Issue 3

Fun Facts

About Wetlands: Wetlands aren't always wet. They only have to be wet at some point during the year to be designated as a wetland.

About Darwin: Darwin was a Backgammon Fiend. Darwin played backgammon every night between 8 and 8:30 PM, Darwin would play 2 games of backgammon with his wife, Emma.

About Pluto: A radio signal from Pluto will take more than five hours to reach Earth.

About Copernicus: Copernicus' Heliocentric Theories were not published in his lifetime. Only a few copies were given to his friends.

About DNA: Our genes are remarkably similar to those of other life forms. For example, we share 98% of our genes with chimpanzees, 90% with mice, 85% with zebra fish, 21% with worms, and 7% with a simple bacterium.

About Frogs: Frogs don't drink water they absorb it through their skin.

About Penguins: Penguins can walk faster than humans.

Learning On The Edge

Mark your calendars now for this summer's **Learning on the Edge Workshop**. Spend a fun-filled week getting Mud Between Your Toes and learning all about the ecosystems of the Coastal Bend. We will study the Edge Effect in the water and on the land. You are bound to have the time of your life **Learning on the Edge**!

This months activity, Fish Counts, is just one of the great lessons you will receive in this summer's curriculum guide for Learning on the Edge.

Upcoming 2010 Dates

Jan 2 - The Moon was first Photographed

Jan 5 - National BIrd Day

Jan 7 - Jupiter's Moons Discovered

Jan 17 - Ben Franklin's Birthday

Feb 2 - World Wetlands Day

Feb 6 - National Oceans Science Bowl

Feb 11 Thomas Edison's BIrthday

Feb 11-12 - Just Gotta Evolve Workshop
www.cbbep.org

Feb 12 - Darwin Day

Feb 15 - Galileo's Birthday

Feb 17 - National Public Science Day

Feb 18 - Pluto Discovered

Feb 19 - Copernicus's BIrthday

Feb 28 - DNA Discovered

March 9 - Texas Public Schools Week

March 13 - Uranus Discovered

March 14 - Einstein's Birthday

March 20 - World Frog Day

March 22 - World Water Day

March 23 - World Meteorological Day

April 11 - National Environmental Education Week

April 16 - Microscopic Wonders Workshop
www.cbbep.org

April 17 - Earth Day Bay Day Celebration

April 22 - Earth Day

April 25 - World Penguin Day

June 14-18 - Learning on The Edge Workshop
www.cbbep.org

June 21-25 - Learning on The Edge Workshop
www.cbbep.org

Coastal Bend Environmental Science:
Learning on the Edge

Summer 2010
Teacher Academy

June 14-18 Grades 3-5
June 21-25 Grades 6-8

Schedule Received
Upon Registration

Academy & Registration
Tuition Free
30 SBEC/TEEAC credits

Field Trips & Lab Activities

Supporting Materials & Supplies

TEKS-Correlated Curriculum

Explore Coastal Bend
Environmental Treasures

Register Today!
Limited Spaces

For Additional Information & Registration Form Contact:
Lari Jo Johnston - Environmental Educator
(361) 885-6207 ~ **ljjohnston@cbbep.org**

Registration form online at: **www.cbbep.org**

The LOTE Summer Teacher Academy made possible through a partnership with:

Sneak Peak: Learning on the Edge

Fish Counts

Subject areas addressed: Math, Science, Social Studies

Time required: 30 minutes

Objective: To study the dynamics of the fish populations in the Nueces River Delta region by modeling a tag-and-release technique used by real-life wildlife managers. This activity will model the changes in population size as they adapt to changes in conditions.

Materials: Several large boxes of goldfish crackers, several smaller boxes of Parmesan goldfish crackers (or some other different colored variety of goldfish cracker), 4 large mixing bowls, Dixie cups (enough for each student to have one), clean sheets of white paper, student data sheets, and pencils.

Background information: Populations of organisms in an ecosystem will fluctuate based on conditions such as availability and condition of habitat, availability of food sources, and number of predators. Wildlife managers monitor the size of wildlife populations by trying to make an accurate estimate of the population in an area. They do this by a catch/tag/release method. They release a known number of tagged specimens into an area and then periodically sample the population and see how many tagged specimens that they can re-catch. By applying a mathematical ratio computation, they can then determine approximately how many organisms of that species there are in the study area. This gives the wildlife manager a good idea of how healthy the ecosystem is, or if the population is responding to some type of environmental stress. In this activity, the students will simulate a normal control situation in the Nueces River Delta region, as well as situations of flooding, drought, and pollution.

Procedure:

1. Take 4 large mixing bowls and label one bowl control, one bowl flooded, one bowl drought, and one bowl polluted.
2. To each of the bowls add 50 parmesan or other flavored goldfish crackers to represent the "tagged" specimens. However, to the polluted bowl, make sure that the parmesan goldfish are broken in half to represent fish killed by pollution.
3. Fill the control bowl 3/4 full with regular goldfish crackers and mix the sample well. Fill the flooded bowl site almost full with regular goldfish crackers and mix the sample well. Fill the drought bowl half full with regular goldfish crackers and mix the sample well. Fill the polluted bowl 3/4 full with the regular goldfish crackers and mix well.
4. Explain to the students how wildlife managers release tagged fish into an ecosystem and tell the students that today they are going to use wildlife management techniques to determine the size of a fish population in the Nueces River under a variety of conditions.
5. Divide the class into 4 groups and assign each group a labeled bowl that will be their sample site.
6. Each group member will then proceed to take a sample from their assigned bowl by closing their eyes and dipping the Dixie cup into their bowl and removing the cup full of fish.
7. Each student takes his Dixie cup sample and carries it to his station where he pours it out onto a clean sheet of paper. He then sorts the goldfish crackers and records the number of regular goldfish crackers and the number of tagged goldfish (the parmesan or other colored goldfish crackers) in his sample. Combine the collected data from everyone in the group to get a total number of regular goldfish crackers and a total number of tagged goldfish crackers for the group.
8. Each group can then determine the approximate number of fish in their sample site bowl by using this ratio:

$$\frac{\text{Number of tagged fish in river}}{\text{Total number of fish in river}} = \frac{\text{Number of tagged fish in group's sample}}{\text{Total number of fish in group's sample}}$$

Remember that the number of tagged fish in the river for each sample is known – 50 fish

Sample calculation:

For a normal site, 10 tagged fish were collected by the group and 50 regular fish were collected. Knowing that in their assigned bowl there were 50 tagged fish, the students calculated

$$\frac{50}{?} = \frac{10}{50}$$

So they multiplied 50 X 50 and then divided by 10 to get the number of total fish in their sample: 250 fish

9. Have each group report their findings and record these on their data page and on a class chart.
10. Discuss the findings and ask students to explain why the population sizes are different in the different situations.

Extension: Repeat the activity with other environmental stressors such as low birth rate because of disease or introduction of more predators.

Fish Counts Student Data Sheet

Group:

Group members:

Group member's name	Number of tagged fish in sample	Number of untagged fish in sample

Total number of tagged fish caught by your group = _____

Total number of untagged fish caught by your group = _____

Remember the number of tagged fish released in your sample site is 50 and use this number to help you determine the total number of fish in your site. Only count whole fish.

Use this formula:

$$\frac{\text{Number of tagged fish in the river}}{\text{Total number of fish in the river (?)}} = \frac{\text{Number of tagged fish in your group's sample}}{\text{Number of untagged fish in group's sample}}$$

Group testing site	Total number of tagged fish in samples	Total number of untagged fish in samples	Calculated total number of fish in river at this site
Control			
Flooded			
Drought			
Polluted			

Questions

1. Which site or condition had the highest number of fish in the calculated total?

2. Which site or condition had the lowest number of fish in the calculated total?

3. Give a reason for each of these sites having the highest or lowest number of fish.

For more information or classroom presentations contact:
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