
Storytelling and Science - What a Concept

By Judy Sima

STORYTELLING AND SCIENCE - WHAT A CONCEPT! With the emphasis on integrating literature into all curriculum areas, we as Media Specialists are always looking for new and unique ways to help our teachers with their units and lesson plans. Most of us are also looking for ways of making the Media Center and our services an integral part of the curriculum. Storytelling affords us just such an opportunity.

There have been many articles and books written about Whole Language and integrating literature into academic areas. Storytelling offers a unique opportunity to infuse folklore and children's literature into all curriculum areas. When a book is read to the class, students focus their attention and energy on the book and pictures. Their imagination is held in check by the pictures that they see. Even if there are no pictures, the book itself acts as a barrier between the reader's words and the listener's ability to create images. Telling a story and connecting it to science, math, or history allows the student's imagination complete freedom to expand and roam free.

Language helps us put things together, and oral language is our first and strongest language. When listening to a story a child's imagination is open to concepts and ideas unfettered by trying to decipher and interpret the printed word. By creating images in the listener's mind, storytelling helps a student experience and look at the world in a much deeper way. Storytelling gives meaning to science concepts by opening a child's mind, arousing curiosity, and encouraging a willingness to explore all possibilities.

Science is questioning the world around us and finding out how things work and why. When teaching science you want to make it meaningful to a student's life. Good science classes include a lot of "hands on" activities and experiments, allowing students to predict and draw their own conclusions.

Science and storytelling? You will find that these two seemingly unrelated elements mix together with electrifying results!

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You can approach the blending of science and stories in two ways: You can take the story first, then find elements in the story that lend themselves to science concepts, or you can start with a science concept or experiment you want to demonstrate, then find a story to bring it out. In selecting an appropriate story, you want to make sure that it is not too long or complicated. Students should be able to pick out the important elements and summarize or retell the story easily. Look for stories that contain problem solving, changes, or physical properties pertinent to the experiment or science concept, e.g. fire, bubbles, motion, growth. Native American and African "How and Why" stories work well with earth science, astronomy, animal behavior, and plants. Matching stories to physical and chemical science is a bit more challenging but even more satisfying when you find ones that work.

When the experiment is performed, you will want the students to make the discovery. Using the scientific method, the class should make a hypothesis, discuss which approach might work and why, then try different experiments, and draw conclusions about the results. When the experiment or science lesson is completed, the results should be tied back to the story.

Several years ago my science teacher friend, Suzanne Fried, and I attended a workshop on Science and Storytelling with Hughes Moir and David Mastie. Moir told stories and described the process of choosing and learning stories, and Mastie did Mr. Wizard type experiments based on elements of the story. Suzanne and I thought we would like to create a similar workshop for the Michigan Reading Association Conference. Suzanne picked her favorite, razzle dazzle, can't fail experiments, (Although she insists that with science, you can't always be sure the experiment will work out the way it is supposed to) and I searched through my repertoire and library to find short stories to tell that would lend themselves to the experiments she was going to perform. The following is a summary of some of the stories and experiments we found that work well together.

Spiders:

Tell: "Anansi and the Moss Covered Rock", or "Why the Spider Has a Small Waist." Both stories involve spiders and food. Anansi

the spider is a trickster and is always trying to get a free meal without having to work for it.

Activity: Research or read how spiders build webs and find food. What foods do spiders eat? To demonstrate how spiders see, cut a window out of a paper grocery bag, cover it with wax paper. Place bits of burlap, black felt, and other fabrics with different color and texture on the floor to represent food. Place bag over student's head and have him look or feel for the food.

Metamorphosis, Frogs:

Tell: "How the Frog Lost Its Tail." The Sky-God gives Frog a beautiful tail, but takes it away again when Frog breaks his promise to share the water from the Sky-God's well with thirsty animals.

Activity: Read and research about metamorphosis from egg to tadpole to adult frog.

Chemical change, Fire:

Tell: "The Snooks Family" or "Twist-mouth Family". Family members have difficulty blowing out the candle so they can go to sleep.

Experiment: Mix baking soda and vinegar. Channel the carbon dioxide gas which is formed, through a toilet paper roll which will extinguish a lighted candle.

Chemical change:

Tell: "The Stonecutter". Japanese tale about man who wishes to be a prince, king, sun, rain cloud, mountain, and back to a stonecutter again.

Experiment: Take two test tubes, fill each 1/3 full of distilled water. Add spoonful of washing soda to one and Epsom salts to the other. Shake and observe. Then slowly pour the contents of one test tube into the other and watch what happens. A gelatinous mass is formed.

Chromatography: the separation of mixtures into their individual components:

Tell: "The Rainbow Crow". A rainbow colored crow with a beautiful voice brings fire to the animals and in the process his feathers turn black and his voice becomes hoarse.

Experiment: Using a water color black marker, draw a wide band across a strip of paper towel. Then dip one end of the paper

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towel into a glass of water. As the water is absorbed and travels up the paper towel strip, the black marker separates into blues, reds, and greens. Different markers bleed different colors.

Surface tension, Bubbles:

Tell: "Black Bubblegum". A Halloween treat comes back to haunt Tommy. "Soap, Soap, Don't Forget the Soap". Young Plug Honeycut gets into trouble trying to remember what his mama told him to buy at the store.

Experiment: Make soap mixture (1/2 cup Dawn or Joy liquid detergent, 1-2 tablespoons glycerine, 5 cups cold water) Using a drinking straw blow bubbles of different sizes, on different surfaces, bubble within bubbles and see how long they last. There are many bubble experiments mentioned in books listed in the bibliography.

Estimation, Surface tension:

Tell: "The Mitten". A boy is lost mitten becomes the home for several animals causing the mitten to stretch and stretch until one little animal causes the whole thing to burst apart.

Experiment: Fill a glass to the top with water, add few drops of food coloring to make it more visible. Have students estimate how many pennies can be placed (slide slowly at the edge of glass) into glass before it overflows. Water will form a bubble like shield rising above the rim of the glass. We've found it takes around 50 pennies.

Experiment: Fill glass pie pan with milk (room temperature). Drop a few drops of different food colors into the milk in different areas. Slowly pour a tablespoon of liquid dishwashing detergent into pan. Colors will scatter and swirl like a kaleidoscope.

Estimation, Surface tension:

Tell: "A Penny a Look". Two brothers set out to find a one eyed man so they can become rich selling a penny a look.

Experiment: Using an eye dropper, drop one drop of water at a time onto a penny. Estimate how many drops of water can be dropped onto the penny before it spills over. Try the experiment a second time using alcohol.

Water displacement, problem solving:

Tell: The Aesop's fable, "The Crow and the Pitcher." A thirsty crow uses his head

and beak to get a drink of water.

Experiment: Fill half a soda pop or juice bottle and predict how many small stones or marbles it will take to make the water rise to the top.

Air pressure:

Tell: Penninah Schram's "The Apple Tree's Discovery ." Little apple tree, who wants more than anything to hold a star in her branches, discovers the star she wished to hold is inside her fruit. (Cut an apple in half horizontally to reveal the star)

Experiment: Tie string to the stems of two apples. Hang the apples from a dowel rod, one inch apart, then blow between the two apples. Air pressure will force apples together. This story can also be used to teach about seeds and plant growth.

This story is a good one to use when talking about plants and seeds.

Physical change, Eggs:

Tell: Syd Lieberman's "Debate in Sign Language." Little Yankle outsmarts an evil king who wants to get rid of the Jews.

Experiment: Place egg in a mug covered with vinegar. The shell will dissolve within 48-60 hours, leaving the egg in tact.

Buoyancy:

Tell: "Why the Sea is Salt." A greedy rich brother tricks his poor brother into giving him a salt mill which ends up on the bottom of the sea.

Experiment: Pour tap water into two large drinking glasses until they are two-thirds full. Add 2 tablespoons of salt to one glass and allow the salt to dissolve completely. Mark the glass with an "S." Gently lower a fresh

egg into each glass. Try the experiment again using different amounts of salt.

Systems of the body:

Tell: "What is the Most Important Part of the Body." Parts of the body argue and decide Stomach should remain king.

Experiment: Show a model or transparency of the systems of the body. Ask and discuss, "which part of the body is the most important?" (Suzanne made a soft sculpture model of the digestive system with a corduroy stomach and a full length large intestine)

Astronomy:

Tell: "Why the Sun and Moon Live in the Sky." Sun tries to build a house big enough so water and all his relatives can visit.

Activity: Brainstorm various forms water can take, e.g. ocean, puddle, stream, river, raindrops. Choose students to be Sun, Moon (his wife) and Water. Teacher narrates the story and feeds dialog to the principle characters. The rest of the class becomes water's relatives. As house becomes crowded, Sun and Moon climb step stools or chairs to stay above the water.

Many difficult concepts can be made clearer by using a story to explain them. One option you may want to explore is creating your own story. Suzanne and I tried the following activity with her 7th grade science class and it worked beautifully. The activity was based on one suggested by storyteller, David Novak.

THE WATER CYCLE

Science Concepts: States of Matter, Wa-

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