TIDEPOOL TREASURES

High Tech Elementary North County

Project Overview

This 12-week project will engage kindergarten and first grade students in learning about the natural phenomena of tides and the tidepool habitat. Students will become experts through authentic field experiences, discussions with professionals, practicing purposeful scientific inquiry, and participating in the critique and revision process. Throughout this project, students will develop the essential reading, writing, math, and collaborative skills to effectively communicate about the natural treasures of the tidepool.

K

DRIVING QUESTION:

How can we, as animal experts, teach others how to protect the animals that live in the tidepool habitat?

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DRIVING QUESTION:

How can we, as first grade scientists, create a product that helps others understand tides and tidepools?

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DRIVING QUESTION:

How can we use science and art to communicate how and why tidepools are natural treasures?

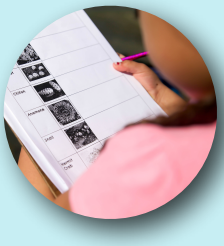
Field Work

Birch Aquarium

Carlsbad Tidepools

La Jolla Family Tidepooling Day

Swami's Tidepools



Experts

Scripps biologist and aquarium collector

SDSU MEBSA graduate students

Products

Our students will build a *Tidepool Treasures Learning Kit.* First graders will write and create learning tools that will explain tides, lunar patterns, and the local tidepool habitat. Kindergarteners will also write *"All-About Books"* for their tidepool animals and create a whole-class *informational text* explaining the adaptations of these sea creatures.

Stephanie Lance, Shelley Lee, Jamelle Jones

Kindergarten Timeline and Learning Targets

DECEMBER:

- What is science?
- Students wonder about water and make observations using the scientific method to study evaporation.
- The water cycle and the ocean
- Sink and float lab
- living vs. non-living study

JANUARY:

- What lives in the tidepool habitat?
- Habitat study (building a pond aquarium)
- Begin tidepool model (add non-living and living features)
- Visit the aquarium and a local tidepool
- What lives in a shell?
- How do animals survive?
- Read books about tidepool and ocean animals.
- Mussel clump dissection
- Choose our animals!
- Begin scientific drawings of our animals (1st/2nd drafts)
- Introduce the critique process for peer feedback

FEBRUARY:

- How we can protect the natural tidepool habitat?
- How we can tell others about the special creature features (adaptations) of our animals?
- Collaborate with fourth grade researchers on our writing
- Work on 3rd, 4th, and 5th drafts of scientific drawings
- Painted paper artwork
- Start book page prototypes for class informational text
- Fieldwork to another local tidepool
- Prepare for exhibition

MARCH:

- How do our animals live together in a community and interact?
- Learn about predators, cousins & additional adaptations
- Discuss food chains & food webs
- Finish painted paper artwork and finalize book pages about a special feature of our animals
- Exhibitions at Birch Aquarium and HTeNC

NEXT GENERATION SCIENCE STANDARDS (NGSS)

- Make observations to determine the effect of sunlight on Earth's surface (including tidepools) (K-PS3-1)
- Use observations to describe patterns of what plants and animals need to survive (K-LS-1)
- Use a model to represent the relationship between the needs of animals and the place they live (K-ESS3-1)
- Communicate solutions that will reduce the impact of humans on land, water, and other living things in the local environment (K-ESS3-3)
- *Science and Engineering Practices:* Plan and carry out small investigations. Analyze and interpret data. Obtain, evaluate, and communicate information. Students communicate with others in oral and written forms using models and drawings that provide detail about scientific ideas.

COMMON CORE LITERACY

- Recognize and write sight words (RF.K.3)
- Tell the main topic and important details in nonfiction books (RI.K. 2) and identify fiction vs. nonfiction texts.
- Understand nonfiction text features and their purpose.
- Learn to read and write informative text (RF.K.4 & RI.K.10)
- Write using pictures and words to help explain about a topic (W.K.2).
- Use peer-critique to improve writing (W.K.5)
- Ask questions, conduct research, and write about it (W.K.7)

COMMON CORE MATHEMATICS

- Record and represent data
- Read and interpret collected data.
- Count, compare, and contrast groups using numbers, shape and size (K.MD.B.3)

PRODUCTS

- All About books (individual)
- Painted Paper Art (Individual)
- Non-fiction "Creature Feature" Book (collaborative)

First Grade Timeline and Learning Targets

NEXT GENERATION SCIENCE STANDARDS (NGSS)

- Observe, describe, and predict the patterns of the motion of the moon (ESS1.A)
- Analyze and interpret data by using observations to describe patterns in the natural world in order to answer scientific questions (1-ESS-1)
- Make observations to collect data that can be used to make comparisons (1-LS1-1)
- All organisms have external parts and use the parts in different to see, hear, grasp objects, protect themselves, move from place to place and seek, find and take in food water and air. (LS1.A)

COMMON CORE LITERACY

- Tell the difference between fiction & nonfiction (RL. 1.5)
- Tell the main topic and important details in nonfiction books (RI.1.2)
- Understand and use helpful parts in nonfiction books to find important facts and details (RI.1.5)
- Find the reasons that an author gives to help teach about the main idea (RI.1.8)
- Write to teach about a topic by giving facts about it (W.1.2)
- Explore books and write about what we learned (W. 1.7)

COMMON CORE MATHEMATICS

- Tell and write time to the hour and half-hour using analog and digital clocks (1.MD.B.3)
- Organize, show and explain number information (1.MD.C.4)
- Ask and answer questions about number information that is organized (1.MD.C.4)
- Represent and interpret data using visuals, tally graphs, and bar graphs. Interpret moon and tide calendar patterns.

PRODUCTS

Teach and Learn Interactive Mats:

- Understanding the moon
- Understanding the tides
- Understanding patterns (Earth, Moon, Sun/ calendar)
- Understanding the tidepool habitat and animals
- Understanding how to go tidepooling

DECEMBER:

- What's up with the moon?
- Evening moon observations
- Introduce new and full moon
- Introduce rotation and orbit
- Earth, moon, and sun demonstrations
- Draw and record moon
- Write in moon observation journal

JANUARY:

- What do we know about the moon?
- Intro to moon calendar
- Moon phase research
- Why are we in the New Year?
- Intro to clocks and telling time
- Build and create your own clock
- New moon and full moon location demonstration
- Waxing and waning moon challenge
- Intro to tidepool sea creatures and habitat
- Fieldwork to Birch Aquarium - Jan. 13
- What is a tidepool? What are tides?
- Introduce extreme high and extreme low tides
- Connect to patterns found in time/day
- Intro to reading a tide calendar
- Connections to tides and time of day
- Clock math practice
- Carlsbad tidepools fieldwork to tally sea animals

FEBRUARY:

- Introduce bar graphs and begin to analyze fieldwork data
- How can we teach others how to go tidepooling?
- Sea creature habitat and adaptations a closer look
- Begin work on interactive products - what can we build to help others understand the content?
- Field work to Swami's tidepools
- Written explanations for content
- Visual representations/models for content

MARCH:

- Practice speaking and sharing work
- March 9th Birch Aquarium Exhibition
- March 15th School Exhibition at HTeNC

Deeper Learning Competencies

Throughout this project, kindergarten and first grade scientists will focus on the following competencies:

1. Master core academic content: Students will develop and draw from a baseline understanding of knowledge of academic discipline (patterns and survival of organisms) and will transfer that knowledge to other situations (tides and tidepool habitat).

2. Think critically and solve complex problems: Students will develop creative tools (books and learning kits) to help others navigate the tidepools safely and with purpose.

3. Work collaboratively: Students will cooperate to identify and create solutions to academic and social needs (helping others to explore tidepools responsibly).

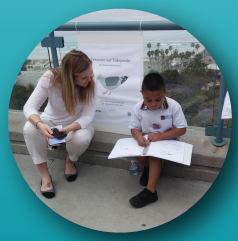
4. Communicate effectively: Students clearly organize their data, findings, and thoughts (student portfolios).

5. Learn how to learn: Students monitor and direct their own learning (through written and oral reflections).

6. Develop academic mindsets: Students develop positive attitudes and beliefs about themselves as learners (through shared field experiences and peer critique to encourage high quality work for each other) that increase their academic perseverance and prompt them to engage in productive academic behaviors.

Our public exhibition will be at *Birch Aquarium on March 9, 2016*

Students will work collaboratively to communicate their knowledge of tides and tidepools with an authentic and local audience, while emphasizing the importance of "treasuring" this special habitat.



THIS PROJECT BUILDS ON KINDERGARTEN AND FIRST GRADE WORK EXHIBITED IN WINTER 2015

For more information about this project and our work from last year, please go to:

htenctidepooltreasures.weebly.com

If you are interested in purchasing our book products from 2015, please visit:

- Treasure Our Tidepools (K): www.createspace.com/5349670
- Tidepool Treasures: An Explorer's Guide (1st): www.createspace.com/5349663