendix) After each clue was given, the teacher asked for ideas. The first sketch was of a house and ship and students were told it originally came across the sea from Africa and lives in houses. Next a sketch of a mouse drawn and students were told this is what it eats. It's face and body shape was drawn next such as fangs for teeth, eye that looks like a marble and whiskers. Students guessed lion and snake when they heard the word fangs. After seeing the sketch of the body, many were able to name the book. This continued for a short period followed by showing the book and reading it for approximately ten minutes. The time spent in the morning amounted to approximately fifteen
minutes. The time allotted for in the afternoon was thirty minutes. The book was again taken out in the afternoon. Students were asked to tell what they remembered about the drawings. Next, the rest of the book was read and students were given a large sheet of paper. The top half was unlined for drawing and the bottom half was lined for writing. The students were to first draw a page using things they remembered from the book we read. As they drew, the teachers went around the room asking students to tell about their pictures and what they wanted written. At the end of the thirty-minute period, the papers were collected.

The next two books were *Frogs* and *The Milk Makers* also by Gail Gibbons. A KWL chart using pictures to represent the words and ideas students volunteered was used (See appendix). A computer clip art illustration of a cow was taped to large tablet of chart paper divided into three sections labeled K- *I know*; W- *I wonder*; and L- *I learned*. Students were asked to name things they knew about cows and a "list" of sketches was made. The same procedure was used for the W- "I wonder" column. Most of the L- "I learned" chart was completed in the afternoon. Then the book was introduced and read for five to ten minutes. The morning time was approximately fifteen minutes. The afternoon instruction began with looking at the chart and "reading" the list as a review. The book was then completed and students were given another large sheet of identical paper to draw and write. The students were told to draw or write using things they remembered from the book we read. As they drew, the teachers went around the room asking students to tell about their pictures and what they wanted written. At the end of the thirty-minute period, the papers were collected. Both of the third and fourth books used identical instructional methods.

The last two books were *Spiders* and *Sea Turtles* by Gail Gibbons. To preview the book *Spiders* an overhead with three groups depicting three different topics was made:

1. Three kinds of webs - triangle, orb or circle, and v-shaped in grass
2. Three enemies - birds, wasps, frogs
3. Three body characteristics - eight legs, eight eyes, and two body parts

Two of the groups were covered while one was explained. The next topic was then revealed moving in a circular pattern until all items were viewed. The teacher then began reading the book for five-ten minutes. In the afternoon, the overhead was again shown using a circular pattern and students volunteered what they remembered. After viewing, the book was then completed and students were given another large sheet of identical paper to draw and write. The students were to draw using things they remembered from the book we read earlier. As they drew, the teachers went around the room asking students to tell about their pictures and what they wanted written. At the end of the thirty-minute period, the papers were collected.

To preview the book *Sea Turtles* by Gail Gibbons an overhead of three topics was made:

1. Three things they *can*/*can't* do: lay eggs on land, swim with flippers entire life, cannot put head inside shell

2. Three enemies- people, sharks, and whales

3. Three things they eat- fish, crabs, and jellyfish
ANALYSIS AND EVALUATIONS OF LESSONS

Many students drew items and dictated sentences using new ideas and language from the books. One student used the word "pup" to describe baby bats. Many drew a claw thumb that bats use to help catch their food. One student with hearing limitations drew and dictated words describing the food chain for a sea turtle saying his turtle was eating a jellyfish and a shark was eating the turtle. Many students were able to draw features of habitats and animals. A few weeks after reading about sea turtles, a student brought in a new folder with a picture of a sea turtle and showed it to others pointing out it was a sea turtle and was swimming in the sea.

Presentations

Students seemed to really enjoy listening and hearing about the books about animals. Students participated and were enthusiastic about drawing and dictating or writing and making their own animal books. They were reminded to draw facts they had learned. Many copied things they had seen in the presentation and then added other things such as flowers or more stars and sunshine.

Game using clues - A game introduced the two books Cats and Bats. This was fun and kept their interest. I purposely kept it short because I only had fifteen minutes to draw clues, guess and begin the book in the morning. In the afternoon, we had approximately thirty minutes to finish the book and draw. Because of the time limitations, some students said they weren't done. They go to specials after science and there was no more time available in the morning or afternoon. While reading the book, students were quiet and seemed to enjoy the topics. After we read about bats, another kindergarten teacher let us borrow a bat she had preserved in a jar. In the book, the author states not many people have seen a bat. Students remembered this and happily said they had seen one. Using a clue game to discover what the book was about was appropriate for kindergarten level and early elementary, but older students would need more difficult clues. A couple students
got the answer right away and complained when others copied their responses. I encouraged them to keep listening for more clues and reminded them we all learn from listening to each other. This seemed to help and the fact that there were more clues, and they seemed to enjoy watching the sketches being made.

**KWL chart.** A KWL chart was used to introduce the books *The Milk Makers* and *Frogs.* Using a KWL chart was new to them. They have chart paper, but I had only seen it used for writing alphabet words. One student copied the words "I wonder" on his page. I thought it was interesting to listen to children tell things they knew about frogs and cows. They seemed fascinated by the science books and didn’t want to stop after the fifteen minutes, but that was all the time available. They also copied color words from a bulletin board such as brown and white.

**Muraling.** Student had not seen an overhead used before and were very excited to see the pictures. I used computer clip art and uncovered sections as I talked about them. Students were very quiet and liked the books very much. All the information was new about sea turtles and they seemed to especially enjoy the scenes in the book of the flippers. Some students talked about sea turtles swimming because they have flippers after we had finished. Planning the muraling helped me organized things I wanted to emphasize such as kinds of webs, body features and foods eaten. I used Simple clip art instead of sketches because the wipe off markers sometimes don’t work well on a smaller area, and I wanted students to be able to accurately see and make the drawings themselves.

**Students’ drawings and sentences.**

Students were able to remember and draw more items than they dictated or wrote. This was interesting and showed their dependence on drawing was stronger. Both familiar and unfamiliar seemed equally fascinating to them and they drew and wrote similar amounts for both. Students also dictated many feeling words, such as, "I love my cat" or "My cat is sad" and "The cat is mad."
Some students’ drawings also show emotion in the faces of the animals they drew with angry, sad, or happy faces. I didn’t see a difference between the more familiar animals such as cats and frogs and those that weren’t as familiar. I learned a lot about students’ lives, their experiences, their likes and dislikes and their feelings about their surroundings. Many students personalized their drawings and words using the term “my spider” or “my cat” rather than a spider or the cat.

Bats

One student drew his bat upside down and wrote, “My bat is sleeping.” Another dictated, “Bats live in the alley. What do I do with them?” My bat is getting some berries.” “Bats hang in the tree.” “He is my friend.” ”The bat flies out in the dark.” ”The bat has a pup.” One student dictated a story, ”The bat is trying to get the girl. The bat cut the girl.” Some used feeling words to describe their pictures, ”My bat loves to play in the trees.” ”I love my smiley bat.” Many drew stars, moon, insects, claws for thumbs, teeth, and grapes for food. bats wings and teeth.

Cats

Some of the guesses were tiger, cat, snake, bear. One student dictated ”The cat. He is hunting. He is in the dark.” Others dictated, ”I love a cat.” ”The cat is mad” ”Cats catch the mice.” ”I love kittens.” ”Baby cats are kittens.” ”The cat is walking by its litter box.” ”The bad cat is chasing the girl.” ”Cats eat fish and mice. I don’t like cats.” Students correctly drew and dictated facts and also added their own personal feelings. One student asked why we were learning about cats. I asked the class the question and one said, ”Because we might want one for a pet.” Another said, ”To know how to take care of a cat or maybe if we know if we want one or not.” I think giving purposes for reading helps reading more authentic. All students said they had seen a cat, but some didn’t like them, others liked only kittens, and some liked both cats and kittens.
Some of the students incorrectly drew or stated information such as, "My frog is blowing bubbles", "My frog flies" and "My frog is sitting on his eggs". Others wrote or drew correct new things such as, "Frogs are different colors", 'My frog is eating a bee" , 'My frog is a good frog", "My frog is catching ants and flies". One student wrote, "My frog is from California” another wrote, "My frog ate a bat”. One student wrote a story saying, "My frog is eating flies and the girl was taking a picture and showing her mother and her class". Pictures of frogs generally showed large eyes, green colors, correct body shape, but also things like long tongues catching insects and eggs in water.

**The Milk Makers**

One student dictated the sentences, "A cow lives in the barn. A man pulls the milk out.” Another student dictated, "My cow is a mama cow. The baby is drinking milk." Many drew pictures of cows outdoors and used words alone or in sentences to accurately describe factual material from the book such as "My cow is eating grass in the dark and drinking water." "The cow has milk" "The cow gives us milk." "I like a calf" "A cow lives in a farm." "The man comes to get some milk." "The baby drinks milk." And "Calves eat milk."

**Spiders**

Many drew correctly eight legs and some drew eight eyes also. Feeling words were more often used for spiders, but also they dictated sentences such as "I do not like spiders. My spider caught a fly." "My spider is a good spider. She likes to eat a butterfly. She likes to catch some bugs in the grass." One wrote, "I like a spider. My spider scares my baby sister." Another student dictated, "My spider is a scary spider. He scares me and he scares my brother." One student dictated, "The person is nice to the spider. The spider eat insects." "My spider is happy." A student connected spiders to his own prior knowledge and dictated, "I have tons of them at home."
Another student dictated, "The spiders have baby spiders. The mom lays eggs." Another student dictated, "My spider was outside. He made his web. He has two parts to his body." A student who drew a colorful spider described his picture by dictating, "My spider is colorful. My spider is a good spider." A student dictated telling both that she didn't like them and a behavior she disliked, "I don't like spiders. My spider bites a ladybug." Another student drew a picture of the spider and a ladybug and dictated, "My spider is good because she eats insects that bite people.

**Sea Turtles**

Students drew colorful pictures and dictated words that indicated their understanding of sea turtles. Most information was accurate, but some was not. One student dictated, "My sea turtle is a good turtle. He is my pet." Another said, "Turtles eat fish. They stay in the water." One student with language and hearing limitations accurately drew a detailed picture and dictated factual information that described the food chain, "The shark is trying to eat the turtle and the turtle is trying to eat the jellyfish." A student said, "My turtle is having fun" and showed a smiling face on her drawing. Another said, "My turtle is happy." A student said, "The turtle is going to eat the fish. He is under water." One student asked a question, "Do sea turtles eat com?" Another said, "My turtle eats jellyfish and fish." Many students said "I like them" and one said, "I like to play with a sea turtle." Another said, "A turtle eats a lot of crabs." One student drew a detailed picture of a crab, sea turtle and shark and said, "Sea turtles like to eat crabs. Sharks eat them." One student personalized the picture he had drawn and said, "I was laying my eggs in the sand. Mom went back in the water to eat." Another student dictated, "My little baby needs some food. The baby turtle drinks some water." A student drew a picture of eggs in the sand and a large turtle and said, "I layed my turtle eggs because my mommy went into the water." Another student drew a picture also of eggs in the sand and said, "The mommy went to the water and the baby wanted to get out." She also has a smiley face sun and lots of detail on her turtle showing flippers. One student said, "The
flipper is so good in the water" and drew a picture of a sea turtle with flippers swimming in the water.

**Time spent**

An equal amount of time was spent on each book. Students have science twice a week for thirty minutes. Two books were introduced in the two days each of the weeks, but one week students had a day off and the second book was introduced the following week. Fifteen minutes was also used from the morning reading time to introduce the books in various ways. Normally students are read storybooks during this time and after the six books, storybook reading continued.

**Focused lessons and assessment**

Finding an instructional method that would promote the most effective learning for students is essential within the time limitations of today's classrooms. Young children have short attention spans and drawing is an attention grabber. The teacher models drawing just like reading by pulling out important details and facts. When students are later given opportunity to draw, they provide assessments of the content for a portfolio and an assessment of the instructional methods for the teacher to review. Being able to convey new information to others is important for providing authentic purposes for learning and audiences for sharing.

Trade books provide opportunities to acquire and use new facts, vocabulary and understanding of the world around them. The one book in the classroom that is usually chosen during free reading is a class book made by children. *When You Give a Moose a Muffin* was used as a prompt for students to write another ending. Children enjoyed recalling what they wrote and drew and shared it with others; they also enjoyed listening to what others wrote and drew.
Expected and Findings

I expected students to enjoy the books by Gail Gibbons and drawing things they remembered. I also expected them to have some prior knowledge about cats and cows. Since they live in an urban area, I did not know how often or familiar they were with farm and other animals. I expected them to draw, but was surprised at how well they drew and the details they used. Many also were able to use terms such as calf, kitten, and pup for young cows, cats, and bats. They also drew eggs for turtles and spiders and frogs. They demonstrated knowledge about other habitats: cows live outside and on farms, bats fly at night, sea turtles spend entire lives in the sea, some cats live in houses with us, spiders have different kinds of webs, frogs live near water and help us by eating insects.

Many conveyed new factual information both in drawings and words that demonstrated they comprehended the books even though there was a lot of new information. Many wrote about emotions (happy, sad, mad, loves) and personalized their animals using the term “my” when describing an animal. This is developmentally typical for young children who are egocentric, but I didn’t expect it because I had emphasized that they were to draw factual things they remembered.

When the books were all completed, we worked in small groups to assemble their pages and they stapled the pages together. I read them the words they had written and they made changes such as adding a word to make more sense and adding some periods at the end of sentences. This was not reflected in the samples because students took their books home the same day. I could see this could work very well and easily into a mini grammar or reading lesson. Since our time was so limited, we did minimal corrections.
THEORY AND RESEARCH:

USING DRAWING and ORGANIZATION TO AID UNDERSTANDING

KINDERGARTEN OBSERVATIONS

The teacher read daily to students as a whole class. They seemed to enjoy this time and settled down quickly. A storybook on tape was also in a listening center. There were half a dozen picture dictionaries on a bookshelf along with workbooks and writing journals, but students were not allowed to freely use them. A two-sided bookshelf contained storybooks and fictional books the teacher had already read to the class. Occasionally students who finished their snack were given a few minutes to choose and look at a book. A class book that contained students’ individual pages with drawings was chosen the most often. It contained a completed response, "If you give a moose a muffin ..." from Laura Numeroff’s (1991) *If You Give a Moose a Muffin.* The classroom contained another shelf with storybooks on tape that could be checked out from the teacher at designated times.

Students were also given weekly library time and could choose books from a table or a cart set out by the librarian. These books were a mix of both expository and storybooks. Students mainly chose books that were familiar or had familiar characters. Students made rainbow fish as an art extension after being read *Rainbow Fish* by M. Pfister. Storybooks read to the class began with the letter of the alphabet being introduced such as *Napping House* for N, *Own Moon* for O, *Polar Express* for P, *Rainbow Fish* for R. Short dittoed books were read that emphasized each letter of the alphabet. Reading time was sometimes both morning and afternoon. Expository trade books were not read during this time or used during my observations.
Time for drawing and writing was limited in the classroom to art projects, individual wipe off boards, and workbooks. Students had bins with markers, crayons and pencils, but were seldom given free time to draw.

Reading

What are students reading during school? Are children curious and attracted to non-fiction trade books, also? According to recent studies among kindergarteners and first graders self-selections for recreational reading were informational texts (Donovan & Smolkin, p.417). However, decisions teachers make concerning genres used in the classroom and their attitudes and expectations affect the kinds of texts used in the classroom, kinds of instruction, and limited comprehension of factual information. Students are not always provided, encouraged or given informational books to read. Observations indicate that more time is spent reading and discussing fictional texts than informational or expository trade books (Teale, W. & Shanahan, T. 2001, p.5-6), and teachers prefer narratives rather than expository texts for classroom use because some teachers view information books are boring, difficult and inappropriate for young children. Teachers also indicated they felt unprepared and uncomfortable teaching science concepts according to Donovan, C, A, & Smolkin, L, B (2001, p.418).

Informational texts are organized differently than narrative texts and the mental processes are different for understanding each. There are also dual purpose informational storybooks such as the Magic School Bus series. These books include a story along with information. The amount of factual information in expository books can make them more difficult to understand (p.424). Young readers with limited knowledge may need explanations about what is factual or fictional when dual purpose informational storybooks are read.

According to Honig (1997, p.17), the best way for building vocabulary is to read extensively. Decoding ability, vocabulary level and spelling are connected to reading and
comprehension level (p.17). Some components of reading programs that produce high literacy rates in school are reading aloud and discussing materials that are a little above students' reading level, writing that stresses both narrative and expository writing, independent reading programs that emphasize simple trade books and informational texts to learn vocabulary words, comprehension programs that teach expository texts along with discussion groups and book clubs, and reading in subject-matter areas (p.21-22). Chall, J., Jacobs, v.A., & Baldwin, L.E. (1990, p.90) suggest students in a study could profit from earlier, increased and more direct vocabulary instruction especially vocabulary that is less commonly spoken and more academic.

"About 7% of American students are able to read at an advanced level by the end of 12th grade" according to National Assessment of Educational Progress. It is crucial that students are prepared and "able to analyze and synthesize expository information and read critically if they are going to thrive in our society". In order to progress in reading students need to have more practice at reading scientific and other types of expository materials. Students who read stories and novels do not get practice at synthesizing scientific, historical or technical materials. They leave school having deficiencies and are only partially literate according to Teale, & Shanahan (200t, p. 6).

Writing

Expository and informational books are preferred over narrative because students draw upon outside reading for ideas in their writing. Expository writing becomes more authentic and meaningful when used in content learning such as journals that explore concepts and discoveries (Chall, J., Jacobs, v.A., & Baldwin, L.E. (1990, p.90). Students scored better in writing when teachers taught using content reading (p.155). More expository writing is needed that stresses such elements as vocabulary and academic styles (p.155). Students who are exposed to informational books have more subjects, writing styles, topics, and vocabulary to draw upon for their own writing.
Yerrick, R. K., & Ross, D. L. promote the idea of integrating science content reading with the use of technology to enhance literacy. One reason for the success of inquiry projects like these is the commonalities between science and writing such as planning steps, making drafts, designing, reviewing and revising. The benefits of these projects expanded students experiences, vocabulary, knowledge of genres, gave students a voice and audience for social concerns and stimulated reading and writing in a real world context. Students Videotaped a trip to a pond, made a movie, drew pictures, classified, wrote stories and made observations and predictions for a bulletin board display. Using expository books opens doors to many authentic real world experiences and activities for learning.

In Strategies That Work by Harvey, S. & Goudvis, A. (2000, p.121) a teacher filled the room with nonfiction books and read them aloud every day. Students made individual books of nonfiction features. When they came across things such as captions, labels and comparisons, they drew a picture illustrating it. The purpose was to build background knowledge of these conventions and how they were used. By having students find examples and talk about these features, their reading was enhanced and also their understanding of vocabulary used in nonfiction books they read (p. 124).

The first purpose of nonfiction is to convey important information, ideas and concepts. Lessons teaching specific strategies help students pull out essential information from texts. Lessons on designing captions, graphics, locating specific nonfiction features, labeling illustrations, noticing language of comparisons such as "the whale was the size of a school bus", build and awareness of essential information and aid comprehension (p.122-124). Nonfiction writing doesn't have to be considered boring.
Calkins (2001, p.436) calls non-fiction reading the words of our world. Today non-fiction reading she says is in a crisis in many schools that are not providing time for non-fiction reading. Yet, much of real world reading is made up of information such as directions, editorials, newspapers, road signs, brochures, manuals, letters, websites, recipes, headlines and books (p.437). She suggests we begin by reading non-fiction texts around students' own interests. Hobbies, games, collections, topics such as skiing, cooking, coin or stamp collections, planning ideas for a sleepover all create interest in reading because of the child's own interest (p.439).

**Drawing and organizing instruction**

Wiggins, G. & McTighe, J. suggest focusing teaching and the limited classroom time to the most important priorities that students need. Thinking about the content standards, lifelong needs and authentic performances help create focused lessons (2001, p.15). Teaching methods are focused on a goal that uses direct instruction, inductive reasoning, and incorporates both cooperative and individual design. Drawing helps the teacher organize the essential content material before and during instruction.

A Graphic Organizer Notebook is a collection of teacher developed blank webs and organizers that students use while reading content material. Each page is designed to aid a particular portion of the material taught in the unit (Fisher, A., 2001, p.1). Students' quiz scores improved significantly after graphic organizers had been implemented (p.1). It was also suggested that teachers use organizers to teach. This models their use for students and reinforces content. Students could create and discuss visuals that reflect patterns within the text such as cause/effect, time/order, compare and contrast (p.2). Teaching with an organizer makes it necessary for the teacher to be familiar with specific content students are expected to know and plan for instruction. Print Shop Deluxe ITI software has layout designs that can be printed and organized into student notebooks.
Visualization strategies improve reading comprehension of text (p.3). Graphic Organizer Notebooks were manageable and motivating for students to use to review and provided clear understanding of what information they needed to know for tests (p.3). Organizers also serve as excellent outlines that can be used for writing essays. Students learned to identify and differentiate between main ideas and details and also became adept at designing their own organizers (p.4). Graphic organizers use an artistic approach to enable teachers to teach reading, writing and study skill strategies that meet the needs of all students and promote active independent learning (p.4).

Illustrations enhance reading, vocabulary and comprehension.

Very young pre-reading children can learn from expository texts. Drawing provides a comfortable scaffold for children to bridge language and reading as they acquire new knowledge and vocabulary. Pictures are also used in many children's books to supplement language limitations of young children. Peter Rabbit, Winnie the Pooh and Big Bird are recognized by children who can retell many favorite stories just by looking at the cover of a book as can many adults. Children who are pre-readers are able to recognize kinds of cereal, logos, and various toys they want from pictures they have seen. Children who are read storybooks can often "read" it again using picture prompts.

Teachers can utilize instructional methods, using pictures to present new information to students before they are able read it independently. Children learn to speak words after first hearing them. Later, they learn to spell them. The more they are read and spoken to, the more their vocabulary is enhanced. As language improves, they communicate more effectively. Communication by drawing pictures precedes written words, and allows children independence to communicate ideas before they are even able to write the words.

Pictures aid comprehension and communication. Pictures precede writing and provide a scaffold for reading such as rebus stories. Rebus stories combine pictures and words that allow
young children the enjoyment of "reading". Many rebus stories have fictional characters and a simple predictable plot.

Value of Pictures in Society

Pictures abound in every area of our information society. Shapes and symbols are used to identify school busses and help students remember their bus because numbers are more abstract. Adults use graphic organizers to help manage their time. We make lists, reminders and notes and put them in places where we will see them as visual cues. Kindergarteners enjoy bringing items to show and tell and communicating information to others. Show and tell combines the different intelligences such as interpersonal, visual-spatial, logical, verbal-linguistic and kinesthetic. Pictures give students who may not understand every word an object to focus on to help them understand what is being described while information is read and communicated.

The amount of information today is increasing and becoming more complex. The need for managing and organizing is greater than ever before. If a teacher can use instructional methods that aid both themselves and their students, he/she can accomplish more with less effort, and make learning more effective, and easier. Pictures are attention grabbers, but can also connect essential content material to aid comprehension and memory and help students become independent learners.

Value of drawing-a case study

"I hear and I forget; I see and I remember; I do and I understand" from a Chinese proverb. Seeing a picture helps memory and comprehension.

Sideinick, M & Svoboda, M.L show how drawing was used in a case study of an eight year old girl with problems learning (174-184). Hannah at seven years old had been placed in foster care in the summer so was beginning a new school as a first grade student.
She met with a resource person in a special education class daily, but was in a regular class most of the day. The instructor was also a licensed art specialist became interested by Hannah's art that was developmentally beyond her age. Her drawings seemed to be examples of what Vygotsky called "pre-writing". They also appeared to be about events in her family life that resulted in her being placed into foster care. She had undergone a variety of tests and the consensus was she was multi-handicapped, in need of occupational therapy, and had a discrepancy of about eighteen months between her physical age and mental age. Accommodations included organizational skills, a standard set of expectations and rules for academics, consistency and a planned schedule.

The author sees this "pre-writing" or drawing pictures of authentic events related to a conviction that children read and write best when the material is their own. Often children's first examples of writing are their own pictures with labels and captions.

Children arrive at schools with many different strengths, styles of learning and interests. They are more likely to become engaged when instructional strategies and environments nurture their particular strengths, interests and learning styles. This also goes along with Gardner's theory of Multiple Intelligences. Learning is strengthened by connections between disciplines.

Artistic expression gives teachers another way of assessing what students understand and creates an enjoyable atmosphere in the classroom. Art is interesting, gives students a sense of accomplishment, by providing a completed product, and give students an opportunity for personal expression. Armstrong, a researcher believed stronger skills could help compensate in areas where skills are weaker.

Students can use drawing to gather and organize thoughts before writing. Children draw using lines and curves to represent objects and later lines and curves are used with drawings to represent labels and names. Writing and drawing have a developmental connection. Because children with learning disabilities are often developmentally and emotionally behind their
chrono\nlogical age, using them together assists students and gives them another avenue to use besides written words.

Hannah’s teacher read stories and the students sang about barnyard animals and were then asked to draw them. Hannah wasn’t able to draw and became frustrated saying she didn’t know what they looked like. The words alone did not convey what the animals looked like. After being shown pictures, Hannah not only understood what the animals looked like, she was able to draw them and construct sentences and simple stories. The pictures provided her an understanding that the words alone didn’t.

Hannah’s regular class also learned how to make a web to begin writing. Hannah was able to make a web and list words with the correct beginning sound. The teacher had Hannah reinforce her web with drawings. More letters were added and she progressed and began to narrate more complex stories.

Hannah became frustrated trying to copy all the words of her narrated stories that the teacher had written down. As a result, the teacher emphasized her drawings and invented captions rather than have her recopy all the words to her narrative. Hannah’s stories became more detailed and she added more information to previously written stories demonstrating she understood sequencing in a story. Hannah began to publish one book with drawings per month. Hannah also was later able to draw another child’s story as he related it to her demonstrating her understanding by drawing pictures of the words she heard.

Other students noticed her success, which also encouraged her. They also helped her interacting with her more, giving her social support and a place in the classroom.

Language or art provides us the means to organize all the stimuli we are exposed to. Drawings were Hannah’s language. Through drawing she was able to organize and bridge the spoken and written word. While she may be behind others her age in understanding texts and
writing, she is able to gather more knowledge, form words, and communicate. As she learned more, she also added to and revised previous stories. In this article, Hannah was able to communicate by drawings. She considered herself an artist and understood what an artist does. Drawings or graphics support and aid connections between reading, writing, and comprehension. Children rely on pictures to understand abstract concepts in math because pictures are more concrete.

This article reminded me of the value of using not only pictures, but also involving students in meaningful and purposeful activities to assist them in becoming independent learners who succeed. Hannah experienced the joy of being able to communicate in new ways using her own drawings. The idea of prior knowledge also helps students and using their knowledge in art to build knowledge in writing and reading makes sense.

### Value of pictures for all ages and occupations

When my children were preschool age and we were packing to go on vacation, I impulsively drew little pictures for them of things they needed to pack such as shorts, tops, socks, and shoes. If they needed three pairs of socks, I drew six little socks. They were thrilled and so was I as they independently "read" the pictures and packed their own suitcases.

Most adults can easily recall the shape of Florida or Italy from having seeing a picture of their shape on a map.

People of all ages enjoy reminiscing looking at pictures recalling events and details not shown, but remembered when a photograph jogs their memory.

Many centuries ago ancient symbols called hieroglyphics were used to communicate. Hieroglyphics are pictorial symbols from ancient times and are the basis for pictures called "glyphs" that are being used by doctors, astronomers, geologists, and other scientists to communicate extensive amounts of detailed data in easily read picture format. These drawings represent facts and data that can be interpreted easily and were originally used by physicians who
needed to quickly assess a patient (Cartland, 1996, p. 324). Graphing, classifying, organizing and communicating data are skills that are more easily taught using pictures. Pictures are better than language because they show the information. Comparisons of weights and measurements may be difficult to process when read, but a student can easily see data comparisons in a pictograph.

Mathew Brady and his photography had an impact on the way people viewed the Civil War. His photographs of battlefields and death of young soldiers raised issues that are still relevant. His photography forever changed the “image of war?” President Lincoln pursued his goals in the face of adversity and inner conflict. Pictures depicting actual historical events can be viewed on a website. These pictures stir emotions and issues that make it more understandable for students. They can see for themselves firsthand.

Pictures are especially valuable for English language learners and those who have limited vocabulary (website San Diego County Office of Education, 1998).

**Expository texts are not being read by or to students in classrooms for variety of reasons**

The majority of books read to young children in school are storybooks with simple plots and numerous pictures that can easily be followed with the main purpose as enjoyment of reading and entertainment. In a fourth and fifth grade classroom book audit to determine whether their book collections included a variety of genres, results revealed very little trade non-fiction was available to students and over 80% of the books were fictional according to Harvey, S. & Goudvis, A. (2000, p.118).

One difficulty with expository texts is the format used to present the factual information. Non-fiction books have bits and pieces of information like a collage and nothing to connect the items in a logical order or sequence. There is no main character or plot or setting the reader can relate to. What occurs first or next doesn’t matter and the facts are somewhat abstract unless
something concrete can be presented along with them to aid understanding and connect them.

Simple drawings provide a concrete link for comprehending data in a logical order.

Because textbooks are difficult with "information too densely packed, too much assumed prior knowledge, too many missing cohesive connections and too much irrelevant information" they lack appeal to child readers according to research done by Ambruster ad Anderson, 1985,1988 (Donovan, C., Smolkin, L, 2001). Replacing textbooks with trade books is one solution teachers have found to the problem. However, informational texts are organized differently than storybooks and are more complicated. For this reason, they are not chosen as often for classroom use. (Donovan, C., Smolkin, L, 2001) A story is organized around characters and plot that occurs over time. Information and events are connected to characters and setting.

Informational texts do not have familiar characters, but unfamiliar formats and characteristics such as captions, diagrams, charts, comparisons, and headings that signal important extra information connected to a topic.

Many school districts have stopped using basal readers in favor of novels. The current push for literature is also in content area classes such as math, science and history. Many districts also have quit buying science books in favor of "hands-on science". The result is children are often not getting the opportunity to read expository texts at school. Only about 7% of American students are able to read at an advanced level by the end of 12th grade. Students need to be able to understand, analyze and synthesize information in today's society. (Teale, W. & Shanahan, T, 2001 p.5)

**Graphic Organizers:**

A Valuable Tool for Understanding and Remembering

Graphic organizers as a teacher's tool can meet the many needs of students in today's classrooms and promote inclusion by providing more involvement for all students.
Students are given new facts, details, concepts, vocabulary, confusing spelling words and may feel overwhelmed unless they know how the are connected to things they know and how to access them when they need it. Graphic organizers provide a structure to organize knowledge so it can be retrieved easily when needed.

A teacher asked a student to number his paper from 1 to 10. The student replied, "Do they have to be in order?" (Winebrenner, p 140). This illustrates the reality that organizational skills need to be taught just like other skills. Some people by nature are more organized than others, but many adults depend on lists to give order to their day's activities. A list provides us with a plan and having a plan alleviates some of the pressures of maintaining busy schedules. Without it, it is easy to feel frustrated, confused, and overwhelmed by appointments, deadlines, interruptions, and distractions.

Many students would benefit from being shown strategies for organizing knowledge as they learn. Students with learning disabilities often are disorganized, appear messy and lack study skills (Winebrenner, p. 27). Graphic organizers are multi sensory which is especially helpful for students with special needs. Spatial learners understand concepts best when allowed to draw them. Artistically gifted students can create a drawing that gives more meaning and helps others comprehension (Grenot-Scheyer p.44). In one case an autistic child grasped new material more quickly when it was paired with diagrams or pictures (Grenot-Scheyer p.6). Writing important vocabulary, steps of problem solving, and facts on the blackboard while talking to the class helps students with limited hearing or who are deaf. A child who only hears bits or pieces of information may loose interest or have gaps in the instruction he needs to function well. His attention may wander or he may lose interest. Graphic organizers give students a place to focus as they are listening, reading or writing. Poor readers who may not be as able to pull out important content and students who have difficulty staying on task can be actively involved and on task by looking for and
completing one of the many types of graphic organizers. Students with limited English also benefit from graphic organizers. Concept maps, story maps, semantic webs or concept diagrams help them make connections between words, meanings, or ideas in long passages of written material.

Students can work in cooperative groups to complete a story map using facts or concepts taught previously. Cooperative groups benefit all children in the classroom as they learn from each other, listen to other's opinions and ideas and work together to complete a collaborative assignment. Those with difficulty writing can still contribute great ideas. Those who have problems giving oral presentations may have wonderful handwriting or artistic ability to draw circles for a Venn diagram or story map or web. How each group organizes the particular details of a web can be explained by someone in the group and discussed giving the class a review of information taught. Various presentations offer multiple explanations and formats that aid all students' comprehension and especially those with learning disabilities.

Teachers and students can create a variety of fun graphic organizers that can be adapted to many subjects. Teachers who organize interdisciplinary and thematic units before beginning teaching can make sure that they include a variety of multi sensory activities that provide for active learning for all students. Listing the activities that emphasize tasting, touching, and smelling for students who have visual impairments, books of various levels and genres, various types of learning centers, and art, music and drama activities insure that the needs of each student are recognized and included (Dolinar, 1994).

The variety of graphic organizers can be adapted for all points of instruction from introduction to review. There usefulness in the classroom is beneficial especially for students with special needs. Using story maps has been shown to help reading and comprehension of special needs students (Friend, 317). The term "future" may be difficult for a young child to understand because it is abstract. A timeline showing the past and future graphically makes it more concrete...
Including a child's birthday in a timeline makes it more personal and interesting to him as he sees holidays or historical events at various distances from his birthday (Wood, 2001. p77). Venn diagrams show differences in main ideas or topics by comparing and contrasting them visually using two intersecting circles. Children can read and see visually what is alike or different. Outlines, brainstorming, and mind maps help students put their thinking on paper before they begin writing a more comprehensive draft. Their writing is more logical and fluent.

Checklists can also be used to monitor and guide students in the writing process. Making a personal dictionary and word books help students focus on the main words they need to know (Grenot-Scheyer, p.48).

In one middle school classroom of students with learning disabilities, a graphic organizer was used effectively to teach students how to first organize content information about bats and then create an outline with it. The classroom teacher was having difficulty and unable to get across to the students exactly what an outline was. Another teacher offered this help. First she paired the students and had them skim the paragraphs to look for the name of a type of bat. She used colored chalk to draw a different shape and color for each bat named. Then she gave the students sixty seconds to find information about specific bats and randomly called on students who raised their hand. Adding diagonal lines off the shapes she then entered facts about each of the three types. Next, she asked for the order the bats were presented and labeled the shapes I, II, III. Lastly beside each diagonal she labeled A, B, and C. All the information was then put into an outline form and the students could see what an outline was (Winebrenner, p.130-132).

Graphic organizers can be integrated into every phase and topic of study. They get and hold students’ attention. Bulletin boards, displays of themes and activities, flow charts of problem solving steps, timelines for art depicting characteristics of an era, groupings of spelling words with
like phonemes, order of operations for math, checklists for homework all demonstrate the wide variety and usefulness of graphic organizers.

A teacher must provide for individual and group needs. Using a variety of instructional strategies when presenting material encourages students to be actively involved. As they become involved, their needs are met and they meet with success. Based on the positive results of their many uses, graphic organizers seem to be a proven useful organizational aid benefiting both students and teachers.

**Conclusion**

"Now and Later" is a brand of candy that can be enjoyed both now and later. Reading is a now and later skill. Consider nursery rhymes learned as small children. Many are read over and over and can be recalled and enjoyed later in life. These rhymes and repetitions sometimes contain valuable information and have lifelong value such as how many days in each month or the names of state capitals. Not all information is essential, but helping students locate important information in expository texts is a worthwhile skill needed in our information society. Comprehension and memory are enhanced when students have more exposure thinking. Informational books give us all new things to think and talk about and understand.

Organizing instruction by using graphic organizers and drawings would aid most students and also provide them with a tool they can use all throughout life. Students learning to organize a story to write today, can organize daily activities, plan events, and understand household finances later in life. I like the lifelong learning aspect of organizers and pictures. Drawing a picture to explain something makes it easier for the novice to understand. Using it in the classroom for instruction provides students with a vital tool they can use throughout their lives.
Satellite pictures of the earth, moon and outer space, MRI images, all help our comprehension when reading scientific language describing things we have no first hand knowledge or experience with. Students need learning opportunities that provide them with the same kinds of support for language or information they may have no first hand knowledge of.

I believe students are more interested in reading when given interesting reading material. Content area books offer a rich source of material at various levels of difficulty for use in the classroom.

**Content area learning strategies for middle school students**

Loranger, A. gave some excellent ideas for using reading to teach content areas (1999). I like teaching interdisciplinary units because the connections to other areas make the content more relevant to students and also reinforces the material in other contexts. This article gave some easy and practical ways to teach reading using content. I believe students are more interested in reading when given interesting reading material. Content area books offer a rich source of material.

This article describes how teachers in Charles Dunn Middle School in Massachusetts all assume responsibility for teaching content area literacy. Sixth grade students enter the classroom and without a prompt from the teacher, take out their books, read for ten minutes and then write a response to what they have read in their response journals. The school is the state’s winner of the 1996-97 International Reading Association Exemplary Reading Program Award, which recognizes outstanding reading and language arts Programs in schools throughout the United States.

Prompted by average to below reading scores, the sixth grade team of teachers worked together in a pilot program they called RCA- Reading in the Content Area. They rescheduled classes to add on period for all sixth graders who would then be taught by four content teachers from English,
Social Studies, Science, and Math. Each content teacher had a group of about 24 students for one quarter. At the end of the quarter, each group of students had had an RCA in each of the four subject areas.

Some of the instruction included: teaching students to differentiate between learning from narrative and expository texts, teaching students strategies for activating prior knowledge, helping students understand how they learn and teaching a variety of study strategies such as using graphic organizers, detecting organizational patterns in texts, and using concept maps.

The teacher designed the lessons to integrate reading, writing, and study strategies into his content area of science. The article focused on some of the specific examples of lessons he used. John, the teacher highlighted in the article believed students need to see connections between life experiences and learning environments. He sees the purpose of education changing from memorizing facts to gaining skills needed to access information and comprehend the knowledge they have read from books to cyberspace.

Ten to fifteen minutes of SSR (sustained silent reading), a bi-quarter book were also part of the RCA program. Students kept reading logs, wrote in journals and kept portfolios of all their work. Some of the specific learning strategies taught in the school were included in the article with the student's reactions. Compare and contrast taught using class pets-an iguana and a hamster where he taught a concept using concrete familiar objects and moved to more abstract strategies were:

1. Sequencing- taught retracing steps of a lost hamster, imagining a frog's thoughts as it goes through metamorphosis
2. Cause and effect- presenting students with written effects and asking students to come up with causes to teach food chains
3. Opinion/Proof-assuming roles in a community to debate the possibility of allowing the new business to build a hotel and the realizing its effects on various individuals then arguing a perspective

4. Study skills- using starfish shaped graphic organizers to draw and write cues to vocabulary words

5. RAFT-a higher thinking skill activity where students assume the Role of a non living thing, think about their Audience, use a Format such as a poem, letter or comic strip to write and Topic, choose a topic to discuss an invention or predator etc.

Students choose from activities and place them in a portfolio. They are assessed through the portfolio after mastering a specific list of skills. Students bring their portfolio to the next content area class and include a rationale as to why they included it and what they learned and liked about the activity. The teacher had learned and used the strategies himself and saw the value of them to his own success. The ideas presented were easy, practical and helpful for student's use and teachers to model in their teaching.
References:


State Flower-- Violet http://wroy.museum.state.il.us/exhibits/symbolesflower.html. ...
Appendix
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<td>4-1</td>
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<td>24-8</td>
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<td>4-4</td>
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<td>4-2</td>
<td>8</td>
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<td>3&amp;4</td>
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<td>15-9</td>
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<td>15-boy</td>
<td>3-2</td>
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<td>12-9</td>
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<tr>
<td>16-boy</td>
<td>5-5</td>
<td>4-5</td>
<td>4-4</td>
<td>2-2</td>
<td>7-4</td>
<td>19</td>
<td>12</td>
<td>16</td>
<td>1&amp;2</td>
<td>+</td>
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<tr>
<td>17-boy</td>
<td>2-3</td>
<td>4-4</td>
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<td>19-boy</td>
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<td>1&amp;2</td>
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<td>12-4</td>
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<tr>
<td>20-boy</td>
<td>7-3</td>
<td>4-3</td>
<td>6-7</td>
<td>6-3</td>
<td>8-5*</td>
<td>10</td>
<td>20</td>
<td>22</td>
<td>5&amp;6</td>
<td>+</td>
<td>31-21</td>
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<tr>
<td>21-boy</td>
<td>2-3</td>
<td>2-2</td>
<td>1-8</td>
<td>2-2</td>
<td>2-2</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>1,2,3,4</td>
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<td>9-17</td>
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<tr>
<td>22-boy</td>
<td>4-3</td>
<td>5-3</td>
<td>1-0</td>
<td>5-2</td>
<td>4-3</td>
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<td>14</td>
<td>5&amp;6</td>
<td></td>
<td>19-11</td>
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</tbody>
</table>

**Bats/ Cats- Clue Drawing**  
**Frogs/Cows- KWL**  
**Spiders/Sea Turtles- Muraling**

**Points:** First number is equal to number of items pictured - body shape, facial features, habitat, foods, enemies, behaviors, other items  
Second number- number of words- animals name, relevant names of items in habitat, behavior, labels, etc.
Illinois Standards: Science

12.A.1a Identify and describe the component parts of living things (i.e. birds have feathers; people have bones, blood, hair, skin) and their major functions
12.A.1b Categorize living organisms using a variety of observable features (i.e. size, color, shape, backbone)
12.B.1a Describe and compare characteristics of living things in relationship to their environments
12.B.1b Describe how living things depend on one another for survival

Materials:
Bats, by Gail Gibbons; sketches of bat characteristics and environment; papers for writing and drawing

Objective: Draw and label parts of a bat and its habitat; describe characteristics; Labeling, making comparisons - flies like a bird, but has no feathers

Anticipatory Set: Play a game called "Clue" - Try to guess what the book is about by facts I will draw.
• Draw a house, big tree, caves - lives in roosts
• Draw stars, moon - nocturnal, awake at night
• Draw insects, mice, fish, flower, blood - foods it eats
• Draw body parts - 4 fingers and thumb with a clas
• Draw mouth with teeth, pointy ears - good listener to sound waves
• Draw body for body, 2 triangles for wings, small triangle opposite head, ears, arms, skin between fingers

Listen closely to the book, because you will be making a page of a book about animals this afternoon.

Procedure:
1. Ask what the cover is called - The Cover - Tells the title, author
2. Ask what the next page is called? Title page-
3. Begin reading book for 5 minutes
4. Tell students we will finish reading it in the afternoon and they will begin a book about animals.
5. In the afternoon, they will draw using a pencil and write other facts they have learned to make a kind of encyclopedia of 6 animals
6. Finish book in afternoon and allow 15 minutes for drawing facts they learned about bats.
7. Show pages - each page has a place to write and draw pictures. Draw things you have learned
8. Put their name in the center and facts they want to draw or write about cats in one of the circles.
9. When they finish the writing and drawing, they can color their pictures.
10. Pages will be collected and saved until all the animal books are read and pages made for each and then, they may take their books home.
Lives in dark places

Shy, gentle

Eats flowers, fruit

Bloody insect

Nocturnal

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G...tv .t0i n~s -

m\~\~es

1'x,'S

S+~_rj

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Science Lessons-Cats

Illinois Standards: Science

12.A.1a Identify and describe the component parts of living things (i.e. birds have feathers; people have bones, blood, hair, skin) and their major functions
12.A.1b Categorize living organisms using a variety of observable features (i.e. size, color, shape, backbone)
12.B.1a Describe and compare characteristics of living things in relationship to their environments
12.B.1b Describe how living things depend on one another for survival

Materials:
Cats, by Gail Gibbons; sketches of cat characteristics; papers for writing and drawing

Objective: Draw and label parts of a cat and its habitat; describe characteristics; Labeling, making comparisons-- cat nose is like a fingerprint

Anticipatory Set: Play a game called "Clue" - Try to guess what the book is about by facts I will draw.
- Draw a ladder and a tree - it can climb
- Draw a cat nose/ fingers on a hand - It's nose print can identify it and is like our fingerprint
- Draw front and back paws with 5 toes in front and 4 in back.
- Draw claws on each paw.
- Draw mouth with number 30 and then four fangs
- Draw a mouse - It eats this
- Draw a cat using circles and triangles and whiskers - long and short hair are the two types
- It can make sounds - hiss, purr, meow, yowl

Listen closely to the book, because you will be making a page of a book about animals this afternoon.

Procedure:
1. Ask what the cover is called - The Cover - Tells the title, author
2. Ask what the next page is called - Title page-
3. Begin reading book for 5 minutes
4. Tell students we will finish reading it in the afternoon and they will begin a book about animals.
5. In the afternoon, they will draw using a pencil and write other facts they have learned to make a kind of encyclopedia of 6 animals
6. Finish book in afternoon and allow 15 minutes for drawing facts they learned about cats.
7. Show pages - each page has a place to write and draw pictures. Draw things you have learned
8. Put their name in the center and facts they want to draw or write about cats in one of the circles.
9. When they finish the writing and drawing, they can color their pictures.
10. Pages will be collected and save until all the animal books are read and pages made for each and then, they may take their books home.
CATS

lives in a house
climbs a ladder or tree

nose print

- 4 toes in back
- 5 toes in front with claws

- 30 teeth, 14 of them called fangs

eats fish

Science Lessons- The Milk Makers

**Illinois Standards : Science**

12.AI a Identify and describe the component parts of living things (i.e. birds have feathers; people have bones, blood, hair, skin) and their major functions
12.AI b Categorize living organisms using a variety of observable features (i.e. size, color, shape, backbone)
12.B.la Describe and compare characteristics of living things in relationship to their environments
12.B.lb Describe how living things depend on one another for survival

**Materials:**

**Objective:** Use words and drawings to describe characteristics of cows; identify items that come from cows.

- **Anticipatory Set:** Tape a picture of a cow to the large chart. Write K, W, L on each of 3 columns. Ask, "Has anyone ever seen one of these? Where did you see it? On the first column of the chart we are going to list things we already know about cows. Then we will write some things we wonder about. This afternoon, we will write things we have learned in the last column.

**Procedure:**
1. Tape a picture of a cow in center of chart
2. Write K, W, L making 3 columns- K for know, W for wonder, L for learned (to be completed after reading book)
3. Ask students to give one or two word facts about the cows as you write their ideas under K- set a time limit of 2 minutes to encourage students to think quickly; can use sticky notes for each item of K and W- will do L in afternoon-(see page 2 for ideas & questions)
4. Listen to the book and this afternoon you will be making another page for your animal book.
5. Ask what the cover is called- The Cover- Tells the title, author
6. Ask what the next page is called? Title page-
7. Begin reading book for 5 minutes
8. Tell students we will finish reading it in the afternoon and they will complete another page for their book about animals.
9. In the afternoon, they will draw using a pencil and write/draw facts they have learned and will make a kind of encyclopedia of 6 animals
10. Finish book in afternoon and allow 15 minutes for drawing facts they learned about frogs. Stress that their book is factual and must contain true facts- i.e. Frogs can’t talk and aren’t pink
11. When they finish writing and drawing, they can color their pictures.
12. Teacher will walk around and write what the student says their picture shows- "Tell me about your picture" or "What words do you want me to write that go with your picture."
13. Pages will be collected and save until all the animal books are read and pages made for each and then, they may take their books home.
   - Cover- they design, name, print their full name
   - Title page: Use cover with 7 circles: Put their name in the center and name or picture of each of the six animals in each one of the circles.
<table>
<thead>
<tr>
<th>K- What we know</th>
<th>W- What we wonder and want to know</th>
<th>L- What we learned</th>
</tr>
</thead>
</table>
| What do cows look like?  
Big, brown, white, black  
Where do they live? farms  
What do cows eat? Grass, hay  
What do cows do? Walk, stand, sleep | I wonder if... cows  
- families  
- stay outside in winter  
- why people eat them  
- do they play | List items they remember from The Milk Makers |
Science Lessons-Frogs

Illinois Standards: Science

12.A.1a Identify and describe the component parts of living things (i.e. birds have feathers; people have bones, blood, hair, skin) and their major functions

12.A.1b Categorize living organisms using a variety of observable features (i.e. size, color, shape, backbone)

12.B.1a Describe and compare characteristics of living things in relationship to their environments

12.B.1b Describe how living things depend on one another for survival

Materials:
Frogs, by Gail Gibbons; sketches of cat characteristics; papers for writing and drawing, modified KWL chart, paper, frog pattern, simple drawings to use on KWL chart as students name things; Reading Strategies: Helping Young Readers to Develop Independent Reading Skills by Jo Fitzpatrick. Il. Ann Iosa. 1998: Creative Teaching Press, Inc, Cypress, CA 29.

Objective: Use words drawings to describe characteristics of frogs; compare frogs and toads

- Anticipatory Set: Tape a picture of a frog to the large chart. Write K, W, L on each of 3 columns. Ask, "Has anyone ever seen one of these? Where did you see it? On the first column of the chart, we are going to list things we already know about frogs. Then we will write some things we wonder about. This afternoon we will write things we learned in the last column.

Procedure:

1. Tape a picture of frog in center of chart.
2. Write K, W, L making 3 columns- K for know, W for wonder, L for learned (to be completed after reading book)
3. Ask students to give one or two word facts about the frog as you write their ideas under K- set a time limit of 2 minutes to encourage students to think quickly; can use sticky notes for each item of K and W- will do L in afternoon- (see page 2 for ideas & questions)
4. Listen to the book and this afternoon you will be making another page for your animal book.
5. Ask what the cover is called- The Cover- Tells the title, author
6. Ask what the next page is called? Title page-
7. Begin reading book for 5 minutes
8. Tell students we will finish reading it in the afternoon and they will complete another page for their book about animals.
9. In the afternoon, they will draw using a pencil and write/draw facts they have learned and will make a kind of encyclopedia of 6 animals
10. Finish book in afternoon and allow 15 minutes for drawing facts they learned about frogs. Stress that their book is factual and must contain true facts- i.e. Frogs can't talk and aren't pink.
11. When they finish writing and drawing, they can color their pictures.
12. Teacher will walk around and write what the student says their picture shows- "Tell me about your picture" or "What words do you want me to write that go with your picture."
13. Pages will be collected and save until all the animal books are read and pages made for each and then, they may take their books home.
   - Cover- they design, name, print their full name
   - Title page: Use cover with 7 circles: Put their name in the center and name or picture of each of the six animals in each one of the circles.
<table>
<thead>
<tr>
<th>K - What we know</th>
<th>W - What we wonder and want to know</th>
<th>L - What we learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do frogs look like?</td>
<td>I wonder if frogs have teeth</td>
<td>List items they remember from <em>FROGS</em></td>
</tr>
<tr>
<td>Big eyes, shiny, green</td>
<td>- live in winter</td>
<td></td>
</tr>
<tr>
<td>Where do they live?</td>
<td>- why people eat them</td>
<td></td>
</tr>
<tr>
<td>Forest, ponds, lakes, zoo</td>
<td>- do they play</td>
<td></td>
</tr>
<tr>
<td>What do frogs eat?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bugs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What do frogs do? Fight, jump, climb</td>
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</tbody>
</table>
Science Lessons—Sea Turtles

Illinois Standards: Science

12.A.1.a Identify and describe the component parts of living things (i.e. birds have feathers; people have bones, blood, hair, skin) and their major functions

12.A.1.b Categorize living organisms using a variety of observable features (i.e. size, color, shape, backbone)

12.B.1.a Describe and compare characteristics of living things in relationship to their environments

12.B.1.b Describe how living things depend on one another for survival

Materials:

Sea Turtles by Gail Gibbons; overhead mural of sea turtle characteristics; papers for writing and drawing, sea turtle pattern; Reading Strategies: Helping Young Readers to Develop Independent Reading Skills by Jo Fitzpatrick. II. Ana. Losa. 1998: Creative Teaching Press, Inc, Cypress, CA 29.

Objective: Use words and drawings to describe characteristics of sea turtles and their environment; compare sea turtles and land turtles

• Anticipatory Set: Show overhead of mural depicting sea turtle characteristics: three things they can/can't do are lay eggs, swim with flippers their entire life, can not put it's head inside it's shell; three of their enemies are people, sharks and whales; three things they eat are fish, crabs, and jellyfish

Ask, "Has anyone ever seen one of these? Where did you see it?

Procedure:

1. Show overhead of 3 things sea turtles can and can't do about, 3 things they eat, 3 enemies
2. Begin reading and commenting on the book and this afternoon you will be making another page for your animal book.
3. Ask what the cover is called- The Cover- Tells the title, author
4. Ask what the next page is called? Title page-
5. Begin reading book for 5 minutes
6. Tell students we will finish reading it in the afternoon and they will complete another page for their book about animals
7. In the afternoon, they will draw using a pencil and write/draw facts they have learned and will make a kind of encyclopedia of 6 animals
8. Finish book in afternoon and allow 15 minutes for drawing facts they learned about sea turtles. Stress that their book is factual and must contain true facts- i.e. turtles can't talk and don't wear clothes.
9. When they finish writing and drawing, they can color their pictures.
10. Teacher will walk around and write what the student says their picture shows- "Tell me about your picture" or "What words do you want me to write that go with your picture."
11. Pages will be collected and save until all the animal books are read and pages made for each and then, they may take their books home.

• Cover- they design, name, print their full name

.: Title page: Use cover with 7 circles: Put their name in the center and name or picture of each of the six animals in each one of the circles.
Science Lessons - Spiders

Illinois Standards: Science

12.A.1a Identify and describe the component parts of living things (i.e. birds have feathers; people have bones, blood, hair, skin) and their major functions
12.A.1b Categorize living organisms using a variety of observable features (i.e. size, color, shape, backbone)
12.B.1a Describe and compare characteristics of living things in relationship to their environments
12.B.1b Describe how living things depend on one another for survival

Materials:
Spiders by Gail Gibbons; overhead mural of spider characteristics; papers for writing and drawing, spider pattern; Reading Strategies: Helping Young Readers to Develop Independent Reading Skills by Jo Fitzpatrick. 1998: Creative Teaching Press, Inc., Cypress, CA.

Objective: Use pictures and words to describe characteristics of spiders; compare spiders and insects

• Anticipatory Set: Show overhead of muraling depicting spider: three kinds of webs they make - orb, triangle, v-shaped in grass; three enemies: birds, frogs, wasps; three body characteristics: 8 legs, 8 eyes, 2 body parts

Ask, "Has anyone ever seen one? Where did you see it?

Procedure:

1. Show overhead of muraling for spiders: 3 things about body; 3 kinds of webs; 3 enemies
2. Begin reading and commenting on the book and this afternoon you will be making another page for your animal book.
3. Ask what the cover is called? The Cover - Tells the title, author
4. Ask what the next page is called? Title page?
5. Begin reading book for 5 minutes
6. Tell students we will finish reading it in the afternoon and they will complete another page for their book about animals.
7. In the afternoon, they will draw using a pencil and write/draw facts they have learned and will make a kind of encyclopedia of 6 animals
8. Finish book in afternoon and allow 15 minutes for drawing facts they learned about sea turtles. Stress that their book is factual and must contain true facts - i.e. turtles can't talk and don't wear clothes.
9. When they finish writing and drawing, they can color their pictures.
10. Teacher will walk around and write what the student says their picture shows - "Tell me about your picture" or "What words do you want me to write that go with your picture?"
11. Pages will be collected and save until all the animal books are read and pages made for each and then, they may take their books home.
   • Cover: they design, name, print their full name
   • Title page: Use cover with 7 circles: Put their name in the center and name or picture of each of the six animals i.e. each one of the circles.
\[ \text{uwfV\textbackslash e-S} \]
The CAT is getting some

...\ 1\-[G]\0\ C

...
The Calf is Sad And I
A CO/"v", v~... 11 =-- the barn.
A man pulls the milk out.
N-ly frog is sitting on his eggs

Unreadable
The shark is trying to eat the turtle and the turtle is trying to eat the jellyfish.

Kento
My spider has eight legs. And:
My spider is happy.
The ancient pictorial symbols of hieroglyphics are the basis for the recent invention of what have become known as glyphs. Doctors, astronomers, meteorologists, geologists, and other scientists discovered that through pictures, they can communicate a wealth of data in a very easy-to-read, simple format. A glyph is a pictorial type of shorthand, in which detailed information can be displayed through features of a glyph symbol.

One of the original uses of this shorthand occurred in hospitals, where physicians needed to interpret data on a patient quickly and efficiently. The "human anatoglyphs" displayed vital statistics about an individual's organ functions and helped doctors track their patient's condition. Figure 1 illustrates the anatoglyph key and an example of how it displays the relative health of each of five organs. The organs that are shaded in most are in need of the most medical attention. Using a different glyph symbol to communicate geological data, statistician Herman Chernoff developed a facial glyph wherein each feature of a human face represented data from soil samples. From these and many other scientific beginnings, glyphs have become increasingly popular with mathematicians of all ages.

Teachers and students alike have discovered that glyphs are a marvelous way of communicating data. A beginning-of-the-school-year survey may result in a "getting acquainted glyph" in which students select among facial features to show classmates their favorite subjects, bus numbers, birthdates, and other information of interest. Variations of Chernoff's idea of a faical glyph that can easily be introduced in elementary school classrooms are described in the April 1995 issue (Harbaugh 1995).

The fish glyphs in figure 2 were designed for a "welcome back to school" theme as students returned to class in the fall. The fish shape, color, number of dots, stripes, eyes, and bubbles represent...
Glyph Bulletin Board

I did a bulletin board about glyphs. I saved an article from "Teaching Children Mathematics" from my 402-math methods class. The word glyph is defined on the board and a key is also put on the board. This is the definition I put on the board:

**THE ANCIENT SYMBOLS OF HIEROGLYPHICS ARE THE BASIS FOR WHAT IS KNOWN TODAY AS GLYPHS. THEY ARE USED BY DOCTORS, ASTRONOMERS, METEOROLOGISTS, AND OTHER SCIENTISTS TO COMMUNICATE DETAILED DATA BY USING PICTURES AND SYMBOLS.**

The class was going to be starting a unit on data and charts and the teacher taught the lesson. I cut out the watches for each student and they added the information to their watch. The information we used is their month and day of birth, their favorite season, their age divided by two, and if they would prefer to own a bicycle or scooter. They drew hands on their watches, punched holes for their nearest age, chose a colored band that represented their favorite season and put the watch together. I stapled the watches and put them on the board. They also put their names on the front of the watch to identify it—there are approximately 120 students in the section.

The title of the board was done in gold cut outs and the background was green. Since it was put up in March, the colors matched St. Patrick's Day.

"It's About Time
It's About You"

Glyphs can be used to show more information quickly and just placing the watches on the board, we noticed that most students in all classes overwhelmingly preferred spring and summer over fall and winter.
Detailed Techniques for Teaching the Lower-case Manuscript Letters

Teach the general rules governing written letters. 

*Ali* letters sit on a *base* line.

Letters or parts of letters are of two sizes. They are either *tall* or *short*. Tall letters or tall parts reach to the line above but do not touch it. Short letters or short parts are half as high as tall letters.

Manuscript letters are made of the clock face, or parts of it, and straight lines. The teacher's chalkboard presentation will show these.

---

**The Clock Face**

These are the four points we use most often

This shows how we use the clock to write *c* (from 2 to 4)
She introduces the term *volume* as a measure of the space inside the container. She asks, "How could you find out which container has the greatest volume?" This question leads naturally to an experiment: The students will fill each of the containers with marshmallows, count them, and record the numbers in a data table.

The teacher explains how they will collect the data, then demonstrates the experimental procedure by filling the cylinder with miniature marshmallows and the bowl with larger marshmallows. The students immediately shout, "That's not fair!" The teacher then asks the class to describe a "fair" procedure. The class decides that the marshmallows must all be of the same size and that they should be dropped into the containers rather than tightly packed. To conclude the class, each student draws a picture of the experiment. Figure 1 shows three containers being filled and marshmallows being counted by tens in an egg carton.

The next day, the children use their pictures to review the experiment before beginning the data collection. Each group receives a two-column data table, completes the column headings, and writes the names or draws pictures of the containers in the first column. The teacher emphasizes the need for accuracy in counting, and the children discuss various methods for grouping and counting the marshmallows. As the students begin their work, the teacher circulates, coaches, and assesses.

After the children complete their data tables (fig. 2), the teacher leads a discussion in which the groups compare their results, to find whether results are reasonable. Most groups report that about 135 marshmallows are in the graduated cylinder and agree that numbers close to 135, but not exactly 135, are acceptable. A group that had recorded only 110 marshmallows for the cylinder decides to refill the cylinder and count again.

On the third day, students graph the data on a bar graph and analyze the results. (See fig. 3.) These graphs will be useful in comparing results across groups, in supporting multiple solution methods, and in fostering number sense and estimation skills.

Differences and similarities across groups are then examined. Differences among groups are most apparent in the data tables. Students discuss reasons for these differences: variations in how the marshmallows were packed, differences in how completely the containers were filled, errors in counting. Uniformity of results across groups is more apparent in the graphs: although the graphs are not exactly the same, they are similar. On every student's graph, the tallest bar is for the bowl.

A lively discussion ensues about why the bowl holds the most—that is, because of its much greater width than the cylinder's—leading to verbalization of this reasoning by many of those students who had predicted that the graduated cylinder would hold the most.

On the final day of the experiment, students work in groups to write answers to questions about the data: "Which container is the tallest?" "The shortest?" "Which held the most marshmallows?" Later questions ask for predictions and generalizations: "Will a taller container always have a
---

**A. Flying Fox**
- Large eyes
- Rests upside down

**B. Vampire Bat**
- Sharp teeth
- Injects clotting chemical
- Sucks blood

**C. Fruit Bat**
- Teeth adapted to its food
- Night flyer

---

**Bats**

---
Science
- Bear videos
- Visit zoo to see a bear
- Invite an expert to class
- Study different kinds of bears and what they eat

Music, Fingerplay
- "Bear's Picnic"
- "A Bear Hunt, etc.

Snacks
- Honey
- Jam
- Crackers
- Bear crackers

Math
- Graph kinds of bears and children vote for favorite, showing results with a graph.
- Graph food that bears eat (let kids taste a variety of food and vote for favorite [graph])
- Count, sort, graph bear crackers, cookies, gummy bears,

Language
- Make Big Book of Bears
- Make own Brown Bear Books

Art
- Construction paper bears
- Bear picture collages
- Bear hats
- Forest of bears
- Circle bears

Science
- Nature Walks
- Collect ladybugs
- Keep in a jar with leaves
- What do they eat?
- Insects
- What do ladybugs do?
- Help trees
- Eat aphids

Categorizing Animals
- Books on ladybugs
- Other animals, insects

Feelings
- "Grouchy" stories
- Starts grouchy ends happy
- Being "afraid"

Drama
- Puppet show
- Act out story

Other Books
- Fairy Tales
- Other bear books
- Berenstein books
- Buzzy Bear series, etc.

Snacks
- Ladybug Crackers
- Frosting (Strawberry Cream Cheese) with raisins

Music
- Songs and Fingerplays

Art
- Construction paper bears
- Bear picture collages
- Bear hats
- Forest of bears
- Circle bears

Math
- Count dots on ladybug
- Counting 1:00, 2:00, 3:00
- Number of legs

Drama
- Puppet show
- Act out story
Psychology
- Discuss how weather may influence one's mood.

Art
- Create a weather bulletin board perhaps using a collage method.

Health & Safety
- Study safety rules for thunderstorms, hurricanes, etc.

Computer Science
- Visit a weather station, and focus on the use of computers.

Science
- Set up a weather station.
- Prepare a lesson on the atmosphere.
- Prepare a lesson on weather extremes.
- Lesson on Celsius/Fahrenheit.
- Make a "cloud [n a bottle]."

Economics
- Develop a lesson on how weather affects industry (skiing, fashion, travel).

History
- Prepare a time line on great moments in weather.
- Prepare a lesson on famous people in weather, and discover who invented which instruments.
- Hurricanes in history - e.g., Columbus, Spanish Armada.

Math
- Convert Celsius/Fahrenheit.
- Prepare a chart on barometric pressure, temperature, and relative humidity.

Language Arts
- Read stories and myths about hurricanes, tornados, floods, etc.
- Write poems about weather while listening to tape recordings of weather sounds.
- Interview a meteorologist.
- Write letters to pen pals living in different climates.
- Watch the film, The Wizard of Oz.
- Observe the weather portion of the news on television.
- Research a particular phenomenon and write individual reports.

Performing Arts
- Every Friday, have one of the cooperative learning groups present a weekend weather forecast.

Margaret Norton

FIGURE 0.14
"Weather" (intermediate/middle school).