

***Culturally specific lesson plans
for elementary teachers
(recommended for grades 3–5)***

by Jacqueline Leonard

Excerpted from *Culturally Specific Pedagogy in
the Mathematics Classroom* (Routledge, 2007)

Underground Railroad Unit

<i>Language Arts</i>	<i>Mathematics</i>	<i>Science</i>	<i>Social Studies</i>
<p>Read <i>Barefoot</i> to students. Introduce key science, math, and context vocabulary. Introduce students to the writing process and have them keep a journal pretending to be a fugitive slave</p>	<p>Provide sample rate and distance problems for students to solve to understand the concept of traveling by foot on the Underground Railroad (i.e. Barefoot traveled eight hours per day. How far could he travel in five days?). Students will explain and show multiple ways to solve problems.</p>	<p>Students will learn about fresh water life and other animals that live in the marsh (i.e. heron, rabbits, deer, mosquitoes, and fireflies).</p>	<p>Students will watch segments (Oh, To Be Free; Slavery and Earliest Escapes) of the Underground Railroad documentary hosted by Alfred Woodard (Michaels, 1998).</p>
<p>Introduce new vocabulary; paired reading of <i>Minty</i>. Introduce students to character study; talk about Harriet Tubman's character traits; continue journaling.</p>	<p>Have students develop word problems around work (i.e. How much money could Minty earn in a week (five days) if she were paid \$1.25 per hour for eight hours a day?). Students will also use data obtained from the Internet to graph high and low temperatures for the past week.</p>	<p>Students will learn about farm animals (chickens, roosters, horses, and cows) and river animals like the muskrat. Students will also learn about the weather, weather forecasting symbols, and discuss the best time of year to plan an escape on the Underground Railroad.</p>	<p>Students will watch three more segments of the Underground Railroad video (Abolition Now, The Angel of Philadelphia, and Great Escapes). They will develop a timeline of the history of U.S Slavery.</p>
<p>Introduce new vocabulary; paired reading of <i>Freedom River</i>. Introduce mosaics as an art extension. Continue journaling.</p>	<p>Have students develop dead/alive posters with rewards for capture. Discuss relative monetary values (place value). Discuss units of measurement. Have students measure the length of the classroom in feet.</p>	<p>Students will learn about the phases of the moon: full moon, quarter moon, crescent moon, gibbous moon, and new moon. They will also discuss how the moon was related to escape on the Underground Railroad. See</p>	<p>Students will watch three more segments of the Underground Railroad video (The Moses of her People, A Band of Angels, and Letters from Home). Students will also work on mapping skills (use URR route from Kentucky to Ohio). Make a</p>

Introduce new vocabulary; paired reading of *Sweet Clara and the Freedom Quilt*. Complete graphic organizer on the quilt story and explain how to use a quilt as a map.

Read Nikki Giovanni's poem "Quilting the Blacked-eyed Pea: We're Going to Mars." In the poem, the journey of a slave from Africa to the U.S is compared to a journey from Earth to Mars. Students may use journal notes to create a poem that tells a story about survival in space.

Help students understand the concept of fugitive slaves swimming a distance of 1000 feet across the Ohio River to freedom?

Introduce geometry terms such as area/perimeter. Students will create designs for a quilt patch. Students will measure the perimeter and area of their patch and find lines of symmetry if any. Allow students to discuss the meaning of symbols on quilts made by slaves, such as the star and a water jug. Then link each piece together to create a large classroom quilt.

Students will graph data related to the Alka-Rocket Activity to discuss the impact of using a quarter, half, and whole tablet and various amounts of water.

www.eduref.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Science/Astronomy/AST0201.html

Students learn about the constellations and how important the Big Dipper and the North Star was to fugitive slaves. Students will create a constellation using coordinates on a graph and identify six constellations. See www.eduref.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Science/Astronomy/AST0200.html

Show ten-minute clip of *Apollo 13* video to demonstrate how rockets take off for outer space. Have students design their own Alka Rocket. Explain how energy is transferred from Alka-Seltzer and water to gas to create lift off. See <http://lunar.arc.nasa.gov/education/activities/active4.htm>

collage that shows how a fugitive slave may have escaped.

Students will watch two more segments of the Underground Railroad video (Rebellion and Rescue, Free at Last!).

Make a Family Tree. Students will interview an elder in their family to learn about their experiences with Civil Rights, citizenship, voting rights, etc. Students will write a report on the elder and share it with the class.

Blues highway

<i>Language Arts/Reading</i>	<i>Mathematics</i>	<i>Science</i>	<i>Social Studies</i>	<i>Math/Science standards</i>
<p>1. Introduction of books: teacher will do book talks about <i>ellington was not a Street</i> (readers needing extra support), <i>When Marian Sang</i> (independent readers), and <i>Bessie Smith and the Night Riders</i> (advanced readers)</p> <p>2. Pre-reading activities (KWL chart) – Students will make predictions about the texts based on the titles/covers.</p> <p>3. Writing: individual students will keep a journal/diary for one week to record life events</p> <p>1. Reading the texts: Teachers and students may read the texts in literature circles, paired readings, or independently.</p>	<p>1. Problem solving will be developed around the theme of the music industry: cost of making demo tapes; timing number of tracks and length of songs; calculating profits and royalties from hit records.</p> <p>2. Students will learn about whole, half, quarter, and eighth notes while they learn to play the recorder.</p> <p>1. Develop problems about the following: weekly wages that could be made in the 1920s as railroad workers and factory workers; develop</p>	<p>1. Student will learn about the human ear and the sense of hearing.</p> <p>2. Students will use Microcomputer-based Laboratory Sound (MBL) to collect waveforms on the following instruments: triangle, tambourine, harmonica, bongo, and maracas.</p> <p>2. Students will compare and contrast the waveforms of each instrument. Students will work in groups, pairs, or individually, to write or create an original song (record on CD).</p> <p>1. Students will learn about the automobile industry and its impact on African American migration from the South.</p> <p>2. Students will use Tinker</p>	<p>1. Students will watch the video <i>Standing in the Shadows of Motown—The Funk Brothers</i>.</p> <p>2. Students will complete the lesson called <i>The Importance of Music</i> and learn about the accomplishments of Louis Armstrong and Bessie Smith.</p> <p>3. Students will learn about the kinds of jobs Blacks were recruited to do and how Berry Gordy used the factory model to create the Motown music machine.</p> <p>1. Students will discuss the great migration after World War I to understand its importance as the biggest population shift in U.S. history.</p>	<p>Mathematics: Number and Operations, Fractions and Decimals, Problem Solving, Communication, and Connections</p> <p>Science: Science as Inquiry, Life Science, and Science in Personal and Social Perspectives</p> <p>Mathematics: Number and Operations, Algebra, Measurement, Geometry, Problem Solving, Communication, and Connections</p>

2. Response to text:
Students will write double entry journals: quote excerpts from texts and personal comments

3. Introduce vocabulary:
–migration, Jim Crow, sod hut, pioneer, sharecropper, tenement, assembly line (word sort)

3. Writing:–Students will keep a journal of about traveling from the South to the North.

a weekly budget for living in the city (rent, food, supplies) distance/rate problems of train trip from the South to the North

2. Students will use their knowledge about measurement and geometry to design a city with townhouses and high rises for factory workers

toys to create a model car to investigate speed by pushing the car down a ramp (FASE, 1998).

3. Students will record data and calculate speed in feet per second.

4. Students will redesign their model to try to improve speed.

2. Students will participate in discussion guide found at www.scholastic.com/dearamerica/parentteacher/guides/dearamerica/colordark.htm to talk about segregation and social injustice.

Science: Science as Inquiry and Science in Personal and Social Perspectives

Viva La Causa!

1. Introduction of books
Teacher will do book talks about *First Day of Grapes* (readers needing extra support), *Harvesting Hope* (independent readers), and *Esperanza Rising* (advanced readers)
http://nancykeane.com/booktalks/ryan_esperanza.htm

1. Use context of the books to develop problem solving around the following: adding the number of crates of grapes needed for a shipment to market; calculate how long it would take a family to make \$1000 if they made only 0.30 a day; distance/rate problems of freedom

1. Students will learn about the parts of a seed and what is needed for a plant to grow
2. Students will plant lima beans in a classroom terrarium and observe and measure the growth of a lima bean over a two-week period to learn about the germination of seeds

1. Discuss role models (St. Francis of Assisi, Gandhi, and Martin Luther King) of Cesar Chavez and why he thought nonviolence was the way to lead a protest
2. Make the Eagle flag that symbolized the *La Causa* Movement
3. Students will listen to

Mathematics: Number and Operations, Algebra, Measurement, Fractions and Decimals, Problem Solving, Communication, and Connections.

Science: Science as Inquiry, Life Science, and Science in Personal and Social Perspectives.

<i>Language Arts/Reading</i>	<i>Mathematics</i>	<i>Science</i>	<i>Social Studies</i>	<i>Math/Science Standards</i>
<p>2. Pre-reading activities (pre- reading plan): Students will make predictions about the texts based on the titles/ covers.</p> <p>3. Writing: students will pretend to be on a freedom march and record journal entries (writing workshop).</p> <p>1. Reading the texts: teachers and students may read the texts in literature circles, paired readings, or independently.</p> <p>2. Response to texts: issues of social justice raised in the texts (reading logs)</p> <p>3. Introduce vocabulary: drought, <i>La Causa</i>, migrant worker, nonviolence, National Farm Workers Association, short handled hoe, strike</p> <p>3. Writing (writing process): students will write a speech about use of nonviolence to achieve equality.</p>	<p>walk from Delano to Sacramento.</p> <p>1. Students will solve problems related to the farmers' strike to understand how much money the owners lost during the movement</p> <p>2. Students will use metric units to build adobe houses (clay) to scale to replicate the Arizona/ Mexican ranches that Cesar and Esperanza used to live on before the drought/Depression, respectively.</p>	<p>1. Students will learn about the importance of recycling and biodegradable objects.</p> <p>2. Students will make a mini-landfill to learn about decomposition. They will observe the landfill for two weeks and record their observations in a journal.</p> <p>3. Students will report their findings to the class using PowerPoint or other multimedia tools.</p>	<p>Spanish music, learn a Spanish song, and create a freedom song with a Latin beat (record on CD).</p> <p>1, Select an appropriate video about Cesar Chavez or migrant farm workers.</p> <p>2. Discuss the physical and emotional toll of walking across the state of California for human rights.</p> <p>3. Discuss hunger strike as form of political action; ramification of hunger strike on individual and community.</p>	<p>Mathematics: Number and Operations, Measurement, Geometry, Problem Solving, Communication, and Connections.</p> <p>Science: Science as Inquiry and Science in Personal and Social Perspectives.</p>

Mae Jemison/Bessie Coleman

Text-based lessons	Computer-based lessons	Math/science activities
<p>Introduction of Books. Teacher will do a book talk about <i>Mae Jemison</i> (Braun, 2005). Pre-reading activities—Students will make predictions based on the cover and the title (anticipation guides). GA will read the text and present 2 math problems related to the story. Students will solve the problems in groups. Students will read portions of <i>Mae Jemison: A Space Biography</i> (Yanuzzi, 1998) and solve five to six word problems related to the text. Students who finish early can create their own word problems. Students will be able to use hand-held calculators in order to focus on the process of problem solving. Strategies and solutions will be discussed. Students will finish reading <i>Mae Jemison</i> text and solve five to six word problems related to the text. Students who finish early can create their own word problems. Students will be able to use hand-held calculators in order to focus on the process of problem solving. Strategies and solutions will be discussed.</p>	<p>Students will select the first menu, which advances a storyline about Mae Jemison and presents them with ten to twelve new word problems (Level 2) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.</p> <p>Students will select the second menu, which advances a storyline about Mae Jemison and presents them with ten to twelve new word problems (Level 2) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.</p> <p>Students will select the third menu, which advances a storyline about Mae Jemison and presents them with ten to twelve new word problems (Level 3) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.</p>	<p>Students will complete the Veggie Shuttle lesson in <i>Mission Mathematics</i>. They will simulate a Space Shuttle launch using an edible model. Students will compare the relative sizes of the Space Shuttle assembly to the external fuel tank, solid rocket boosters, and the orbiter and solve three to four word problems using these facts.</p> <p>Students will watch a ten-minute video clip of <i>Apollo 13</i> showing rocket lift off. Then they will complete Fizzy-Tablet Rockets lesson in <i>Mission Mathematics</i>. They will learn about Newton’s Third Law of Motion, design a rocket, and watch the rocket launch. Data will be collect, compared, and represented in a graph.</p> <p>Students will continue to learn about rockets by completing the Protractor Rocket lesson in <i>Mission Mathematics</i>. Students will compare flight distances or rubber-band rockets when the launch angle and amount of force vary. They will also measure angles with a protractor and distances with a meter stick. They will collect, organize, analyze, and interpret data and find the range, median, and mean of a set of data. Students will complete the Rescue and Mission lesson in <i>Mission Mathematics</i>. Activities include learning about life, gravity, drag, and thrust to</p>
<p>Introduction of Books. Teacher will do a book talk about <i>Nobody Owns the Sky, Fly High! And Story of Aviator Elizabeth</i></p>	<p>Introduction of Hypermedia. Teacher will review a demo version of the hypermedia module about Bessie Coleman to get children</p>	

Text-based lessons	Computer-based lessons	Math/science activities
<p><i>Coleman</i>. Pre-reading activities—Students will make predictions about the texts based on the covers and the titles (anticipation guides). Read portions of <i>Talkin’ About Bessie</i> and present two math problems related to the story. Students will work in groups to solve the problems.</p> <p>Students will read <i>Nobody Owns the Sky</i> independently, then they will work independently to solve five to six word problems related to the text. Students who finish early can create their own word problems. Students will be able to use hand-held calculators in order to focus on the process of problem solving. Strategies and solutions will be discussed.</p> <p>Students will read <i>Fly High!</i> independently, then they will work independently to solve five to six word problems related to the text. Students who finish early can create their own word problems. Students will be able to use hand-held calculators in order to focus on the process of problem solving. Strategies and solutions will be discussed.</p>	<p>familiar with logging in and using passwords. Children will be able to access four scenes, which will be read with voiceover technology. Each scene will also present students with four related story problems. Teacher will work with the students to help them solve problems and enter their responses on the computer.</p> <p>Students will select the first menu, which advances a storyline about Bessie Coleman and presents them with ten to twelve word problems (Level 1) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.</p> <p>Students will select the second menu, which advances a storyline about Bessie Coleman and presents them with ten to twelve new word problems (Level 2) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.</p>	<p>understand aeronautics. Students will use spinners to play the game and learn probability as they learn these terms. Students will collect, organize, and interpret data as well as construct tally tables and bar graphs. They will also learn about probability to determine the likelihood or probability of success.</p> <p>Students will use geometry and measurement skills to make their own kites (Indian, Box, or Diamond kite). The URL for the kite lesson is: www.aka.org.au/kites_in_the_classroom/plans.htm. Once the students finish their kites they will fly them and record data on how long their kite was able to stay in the air and estimate how high they think their kites flew.</p> <p>Students will complete the Air Show lesson in <i>Mission Mathematics</i>. Activities include making a paper airplane. Data will be gathered on how close the plane lands on a target, the number of flips it can make, how long it stays in the air, and how far it can fly. Students will record data, and analyze data and complete a glyph to represent the data on their individual airplanes. Then the class will make a table from a sample of ten students’ data and find the median score. A mapping activity will conclude the lesson as students learn how to use scale to determine distances.</p>

Christa McAuliffe/Amelia Earhart

Text-based lessons

Introduction of Books.

Teacher will do a book talk about *Christa McAuliffe: A Space Biography* Pre-reading activities—Students will make predictions about the text based on the cover and the title (anticipation guides). Teacher will read portions of *text* and present 2 math problems related to the story. Students will work in groups to solve the problems.

Students will read portions of *Christa McAuliffe* story and solve five to six word problems related to the text. Students who finish early can create their own word problems. Students will be able to use hand-held calculators in order to focus on the process of problem solving. Strategies and solutions will be discussed.

Students will finish reading *Christa McAuliffe* text and solve five to six word problems related to the text. Students who finish early can create their own word problems. Students will be able to use hand-held calculators in order to focus on the process of problem solving. Strategies and solutions will be discussed.

Computer-based lessons

Students will select the first menu, which advances a storyline about Christa McAuliffe and presents them with ten to twelve new word problems (Level 2) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.

Students will select the second menu, which advances a storyline about Christa McAuliffe and presents them with ten to twelve new word problems (Level 2) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.

Students will select the third menu, which advances a storyline about Christa McAuliffe and presents them with ten to twelve new word problems (Level 3) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.

Math/Science activities

Students will complete the Veggie Shuttle lesson in *Mission Mathematics*. They will simulate a Space Shuttle launch using an edible model. Students will compare the relative sizes of the Space Shuttle assembly to the external fuel tank, solid rocket boosters, and the orbiter and solve three to four word problems using these facts.

Students will watch a ten-minute video clip of *Apollo 13* showing rocket lift off. Then they will complete Fizzy-Tablet Rockets lesson in *Mission Mathematics*. They will learn about Newton's Third Law of Motion, design a rocket, and watch the rocket launch. Data will be collect, compared, and represented in a graph.

Students will continue to learn about rockets by completing the Protractor Rocket lesson in *Mission Mathematics*. Students will compare flight distances or rubber-band rockets when the launch angle and amount of force vary. They will also measure angles with a protractor and distances with a meter stick. They collect, organize, analyze, and interpret data and find the range, median, and mean of a set of data.

Text-based lessons	Computer-based lessons	Math/Science activities
<p>Introduction of Books. Teacher will do a book talk about <i>A Picture Book of Amelia Earhart</i>, <i>Amelia and Eleanor Go for a Ride</i>, and <i>Amelia Earhart: Pioneer of the Sky</i>. Pre-reading activities: students will make predictions about the texts based on the covers and the titles (anticipation guides). Teacher will read portions of <i>Amelia Earhart: Pioneer in the Sky</i> and present two math problems related to the story. Students will work in groups to solve the problems. Students will read <i>A Picture Book of Amelia Earhart</i> independently. Then they will work independently to solve five to six word problems related to the text. Strategies and solutions will be discussed. Students who finish early can create their own word problems. Students will use hand-held calculators in order to focus on the process of problem solving.</p> <p>Students will read <i>Amelia and Eleanor Go for a Ride</i> independently, then they will work independently to solve five to six word problems related to the text. Students who finish early can create their own word problems. Strategies and solutions will be discussed. Students will use hand-held calculators in order to focus on the process of problem solving.</p>	<p>Introduction of Hypermedia. Teacher will review a demo version of the hypermedia module about Amelia Earhart to get children familiar with logging in and using passwords. Children will be able to access four scenes that include text, which will be read with voiceover technology. Each scene will also present students with 4 story problems related to the scenes. The teacher will work with the students to help them solve the problems and enter their responses on the computer.</p> <p>Students will select the first menu, which advances a storyline about Amelia Earhart and presents them with ten to twelve word problems (Level 1) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.</p> <p>Students will select the second menu, which advances a storyline about Amelia Earhart and presents them with ten to twelve new word problems (Level 2) to solve on the computer. Scaffolding and hints will be provided as well as calculator and manipulative tools.</p>	<p>Students will complete the Rescue and Mission lesson in <i>Mission Mathematics</i>. Activities include learning about life, gravity, drag, and thrust to understand aeronautics. Students will use spinners to play the game and learn probability as they learn these science terms. Students will collect, organize, and interpret data as well as construct tally tables and bar graphs. They will also learn about probability to determine the likelihood or probability of success.</p> <p>Students will use geometry and measurement skills to make their own kites (Indian, Box, or Diamond kite). The URL for the kite lesson is: www.aka.org.au/kites_in_the_classroom/plans.htm. Once the students finish their kites they will fly them and record data on how long their kite was able to stay in the air and estimate how high they think their kites flew.</p> <p>Students will complete the Air Show lesson in <i>Mission Mathematics</i>. Activities include making a paper airplane. Data will be gathered on how close the plane lands on a target, the number of flips it can make, how long it stays in the air, and how far it can fly. Students will record and analyze data and complete a glyph to represent the data on their individual airplanes. Then the class will make a table from a sample of ten students' data and find the median score. A mapping activity will conclude the lesson as students learn how to use scale to determine distances.</p>