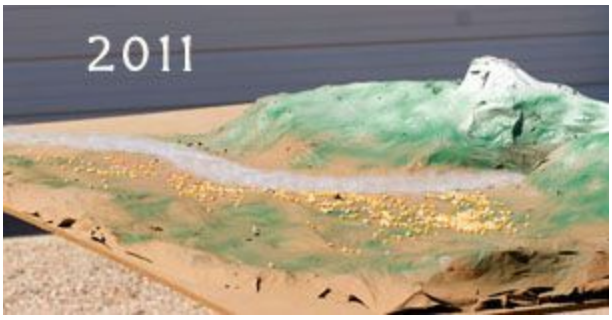
Four seasons of the Holistic Watershed Time Machine©:

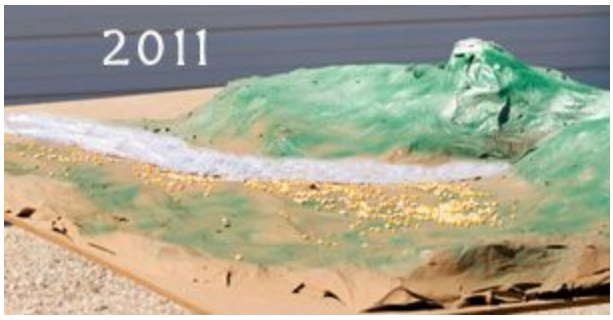
In the 18th century, before most European settlers had discovered the Fountain Creek, the watershed was much different than today. More people means more pollution and more water coming down the Fountain Creek.

Mouse over an image to go back in time.

Spring



Summer



Fall

Winter

With our unique Tava'-ci Pa'a classroom program, students will actually create this exciting Time Machine.

Materials:
Sheet of 3/8 inch plywood
10 ft of 1 1/2 inch mesh poultry wire
Paper Mache
Sack of newspaper
(15) 4 oz bottles of washable school glue
Tap water
Scotch tape

Watercolor paint
Foil
Cloth
Staples
Small sticks
Map of the watershed and topographic map of the mountains in the watershed.
You can download the watershed map here, and the topographic map here.
Tools:
Paint brushes
Sponge
Heavy duty staple gun
Scissor
Wire cutters
20-ql. Plastic Tote

Teacher Lesson Plans
Creating a Holistic Watershed Time Machine is designed to be a fun, physically active and interactive learning process. It invites the teacher to pose questions for the students to think about and want to learn more. It inspires the student to move forward with confidence because his/her areas of interest and knowledge are always available to be focused on by them.

Creating is bringing something into being. It is also defined as producing something through artistic or imaginative effort. This core element of this learning system should always be remembered throughout the program.

Holistic is the importance of the whole and the interdependence of all its parts. We included holistic in this learning system because children will greatly benefit from become aware and concerned with the entirety of a watershed rather than with simply analysis or separation of it into parts, i.e. hydrology, biology, sociology, political science, mammals, insects, etc.

Watershed is an area of land where surface water from rain and melting snow or ice converges to a single point, usually the exit of the basin, where the water join another water body such as a river, lake wetland or ocean. A watershed includes everything living with it.

Time Machine is a concept that fires up imagination and allows students to look at the environment from different centuries with the blink of an eye. This unique approach to perspective brings attention to the changes the environment experiences due to human involvement. It helps the child understand what was, what is and what can be in tangible ways. It uses fantasy to bring reality into a useful, workable perspective.

Building a Holistic Watershed Time Machine should be a simple, fun, and educational step-by-step. Remember, everything that exists in the land area of the watershed is something to learn about and understand how it relates to everything else.

We recommend you begin by learning, if you don't already know, about the watershed in your own community – every community has one. You can find this information online. Try typing in the name of your town and then watershed. If you live in Colorado you will find lots of information atwww.coloradowater.org. You will find links to useful watershed sites on our educational homepage.

Please be thoughtful of the questions your students ask. They will open the door to how this program becomes holistic. Questions about water pollution and chemistry can naturally connect questions of what reptiles live in the watershed and what they do to help keep a balance in nature. Pollution can connect to water law and justice can connect to history of Native Americans. It is a process of endless possibilities and options.

It will be best if you can find a place to set up and leave the 4 x 8' plywood board as you take your Time Machine through all of the seasons and centuries of exploration. Naturally, you can make the Time Machine smaller, if necessary. Good planning of materials and student assignments will keep the process on a steady flow. Hopefully, you will enlist a parent or two to help you get materials and supplies.

The Steps

Step 1: PLANNING
Estimated time: 1 hour
Print out your map of the watershed. Fold it in to quarters and draw pencil lines on the folds.
Students will use these reference points on the plywood.
On the plywood make marks every 2 feet.

Using the reference points sketch out the outline of the watershed on the plywood.

Step 2: WIRE FRAME
Estimated time: 2 hours
Using the topographic map as a guide, make the rough shape of the mountains with the poultry wire.
Staple the wire to the plywood and use the wire cutters to trim it.

Step 3: COVERING
Estimated time: 5 hours total not counting drying time in between each layer.
Students will now cover the wire frame with paper mache.
Tear small strips of newspaper. Students will need different lengths and widths but try to keep the strips between 1/2 inch and 2 inches wide.
Students will need to tear enough strips to comfortable fill a 20 quart plastic Tote.
Make the paper mache paste.
Mix one 4 oz. bottle of washable school glue to 8 oz of water.
Students will need about 15 bottles total but mix up 3 bottles at a time.
Dip the strips of paper into the paste, making sure that both sides, from top to bottom are covered.

Using your fingers wipe away any excess paste.

Lay the strips across the wire frame.
The trick is to criss cross the strips and use different lengths and widths to cover the wire frame.

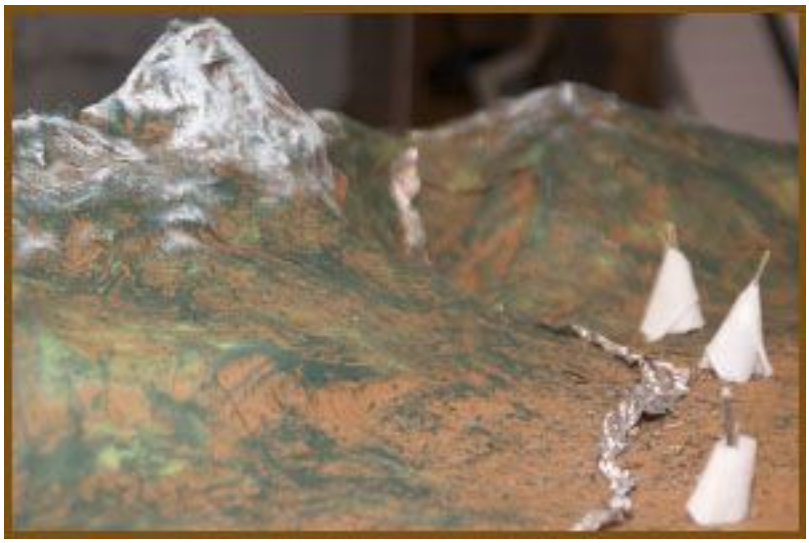
Step 4: PAINTING
Estimated time: 2 hours not counting drying time in between each coat of paint.
After the paper mache has dried students can now paint.
A brown earth color is a good choice for the base color.

Once your first coat has dried, using a sponge, apply some green colors to the mountains
and then some white as snow to the mountain peaks.

Step 5: Add the "Time Machine"
Estimated time: 2 hours
1711

Students will now create the creek as it would have looked in 1711 and add the teepees to show how the natives would have lived.
Students will use foil or strips of cloth to create the creek.
Cut thin, maybe 1/2 inch strips of foil or cloth and lay them on the Time Machine were the creek would go.
Now cut strips of cloth about 1 1/2 inches wide and 3 inches long to use as the covering for the teepees.
Make a small cone then tape the end. Then put in some small sticks and place on the Time Machine.

2011
Students will now show how the creek changes in modern times. The current development around the Fountain Creek adds more water, more pollution and just more people.
To reflect this students will cut larger strips of foil and place houses around. You can use the small houses and motels that come with the Monopoly board game, popcorn or rice.



	4 Points	3 Points	2 Points	1 Point
Knowledge Gained	Student can accurately answer all questions related to facts in the Time Machine and processes used to create the Time Machine.	Student can accurately anwer most questions related to facts in the Time Machine and processes used to create the Time Machine.	Student can accurately answer about 75% of questions related to facts in the Time Machine and processes used to create the Time Machine.	Student appears to have insufficient knowledge about the facts or processes used in the Time Machine.
Attractiveness	The Time Machine is exceptionally attractive in terms of design, layout, and neatness.	The Time Machine is attractive in terms of design, layout and neatness.	The Time Machine is acceptably attractive though it may be a bit messy.	The Time Machine is distractingly messy or very poorly designed. It is not attractive.
Working Together	Students worked together and completed their own parts.	Students worked together but did not complete their own parts.	Students did their own part but did not work together.	Students did not work together.
Used Sources	Students used greater than four sources.	Students used less than three sources.	Students used less than two sources.	Students used one source.