

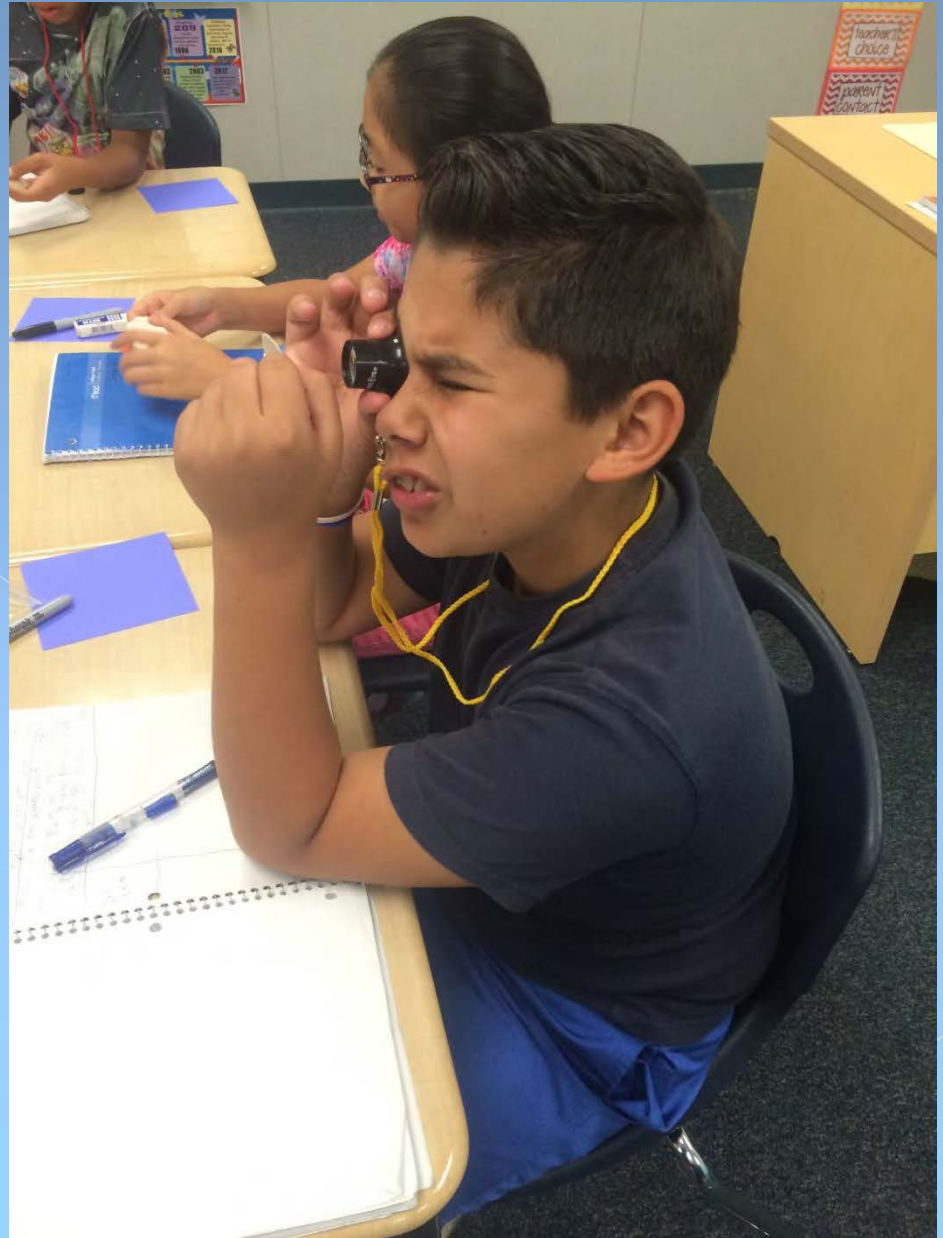
**Let's explore.**

# Sketch your sand dollar.

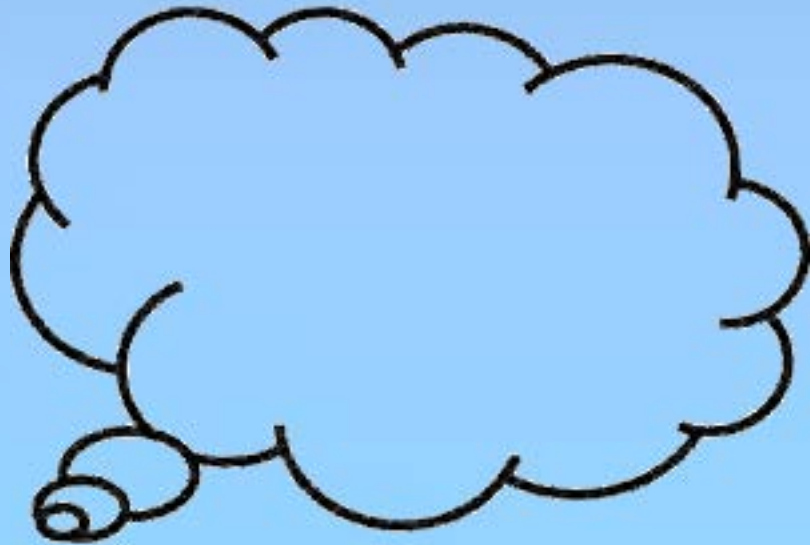
- Use your mounted white paper.
- Make it at least as big as actual size.
- Position your drawing to leave room for text.
- Suggestion: pencil then black pen.
- Be ready to say your sand dollar questions aloud.



# Using Tools



We Wonder...



# Exploring Our Questions

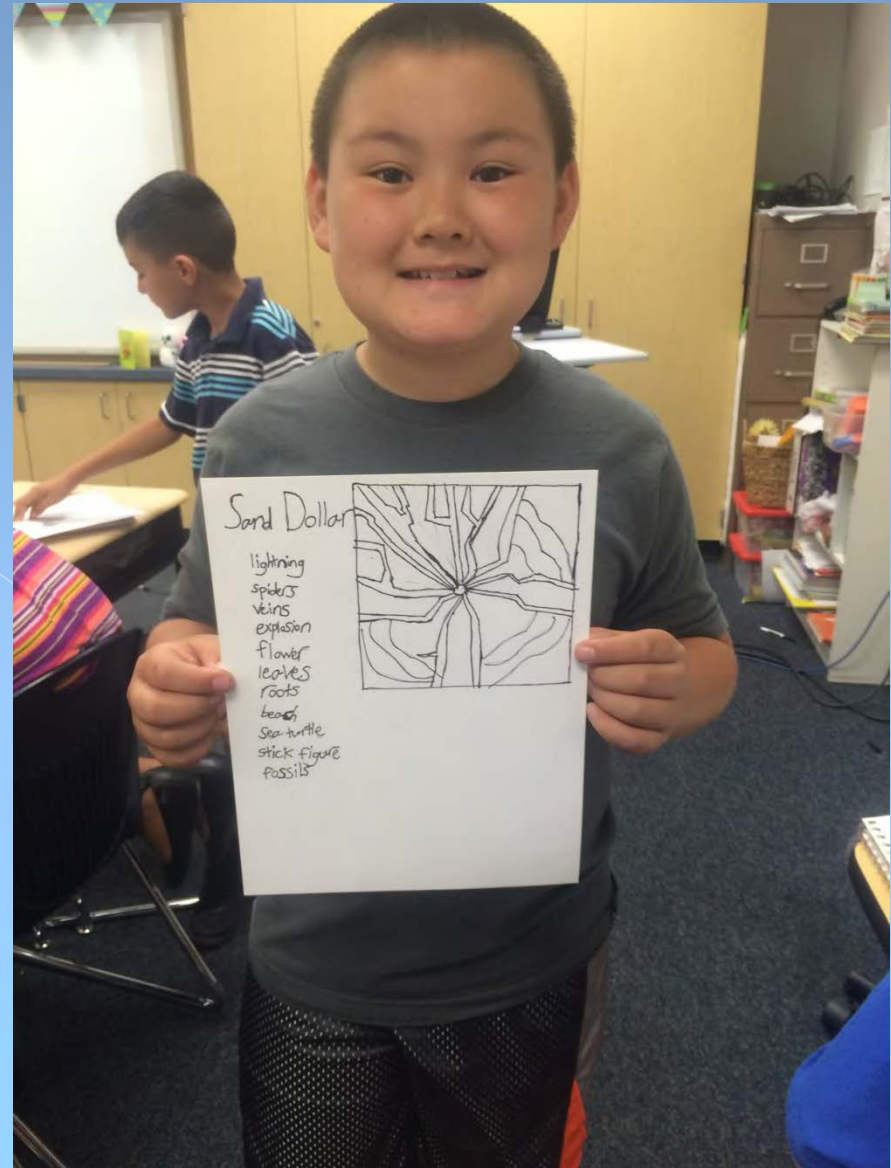
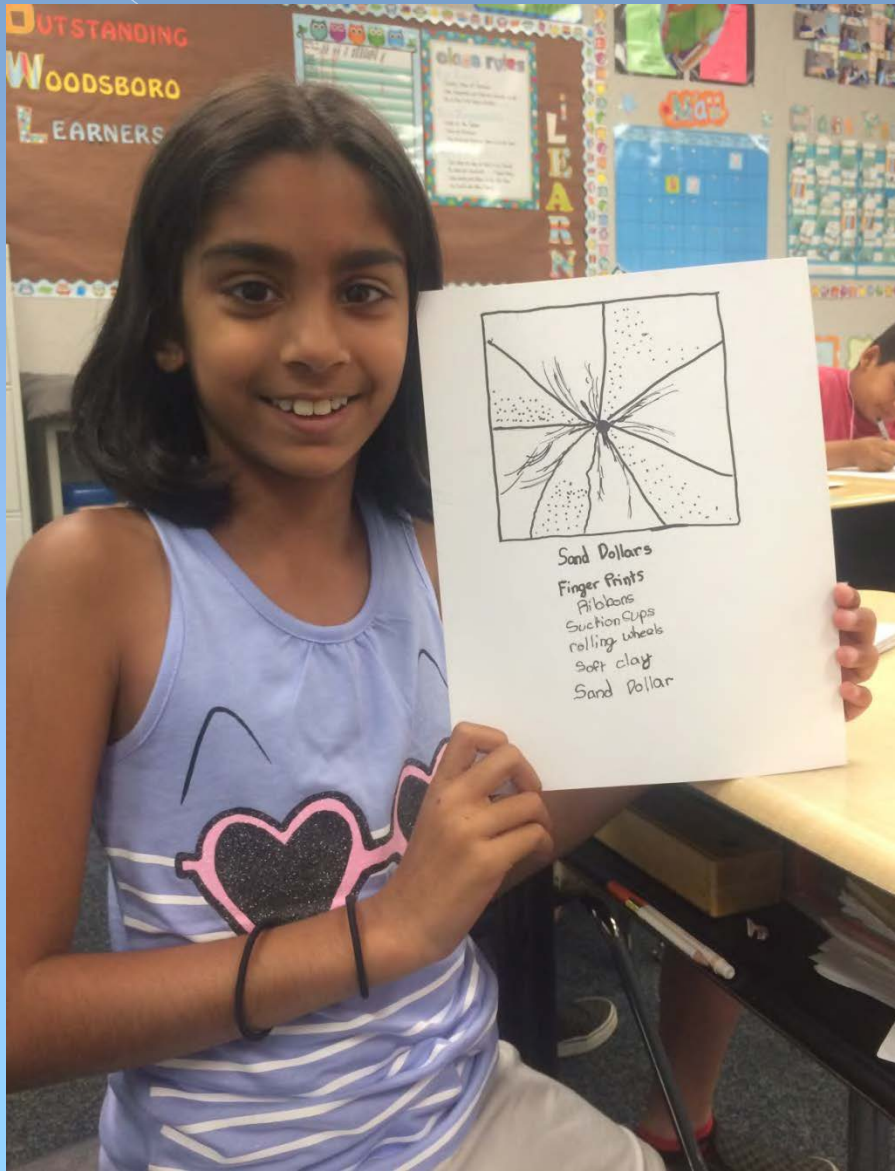
- Choose some questions and answer them using text.
- Choices:
  - > Mini book
  - > Internet
- Share your answers for our chart.



# Put it in Writing!

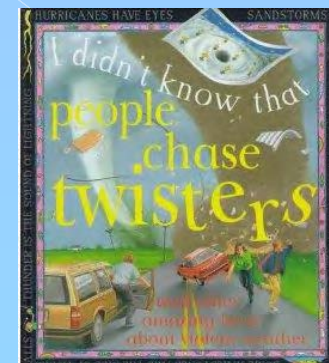
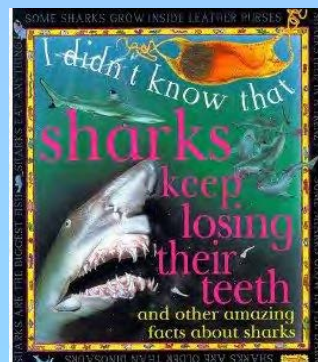
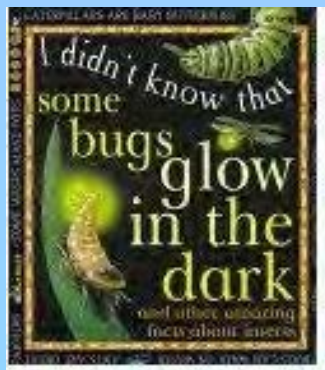
- Construct some well-composed language to capture one or more new things you learned about sand dollars.
- Write it on your sand dollar card.
- You have choices!
  - > Shape poem?
  - > Haiku?
  - > Paragraph?
  - > Or...





# I Didn't Know That...

- Begin your writing with “I Didn't Know That...”
- Complete the prompt with one or more sentences that use at least one new word. (The more the merrier!)





# THAT was inquiry based learning. Let's Analyze It.

What's your response?

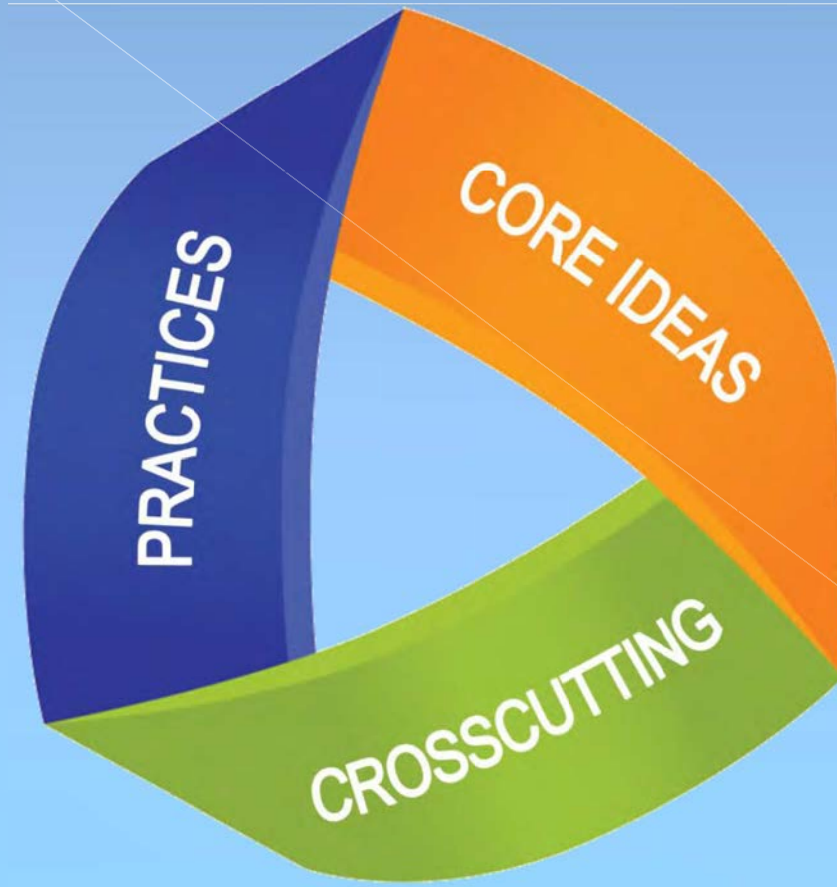


# **Why Inquiry-Based Instruction?**

# Inquiry Teaches Students How to Learn

- Inquiry teaches content with understanding (not rote memorization).
- “The need to know” is a human drive. Inquiry-based instruction is very motivating.
- When students learn through inquiry, they learn the content AND how to learn...forever!

# The Next Generation Science Standards





# Structure: 5E Learning Cycle

1. **Engage:** Pique interest, questions.
2. **Explore:** Hands-on involvement to address questions.
3. **Explanation:** Answering the qs in formal terms.
4. **Extension:** Use the information.
5. **Evaluation:** Everyone assesses what was learned.



# Leading Inquiry-Based Learning

Structures and Tips



# Tips: Talk like Scientists and Engineers

- Devise situations that encourage questions about the built and physical environment.
- Create problem/question settings and paths to explore them.
- Talk less. Listen more.
- Productive questions
  - > What are you wondering?
  - > What's the problem?
  - > How can you find out?
  - > What's an alternative explanation?
  - > Does it work when you try it?
  - > What's your evidence?



**Let's Live It Again!**

Engineering Example



# Build a Boat!

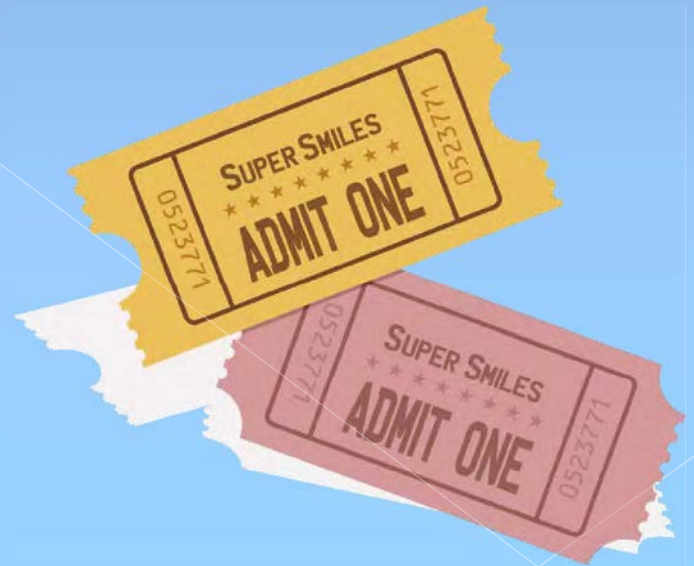
- ◎ PROBLEM!! We need a boat that can carry a HUGE number of pennies!
- ◎ Constraints:
  - > Foil
  - > 6X6 inches
  - > Right now!
- ◎ Talk about it!
- ◎ Build one. Try it.
- ◎ Build a second. Try it again. Compare.

# The Three Phases of Engineering Design

- Defining problems
  - > Criteria
  - > Constraints
- Develop Solutions
  - > Consider multiple possible solutions
- Optimizing solutions
  - > Test solutions and compare
  - > Consider trade-offs
  - > Assess impacts

# Ticket Out!

What can YOU do better MONDAY to encourage kids to inquire?



Thanks for coming!

Go forth and inquire!

