ALIGNMENT WITH CALIFORNIA STATE BOARD GRADE 4 EDUCATION STANDARDS

Both of the **Life Sciences** components of the State 4th Grade Science Contents Standards are fully integrated into the Shellmaker 4th Grade program

2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:
a. *Students know* plants are the primary source of matter and energy entering most food chains.
b. *Students know* producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.
c. *Students know* decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.
3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:
a. *Students know* ecosystems can be characterized by their living and nonliving components.
b. *Students know* that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
c. *Students know* many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
d. *Students know* that most microorganisms do not cause disease and that many are beneficial.

One of the two **Earth Science** components is addressed through observation and discussion of the features of UNB:

5. Waves, wind, water, and ice shape and reshape Earth's land surface. As a basis for understanding this concept:
a. *Students know* some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.
b. *Students know* natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces.
c. *Students know* moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

The program is designed for students to explore nature through observation and interpretation, consistent with the **Investigation and Experimentation** component of the State 4th Grade Science Contents Standards:

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands*, students should develop their own questions and perform investigations. Students will:
a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.
b. Measure and estimate the weight, length, or volume of objects.
c. Formulate and justify predictions based on cause-and-effect relationships.
d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.
e. Construct and interpret graphs from measurements.
f. Follow a set of written instructions for a scientific investigation.

The following components of the State 4th Grade **History/Social Science** Contents Standards are reinforced through observation of the Bay and its surroundings, the use of maps and aerial photographs to show the Bay and the 150+ square miles of Orange County that drain into the Bay, and discussion of the life of the local Tongva (Gabrielino) Indians:

4.1 Students demonstrate an understanding of the physical and human geographic features that define places and regions in California.
3. Identify the state capital and describe the various regions of California, including how their characteristics and physical environments (e.g., water, landforms, vegetation, climate) affect human activity.
4. Identify the locations of the Pacific Ocean, rivers, valleys, and mountain passes and explain their effects on the growth of towns.
5. Use maps, charts, and pictures to describe how communities in California vary in land use, vegetation, wildlife, climate, population density, architecture, services, and transportation.
4.2 Students describe the social, political, cultural, and economic life and interactions among people of California from the pre-Columbian societies to the Spanish mission and Mexican rancho periods.
1. Discuss the major nations of California Indians, including their geographic distribution, economic activities, legends, and religious beliefs; and describe how they depended on, adapted to, and modified the physical environment by cultivation of land and use of sea resources.

4TH GRADE SHELLMAKER SCHOOL TOUR PROGRAM

Shellmaker Island is the perfect setting for a truly remarkable outdoor learning experience that ties together so many of the various facets of the Science and History/Social Science curriculum. Shellmaker sits at the dividing line between the waterfront homes and yachts of Lower Newport Bay and the natural beauty of the Upper Newport Bay Ecological Reserve. Upper Newport Bay is one of only a few remaining estuaries in Southern California and is the home of nearly 200 species of birds, including several endangered species, as well as numerous species of mammals, fish, other critters and native plants. The Bay is an important stopover for migrating birds on the Pacific Flyway and up to 30,000 birds can be seen here on any day during the winter months.

The 4th Grade program is an intensive 1½ hour outdoor program designed to allow students to allow students to experience the wonders of nature while covering core materials of the California State Board Education Standards as shown overleaf. Shellmaker School Tours are conducted by trained volunteer naturalists on Wednesday and Friday mornings from 10:00 until 11:30 AM. Children rotate between four outdoor stations at which they learn about different aspects of the bay as related to the 4th grade curriculum. Each school group is divided into sub-groups of approximately 15 students. Each sub-group is assigned to a tour guide who leads the sub-group from station to station.

Ecology/Plant Station

Plants are the primary source of matter and energy entering most food chains. Shellmaker Island is the home of the California Coastal Commission (CC) Native Plant Nursery. At the Ecology/Plant Station students learn about the living and non-living components of wetland and upland ecosystems, and the interactions between plants and animals. They see how saltmarsh plants are adapted to survive with their roots submerged in saltwater. They watch consumers and decomposers in action, and get to feel and smell cultivated native plants such as sagebrush and pickleweed.

Geography/History Station

Here students observe their surroundings and study 3-dimensional, topographic and street maps and aerial photographs of Upper Newport Bay, Newport Beach, and Orange County. They have the opportunity to see how the reshaping of the earth's land surface occurs and discuss physical and human geography issues relating to the bay. Freshwater flows into the bay from a watershed drainage area of roughly 154 square miles. The ongoing formation of mudflats by the deposition of sediment washed down from the watershed can be readily seen. The Bay also sits on an old earthquake fault and the geologic processes of uplift, erosion, and landslide are apparent on the surrounding bluffs. Archaeologists digging into Upper Newport Bay's past discovered that the bay area was inhabited 9,000 years ago. This is the earliest dated site for a native American settlement in Orange County. So it is fitting for students to also learn here about how California Indians lived in harmony with the bay from pre-Columbian times. Either Earth Science or California Indians will be addressed based on the preference of the school booking the tour.

Bird Station

At the Bird Station the concepts of observation and interpretation are addressed through the use of binoculars for bird watching. Particular attention is paid to the feeding habits of the birds. Students learn about the food chains and food webs to which various birds belong, Bird adaptation and survival strategies are discussed.

Marine Life Station

Shellmaker Island is the home of the California Department of Fish and Game (DFG) Marine Studies Center (MSC). At the Marine Life Station the producers, consumers and decomposers of the bay are examined and underwater food webs discussed. Mud samples are taken from beneath the MSC dock and examined for worms, shellfish and other marine invertebrates. Mussels, sea squirts, etc. can be touched and fish observed in the outdoor tanks. Depending on availability, students may also go inside the Marine Lab and see the indoor aquaria that replicate the upper and lower bay and coastal tidepool ecosystems.