

Science Camp Curriculum

Day 1: Climate

What is climate?

- The weather in some location averaged over some long period of time. Climate is not the same as weather, but rather, it is the average pattern of weather for a particular region.

What are the different components of weather?

- precipitation, temperature, humidity, sunshine, wind, clouds
- weather events (ie – hurricanes, tornados, hail storms, etc)

What is climate of SC?

- http://www.dnr.sc.gov/climate/sco/sc_climate.html

Getting to Know You:

- Kids fill out Venn Diagrams of similarities/differences in pairs or threes and then present them to the group
- Play name game

Activity 1 – Measure the Weather!

- Make anemometer and barometer (see PDFs)
- Set up rain gauge, thermometer (maybe hygrometer and/or sunshine recorder)
- Collect and record weather data – sunshine, cloud cover/type, temperature, wind, pressure, humidity, rain (if any) [use AlphaSmarts]

Activity 2 – Predict the Weather!

- Discuss: Weather maps – how to read, look at today's
- Write down our predictions [will probably need big paper chart to record our predicted v. weatherman's predicted v. actual throughout week]
- Record weatherman's prediction (after making our own)
- Each day will need to follow up by doing quick weather data collection, next day prediction)

Activity 3: Hurricanes

- Discuss: What are hurricanes and why do they happen?
- Discuss: Hurricane season and hurricanes in SC
- Make hurricane bottle(s) [depending on cost/time, I could do a demo, groups could make ones, or each child could make one to take home]

Activity 4: Air Quality

- Discuss: What are pollution and climate change? Why is it happening?
- Brainstorm: What can we do to reverse/stop climate change?
- Air quality: Vaseline on paper, need to run through Thursday. Fill out experimental method sheet. One Vaseline note card goes in predicted "dirty" air area; other goes in predicted "clean" air area.

AFTERNOON:

Quiet Reading Time:

- Read scientific books for 20 min (read aloud to kids if can't concentrate by themselves)
- Have each child share a fact learned afterwards (in group circle)

Team Building:

- All stand on beach towel (no one can be touching the ground) and sing "Row, Row, Row Your Boat"
- Blindfolded partner scavenger hunt: one person blindfolded (ie – eyes closed), other person guides them to a specific object (pine cone, pine straw, etc) that they must pick up and bring back to camp leaders. Then switch roles.
- Keep the ball in the air – stand in a circle and keep a balloon or ball in the air
- Silent line up by birth date – campers must order themselves by birth date (month and day but not year) from Jan 1 to Dec 31 without talking/making any noise

pH Experiment:

- Explain acids/bases, the concept of pH as measurement scale
- 6 or 7 liquids – coke, coffee, vinegar, dissolved baking soda, dissolved cornstarch, dissolved house hold cleaner, etc
- Fill out experimental methods sheet and predict acid/base
- Use pH strips to test and find out actual pH
- Graph results (bar graph)

Scrapbooking:

- Will be a record of week's activities
- Ribbon and stickers are popular accessories for this activity
- Make a cover and intro page about themselves. Take a digital picture of each child to put into scrapbook.
- Make a page about something science-y they did or learned today
- Punch holes in pH experiment graph so it can go into scrapbook

Day 2: Ecosystems

What is an ecosystem? What are the parts of an ecosystem?

- Environment, habitat, population, community

What different types of ecosystems exist?

- Biomes
- Map and graph from BBC
- Discuss the ecosystem in which we live

Activity 1: Vegetation/Animals

- Take a walk: observe and discuss the types of vegetation around us

- Each child chooses one specific type of vegetation or animal of which to take a digital photo. Then, use field guides to identify and use AlphaSmarts to answer following questions: 1) What is its name? 2) What does it look like? 3) In what type of habitat does it live? 4) Note any ways it might have adapted to its environment. 5) What other animals/plants might it be competing or cooperating with? 6) Describe how this organism might be interdependent with others in the habitat. 7) Other interesting facts
- Transfer files to computer, print off page with both photo and paragraph for each child. Paste onto construction paper.

Activity 2: Make leaf cards

- Collect leaves
- Decorate paper with different leaf images – makes good note cards
- Leaf prints: paint underside of leaf with poster paint, place inky side of leaf in the position in which the image is desired, cover leaf with piece of paper towel, firmly rub over leaf with spoon or rolling pin. Carefully remove towel and leaf!
- Leaf stencils: Place leaf in desired position on paper, tape it down (tape should be hidden), brush paint around edges, carefully remove leaf.
- Leaf rubbings: place leaf bottom side up, put paper on top of leaf, rub paper with the flat side of a crayon, image of leaf should appear.

Activity 3: Make bird feeders

- Collect pine cones outside – each child should have one
- Tie long string to one end of the pine cone
- Put wax paper down. Spread thick layer of peanut butter. Roll cones in it.
- On another sheet of wax paper, spread out some bird seeds. Roll peanut butter covered cones in the seed.
- Hang cones at park (to observe for rest of week); note what types of animals eat them!
- Use Activities 2&3 to talk some about human's interactions and interdependence with their natural environment

AFTERNOON:

Quiet Reading Time

Scavenger Hunt:

- Make list of 10-15 things they can find in the park
- Give paper bags to collect
- Time them to see how quickly they complete the task

Genetics lesson:

- Discuss DNA
- Draw Punnett square and talk about patterns of inheritance. Give examples with eye color and/or Sickle cell anemia

- Continue lesson another day if lots of interest

NOVA videos

- Only show 20-30 minutes

Scrapbooking:

- 2 pages relating to day's activities

Day 3: Gardens

Why do people make gardens?

What types of gardens exist?

How are gardens an example of environmentally friendly living? Are there cases when they are not?

Activity 1: Work on the garden

- Week 1: Make garden plan, plot out garden size & shape, dig up soil to make it more plantable (mix in compost), plant plants and water, cover with mulch. Take digital pictures. Water daily from here on out.
- Week 2: Plant more plants (?), water (need to water more than once a week – usually daily), tend to plants – weed, etc, surround garden with concrete stones, build bird bath (using terracotta pots). Take digital pictures.
- Week 3: Water, tend to plants (harvest any veggies?), make more stones (out of concrete), make another bird bath. Build sundial (*never did*). Take digital pictures. Discuss use of sundials (if build one), learn how to use it, maybe measure Earth's circumference.

Activity 2: Solar Cooking (*During full sun only!!!*)

- Discuss: sustainable living – what is it, how gardens are an example (local food), can increase sustainability by cooking food using renewable energy source
- Discuss: how a solar cooker works, how to make one
- Build solar cooker, find a sunny spot for it (digital camera)
- Make a snack! (digital camera)

Activity 3: Rotating Stations

- Children will work on garden in small groups
- Other groups: make science posters – on flowers, water cycle, diseases, etc; make seashell wind chimes – paint seashells, put on fishing line, tie to driftwood; play games – Jenga, twister, checkers, etc

AFTERNOON:

Quiet Reading Time

Concrete Stones:

- Have children mix up concrete in small groups, pack concrete into cut out bottoms of gallon milk jugs. Leave outside to dry overnight.

Birdbath:

- See 'garden resources' sheet for specific instructions
- Have children paint the three pots and one saucer needed to make bird bath. Work on it in rotating groups while others make concrete blocks.
- After paint has dried, glue bird bath together using Gorilla Glue
- Paint with sealant to protect paint (optional)

Gak:

- Make out of cornstarch and water (let children make their own individual batches)
- When right consistency, will harden when you squeeze it and then turn to liquid when released
- This activity demonstrates the principles of thixotropy/isotropy

Crystals:

- Never did in our science camp
- Several different ways to do this; look up different methods online or in science experiment books

Scrapbooking

- Make a couple of pages
- For one page, could do a garden collage (need old magazines)

Day 4: Parks and Greenspace

Why do we have parks and greenspace?

Brainstorm: what are the benefits? How can we measure those benefits?

--- possibly have matron of Mays Park or some other park person come talk for 30 min

Activity 1: Measuring the benefits

- Count the number of trees in the park (to make more scientific, could also try to count the number of trees in a developed area – need to use a set area of space (i.e. – xx m² to make accurate) (didn't do this part)
- Take down air quality sheets (see day 1) – get kids to brainstorm about how to best quantify their results, then make a graph of them (bar graph)
- Measure temperature in park (under shade of trees), then on tennis court (which could represent a non-park area without shade)
- Have kids examine map of housing prices (<http://www.richlandmaps.com/redirect.asp?htmlpage=www.richlandmaps.com/maps/maps.html>) and note any differences they find between houses next to parks and those far from parks. Possibly graph these findings as well.

Activity 2: Dream Park

- Kids draw designs of their dream parks. Encourage them to keep in mind benefits discussed earlier and try to incorporate them into their designs.
- Using AlphaSmarts, each child should then write a short paragraph on their park – explaining the design, why it is their image of an ideal park, and what benefits it brings to the community and users.
- Pair kids up and have them peer edit each other's work (may have to print out drafts first)

Activity 3: Public Speaking

- Discuss: importance of communication (written and oral) in science
- Divide kids into pre-assigned groups based on days (on day 1 will need to let kids know we are doing this and choose a topic). Each child will have his own topic – either an overall intro/conclusion, a day focus intro, or an activity explanation/findings – will depend in part on how many kids have each week. They each will have about 1 min to talk (more if there are less than 20).
- Write out speeches (AlphaSmarts or by hand). Peer edit them. Practice as groups and then have mock presentations to other groups. Edit and rehearse more.

Activity 4: paint concrete stones from previous day; put sealant on if desired

Activity 5: Make strengths chain

- Each child cuts five strips of construction paper
- Write a strength on each strip (encourage interpersonal strengths as well as skills)
- Connect all strips into a long paper chain
- Have children stand in a circle holding a chain; each child should say one of her strengths
- Discuss how we all have individual strengths, but the chain represents that we are all more powerful together

AFTERNOON:

Quiet Reading Time

Bovine Heart Dissection

- Discuss heart anatomy, the path blood follows through the heart
- Dissect a bovine heart as a demonstration. Can probably get heart from Publix – call about a week in advance. Wear gloves, clean up well afterwards.

Scrapbooking

Day 5: Wrap-Up

Activity 1a: Climate wrap-up

- Collect final climate data.
- Make climate graphs – predicted v. actual

- Measure rain quality (check for acid rain) if have collected any over the week

Activity 1b: Women in Science skits

- Print out info on notable women scientist from Wikipedia
- Kids group in pairs or threes; read info about their scientist, then design a short skit that they will present to the group that conveys important info
-

Activity 2: Women in Science

- Panel of women scientists from USC (and other places?) talk to kids

Activity 3: Party!

- Parents arrive; kids show scrapbooks, what they've made throughout the week
- Everyone eats pizza!

AFTERNOON:

Quiet Reading Time

Sprinklers (need bathing suits/towels)

Movie

Games