

Quilty As Charged

“How patterns influence expression”

Grades 4th-5th



Introduction:

Quilty As Charged is a set of 4 lessons focusing on patterns and how they influence expression via quilts. Students will explore expression in quilt patterns through the perspectives of history, culture and quilters. Students also investigate how nature, culture and history inspire quilters expression. The lessons were created for gifted 4th and 5th grade students.

Rationale:

Each lesson explores how patterns influence expression while addressing a variety of skills, contents and concepts. The overriding concept is patterns. Since patterns are everywhere; (time, money, communications, weather, etc...) the ability to recognize and interpret patterns is crucial. Patterns create order out of chaos. Understanding patterns gives us the ability to make accurate predictions about what might come next. Almost every occupation involves pattern recognition. In medicine and health doctors look for patterns within a patient's history (family and the patient themselves) to make good decisions for each patient. Financial patterns help guide stock brokers, banks and investors as well, as they predict investment options. Police are look at patterns in crime in order to better serve and protect their citizens.

In this unit students will learn how patterns influence expression in history, nature and culture through quilts while also applying and adding to their knowledge of patterns in math.

Students will learn:

<ul style="list-style-type: none">• Patterns can be observed with any of the five senses.• Patterns are common in both nature and manmade designs.• Patterns have an underlying mathematical structure.• Patterns are discernible regularities in the world• Patterns repeat in a predictable manner.• Patterns exist in nature.• Many manmade patterns or designs are inspired from nature.• Causal patterns are patterns whose parts affect each other in certain ways (Linear, Domino, Cyclic, Spiraling, Relational and Mutual)	<ul style="list-style-type: none">• Tessellations are a specific type of pattern• The specifics that determine a tessellation (no overlaps or gaps)• The types of tessellations (regular, semi-regular)• Using tessellations involves art and math skills• There are 4 ways of moving to another position in the tessellation. Translation, Reflection, Rotation, Glide Reflection (4 types of symmetry)• Different cultures inspire different quilt patterns/styles.• Culture determine reasons for quilts• What elements make up cultures.• There are ways to recognize quilt characteristics of different cultures.• Quilt characteristics represent different cultures.• The meaning behind the characteristics
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This content is important to student learning because it show the connections patterns have between math, art, history, culture, communication and nature to name a

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few. In a typical patterns lesson patterns are linear and exist within a math book or worksheet, this unit shows students the global essence of patterns. Students get the basics of patterns, then go deeper and explore patterns in other areas besides math. Students will learn how cultures such as African Americans and Amish have different elements of patterns expressed in their quilts based on their history, physical locations and beliefs. Students will learn how patterns in nature show up in everyday structures and designs and can inspire and are reflected with a quilter's work. Students will also learn how patterns exist in history not just through people's behaviors and actions but were used for communication. Quilt codes (patterns) were used to secretly communicate information and direction to the travelers throughout the Underground Railroad. This unit gives students a deeper understanding of patterns yet it only scratched the surface. There is so much to learn about patterns and I feel this unit get students to think more about where else patterns exist and helps them to recognize patterns around themselves more.

After this unit students will be able to:

<ul style="list-style-type: none"> • Create new examples of patterns in our world, beyond just visual patterns. (incorporating the 5 senses) • Analyze the relationship between patterns. • Explain how nature inspires manmade patterns • Identify and give examples of causal patterns • Explain how patterns found in nature inform other patterns. • Create and explain how to create a tessellation 	<ul style="list-style-type: none"> • Describe their tessellation based on movement/symmetry • Create tessellations that display one or more of the four movements or types of symmetry. • Compare and contrast • Make generalizations based on content knowledge • Make inferences while reading texts • Use text and prior knowledge to make connections • Evaluate differences
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These skills are important for students to learn because they will take their knowledge and put it to use. Once they begin recognizing patterns they can make educated choices, inferences and predictions within school work and in life. These skills help student become lifelong thinkers and learners.

Differentiation for Gifted Learners

This unit is beneficial for gifted learners because it takes it allows students to expand their knowledge about patterns by digging deeper and going beyond the basic pattern lessons in math class. Students will learn how patterns influence expression from a historic, cultural and quilter's perspective. This unit is also appropriate for gifted learners due to the quick pacing and depth of content learned. Gifted students do not need as much foundational instruction because of their rich prior knowledge. Because of this no

time will be wasted reteaching what they already know. They will have more time learning new information and with critical thinking tasks.

The content of this unit is differentiated for gifted learners with engaging, sophisticated reading materials with challenging vocabulary. The reading materials also expose students to information about different cultures. In each lesson the learning process is differentiated for the gifted learners individual learning styles and advanced abilities. Students may read independently or with a partner based on their learning preference. When working on projects students must engage in critical thinking when categorizing and justifying their work. The auditory and visual learner will be addressed with the videos. Students will make observations and categorize patterns based on what they see. Students' creations are open ended. They are limited only by their own creativity. Each student gets to solve an open ended problem (situation) in a small group. They get to come up with their own solutions. There are many possible solutions. Students will work in collaborative groups. Each group will have a passage to read, answer questions and then report findings to the whole group. Each lesson has an open-ended project so each student can apply his/her learning. For each project students must show significant evidence of their understanding of the concept. Yet since the projects are open ended students are allowed to show their own creative flair with in their final products. The unit takes into account the many learning styles of gifted students by providing a variety of learning environments. Students are given opportunities to work independently, with a partner, in small groups and in whole class settings. Even though students are given much freedom to work as they feel best, students are also challenged to work on their collaboration skill through small cooperative groups. Working with others can be difficult for independent learners but is a very important skill to learn for school and for life.

This unit is intended for gifted learners in a 4th or 5th grade classroom. Since patterns are part of the Common Core Curriculum; students will already be familiar with patterns by 4th grade. The unit provides enough information in each lesson for students from all socioeconomic backgrounds to be successful. The lessons are designed for the fast pace of a gifted classroom, but can be modified (time wise) for students of all achievement levels. All students can learn and achieve in this unit with flexible pacing. This lesson would especially appeal to students whom like to be creative and express themselves through design, however it would also appeal to students who have a flair for math, science and social studies.

English Language Learners would need support with the language, vocabulary and reading components, but would be able to be on equal footing with other students do to the creative and open-ended ness of the projects.

Students who have difficulties with visual spatial activities may struggle with placing the shapes in a pattern and with symmetry. For these students I have included a nine square quilt template with precut shapes to practice with before attempting to complete a final product. (Quilt Square Challenge- Math Wire) These students also benefit from watching others manipulate the shapes or working with a partner. The open end aspect of the projects allows for all levels of finished work. This allows for all students to be successful.

Goals and Outcomes

1.) Content Goal: To develop and understanding of patterns and their features.

Students will be able to:

- Describe the commonalities in patterns in nature and manmade.
- Examine the underlying mathematical structures in patterns.
- Analyze the influence patterns have on expression.
- Compare and contrast the attributes and origins of patterns found within cultures.

2.) Process Goal: To understand how patterns influence expression.

- Explain how patterns found in nature inform other patterns.
- Define the roles patterns play in communication.
- Make generalizations based on content knowledge.
- Create a product that displays complete understanding and application of concept

3.) Concept Goal: To understand the concept of patterns

Students will be able to:

- Analyze the relationship between patterns.
- Transfer their knowledge about how patterns influence expression to another aspect about patterns.
- Create new examples of patterns in our world, beyond just visual patterns. (incorporating the 5 senses)

Assessment Plan

Each lesson in the unit had sets of questions used before during and after the lesson to assess students' understandings throughout the unit and support the essential understanding: Pattern influence expression. Of course the over entire unit our essential question was a part of our discussions. (How do patterns influence expression?)

Each lesson also had a product produced by the students to demonstrate the progression of their understandings of the concept. Prior to the first lesson I gave students a pre-assessment (Color Me Quilty) to determine their understanding of how patterns influence expression. The students were given an 8 inch square of blank paper and instructed to fold into fourths. This also gave me an idea of what each student remembered about fractions. The instructions were chose 4 things that represented themselves. Suggestions were favorites: food, color, book, etc. The only caveat was they had to use color and pattern to respect the item without drawing it. So for example if they wanted to show their favorite song they could write the title or someone singing they had to come up with color of the song. This was challenging for them, but a great lead in to our unit. Their pre-assessment product was also great to compare to their final product and see how much they had grown.



Examples of the pre-assessment shows that some students had difficulties not drawing a picture (upper left); while others were more successful.

The following projects were used as formative assessments to monitor students' progress.

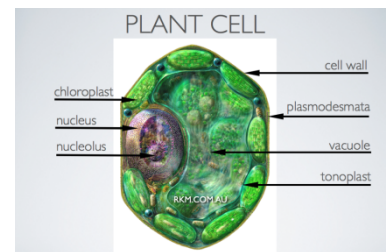
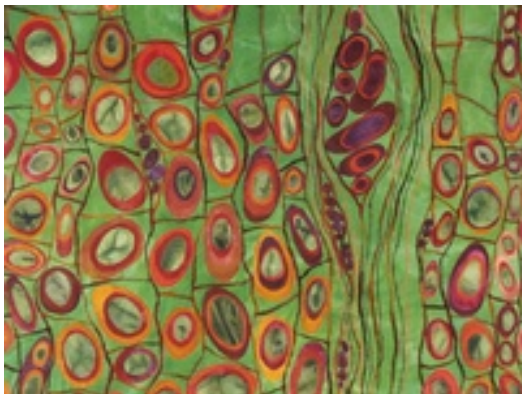
Lesson 1: The focus of this lesson was to explore how patterns influenced expression by learning about quilts codes during the time of the Underground Railroad. Students were told: "You are a member of the Underground Railroad and you must secretly communicate with the travelers through a quilt code." 1. What do you need to tell them? 2. Create a secret quilt code that only the travelers will understand. 3. How does your pattern influence expression?



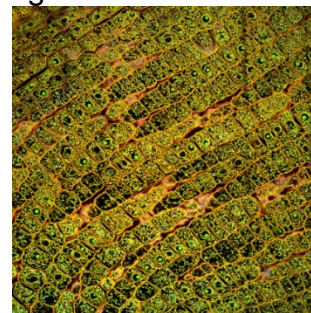
Examples of the Quilt Codes shows again how some students were able to create secret codes and other created less secretive (compass rose). It is also evident who was developing an understanding of patterns (top right) and some were still creating pictures (sun and trees)

Lesson2: Students learned how patterns in nature could influence a quilter’s work. Students were asked to take on the perspective of a quilter and create a quilt square inspired by nature. The objective was to use shapes and colors from their natural object without drawing the object. I wish I had more examples of the students work form this less as it was really neat to see what they chose and their progression to more patterns and less illustrations. Below are examples we used in class. The first images is a quilt pattern inspired by plant cells.

Quilt



Plant cell images



Lesson 3 Students learned about a special types of pattern called a tessellation. The students were given a dilemma to solve. They had to “tile a floor’ with tessellations using certain criteria. This proved to be an interesting assessment. I learned that most of my group loved tessellations and didn’t want to stop making them. However I had two that struggled with it and one student ended up balling up the paper in frustration. He struggled with “seeing how it went together” (visual spatial) After observing him I was able to pair him up with a more successful partner and they created a tessellation together. Even though he was able to be successful, he told me he liked the making the other patterns better.

Lesson 4 Students read and learned about how different cultures expressed themselves through quilt patterns. After reading about three different cultures students made lists of what they learned about the quilt patterns within their assigned culture. We shared our findings as a large group and made a list of the similarities and differences among the cultures with regards to patterns. This lead to our summative assessment; the students were assigned a performance task (Quilt talking about me). They students had to become quilters and create a quilt square to represent themselves for a new museum exhibit. They had to apply what they learned in the unit about patterns. The students did very well creating patterns without just drawing a picture. One student loved baseball and created a pattern inspired by the lacing on a baseball. It was very simple with only two colors but he alternated the lacing in diagonal rows and created a great pattern to represent his hobby. This showed me he had come along way and had learned the concept. Because he was the student who made an obvious, yet good, compass rose for his not secret code in lesson 1.

Lesson Plans:

TEACHER NAME		Lesson #
Christy Wright		1
MODEL	CONTENT AREA	GRADE LEVEL
Taba Content Development	Math	4 th -5 th
CONCEPTUAL LENS		LESSON TOPIC
Pattern		Recognizing patterns everywhere; quilts
LEARNING OBJECTIVES <i>(from State/Local Curriculum)</i>		
<p>4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</p> <p>5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.</p>		
THE ESSENTIAL UNDERSTANDING <i>(What is the overarching idea students will understand as a result of this lesson?)</i>		THE ESSENTIAL QUESTION <i>(What question will be asked to lead students to “uncover” the Essential Understanding)</i>
Patterns influence expression.		How do patterns influence expression?
CONTENT KNOWLEDGE <i>(What factual information will students learn in this lesson?)</i>		PROCESS SKILLS <i>(What will students be able to do as a result of this lesson?)</i>
<ul style="list-style-type: none"> • Patterns can be observed with any of the five senses. • Patterns are common in both nature and manmade designs. • Patterns have an underlying mathematical structure. • Patterns are discernible regularities in the world • Patterns repeat in a predictable manner. 		<ul style="list-style-type: none"> • Create new examples of patterns in our world, beyond just visual patterns. (incorporating the 5 senses) • Analyze the relationship between patterns.

GUIDING QUESTIONS

What questions will be asked to support instruction?

Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
<ul style="list-style-type: none"> • What is a pattern? • Where have you noticed patterns? • What are some examples of patterns? (nature, manmade, music...) • How do patterns influence expression? • What expression can be influenced by patterns? 	<ul style="list-style-type: none"> • How do you determine a pattern? • What are the aspects of a pattern? • How can we classify these patterns into groups? • How can you justify your classification? • How are patterns detected by the 5 senses? • What are examples of patterns that we can see, hear, feel, taste, and/or touch? 	<ul style="list-style-type: none"> • What is the relationship between patterns, such as within a quilt? • Where are patterns found in our everyday world? • How patterns change? • When do patterns changes? • What causes patterns to change? • How do patterns influence expression? • What are some examples of pattern influencing expression? • What roles did patterns play in the underground railroad quilts?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
Students will also read engaging and sophisticated reading materials with challenging vocabulary.	Students must engage in critical thinking when categorizing and justifying their work. Student may read independently or with a partner. The auditory and visual learner will be addressed with the videos.		Allow students to move and work in assigned small groups as not to remain stationary and allow them to consider the perspective of others.

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

Have Quilt power point playing as students enter the room and get settled.

Pre Lesson Questions:

- What is a pattern?
- Where have you noticed patterns?
- What are some examples of patterns? (nature, manmade, music...)

The lesson will begin with a video about patterns, "Patterns are Everywhere". I will pose questions for them to consider as they watch the video, "What are patterns?" and "Where do we find patterns?"

https://www.youtube.com/watch?v=4x-K_1svTdY (Patterns are everywhere)

Debrief the video before going onto the next segment.

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Students will read two (almost identical) articles pertaining to patterns as it relates to quilting. One article, Did Quilts Hold Codes to the Underground Railroad and Story of the Underground Railroad with Quilt Code Patterns. Students will make a list (description) of the types patterns you have noticed within the quilts, from the video and any others they have thought of.

After students have compiled their initial list; share the video about the Underground Railroad quilt codes and allow them to add to the list.

<https://www.youtube.com/watch?v=T2VzIC-hOBA> (Underground Railroad quilt square codes)

Articles:

<http://news.nationalgeographic.com/news/pf/70630403.html>

<http://home2.fvcc.edu/~cgreig/final/story.html>

1. Students will share and we will compile our lists into one list. (Lists will be written on the board as students volunteer words.)

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

Grouping and Labeling:

1. Students will be placed in small groups of about 4 students. They will group and categorize the patterns select words from the list from the board: you will need to let students know how many words they should choose to work with in their groups) from our list based on how they fit together. The guidelines will be, to form at least 3 groups with at least 3 examples in each group. The examples must have something in common.

(Side Note for teacher: You may want to go to the articles selected. Follow your own instructions for students. Notice what words you select and how you group them in order to anticipate what students will come up with and how it matches your essential understanding. How will this experience lead students to the essential understanding?)

2. Students will share and justify their grouping choices with the teacher and whole class.)

During the Lesson Questions:

- How can we classify these patterns into groups?
- How can you justify your classification?

Elaborate — *Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

1. Student will be asked to regroup their items using 4 different categories. If it doesn't come up during their talks I will ask the students to think about what patterns could be observed with the 5 senses and reclassify them. Once again students must justify their category choices and why the items fit under them.

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We will then share and justify our new categories and groups. "What have you learned about patterns as a result of thinking deeply about patterns and words that are associated with them?"

2.

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

I will ask students to look back at the quilt images and describe the relationships between the patterns. How do they inform each other? This relationship can be explained in a paragraph and illustration.

Post Questions: What is the relationship between patterns, such as within a quilt?, Where are patterns found in our everyday world?, How patterns change? When do patterns changes? What causes patterns to change? How do patterns influence expression?

Extension: (If time allows) – You are a member of the underground railroad and you must secretly communicate with the travelers through a quilt code. 1. What do you need to tell them? 2. Create a secret quilt code that only the travelers will understand. 3. How does your pattern influence expression?

Quilty as Charged

SPARK Camp 2016

Christy Wright







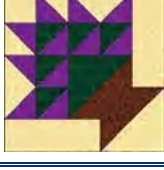
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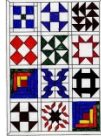
Quilt Code Patterns

According to Ozella Williams, an African American woman who lives in South Carolina, tells the story that her mother told her about the Underground Railroad Quilt Code. Apparently, there were ten quilts used to direct slaves to take particular actions. Each quilt featured one of the ten patterns. The ten quilts were placed one at a time on a fence. Since it was common for quilts to be aired out frequently, the master or mistress would not be suspicious when seeing quilts displayed in this fashion. This way, the slaves could nonverbally alert those who were escaping. Only one quilt would appear at any one time. Each quilt signaled a specific action for a slave to take at the particular time that the quilt was on view. The code had dual meaning: first to signal slaves to prepare to escape and second to give clues and indicate directions on the journey.

Quilt Blocks and Codes

	<p>Monkey Wrench - Meant for them to gather tools needed for a long journey; both mental and physical, as in memory, food, knife, etc. For piecing instructions, <u>Monkey Wrench</u>.</p>
	<p>Wagon Wheel - Meant for them to load the wagon, or prepare to board the wagon to begin the escape.</p>
	<p>Carpenter Block - Meaning help from "Jesus", would guide them.</p>
	<p>Bear Paw - Meant for them to take a mountain trail, out of view and follow the path made by bear tracks. The tracks would lead them to water and food.</p>
	<p>Basket - Meant for them to bring enough food and supplies to get to the crossroads.</p>

	<p>Crossroad Block</p> <p>- Referred to Cleveland, Ohio, an area offering several routes to freedom. It also signifies reaching a point where a person's life will change, so one must be willing to go on.</p>
	<p>Log Cabin Block</p> <p>- A secret symbol that could be drawn on the ground indicating that a person is safe to talk to. It also advises seeking shelter.</p>
	<p>Shoo-fly Block</p> <p>- It possibly identifies a friendly guide who is nearby and can help.</p>
	<p>Bow Tie Block</p> <p>- Meant for them to dress in disguise, or put on a change of clothes.</p>
	<p>Flying Geese Block</p> <p>- The points were meant to follow that direction, such as where geese would fly during spring migration.</p>
	<p>Birds in the Air Block</p> <p>- Meant for them to follow the birds in the air.</p>
	<p>Drunkard's Path Block</p> <p>- Meant for them to create a zig-zag path and not to walk in a straight line so to avoid pursuers in this area.</p>
	<p>Sailboat Block</p> <p>- Meant for them to take the sailboat across the Great Lakes.</p>
	<p>North Star</p> <p>- Meant for them to follow the north star</p>



Story of the Underground Railroad With Quilt Code Patterns



The Monkey Wrench

turns the Wagon Wheel



toward Canada.

With help from Jesus, the Carpenter,



follow the Bears' Trail



through the woods.

Fill your Baskets



with enough food and supplies to get you to the

Crossroads

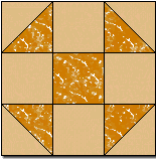



. Once you get to the Crossroads,

dig a Log Cabin



in the ground.

Shoofly  *told us to dress up in cotton and satin Bow Ties* 

Follow the Flying Geese  *and*

Birds in the Air  *, stay on the Drunkard's Path* 

Take the Sailboat  *across the Great Lakes*

to the North Star  *above Canada.*

History of the Underground Railroad: Did Quilts Hold Codes to the Underground Railroad?

The Underground Railroad is the compelling story of resistance and struggle of slaves in their quest for freedom, incorporating every route, every person, every place, and every act taken by or on behalf of the enslaved. The Underground Railroad story spans the Atlantic, stretching from the interior villages of Central Africa to the coastal kingdoms of West Africa; from Senegal in the north to Angola in the south; stretching across the Atlantic Ocean to the New World plantations in the Caribbean and North and South America. It is a story dating back to the 1400s when the Portuguese landed in what is now known as Sierra Leone and began the first mass enslavement and movement of Africans to the Western Hemisphere. It is the story of slave traders, white, Arab, and black, and the Africans they enslaved. It is the story of families torn asunder, kidnapped, bought, and sold. It is the story of individuals choosing their destiny. It is the story of a people's struggle for freedom echoed in the words of Harriet Tubman and Frederick Douglass declaring their intentions to "live free or die."

By virtue of its covert nature, the Underground Railroad is also the story of codes and secrets involving cunning systems of visual and oral communication, known only to those involved and reflecting the indomitable spirit of a people's resistance to slavery and desire to be free.³



Language of the Underground Railroad

Ever since the first African slaves came to this country in the 1600s, there were many attempts to escape to freedom. However, they didn't have a phrase for this effort until around 1830. America's first railroads began to run that year. People who helped organize these escapes began to think of their work in terms of a railroad. They added "underground" because their work was underground, or very secretive.

Because of this connection, they often used the same kinds of words to talk about their work as those on the railroad did. These words became a kind of code for them. They could use them in everyday conversation and people would think they were talking about the railroad, not runaway slaves.

They called the people who helped slaves escape "conductors," like the people who ran the trains. Harriet Tubman was a famous conductor on the Underground Railroad.

The safe places where escaping slaves could hide were called "stations," just like the stations on a railroad. The "station master" was a person in charge of that hiding place, just as the station master was in charge of a railroad station.

The people who were traveling were sometimes called "passengers," just as they would be on a regular train. At other times, they were referred to as "baggage."¹

Historians Jacqueline Tobin and Raymond Dobard first posited the quilt code theory six years ago in their book *Hidden in Plain View: A Secret Story of Quilts and the Underground Railroad*, published in 1998. In the book, the authors chronicled the oral testimony of Ozella McDaniel, a descendant of slaves. McDaniel claims that her ancestors passed down the secret of the quilt code from one generation to the next.

The code "was a way to say something to a person in the presence of many others without the others knowing," said Dobard, a history professor at Howard University in Washington, D.C. "It was a way of giving direction without saying, 'Go northwest.'"



The Code

In a series of discussions with Tobin and Dobard, McDaniel described the code: A plantation seamstress would sew a sampler quilt containing different quilt patterns. Slaves would use the sampler to memorize the code. The seamstress then sewed ten quilts, each composed of one of the code's patterns.

The seamstress would hang the quilts in full view one at a time, allowing the slaves to reinforce their memory of the pattern and its associated meaning. When slaves made their escape, they used their memory of the quilts as a mnemonic device to guide them safely along their journey, according to McDaniel.



Fact or Myth?

The quilt-code theory has met with controversy since its publication. Quilt historians and Underground Railroad experts have questioned the study's methodology and the accuracy of its findings.

Giles R. Wright, a New Jersey-based historian, points to a lack of corroborating evidence. Quilt codes are not mentioned in the 19th century slave narratives or 1930s oral testimonies of former slaves. Additionally, no original quilts remain.

"What I think they've done is they've taken a folklore and said it's historical fact," Wright said. "They offer no evidence, no documentation, in support of that argument."

Dobard refutes the claims that his book lacks evidence, noting that he uses oral history and thus lacks written records. "Who is going to write down what they did and what it meant [if] it might fall into the wrong hands?" Dobard said.

Addressing the lack of concrete evidence, Dobard emphasized the fragility of quilts. "Consider the nature of quilts. A quilt was to be used," Dobard said. "To expect a quilt that remained within the slave community to survive more than one hundred years is asking a lot."

Fact or myth, people agree that the idea of a quilt code is compelling. Bonnie Browning of the American Quilter's Society in Paducah, Kentucky, said: "It makes a wonderful story."

TEACHER NAME		Lesson #
Christy C. Wright		2
MODEL	CONTENT AREA	GRADE LEVEL
Bruner	Math	4 th - 5 th Grade
CONCEPTUAL LENS		LESSON TOPIC
Pattern		Recognizing patterns everywhere; nature, quilts
LEARNING OBJECTIVES (from State/Local Curriculum)		
<p>4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</p> <p>5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.</p>		
THE ESSENTIAL UNDERSTANDING <i>(What is the overarching idea students will understand as a result of this lesson?)</i>		THE ESSENTIAL QUESTION <i>(What question will be asked to lead students to "uncover" the Essential Understanding?)</i>
Patterns influence expression.		How do patterns influence expression?
CONTENT KNOWLEDGE <i>(What factual information will students learn in this lesson?)</i>		PROCESS SKILLS <i>(What will students be able to do as a result of this lesson?)</i>
<ul style="list-style-type: none"> Patterns exist in nature. Many manmade patterns or designs are inspired from nature. Causal patterns are patterns whose parts affect each other in certain ways (Linear, Domino, Cyclic, Spiraling, Relational and Mutual) 		<p>Students will be able to ...</p> <ul style="list-style-type: none"> Explain how nature inspires manmade patterns Identify and give examples of causal patterns Explain how patterns found in nature inform other patterns.
GUIDING QUESTIONS <i>What questions will be asked to support instruction?</i> <i>Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding</i>		
Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
<ul style="list-style-type: none"> What are patterns? Where have you found patterns? How can we use patterns (<i>found in nature?</i>) to inspire manmade patterns? What shapes or figures might we see in patterns? Where do quilters get their ideas (for a quilt) from? What inspires them? What is the purpose of making a quilt? 	<ul style="list-style-type: none"> What patterns do you see? What shapes do you see within the patterns? What relationships do you notice within the patterns? How do the patterns impact each other? How can we organize pattern examples using causal pattern categories? How are quilters like scientists or detectives? In addition to need and telling a story why else would someone make a quilt? 	<ul style="list-style-type: none"> How would you describe the patterns you saw? How did the natural patterns inspire your own pattern? What changes did you make? How do patterns influence expression?

DIFFERENTIATION			
<i>(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.</i>			
Content	Process	Product	Learning Environment
	Students will make observations and categorize patterns based on what they see. Students creations are open ended. They are limited by only by their own creativity.	Nature Inspired Pattern: The product must mimic an object in nature.	

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

As students enter the room they will see assorted quilts displayed in the room

Students will then be instructed to make a list of everything they think would be needed to make a quilt.

- What materials and tools are needed?
- What plans needs to be made?
- What skills are needed?
- Where would a quilter work?
- What would a quilter look like?
- What knowledge does a quilter need to make a quilt?

After the have listed their answers, students will be asked to share their responses with the class. We will compile a class list.

Teacher will ask the pre-lesson questions. Students respond as a whole group.

- What are patterns?
- Where have you found patterns?
- How can we use patterns (found in nature?) to influence manmade patterns? Expressions of art?
- What shapes or figures might we see in patterns?
- Where do quilters get their ideas (for a quilt) from? What influences and inspires them?
- What is the purpose of making a quilt?

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Class will view the PowerPoint Quilt Patterns that Mimic Nature. Students will be asked to think about how patterns in nature might inspire a quilt maker.

- What do quilters need to know most about? (patterns)
- What do patterns mean to a quilter?
- What patterns do you see?
- What shapes do you see within the patterns?
- What relationships do you notice within the patterns?
- How do the patterns inform other patterns? (within the natural patterns and the relationship between natural patterns and quilt patterns)

After the PowerPoint students will be asked to go back to their lists and think about what else a quilter might do or think about when they decide to make a quilt.

Students are then divided into groups. The teacher tells the students that they are going to look at look at images of quilts at (about 5 depending on the number of students) stations. At each station students will silently look through the "quilter's eye" and try to predict what was the inspiration for the quilt. Students will have a pencils, crayons and paper to document what they see. Students will document what they see and make an assumption as to what was the original inspiration. After each station visit; the groups can come back together to share their finding for about 5 minutes and then move on to the next station.

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

After visiting all stations, each group can share their findings. We will collect data as a whole group in chart paper.

Students will then be introduced to Causal Patterns to determine which category the quilt patterns fit under.

- <http://causalpatterns.org/pdfs/SixCausalPatterns.pdf>

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Students will create their own "quilt pattern" inspired by nature using the quilt square template and crayons. Student may search internet for

images of patterns in nature or possibly walk around the grounds outside of the school. Students will choose one or more of the 6 causal patterns to categorize their pattern.

Students will need:

- internet access
- crayons
- rulers
- Causal Pattern handout
- scissors

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Students will be evaluated by their quilt square and their explanations of which causal pattern category it fits under and what (in nature) they were inspired by.

Exit Ticket question:

How can nature influence quilt designs? How can patterns influence other patterns? How do patterns influence expression?

Six Causal Patterns (***) The link between quilt patterns and causal patterns may be tricky...for me)

Pattern	Explanation
Linear Causality	My car hit a car. Ends
Domino Causality	Dominoes hit one after another, eventually stops
Cyclic Causality	Which came first the chicken or the egg? No beginning or ending
Spiraling Causality	Spirals similar to cycle , yet has a clear beginning and ending
Relational Causality	Two teams playing a game. As the number of points change the relationship changes, One team will win, one will lose.
Mutual Causality	Positive or negative for both or just one. 2 friends, people and pets, gardener and plants

Quilt Patterns that Mimic Nature



TEACHER NAME		Lesson #
Christy Wright		3
MODEL	CONTENT AREA	GRADE LEVEL
Creative Problem Solving	Math	4 th – 5 th
CONCEPTUAL LENS		LESSON TOPIC
Patterns		Tessellations
LEARNING OBJECTIVES <i>(from State/Local Curriculum)</i>		
<p>4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</p> <p>5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.</p> <p>4.G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.</p> <p>4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw</p>		
THE ESSENTIAL UNDERSTANDING <i>(What is the overarching idea students will understand as a result of this lesson?)</i>		THE ESSENTIAL QUESTION <i>(What question will be asked to lead students to “uncover” the Essential Understanding)</i>
Patterns influence expression.		How do patterns influence expression?
CONTENT KNOWLEDGE <i>(What factual information will students learn in this lesson?)</i>		PROCESS SKILLS <i>(What will students be able to do as a result of this lesson?)</i>
<p>Students will know:</p> <ul style="list-style-type: none"> Tessellations are a specific type of pattern The specifics that determine a tessellation (no overlaps or gaps) The types of tessellations (regular, semi-regular) Using tessellations involves art and math skills There are 4 ways of moving to another position in the tessellation. Translation, Reflection, Rotation, Glide Reflection (4 types of symmetry) 		<p>Students will be able to:</p> <ul style="list-style-type: none"> Create and explain how to create a tessellation Describe their tessellation based on type Describe their tessellation based on movement/symmetry Create tessellations that display one or more of the four movements or types of symmetry .
GUIDING QUESTIONS <i>What questions will be asked to support instruction?</i> <i>Include both “lesson plan level” questions as well as questions designed to guide students to the essential understanding</i>		
Pre- Lesson Question	During Lesson Questions	Post Lesson Questions
<p>What is a tessellation?</p> <p>What examples of tessellations have you seen?</p> <p>What is the relationship between tessellations and patterns?</p>	<p>How can you determine if a figure will tessellate or not?</p> <p>How can you describe your tessellation? (symmetry, type)</p> <p>What is the difference between a tessellating and non-tessellating shape?</p> <p>How do you predict what the next shape is and where it fits in the tessellation?</p>	<p>What are the characteristics of a shape or figure that tessellates?</p> <p>What would cause a shape not to tessellate?</p> <p>How would you describe the movement/symmetry of your tessellation?</p> <p>How could you variant your tessellation for a new design?</p> <p>How do (tessellation) patterns influence expression?</p>
DIFFERENTIATION <i>(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.</i>		
Content	Process	Product
		Learning Environment

Christy C. Wright
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	Each student gets to solve an open ended problem (situation) in a small group. They get to come up with their own solutions. There are many possible solutions.	There are many possible solutions.	Small group
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PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates*

(15-20 minutes) When students enter the room teacher will have a video of Escher's tessellations running as students walk in the room. Students will be asked the characteristics of a tessellation? Describe what you notice about the arrangements of the shapes in the tessellations? Students are asked to share their responses. list of their responses.

Hook Video of Escher's tessellations:

<http://www.bing.com/videos/search?q=tesselations+youtube&&view=detail&mid=D150147D64176974902DD1501ED2A56A421C513B59C89ED2A56A421C513B59C89&fsscr=0&FORM=VDQVAP>

Teacher then asks a pre-lesson questions.

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

(5-10 minutes)The students will observe a video or power point about tessellations and how they are formed. After viewing the video students will be referred to anything else we can add to our class list about Tessellations?

(Video – What are tessellations)

<http://www.bing.com/videos/search?q=tesselations+youtube&view=detail&mid=ED2A56A421C513B59C89ED2A56A421C513B59C89&FORM=VIRE>

(45-60 minutes)The students are then divided into groups. The teacher introduces to Tiling Dilemma in which they have to use their tessellation knowledge and kitchen floor according to the Robertson's requirements.

The students will be provided with:

- Paper
- Pencils
- Crayons
- Rulers
- Index cards
- Scissors
- The Tiling Dilemma sheet

(Steps to the Creative Problem Solving are attached to the Dilemma sheet)

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce students toward a deeper understanding.*

(10-15 minutes)After students have had time to complete their task the teacher will provide time for each group to present their proposals for the Robertson's and decide if they think the Robertson's would choose their proposal based on the information we have about what the Robertson's wanted.

Each proposal will be given an award based on the design (happiest, most active, calmest, etc...)

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, new concepts, and apply their understandings to the world around them in new ways*

(45-60 minutes)Students will be divided into different groups and asked to create an advertisement (poster or commercial) for your company emphasizing your design work and why that makes your work more desirable than other patterns. These will be presented to the class.

(10-15 minutes)Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Students will be given index cards to use as exit tickets.

Students will be asked to: How do patterns (tessellations) influence expression in your work?



Tiling Dilemma

Meet the Robertson's

Ed and Jane Robertson's just remodeled their house and have updated the patio area. They want to have their new patio floor tiled. They aren't so picky about the design but they are huge fans of M.C. Escher's tessellations and want something creative and different from their old plain wooden deck. You have been hired because of your high customer satisfaction rate. You have to create a floor design that will please the Robertson's. Their requirements are that the tessellation must have at least 2 different shapes, only 3 colors and one of the types of tessellation symmetry.

- Kitchen size is 8.5 ft X 11 ft.
- At least 2 different shapes
- Only 3 colors
- Use one of the types of symmetry

Creative Problem Solving Stages:

Robertson's Tiling Dilemma

1. Envisioning or Objective Finding: The challenge faced is to satisfy our customers? How can we create the perfect tiling tessellation for the Robertson's new patio?
2. Fact Finding:
 - What: new floor design
 - Who: Ed and Jane Robertson and our tiling company
 - How: We have to develop a creative tessellation design for the Robertson's
 - Where: We plan in our office; we create the floor on the patio.
 - Why: The Robertson's have hired us and it's our job.
 - When: Get started today; finish as quickly as we can and still create a quality product.
3. Problem Finding: In what ways are we going to create a unique design yet finish within a reasonable time? How do we incorporate all of the requirements of the Robertson's in our design?
4. Idea Finding: Our designers need to start drawing up different tessellations and see what we come up with. We must come up with at least 3 options for the Robertson's to choose from.
5. Solution Finding: Ask ourselves: Did we incorporate all of the requirements given to us by the Robertson's? Take our examples to the Robertson's and see if or which one they choose.
6. Acceptance Finding: Build the tile floor for the Robertson's and finish the job with another satisfied customer.

TEACHER NAME		Lesson #
Christy Wright		4
MODEL	CONTENT AREA	GRADE LEVEL
Questioning	Math – Social Studies	4 th and 5 th grades
CONCEPTUAL LENS		LESSON TOPIC
Patterns		The relationship between pattern and culture
LEARNING OBJECTIVES <i>(from State/Local Curriculum)</i>		
<p>4. OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</p> <p>5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.</p> <p>4.C.1 Understand the impact of various cultural groups on North Carolina.</p> <p>5.C.1.4 Understand how cultural narratives (legends, songs, ballads, games, folk tales and art forms) reflect the lifestyles, beliefs and struggles of diverse ethnic groups.</p>		
THE ESSENTIAL UNDERSTANDING <i>(What is the overarching idea students will understand as a result of this lesson?)</i>		THE ESSENTIAL QUESTION <i>(What question will be asked to lead students to “uncover” the Essential Understanding)</i>
Patterns influence expression.		How do patterns influence expression?
CONTENT KNOWLEDGE <i>(What factual information will students learn in this lesson?)</i>		PROCESS SKILLS <i>(What will students be able to do as a result of this lesson?)</i>
<p>Students will know:</p> <ul style="list-style-type: none"> Different cultures inspire different quilt patterns/styles. Culture determine reasons for quilts <p>what elements make up cultures.</p> <ul style="list-style-type: none"> that there are ways to recognize quilt characteristics of different cultures. that quilt characteristics represent different cultures. the meaning behind the characteristics 		<p>Students will be able to:</p> <ul style="list-style-type: none"> Compare and contrast Make generalizations based on content knowledge Make inferences while reading texts Use text and prior knowledge to make connections Evaluate differences

GUIDING QUESTIONS

What questions will be asked to support instruction?

Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre- Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
<ul style="list-style-type: none"> • What is culture? • How does culture shape patterns? • What elements make up culture? • How does culture impact people's lives? • What cultural factors determine the clothing people wear /use? 	<ul style="list-style-type: none"> • How would you describe the differences/similarities of the cultures? • What quilt similarities did you find? • What differences did you find? • In what ways does where each group lived affect their quilts? • What evidence did you use to support your choices? • How did culture determine why people made quilts? • How did culture determine how people used quilts? • How did culture influence the designs and colors used in their quilts? • How did culture influence the different ways quilts were used? • How does culture shape patterns? 	<ul style="list-style-type: none"> • How did their culture define their quilt patterns? • What elements of their lives showed up in the quilt patterns? • How did their cultures define their quilts patterns? • What elements of their lives showed up in the quilts? • How does your life compare to someone in one of these cultures? • What factors affected their quilt patterns? • What common threads connect each culture? • What element of the culture stood out to you the most? • What cultural characteristics do you recognize in quilt patterns? • How can you identify a culture based on quilt pattern elements? • How did culture influence the reasoning for making the quilts? • How did culture influence the patterns of the quilts? • How do patterns influence expression?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
<p>Students group will read a passage about a different culture.</p>	<p>Students will work in collaborative groups. Each group will have a passage to read , answer questions and then report findings to the whole group.</p>	<p>Students create a quilt square or mini quilt that reflects the culture they read about (or another culture.) The group will be able to point out and explain the elements they chose to reflect their chosen culture.</p>	

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

As students enter the classroom, there will be images of various quilts around the room. Students will be encouraged to tour the "Quilt Gallery."

- After students have had a chance to tour, the teacher will ask each student to stand in front of a quilt image of their choosing. Students will then be asked, "Why did you choose this quilt?" "What is it about this quilt that stood out to you?" (color, design, theme, size, condition, etc...) "What do think the purpose of this was?" "Why was it made?" "What was the quilter's purpose?" "Who do you think made it?" (a man, woman, child, artist, young, old...) "Why do you think that?" "How does culture shape patterns?" What is culture?

Pre-Lesson Questions:

- How does culture shape patterns?
- What elements make up culture?
- How does culture impact people's lives?
- What cultural factors determine the clothing people wear /use?

Teacher will then introduce the quilting traditions passages; African American, European American, Amish and Pioneer by saying. We are going to be reading and learning about quilting traditions from four different cultures. Each passage has photos and information about the history of the patterns, colors and uses of their quilts. While reading today students will be asked to consider our Essential Question on the chart paper, "How does culture shape patterns?"

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Students will be divided into four equal groups.

- Each group will read about one of the four cultures. Each student will have their own copy to read.
- As a group, the students will be asked to make a list of facts they discover about the culture. "Think about the patterns they see developing about the culture." "What patterns are common among members of this culture?"
- Each group will also come up with 5 questions they have after reading the passage. The teacher will suggest the students use the following question stems:

I wonder if...

I wonder why...

I wonder what...

Teacher will circulate during this time to facilitate groups.

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

We will come back as a large group and each group will report on their culture reading. They will:

- Tell what group they read about
- Share the important facts they listed and explain why they felt they were important. (Teacher will list these on a chart to compare and contrast the groups.)

The teacher will then ask the Pre-Lesson Questions. Students will answer teacher's questions and are encouraged to ask some of their own.

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Students will be given a performance task- **Quilt Talking About Me**. (attached separately) Students are asked to take on the role of a quilter and design and construct a quilt or quilt square for the NC History Museum in Raleigh.

Students will be asked to think about: What will others learn about you from the quilt/squares you create? Consider what you learned this week about patterns and different cultures when you plan your quilt/square.

Students will be given some class time to begin planning the project and ask any clarifying questions.

After their task is complete, each student will share their quilt square with the class. The teacher will ask the Post-Lesson Questions.

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Christy C. Wright
July 17, 2016

Teacher ends the class and asks them to think about and share what they learned today.

- that caused you to think and why it made you think
- that surprised you and why
- that you want to share with someone else and why

Students are then given a Post-it note and asked to answer our essential question on the chart paper. "How do patterns influence expression?"



Performance Task – Quilt Talking About Me

The North Carolina Museum of History in Raleigh is opening a new exhibit, titled Quilt Stories. The museum wants to collect quilts that tell stories through quilting instead of words. You have been learning how nature, history and patterns in everyday life inspire quilters' work and that quilts are more than just a collection of shapes and colors. You have been chosen to express your story or inspiration through the medium of quilting.

Your task as a quilter is to design and construct a paper quilt that will tell your story. The story may be about yourself or someone/something significant to you. Since each square will represent a new chapter of your story you need to be very knowledgeable about your topic in order to make a quilt. Your quilt patterns may be inspired by anything and needs to reflect what you have learned about patterns and how patterns inform prediction. Along with your quilt you will write a brief paragraph summarizing your “quilt story.”

*Side notes: I haven't decided if time will allow for a complete quilt (poster board sized/ 9 squares) or if each student will only have time to make one special square to make a community quilt.

If we opt to do a community quilt; then we would photograph the finished product and compile their narratives (paragraph) into a book for each student to keep. But the task would remain the same as above.

Options:

- Complete 9 square quilt
- One or more squares for a community quilt



Quilt Talking About Me – Performance Task Rubric

	Does Not Meet Standard 1	Sometimes Meets Standard 2	Meets Standard 3	Exceeds Standard 4	Score
Conceptual Understanding: “Patterns influence expression”	Misunderstanding of concept	Partial understanding of concept	Substantial understanding of concept	Thorough and complete understanding of concept	
Skill: Represents/expresses topic through pattern	Quilt square doesn’t represent the topic	Quilt square represents the topic partially	Quilt square represents the topic generally well	Quilt square represents the topic exceptionally well	
Paragraph clarity and reflection of quilt square	Paragraph doesn’t reflect the quilt square	Paragraph reflects the quilt square with some clarity	Paragraph reflects the quilt square with general clarity	Paragraph reflects the quilt square with exceptional clarity	
Quality/creativity of Quilt/ Quilt Square	Lacks quality and creativity	Adequate quality and some creativity	Substantial quality and creativity	Exceptional quality and creativity	

Unit resources:

Books for student and teacher usage:

- Valerie, F. (1985). *The Patchwork Quilt*.
- Jaqueline, W. (2005). *Show Way*. Putnam.
- Deborah, H. (1993). *Sweet Clara and the Freedom Quilt*. Random House.
- Jeanette, W. (1988). *Follow the Drinking Gourd*. Random House.
- Tony, J. (1996). *The Quilt Story*. Puffin Books.
- Patricia, P. (1988). *The Keeping Quilt*. First Aladdin Books.
- Dixon, D. J. (2006). *Vitoria's Quilt Remembered*. Dorothy Dixon.
- Mitchell, R. (1997). *The talking cloth*. New York: Orchard Books.
-

Websites for teacher and classroom usage:

Website	Annotation
Terry, K. (n.d.). Mathwire.com March 2011. <i>Mathwire.com Quilt Square Challenge</i> . Retrieved June 2016, from http://mathwire.com/quilts/qschallenge.html	The Quilt Challenge activity on this site is useful for extra practice for quilt square design. (visual spatial practice)
(n.d.). Freedom Codes. <i>You Tube</i> . Retrieved June 2016, from https://www.youtube.com/watch?v=T2VzIC-hOBA	Freedom Codes video shows and explains the secret quilt codes used during The Underground Railroad
(n.d.). Math In Art. <i>Tesselations</i> . Retrieved June 2016, from http://www.csun.edu/~Imp99402/Math_Art/Tesselations/tesselations	This site has tessellation definitions, vocabulary and colorful examples.
Baker, T. (n.d.). <i>Zome Symmetry and Tiling</i> . Retrieved June 2016, from http://math.sfsu.edu/cm2/papers/TiaTessellation.pdf	This PDF provides more information about tessellations, symmetry and tiling.
Hicks, K. (n.d.). Pintrest. <i>Children's Books With Quilting Theme</i> . Retrieved June 2016, from https://www.pinterest.com/kyrahicks/childrens-books-with-quilting-theme/	Pintrest site with Children's book about quilting pins.(teacher)
Quilt History - A short introduction to period quilting. (n.d.). Retrieved May 02, 2016, from http://www.quilthistory.com/quilting.htm	History of quilting - informational (teacher).
Handmade Quilt. (n.d.). Retrieved August 02, 2016, from http://amishspirit.com/amish-quilts-for-sale/	Information about Amish quilts (teacher)

Contributions to Quilting by Ethnic Groups. (n.d.). Retrieved August 02, 2016, from http://www.womenfolk.com/historyofquilts/multicultural.htm	Quilting tradition form different ethnic groups

Color Me Quilty (pre-assessment)_

1. Divide your quilt square into 4 equal sections.
DO NOT CUT your sections.
2. Choose 4 of the following prompts and color each section accordingly.
 - Colors and patternss only
 - No words
 - No pictures
3. Prompts:
 - Color of you (not skin, hair or clothing color)
 - Color of your favorite joke or something that makes you laugh
 - Color of someone/pet you love
 - Color of something fun you have done since school has been out
 - Color of your favorite food/beverage
 - Color of your favorite book or movie

- Color of your favorite pastime
- Color of your favorite song

4. Label the back of your sections for your own reference.