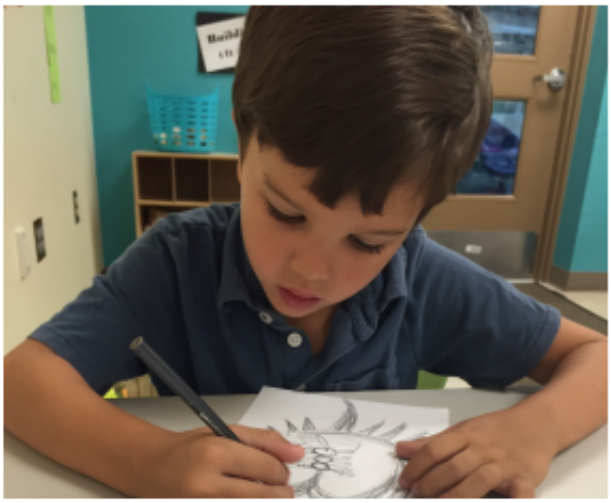
Where
Inquiry
Intersects the *Arts*

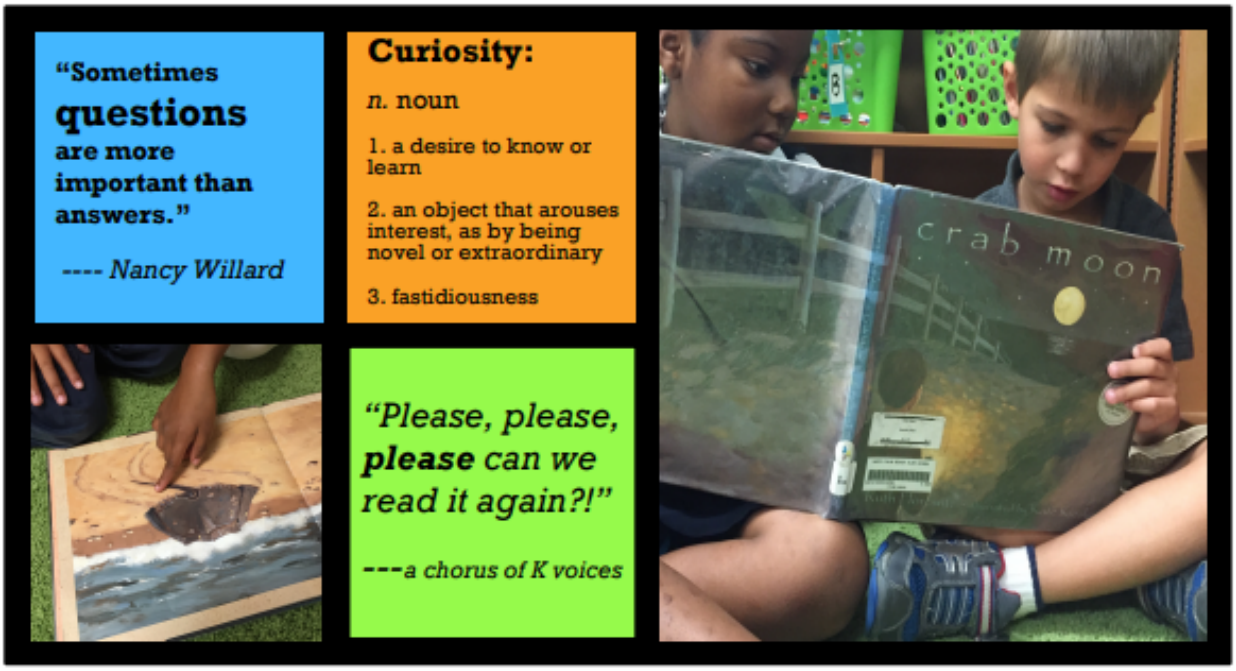


A Sample Process:

Kindergarteners & Horseshoe Crabs

An Inquiry-based, arts integrated, cross-curricular unit of study, April 2015, Kari Ratka's kindergarten classroom

The Conservatory School @ North Palm Beach



Step 1:

Finding an authentic spark

On a random Tuesday in April we read a book called *Crab Moon*, by Ruth Horowitz that we had checked out on a whim from our very own school media center. We were spending lots of time reading different types of texts with the goal of understanding the differences between fiction and non-fiction genres as readers. This particular story would be classified as "Realistic Fiction," with a main character, a storyline, painterly illustrations, but chock full of factual information about the ancient sea creatures known as Horseshoe Crabs. From the first page, there was something *magical* about this book; our normally "lively" kindergarten carpet was effortlessly quiet, eyes were fixed, bodies were still, minds were clearly engaged. **All** seventeen of them. That doesn't happen every day! We followed the character of Daniel on his summer journey to the beaches of Rhode Island and through his own magical encounter with a species as old as the dinosaurs, that is classified as a member of the spider family, but swims in our modern day oceans. How wonderfully confusing! When the last page concluded, the bubble burst- in the best possible way... "Wait, they lived with the *dinosaurs*?!"... "Whoa, look how huge they are, and there are so many, it looks like rocks on that beach?"... "But I don't want those birds to migrate and eat the crab eggs and make them endangered. How can we stop it?"...Forget about raising hands, they simply couldn't contain their fascination in the most amazing, *authentic* way. We had stumbled

Step 2: connecting the standards

The next part of the process fell to me as the teacher. Knowing how captivated my students were by these crabs, I needed to sit down and take a global look at my standards across all subject areas. Our point of entry had been a great tie- in with literacy and our Reader's Workshop Unit about Non-fiction, so I marked a few Reading standards that I knew we would continue to explore in conversation about Crab Moon and as we did more research in non-fiction sources. On to the obvious link: Science! I knew that I had already hit my Living Organisms standards thoroughly at the beginning of the year with another Inquiry Based unit on birds. I wanted to find a connection deep enough that we could spend some time here in this clearly magical place and still know we would be well rounded little scientists, mastering all of our big ideas by June. When my eyes fell to "Earth & Sky" and its general concepts about the sun and moon and cyclical changes on the Earth I knew we had a match! *Crab Moon* was all about the high tide, and the students were already asking questions about what that meant. I knew that writing would also be heavily embedded throughout the inquiry process, which provides such unique opportunities to teach into skills in addition to those taught in Writer's Workshop. Finally, I took a quick look at arts standards, already having a vague idea that I might want to integrate down the road with both visual art and music once we had gathered knowledge that we needed to transform and make our own. I had a plan now, and the reassurance that this already rich topic and all we would do with it would be heavily supported by our standards. Having this loose map in place anchored my thinking about what lay ahead. We would seek answers, and we would create… with a strong framework guiding us.

By the end of our unit of study, the list of standards we touched upon with this one was quite staggering!

LAFS.K.RI.1.1
LAFS.K.RI.1.2
LAFS.K.RI.4.10
LAFS.K.L.3.6
LAFS.K.SL.1.1
LAFS.K.SL.1.2
LAFS.K.SL.1.3
LAFS.K.SL.2.6
LAFS.K.W.1.2
LAFS.K.W.3.7

SS.K.G.3.3
SS.K.C.2.1
SS.K.C.2.3
VA.K.H.3.1
VA.K.S.1.1
VA.K.O.1.1
MU.K.F.1.1
MU.K.O.3.1
MU.K.C.3.1
MU.K.C.1.2

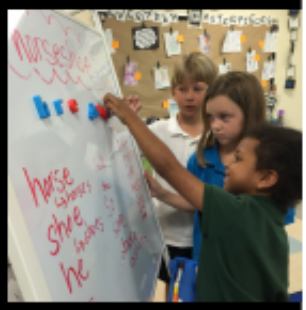
SC.K.E.5.2
SC.K.E.5.3
SC.K.N.1.1
SC.K.N.1.2
SC.K.N.1.3
SC.K.N.1.4
SC.K.N.1.5

"It's hard to walk like a horseshoe crab! But maybe it's not hard for them with 10 legs? I need 8 more legs!

---- *Autumn*

"I knew before I even saw the words on the cover that this book was about the moon because in the picture it's so big."

---- *Senia*



Step 3: Growing the idea

Building into classroom conversation & activity

Once the spark is lit it is tempting to jump headfirst into seeking answers to the questions fueling students initial fascination with a topic, but we sat on this one for awhile. We fanned the flame by continuing to weave horseshoe crabs into our daily life. At morning meeting we discussed how they might greet each other, which spawned a conversation about their social habits and family structure… more questions! We discussed what sources we might turn to to find the answers to these questions, and continued great conversations about fiction versus non-fiction texts. In morning work, students continued to record ideas, thoughts, and questions about the crabs in their journals and on sticky notes. We played our favorite word work game, making many smaller words with the letters in the word horseshoe. We started exploring the Earth & Space science standards that would scaffold our learning, resting for awhile on the idea of "cycles." We brainstormed about cycles in the world all around us, and even learned "the Byrds " classic "*Turn, Turn, Turn*" with lyrics adapted to our learning as our shared reading. And nearly every day I resolved minor arguments over who got to read our beloved copy of *Crab Moon* during Independent and Buddy Reading time. Our list of questions grew and grew, along with our desire to answer them, and my own ideas of what we might do with that information once we had it. The anticipation was palpable; horseshoe crabs had burrowed themselves deep into our classroom culture.

Step 4:

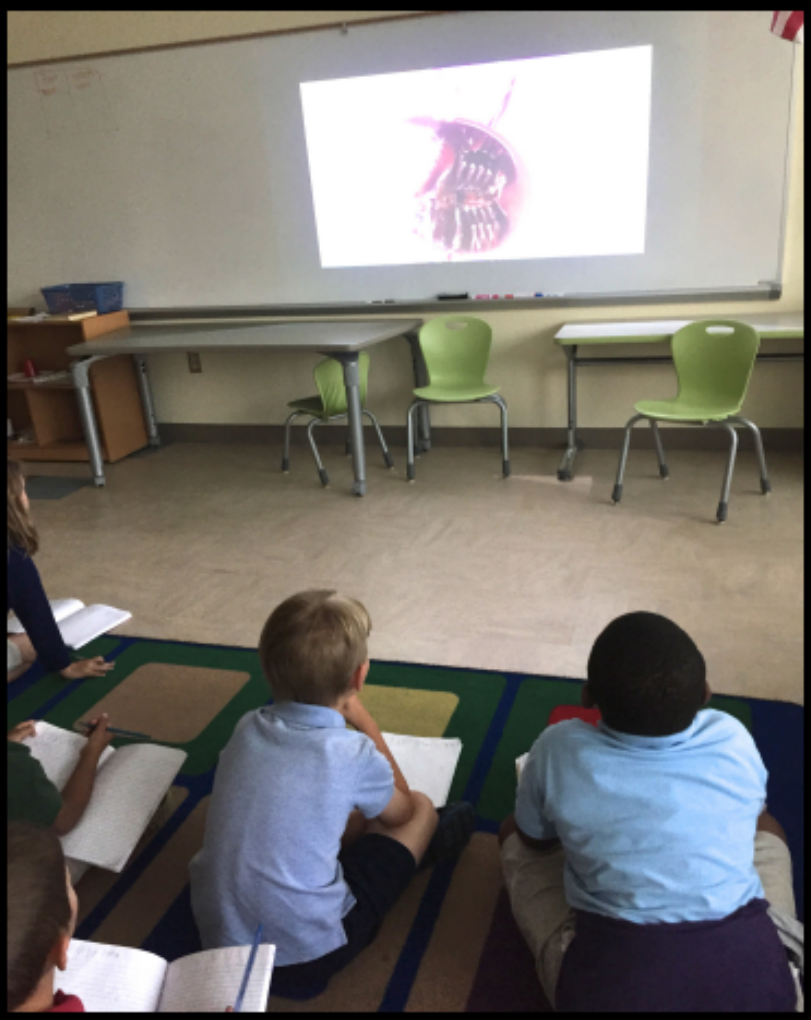
Deepening Inquiry

Fueling curiosity through research

In all, we spent nearly two weeks growing a list of burning questions we had about these unique creatures. At the kindergarten level, the research process is often a group experience. While we went into our fact finding expedition with a common mission, taking notes in their own journals really allowed students to hone in on pieces of information that resonated with them on an individual level. We searched websites, watched videos of various aspects of horseshoe crab behavior, and studied diagrams to better understand their strange and complex body structure. We used our list of questions to keep us focused, with the goal of answering each and every one on a bright blue post-it note. It quickly became clear though, that these questions were just the beginning. Students were encouraged to write down their *new* questions next to the sketches, words, and sentences in their notes that made them wonder. Fresh from our previous day's conversation about Earth's cycles, a student raised her hand and said, "Hey, it's a question cycle!" Profound thoughts from a tiny six year old mind! We committed to follow that cycle until we felt like experts.

"Oh! That's why their tracks in the sand are so wide... its because they crawl with their feet and they steer with their tail too!"

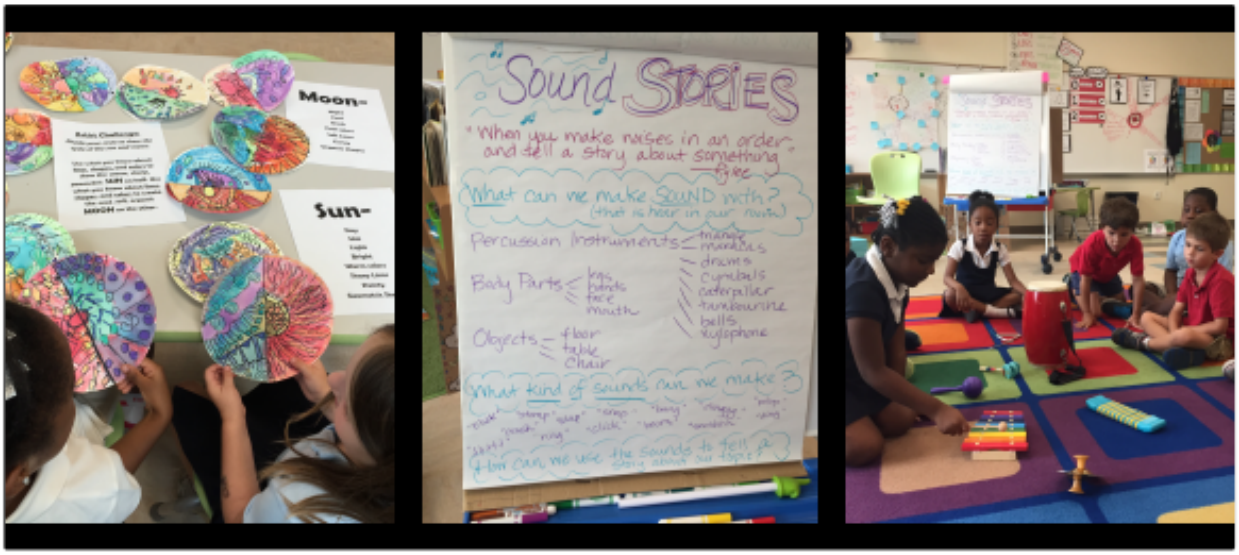
--- Emma



"Whoa, these guys are pretty amazing!" ---- Marcus

Step 5: Integrating the Arts

Transforming new knowledge through creation



Painting Day & Night…

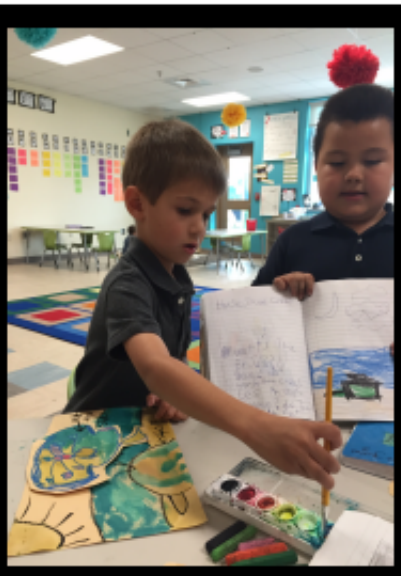
Visual art was tucked into many corners of this inquiry expedition, but often focused on realistic observation drawings, so when it came time to explore the Sun & Moon and cycle of day & night, we had some fun with abstract color and design. We reviewed warm and cool colors and determined that warm should represent the sun and cool the moon. Then we reviewed organic and geometric shapes and lines, Students were given a large circle and asked to use all three elements: color, shape, and line to create a radial design that represented the shift from day to night, and the differences in the sun and moon. We looked at Monet's haystacks to study light and color at different times of day, and bright Aboriginal designs too.

Musical Sound Stories…

Once we had hit all the main concepts outlined in the science standards: The cycle of sun and moon and how that affects the tides, which in turn affect the horseshoe crabs as they lay their eggs, it was time to synthesize that chain of relationships into something meaningful. We would create sound stories. Rylee defined a sound story for us as "when you make noises in an order that tells a story about something." We decided that in order to create one, we needed to determine 1.) what we would make sounds with, 2.) what kinds of sounds we would make, and 3.) how we would put them in an order to tell the story of day circling to night, high tide to low tide, and the crabs riding ashore to lay their eggs. I wanted students to have the experience of composing and performing the sound stories in small groups, so to prepare, we practiced the process as a whole group with the life cycle of the butterfly as our story. We introduced key music vocabulary, like tempo and dynamics, and we learned valuable lessons about how important silence in the background is after many interrupted "takes"! Students loved deciding which instruments sounded most like which steps in the cycle. John said, "the caterpillar instrument makes the best sound for a caterpillar… that's so funny!" We explored the idea of body percussion too. When it came time for horseshoe crab sound stories, students were eager and ready to create and perform. Artist statements, both verbal and written help justify musical choices and assess scientific understandings.

The power of *studio spaces*...

In addition to more formal arts integrated learning activities focused on exploring one concept through one art form, in our classroom we also build in time for creative expression in our "Studio Spaces; " 6 centers with varying art mediums scattered around our room. During studio time students work collaboratively in a small group to discuss, plan, build, make, create, revise, and share their ideas relating to a specific creative challenge. For this project, the challenge was simply "Create a work that teaches about horseshoe crabs."



At the visual art studio...

Noah and Christopher brought their journals with their notes to their work space and decided they would use paint to show what they knew about the body parts of the horseshoe crab. Christopher explained that they wanted to show the hard shell of the top of the crab, and then show what was hiding underneath--- 10 legs, 9 eyes, "book" gills and more! They determined who would create each part, then put it all together. As they shared their final product with me, we discussed how adding labels, especially to the complicated underside would be a smart revision to make.

At the drama studio...

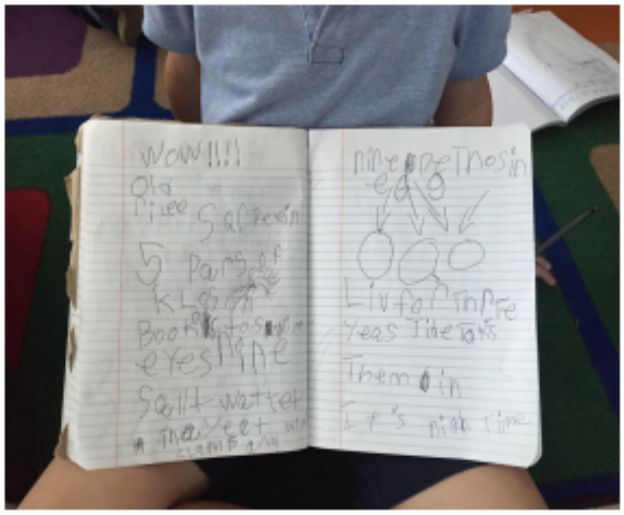
Rylee, Charlotte, and Autumn planned to create a landscape scene and small puppets that would travel on the tides from the ocean onto the sand to lay their eggs (around 80,00 in a season per female crab!). They used a variety of materials to create their props, then acted out the sequence of events. They wanted a better way to show the tracks left in the sand by the crabs, so I suggested a flexible material like yarn; they were thrilled with the outcome. "That's perfect, just like the way their tails drag!" Charlotte declared. After a second run through with their popsicle stick crab characters, Rylee requested post-its so that she could make "signs to show which way they move... like how they go onto the sand at night and ride back to the ocean for the day" (correctly asserting the direction of the tides we'd just learned about).

At the block studio...

Marcus and Keegan struggled through a few failed plans, the first of which involved a sea castle, which they quickly realized didn't teach much about their beloved crabs (a quick lesson in fiction vs. non-fiction). They settled on creating one giant horseshoe crab. They explained that "He has a tail, and he is going from the ocean (green carpet) onto the sand (brown carpet)." When asked what the small blocks inside the outline represented, they explained that this was the top of the shell, so that was showing the texture on top from barnacles. "Well, maybe some of them are eyes too, because some of their eyes are on top of their shell," Keegan added. Then she realized she still needed more information about those eyes... "Wait, horseshoe crabs have 9 eyes, but how many ***are*** on top? and how many are underneath?..." sounds like another question for a pink post-it!

Step 6:

celebrating the journey!



Sharing the outcomes. **Reflecting** on the process.

*"Learning is **creation**, not consumption. Knowledge is not something a learner absorbs, but something a learner creates."*