

Wayland Public Schools

May 2, 2016 School Committee Meeting

# Curriculum Spotlight #13

## Grade 2 Sand Dune STEM Project

# Grade 2 Sand Dune STEM Project

## Engineering Design Challenge

Residents of the town of Orleans on Cape Cod are concerned about the erosion of the sand dunes on their beaches. Both water and wind are changing the shape of the dunes and the beauty of their beaches.

They heard that there are some very creative second grade scientists in Wayland and they would like your help with this problem. Would you work in teams of three to four and build a design to prevent the wind and water from changing the shape of the dunes?

# Grade 2 Sand Dune STEM Project

## Erosion and Weathering

### Objectives:

- To investigate and understand physical changes on Earth
- To realize how wind and water change the land
- To provide a solution to slow or prevent wind and water from changing the shape of the land

### Standard 2-ESS-1:

Compare the effectiveness of multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

# Grade 2 Sand Dune STEM Project

## Guiding Questions

- How do wind and water erosion differ?
- Do you think one form is worse than the other?
- Where else have you seen examples of erosion?

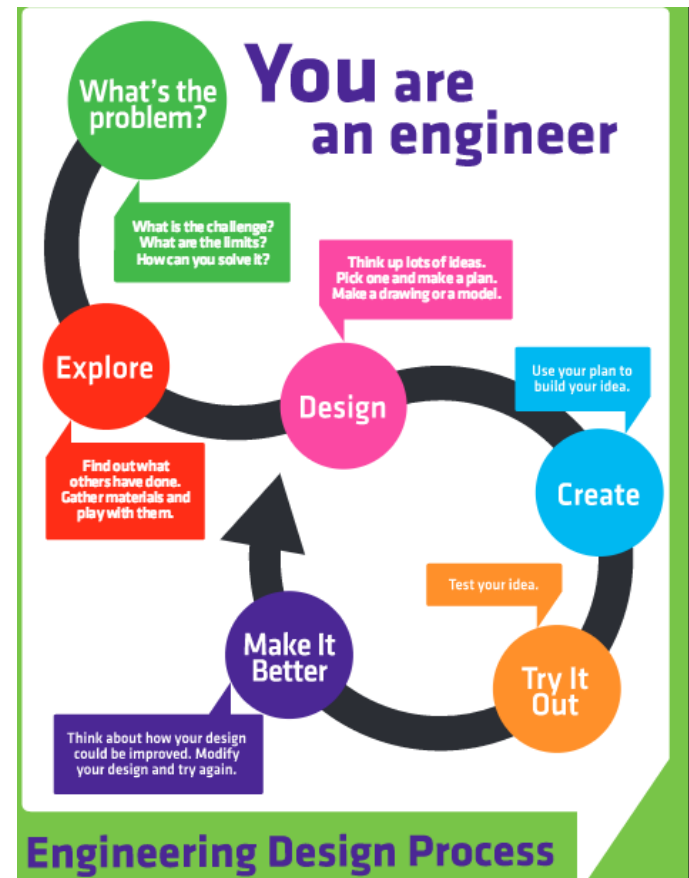
## Reflection Questions

- How does human activity contribute to erosion?
- How can erosion be harmful?
- What other materials could you consider if you were to redesign this exploration?

# Grade 2 Sand Dune STEM Project

## Engineering Design Plan

- Identify the Problem
- Explore
- Design
- Create
- Try It Out
- Make It Better



# Grade 2 Sand Dune STEM Project



Gathering Materials



Teams Working Collaboratively



A First Attempt



# Grade 2 Sand Dune STEM Project



Testing Under Rainy Conditions



Testing Under Windy Conditions  
(using a hair dryer)

# Grade 2 Sand Dune STEM Project

## Redesign





# Grade 2 Sand Dune STEM Project



# Grade 2 Sand Dune STEM Project

## Other Solutions



# Grade 2 Sand Dune STEM Project

## An Extension

Writing instruction in second grade covers narrative, opinion and informative styles of writing.

Teachers Gretchen Knox and Miriam Morrison designed a supplementary writing assignment based on the work of Lucy Calkins, who is an author of numerous highly respected professional texts on reading and writing. Their focus was on building students' skills on informative/informational writing. Calkins' goal is to have students, "writing like scientists."





# Grade 2 Sand Dune STEM Project

**Identify the Problem** – Describe the challenge to be solved.

**Explore** – What materials are available.

**Design** – Draw and label your idea for a solution.

**Create** – Make your solution.

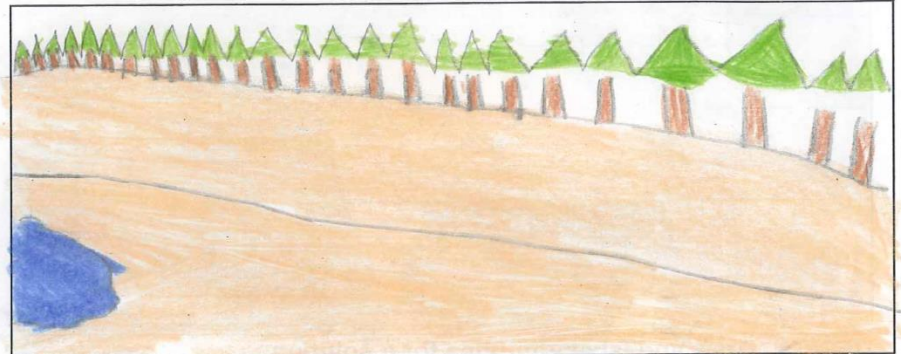
**Try it Out** – Test your solution.

**Make it Better** – Evaluate how the solution worked and think of how to improve your design.

Name: \_\_\_\_\_

Date: 3/31/16

The Engineering Design Process- Erosion and Weathering



IDENTIFY THE PROBLEM- Describe the challenge to be solved:

Works as a team to  
build a design that slows or  
prevents wind and water from  
changing the shape and size of the sand

EXPLORE- What materials are available?

dunes in Orleans,  
rocks, clay, craft sticks, leaves,  
bark, pine needles, pebbles, twigs,  
grass, plastic bins, sand, ✓

# Grade 2 Sand Dune STEM Project

## A Shift in Teaching and Learning

- This outdoor project is open-ended, messy and memorable. It takes a lot of time (2 days) and requires more than one adult, but it's worth it.
- It lends itself to deeper thinking and it builds problem-solving skills.
- It trusts students to go wherever their ideas take them, tapping into their creativity and sense of possibility.
- It's an opportunity for students to collaborate. Students feel the gains of their cooperative efforts, as well as the frustrations when they have trouble agreeing. They learn the value of compromise.
- It's more about the process than the product. Students learn the value of trying things out to see if they work. They learn it's OK if things mess up, and they are given the time to go back, discuss things over and try something else.
- Teachers report that there are high levels of excitement during this unit.



# Grade 2 Sand Dune STEM Project

---

## In the Words of Our Students

- “I loved it!”
- “I liked the surprises once I put our creations to the test.”
- “Sometimes you think something is going to work and when you try it and it doesn’t, you get a second chance.”

# Grade 2 Sand Dune STEM Project

## Basking in the Joy of It All



Wayland Public Schools

May 16, 2016 School Committee Meeting

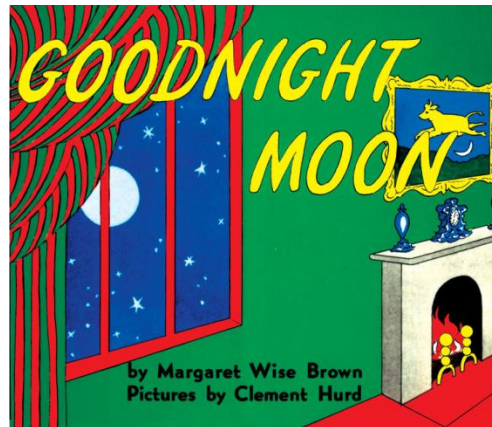
# **Curriculum Spotlight #14**

## **Freshman Read Aloud Project**

# Freshman Read Aloud Project



Mary Cassatt, Nurse Reading to a Little Girl, 1895



**T**HE ROYAL INSTITUTION of Great Britain has stood on the same site since 1780, and in more than 200 years it would seem one of the oldest and best buildings in central London. But on April 6, time did a funny thing. The institution's 212 years of existence suddenly contracted, and went from seeming extraordinarily long to astonishingly short.

"You can't extend 6.4 billion years ago, but it's got 6 billion years before the first rise out," Sir Martin Rees, the Astronomer Royal, told the audience seated among the books and woodwork of the institution's ancient story library. "It won't be humans who witness the world's demise. It will be entities as different from us as an ant from a bug."

The occasion for Rees's mind-bending assertion was his acceptance of the 2013 Templeton Prize, an annual cash award of \$1.7 million, payable to individuals who have made "an exceptional contribution to affirming life's spiritual dimension" — in Rees's case, by looking millions of years into the future and venturing a guess as to what might be waiting.

Humans have been interested in the future for millennia, mostly as a subject for divination. But divinations were, along with experience, also, thinking small. Most humans who have ever lived have died in conditions almost exactly like the ones in which they were born, and without written history had no way to grasp that the future might be different at all. Only now have we gained the scientific knowledge necessary to speculate how exactly how deep a rabbit-hole the future really is, not just long enough to see engines rise and crumble, but long enough to make all human history and even like a memory of the gods.

This newfound appreciation for the depths of time has led a handful of thinkers like Rees, a theoretical cosmologist by training, to begin venturing some of humanity's best and clearest guesses about what may lie far, far, far ahead. Serious futurologists are not a large group yet. "It's a fairly new area of inquiry," says Nick Bostrom, an Oxford University philosophy professor who heads the school's Future of Humanity Institute. But they are trying to give a first draft of a map of the future, using the kinds of rigor that theologians and uneducated guessers from previous generations didn't have at their disposal.

In the history of prediction, there are a few examples

Graeme Wood is a contributing editor of *The Atlantic*.

FUTURE.42

# Freshman Read Aloud Project

The Read Aloud Project requires students to read aloud from a published non-fiction source to an adult in their family for 20 minutes a day, at least three times a week for five to six weeks. (Alternately, they can read a fiction piece written before 1900.)

Students can choose to read from almost anything they want – books, magazines, or newspapers – but the readings should target a general adult audience, not just teenagers. They are asked to find interesting topics and entertaining writers that will appeal to them and to their audience.

*(Barbara Shellito's Freshman English Class, Wayland High School)*



# Freshman Read Aloud Project

## Primary Goals

To allow students to hear and feel the rhythms and grammatical structure of well-written prose, so they can emulate it in their own writing as their ideas become more complex in high school and college.

To enable students to practice reading aloud various difficult but interesting published writings. The goal is to improve their ability to convey the meaning clearly to an adult audience as well as to themselves. In the process, they will become more fluent readers as they learn to interpret and anticipate an author's ideas and tone based on word choices, syntax, and punctuation.

*“The purpose of this assignment is to train your eye and ear to recognize the rhythm, punctuation, and energy of well-written prose. You will also increase your vocabulary, your general knowledge, and your ability to read aloud.”*

# Freshman Read Aloud Project

## Secondary Goals

- To allow students and their parents to see them as becoming part of a wide community of lifelong adult learners.
- To allow students to see that practice makes improvement in this generally undeveloped skill.
- To introduce them to “grown-up” sources of information and reading enjoyment, such as popular books, magazines, and newspapers.
- To build their confidence in being able to read aloud in class and elsewhere when it is needed.
- To develop public speaking skills.
- To remind them of the pleasure of sharing reading time with a parent or friend.

# Freshman Read Aloud Project

## Reflection Journal (signed by parent/audience)

Date and Time (Minimum: 60 minutes over 3 sessions)	Audience	What I Read (Source)	My Response (3-4 sentences each)
Saturday, April 28 <sup>th</sup> 5:00 – 5:25	Mom	Joe Morganstern Wall Street Journal May 7, 2016	This movie reviewer really knows how to insult a bad movie. He really can't stand movies that lack dramatic consistency. My favorite line in his review of ... was ...

# Freshman Read Aloud Project

## Final Reflection Paper

- Write a paper detailing your thoughts and feelings about the [project]. This requires you to stop and think about how the project as a whole worked for you and your family, how your feelings about it may have changed over the weeks, and how you think it may affect you now that it is complete.
- As with any essay, you should have a thesis statement which you will support with detailed evidence. Organize your thoughts before you start writing. A possible thesis would be to argue for or against this project being assigned to honors freshmen in future years.
  - Do you think it has been a worthwhile effort for you?
  - Consider any problems that developed as you completed the project as well as positive effects. Were there any surprises along the way?
  - Any results by the end that you didn't anticipate in starting out?
- Remember to go back over your work to revise and edit it for sentence structure, punctuation, etc. This is a short paper, but please make it one you can be proud of.

# Freshman Read Aloud Project

## **Excerpts from Students' Reflection Papers Gaining Comfort Reading Aloud**

Now I feel as though I could read aloud without feeling a large amount of stress or anxiety.

Overall, I found that this project gave me courage to read aloud.

I was able to add emotion and varied emphasis. I realized that as I was reading, I was asking myself, “What should I emphasize?” I paid attention to the words and what they meant. When you read aloud, you really get a sense for what the author intended it to sound like.



# Freshman Read Aloud Project

---

## **Excerpts from Students' Reflection Papers** **The Forms of Writing**

When I read from many different authors and genres, I really started to see the difference in writing techniques and tone. This is something I haven't noticed before.

# Freshman Read Aloud Project

## **Excerpts from Students' Reflection Papers Strengthening Family Ties**

Though the focus of this project [was] to improve my skills as a public speaker, I was able to strengthen my relationships with my family.

I feel like even though this project has ended I still want to read aloud to my family from time to time.

The next beneficial aspect of this project was keeping up with, and discussing, current events with my mom...The most interesting articles to read with my mom were the ones about medicine because she was able to give me her opinion and background knowledge on the subject. For example, we read an article about how doctors often give their patients placebos to help cure them without harsh side effects, and this provoked an interesting conversation between my mom and [me].

# Freshman Read Aloud Project

## **Excerpts from Students' Reflection Papers Exposure to Non-Fiction**

I was forced to read articles that I would never have chosen, and it ignited a new passion for reading.

While doing this project, I was able to immerse myself in global affairs...

Throughout the weeks of reading various non-fiction articles, I eventually was able to become familiar with the different ways in which they're structured. The first week of reading non-fiction articles, I was frustrated with how they were different and, in my opinion, harder to understand than fiction pieces. Unlike a fictional story, non-fiction pieces don't tend to follow chronological order, so it's up to the reader to put the events in a logical sequence.

# Freshman Read Aloud Project

## Excerpts from Students' Reflection Papers Overcoming Difficulties

When our class was originally assigned the project of reading non-fiction pieces out loud to an adult, I wasn't looking forward to it. Immediately a list of obstacles ran through my head: not having time, tackling unfamiliar vocabulary, not knowing background information needed, and many more. However, once I began the project I found that, with some work, I could overcome these obstacles to my benefit; not only did I become familiar with the structure of non-fiction pieces, but also I was able to keep up with current events.

At the start of the project, I would skip over the "big words" out of frustration, but as the weeks passed I decided to slow down and ask for clarification on words I didn't know.

At first, I thought this project would be a breeze. I can hear my voice in my head when I read, and I believed that I used the proper emotion and diction; I thought I would be able to read aloud very well. However, when I started reading, I was surprised to find my voice sounded rigid and emotionless. There were awkward pauses and I had to repeat some sentences. It didn't sound anything like how I wanted it to sound. It was frustrating. Over the weeks I struggled, but I definitely improved.

# Freshman Read Aloud Project

## **Excerpts from Students' Reflection Papers Overall Impressions**

Through the process of reading aloud, I sharpened my skills, brought my family together, and gained a new perspective on reading.

While reading aloud to my family proved to be more difficult than I initially expected, the outcome yielded more positive results than I could have imagined. Both developing my pronunciation, tone, and diction in my reading as well as improving my awareness of world happenings, this project allowed me to take a step back and observe myself as a reader, fine tuning my read aloud skills.



# Freshman Read Aloud Project

## Excerpts from Students' Reflection Papers Overall Impressions

I remember as a little kid getting excited to brush teeth, pull on my PJ's and crawl into bed, waiting for my dad to walk into my room with a story to read. More often than not, he'd have One Morning in Maine in his left hand. My father probably read this book to me over a thousand times; it was my favorite. I didn't love this book for the illustrations on the pages or really for the plot line itself, I loved it because of the way my dad read it aloud. I remember being amazed at how he never stumbled over a word, how he knew to raise his voice as Sal asked her father a question, and at how he gave a slight pause in sight of a comma. As a child just learning to read, I was always astonished at his reading ability. Before starting this reading project, matching my father's reading ability seemed impossible. However, after reading aloud to one of my family members for six weeks, I have seen improvement in my reading ability and have grown more confident reading aloud. As a bonus factor, I found that I have become more educated in many different subjects, as I have read about them over the past weeks.

