E.T. A LOCAL WAY OF LEARNING

Title: HOW THE SALT PONDS ADD UP

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Grade Level: 2-3

Concepts:
2. Ecosystem
4. Water
12. Stewardship

Disciplines
1.Math
2. Social Studies

Objective:

For the purpose of gaining familiarity with the names of the salt ponds of the Virgin Islands, students will do addition word problems per attached activity with a majority of students performing at "C" or above level.

Rationale:

While the activity more directly involves word problem mathematics skill development, the nature of the word problem deals with things vital to the Virgin Island environment, and in so doing, fosters an awareness of the importance of salt ponds..

Directions:

1.Teacher could read the selection "Vanilla Clouds and Chocolate Holes", or discuss salt ponds from DCCA Fact Sheet.

2.Distribute the math word problem work sheet. Allow about 20-25 minutes for completion.

3.Correct and score.

4.Ask children if they know/or have visited any of the salt ponds that are named in the activity. What do they think of their importance to the Islands?

Resources:

Coastal Habitats: **Salt Ponds**, DCCA Environmental Fact Sheet No. 7.

Jadan, Ivan and Doris. "Vanilla Clouds and Chocolate Holes", The Holiday **Adventures of Ivan Environman**. Cruz Bay, 1975. pp. 88-94.

Name:_____

Class:_____

H0W THE SALT PONDS ADD UP Score:_____

16-18 = A
13-15 = B
10-12 = C
7-9 = D

Ivan Environment, in The Holiday Adventures of Ivan Environment, tells a story of "Vanilla Clouds and Chocolate Holes". This part of the story tells why salt ponds are important:

> The pupils in Professor Pepe's class could see for themselves how the little saltwater pond behind Chocolate Hole trapped most of the chocolate-covered mud that washed downhill after a heavy rain. They could see for them selves why it is important to leave little salt ponds and holes the way they are. "The little pond may hot look like, much at first glance, said Pepe Ivan." “But imagine how Chocolate Hole would look if people were to interfere with the way the pond does its job. That's why the Virgin Islands has laws now to prevent people from changing the shoreline and disturbing little ponds like this."

There are many salt ponds in the Virgin Islands. See if you can work out these problems:

A. St.John

1. Hawksnest Bay, Foot of More Hill, Newfound Bay, Calabash Boom, Chocolate Hole (has 2), Hart Bay, Great Lameshur Bay, Kiddel Bay, Harbor Point, Fortsberg, Turner Point, Elk Bay, Haulover Bay and Privateer Bay are listed as small salt ponds. How many small salt ponds are there on St. John?

2. Europa Bay, the Salt Pond at Drunk Bay, and Pond Bay are all medium-sized salt ponds. How many medium-sized salt ponds are there on St.John?

3. Chocolate Hole also has one large salt pond and there is another large one at Grootpan Bay. How many large salt ponds are there?

4. How many small, medium, and large salt ponds are there all together on St. John?

B. St.Thomas

1. There are three small salt ponds each at Little Coculus Bay and at Water Point; there are two small salt ponds each at St. John Bay, Foster Point, Cabrita Hill, Smith Bay and Mangrove Lagoon; and Smith Bay, Foot of Flag.Hill, Coculus Point, Bolongo, Krabbepan Point, Great Bay North and Great Bay South, Water Point, Scott Beach, Long Point, Bovoni Bay, Bolonao Bay, Frenchman Bay, the Cove between

Frenchman and Morningstar, Perservance and Fortuna have a small salt pond each. How many small salt ponds are there on St. Thomas?

2. There are medium-sized salt ponds at Frenchman Bay, Water Point, two each at Great Bay and Muller Bay, Compass Point and Great Bay North. How many medium-sized salt ponds are there on St. Thomas?

3. Mangrove Lagoon has two large salt ponds, and Benner Bay, Vessup Bay, Red Bay, Mandahl Bay and St. John Bay each have one large salt pond. How many large salt ponds are there on St. Thomas?

4. Mandahl Point is a very large salt pond. Write the number "I" in the blank for this very large salt pond on St. Thomas.

5. How many small, medium, large and very large salt ponds are there all together on St. Thomas?

C. St.Croix

1. Robin Bay, Coakley Bay and Chenay Bay are large salt ponds. How many large salt ponds are there on St. Croix?

2. Great Pond Bay and West End are called very large salt ponds. How many very large salt ponds are there on St. Croix?

3. How many large and very large salt ponds are there on St. Croix?

D.Adding everything up:

1. How many small salt ponds are there on St. John, St. Thomas and St. Croix?

2. How many medium-sized salt ponds are there all together on the three Islands?

3. The three Islands have how many large salt ponds?

4. How many very large salt ponds are there in the Virgin Islands?

5. How many small, medium, large and very large salt ponds are there on the Virgin Islands all together?

6. Which Island has the most salt ponds?

EXTRA CREDIT:

On a geopolitical map of the Virgin Islands, have students mark the location of the salt ponds named in this activity.

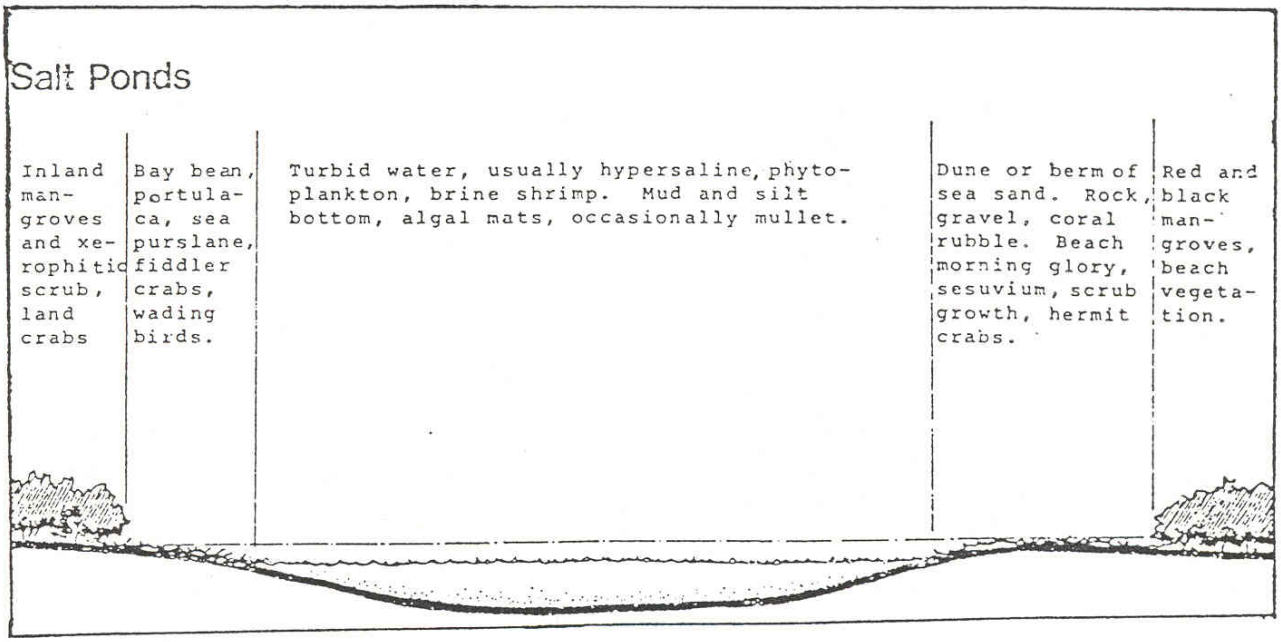
DCCA ENVIRONMENTAL FACT SHEET NO. 7
COASTAL HABITATS: SALT PONDS

What Are They?

Most salt ponds are former bays or parts of a bay. Over time, they became closed by reef or mangrove growth across the bay. The closure may be accelerated by sand and rubble tossed up on the shallow closing, berm by storms. Soil will follow and eventually a new sand beach may bind on the other side.

Once the bay is closed, the salt pond begins to act as a trap for fresh water and sediment which runs off of adjacent uplands. If the salt pond did not exist, this runoff would go directly in to the bay. As such, salt ponds serve an important buffering function, reducing, turbidity and salinity fluctuations in the bay.

In addition to fresh water, salt ponds may also still receive salt water from the outside bay. This will percolate through the berm if it is porous enough. Evaporation in a closed pond is very rapid so that the salinity increases and the pond, if not replenished from the bay or by rain water, will dry up completely leaving crystallized salt on the surface. Occasionally, a pond berm will be breached by storm water from the land or sea. When this occurs, the pond can be re-invaded by marine animals usually crabs and fishes. These will die off as the pond recloses and salinity increases again.



What Lives There?

Because salt ponds are subject to eratic influxes of both fresh and salt water, they offer extremely unstable and harsh habitat conditions. Nonetheless, it attracts fiddler crabs, large land crabs, flies, midaes, and mosquitoes. A number of wading birds (stilts, sandpipers) feed along the edges of the ponds on crabs, insect larvae, and other small animals. Kingbirds, martins and swallows feed on flying insects over the water. Ponds may contain large numbers of brine shrimp'. These can give the pond a brownish-pink tinge. Salt pond coloration, however, is highly variable, due to a variety of algae which may give it a green, orange, brown, pink, or red color.

What Changes Occur There?

As mentioned above, we do know that salinity varies greatly ranging from nearby fresh water after a storm to more than three times the salinity of seawater after periods of heavy evaporation. Periodic changes of this magnitude can have a catastrophic impact on the' organisms inhabiting the pond. During a heavy storm, masses of halophilic (salt - loving) plants and insects are killed. These often account for the occasional bad odor around salt ponds.

Salt ponds, which act as runoff and sediment traps, end up with high concentrations of pollutants. Because most of the upper layers of pond sediments are highly organic and being decomposed, disturbing these sediments usually releases obnoxious sulfide odors. If a pond is opened and these materials are dispersed, they use up t@ available oxygen rapidly. This can kill plants and animals in the adjacent bay.

Location of Salt Ponds

The following chart shows the location of salt ponds on the three main islands. Compared to the other islands, St. Croix has very few salt ponds. However, these are all large and receive runoff from very large areas (watersheds). Accordingly, they contain more water and more plant and animal life. St. Thomas and St. John have many more ponds which are smaller. Like the many pocket beaches, this is largely a consequence of the differences in shoreline configuration. Most salt ponds from at the head of embayments, a setting which also favors beach formation. In fact, in most cases, beaches and salt ponds occur together--a characteristic association on all three islands.

Location of Virgin Island salt ponds, excluding cays.

St. John

Hawksnest Bay (west)…….small
Foot of More Hill…….....small
Newfound Bay…….....small
Calabash Boom……...small
Turner (Enighed Pond)…….....large
Chocolate Hole……2 small, 1 large
Hart Bay……small
Europa Bay…….medium
Great Lameshur Bay…….small
Grootpan Bay……large
Kiddel Bay…….small
Salt Pond – Drunk Bay……...medium
Harbor Point, Coral Bay…….small
Fortsberg…….small
Turner Point……small
Elk Bay……small
Haulover Bay……..small
Pond Bay…….medium
Privateer Bay……...small

St. Thomas

St. John Bay……2 small, 1 large
Smith Bay……...1 (cove)
Foster Point…….2 small
Mandahl Point……1 very large
Foot of Flag Hill……...1 small
Frenchman Bay……1 medium
Little Coculus Bay…….3 small
Bolongo Bay……..1 small
Cabrita Hill……...2 small
Water Point……1 medium, 3 small
Great Bay…….2 medium
Muller Bay……...2 medium
Vessup Bay……...1 large
Krabbepan Point……...1 small

Compass Point……1 medium
Mandahl Bay……1 large
Smith Bay…….2 small
Red Bay……large
Great Bay (north)…….small, medium
Great Bay (south)……small
Water Point…….small
Scott Beach…….small
Benner Bay…….large
Mangrove Lagoon……2 large
Long Point……small
Bovoni Bay……small
Bolongo…….small
Frenchman Bay…….small
Cove between Frenchman & Morningstar……small
Perseverance……..small
Fortuna……small

St. Croix

Great Pond Bay……very large
Robin Bay……large
West End……...very large
Coakley Bay…….large
Chenay Bay……..large

Major Attributes	Use Limitations
Salt ponds act as natural settling traps to protect marine resources.	Sediments are unstable for foundations; pilings are usually required.
Water level and salinity fluctuates greatly. This limits biota.	Filling may cause extrusion of pond sediments and will eliminate the pond's water catchment function. Flooding may result.
Wildlife habitat, particularly for birds.	Opening of salt ponds is generally undesirable due to the threat of water pollution from pond sediments.

Island Resources Foundation, V. I. Marine Environment (VICZM Program, Tech. Supplement No. 1, 1976). (Editor: Marsha McLaughlin, Policy and Planning Unit, DCCA. Further info. - Environmental Specialist, DCZM).