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Interdisciplinary STEM Teaching & Learning  
Conference

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Mar 23rd, 3:00 PM

### Using Creative Writing to Facilitate Science Learning

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The background is a solid yellow color. It features several geometric shapes: a large blue rectangle in the top right corner, a white rectangle in the middle right, and a white rectangle in the bottom right. The title text is centered and spans across these shapes.

# **Using Literacy and Culturally Responsive Pedagogy to Enhance Science Content**

**Dr. Alma Stevenson and Dr. Lacey Huffling  
Georgia Southern University Statesboro Campus**

# Who we are

- Science and Literacy educators
- Passionate about equity in science education
- Work with historically underrepresented populations
- See literacy and culturally responsive teaching as ways to integrate students' cultural resources into the content



Introduce yourself:  
How long teaching  
Where from  
Grade levels



Students, write your response!

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# Our Goals for Today's Session

- Discuss Culturally Relevant Pedagogy (CRP).
- Discuss multiple literacy strategies.
- Experience one mini lesson adapted from the original lessons and see examples of student work.
- Share experiences and ask questions.
- Brainstorm ways to develop science unit infused with literacy and CRP



What do you want  
to know about  
today's topic?



Students, write your response!

# Our Attempt

Informal learning residential week-long program sponsored by GA Department of Education Migrant Program

5 days of 4-hour class sessions (1st Day was 4 hours in morning and 3 in afternoon)

25 rising 6th-8th graders (18 female, 7 males)

All children of migrant farm workers of Mexican descent

# Tenets of Culturally Relevant Pedagogy

- Respect for the legitimacy of different cultures
- Incorporate students' cultural, linguistic, and social backgrounds into the curriculum
- Provide a challenging curriculum and relate new information to students' life experiences
- Cultivate a community of learners in your classroom
- Address a spectrum of learning styles
- Maintain high expectations for student success



# How We Infused CRP

Chose to focus on soil ecosystems:

- Connections to soil through families' jobs
- Highlight students' and families' funds of knowledge (Gonzalez, Moll, & Amanit, 2005)



<u>CRP Tenet</u>	<u>Connection in Soil Ecosystems</u>
Respecting different cultures and incorporating cultural information into the curriculum	Highlighted culture of migrant workers which is often not presented in formal education
Relating new information to students' life experiences	Introduced academic language and scientific concepts to students' life experiences
Teaching to the “whole child” and treating the classroom like a community	Used cooperative learning throughout week-long experience
Addressing a spectrum of learning styles	Provided multiple ways for students to learn (e.g. hands-on data collection; multiple texts and multiple literacy strategies)

How well do you understand how our topic of Soil Ecosystems addressed aspects of CRP?



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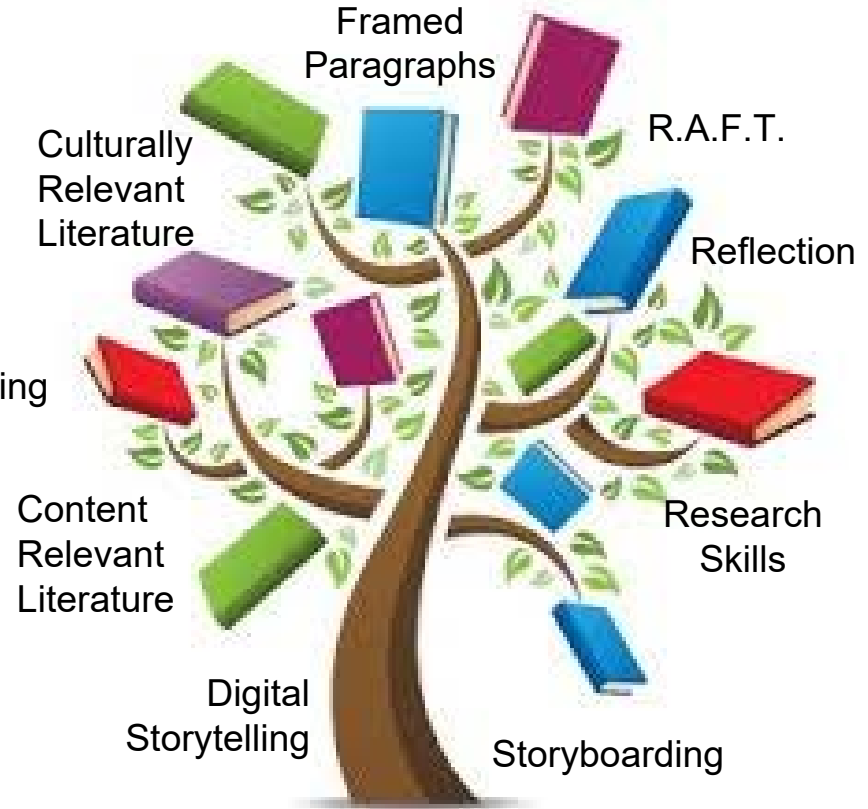


Students choose an option

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# Integrating Literacy: Strategies to Enhance

- Language skills
- Academic content learning
- Academic vocabulary
- Scientific writing ability





Circle the literacy strategy you have used before:

Conferencing

Storyboarding

R.A.F.T

Reflection

Culturally  
Relevant  
Literature

Content  
Relevant  
Literature

Framed  
Paragraphs

Digital  
Storytelling

Research  
Skills



Students, draw anywhere on this slide!

# Connections to *Common Core* (NGAC and CCSSO 2010)

WHST.6-8.2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (*MS-LS1-5*),(*MS-LS1-6*)

WHST.6-8.7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (*MS-LS1-1*)

WHST.6-8.8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (*MS-LS1-8*)

WHST.6-8.9. Draw evidence from informational texts to support analysis, reflection, and research. (*MS-LS1-5*),(*MS-LS1-6*)

SL.8.5. Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (*MS-LS1-2*),(*MS-LS1-7*)

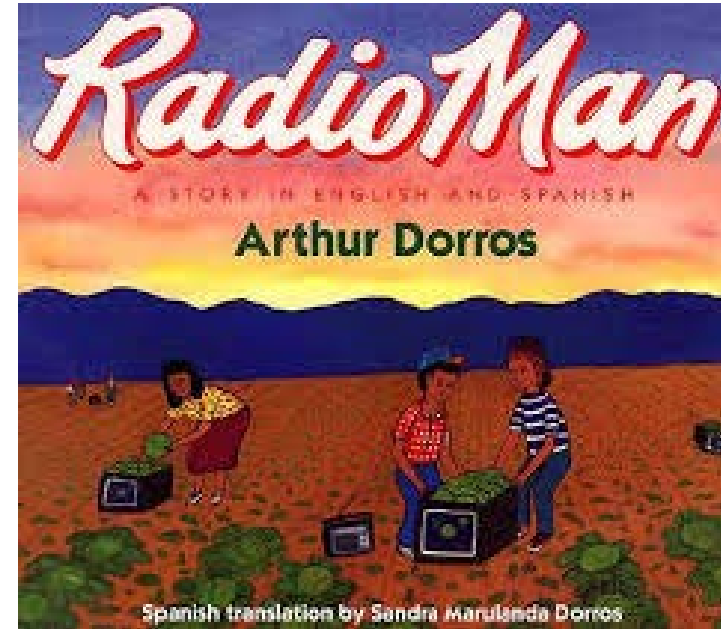
# Culturally Relevant Literature

Depicts a migrant boy (Diego) who travels the US with family to harvest crops.

Engaged students in read aloud of text.

Asked how the story compared and contrasted to their life experiences.

In end of week surveys and interviews, students shared how much they liked



(Dorros, 1997)

# Google Map Activity based on *Radio Man*

[https://www.google.com/maps/d/u/1/edit?mid=1xtUEUob9uP5\\_63LbaW5V3ZVqY\\_k&ll=35.704549221453654%2C-110.03145&z=5](https://www.google.com/maps/d/u/1/edit?mid=1xtUEUob9uP5_63LbaW5V3ZVqY_k&ll=35.704549221453654%2C-110.03145&z=5)





# Share what you observed:



Students, write your response!

## R.A.F.T. (Role, Audience, Format, Topic)

Partners worked together to write a children's book on seed finding perfect place to grow.

Gave students choice:

- Freedom to choose a favorite vegetable or fruit

- Provided two options for role (child seed or parent plant)

- Provided two options for audience (furry friend or children

# Determination of Science Investigations and Instruction

Based content presented on R.A.F.T. topic: Finding perfect place to grow

Example: Day 1 afternoon - Explore and examine local soil

samples  
Students curious about wet vs. dry soil

Led to student investigation of wetting soil samples

Started finding organisms in soil samples

Led to setting up soil samples in beakers to

examine next day

# Framed Paragraph

## Types of Soil

I learned that there are 3 types of soil. Sand is smooth and it looks like clay. When it gets wet it gets muddy. Its particles are bigger than clay's particles. Clay is rocky and it looks like mud. When it gets wet it gets muddy. Its particles are smaller than sand and silt. Silt is soft and it feels smooth when you touch it. When it gets wet it gets squishy.

Our sample looked like soil. When it got wet, it got like clay, which showed it was like soil texture through our qualitative data. Our quantitative data showed our sample to be 100, which means it had 0 % clay, 33.3 % silt, and 66.7 % sand.

## What did I learn?

I learned that there is 3 types of soil, sand, clay, and silt. Sand had the percentage of 66.7. Clay had the percentage of 0. And silt had the percentage of 33.3.

# Reflection

- What did I learn today?
- How can I connect my learning with today's readings lesson, and lab, with my own experiences?
- What did I observe today?
- How can I connect my observations with today's readings, lesson, and lab, with my own experiences?

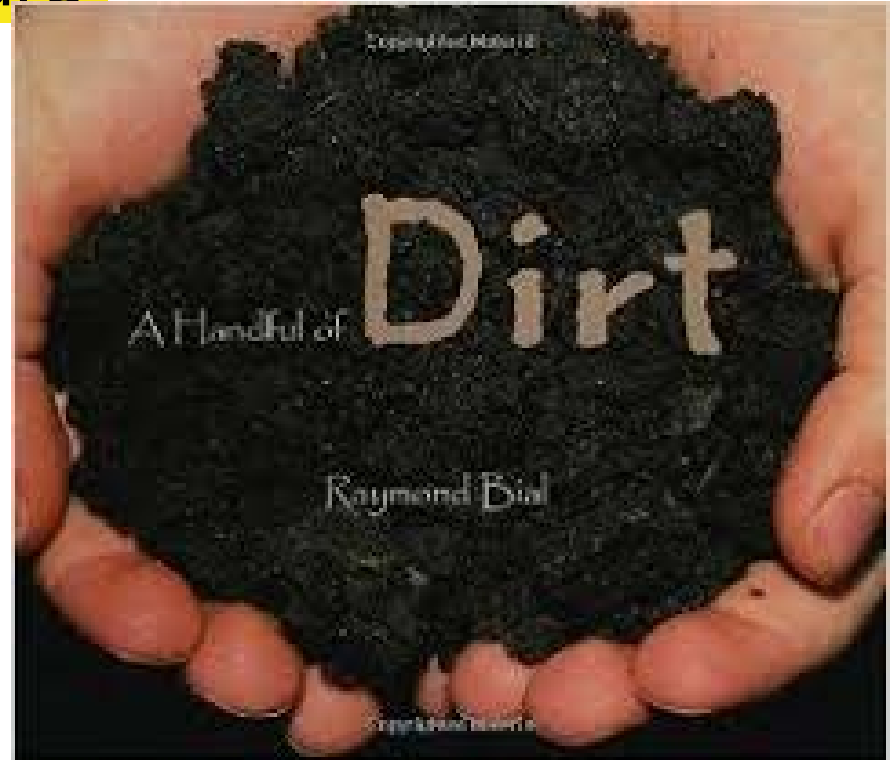
We do not learn from experience... we learn from reflecting on experience.

- John Dewey



# Content Relevant Literature

- On 3rd day, read aloud non-fiction book
- Asked guiding questions
  - What similarities did you notice from text and your soil observations?
  - What information from the text will help you



# Research Skills

- Needed information for Digital Story
- Pre-selected websites to explore
- Discussed information that was needed
- Recorded in lab book



# Storyboarding

Introduction:

Plot: Challenge

Attempt

Decide

Attempt

Climax

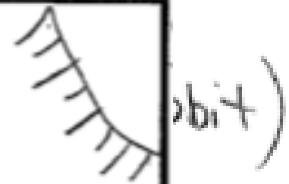
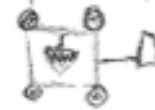
Solution

Result:

Sketch of page #1:



Sketch of page #2:



Words on page #1:

"My name is Strawberry Short  
Cake!" ... "It's getting into being  
early fall and I need to find a good  
friend like you to help me."

Words on page #2:

Mr. Muffin - "Better hurry up if you  
want to plant your seeds because  
cause another witch is here I over heard  
the farmers talking about somebody  
wanting to buy the land. Lots of

out  
le  
ause  
ber up



# Conferencing

- Provided written feedback on drafts each day
- Ran peer review workshops
- Had face-to-face conferences with each pair on Γ



# Digital Storytelling

[https://docs.google.com/presentation/d/1ksiPN8ijnt0A\\_8gQvIO7eCiWcejQmItfyEToaROn5mA/edit#slide=id.g134da90042\\_0\\_6](https://docs.google.com/presentation/d/1ksiPN8ijnt0A_8gQvIO7eCiWcejQmItfyEToaROn5mA/edit#slide=id.g134da90042_0_6)

[https://docs.google.com/presentation/d/1HqOrUh7ofBywyqRIItL-rqoKK-HBHqLi0bVwAuuvtjs/edit#slide=id.g1455cbcb9a\\_0\\_0](https://docs.google.com/presentation/d/1HqOrUh7ofBywyqRIItL-rqoKK-HBHqLi0bVwAuuvtjs/edit#slide=id.g1455cbcb9a_0_0)

[https://docs.google.com/presentation/d/1CbirvmftrLEHjvx-OWCS8eV-WAVQMLiKASkOQ1l8ErM/edit#slide=id.g134da90042\\_0\\_16](https://docs.google.com/presentation/d/1CbirvmftrLEHjvx-OWCS8eV-WAVQMLiKASkOQ1l8ErM/edit#slide=id.g134da90042_0_16)

[https://docs.google.com/presentation/d/1sOEvTsRgmvoG\\_pe-GN9Te9WEc6SPZbbEq1nYS3pA2qo/edit#slide=id.g145887e958\\_4\\_32](https://docs.google.com/presentation/d/1sOEvTsRgmvoG_pe-GN9Te9WEc6SPZbbEq1nYS3pA2qo/edit#slide=id.g145887e958_4_32)



Circle the literacy strategy you want to try now:

Conferencing

Storyboarding

R.A.F.T

Reflection

Culturally  
Relevant  
Literature

Content  
Relevant  
Literature

Framed  
Paragraphs

Digital  
Storytelling

Research  
Skills



Students, draw anywhere on this slide!

# Digital Storytelling

[https://docs.google.com/presentation/d/1ksiPN8ijnt0A\\_8gQvIO7eCiWcejQmItfyEToaROn5mA/edit#slide=id.g134da90042\\_0\\_6](https://docs.google.com/presentation/d/1ksiPN8ijnt0A_8gQvIO7eCiWcejQmItfyEToaROn5mA/edit#slide=id.g134da90042_0_6)

[https://docs.google.com/presentation/d/1HqOrUh7ofBywyqRIItL-rqoKK-HBHqLi0bVwAuuvtjs/edit#slide=id.g1455cbcb9a\\_0\\_0](https://docs.google.com/presentation/d/1HqOrUh7ofBywyqRIItL-rqoKK-HBHqLi0bVwAuuvtjs/edit#slide=id.g1455cbcb9a_0_0)

[https://docs.google.com/presentation/d/1CbirvmftrLEHjvx-OWCS8eV-WAVQMLiKASkOQ1l8ErM/edit#slide=id.g134da90042\\_0\\_16](https://docs.google.com/presentation/d/1CbirvmftrLEHjvx-OWCS8eV-WAVQMLiKASkOQ1l8ErM/edit#slide=id.g134da90042_0_16)

[https://docs.google.com/presentation/d/1sOEvTsRgmvoG\\_pe-GN9Te9WEc6SPZbbEq1nYS3pA2qo/edit#slide=id.g145887e958\\_4\\_32](https://docs.google.com/presentation/d/1sOEvTsRgmvoG_pe-GN9Te9WEc6SPZbbEq1nYS3pA2qo/edit#slide=id.g145887e958_4_32)

# Classroom Resources

Google Map for *The Radio Man*

Math problems based on *The Radio Man*

Soil Observation Data Table

Soil Texture Labs

Porosity, Permeability, and  
Infiltration Rate Labs

Student Google Maps

Soil Chemical Testing Lab

Soil Collection Datasheet

Soil Research Sites

Whole Class Data Table on  
Google Sheets

Start a Mind Map by drawing or typing anywhere:



Students, draw anywhere on this slide!

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Circle how you are feeling about infusing literature and CRP into your science curriculum:



 Pear Deck



Students, draw anywhere on this slide!

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# THANK YOU!



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Alma Stevenson-

[astevenson@georgiasouthern.edu](mailto:astevenson@georgiasouthern.edu)



# Links for Resources

Google Map for *The Radio Man* - <https://goo.gl/LR1pNX>

Math problems based on *The Radio Man* – <https://goo.gl/VNDFNP>

Soil Observation Data Table - <https://goo.gl/aIYFFE>

Soil Texture Labs - <https://goo.gl/qyajbx>

Porosity, Permeability, and Infiltration Rate Labs - <https://goo.gl/ZFK1Zx>

Soil Chemical Testing Lab - <https://goo.gl/tjDKqq>

Soil Collection Datasheet - <https://goo.gl/KJOHQ>

Whole Class Data Table on Google Sheets - <https://goo.gl/wTyFTp>