

# **A3: Mathematics and Children's Literature**

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PJ-1

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EDUC 4274

Prepared for: Dr. Dan Jarvis

**Book Details:**

Smucker, Barbar, and illustrated by Janet Wilson. Selina and the Bear Paw Quilt. Toronto: Lester Publishing. 1995. ISBN #: 1-89555-70-1.

**Book Summary:**

Selina and the Bear Paw Quilt follows the central character, Selina, during pioneer times in Pennsylvania. Selina enjoys watching her grandmother make quilts out of memorable pieces of material (such as old dresses, old baby clothing) but is told that she is too young to make a quilt of her own. Her grandmother teaches her that a bear paw quilt is a specific pattern on a quilt and that the materials used tell a story about the maker's life. Later that night Selina overhears that her family must move to Upper Canada because there is war and it is no longer safe to stay in Pennsylvania. Selina is saddened to hear that her grandmother will not be able to travel with them because she is too old to make the journey. Selina's grandmother gives Selina the quilt that she made.

Once Selina's family reaches Upper Canada they stay with relatives and look at the grandmother's quilt. Selina describes the significance of each piece on the quilt to her relatives. Later that night Selina discovers that her bed has a quilt on it that is made up of her cousins' different dresses. Selina learns that this is a different type of quilt with a different pattern, but it is like her grandmother's quilt because there is a piece of her grandmother's wedding dress on it. This causes Selina to realize that a piece of her grandmother will always be with her.

**Critique:**

In critiquing Selina and the Bear Paw Quilt using Hellwig, Monroe, and Jacob's article titled "Making Informative: Selecting Children's Trade Books for Mathematics Instruction"

(2000) we believe that it has a combination of strengths and weaknesses. The strengths lie within the visual and verbal appeal category; and the connections category. The weaknesses lie within the accuracy category; the audience category. The book can be ranked highly in the overall “wow” factor category when used appropriately.

*Accuracy:* Selina and the Bear Paw Quilt is a quality piece of children’s literature however it does not contain any mathematical phrases, terms, and direct links to mathematic content. Without direct teacher instruction and guidance it would be difficult for students to make the connection between the book and the math curriculum. This is why our questions before, during, and after the read aloud are heavily focused on the patterns within the quilt and what the students see. These prompts are needed in order to get students thinking about the mathematical content of the book. Without these teacher prompts the book’s mathematical link to patterning may be lost on most students.

There is a definite connection between the book and the grade three social studies curriculum, and this is one of the reasons that we think this book could be integrated into a grade three classroom.

Overall we believe that Selina and the Bear Paw Quilt is entitled to a mark of 4/6. This mark is given because of its applicability to the mathematics curriculum rather than its explicit use of mathematical terminology and content.

*Verbal and Visual Appeal:* The detail of the illustrations is highly impressive and enhances the meaning of the written words. Without such detailed illustrations of the patterned quilts the book would lose some of its effectiveness in teaching its connection to the patterning unit. Moreover, the book has high verbal appeal. The reader is intrigued to know what happens to Selina and her family once they move to Upper Canada and the events unfold in an

unpredictable manner. This heightens the reader's interest and motivates the reader to keep reading. As a result of the book's visual and verbal appeal, we believe it deserves a score of 6/6.

*Connections:* Selina and the Bear Paw Quilt is particularly relatable to the context of the grade three Ontario classroom. In particular, the book connects to the social studies curriculum unit on pioneers, and as such this connection would peak students' interest level. This is why we chose to incorporate the pioneer studies into our mathematics lesson. We believe that the book may lose its connectedness to students if it is not directly linked to something meaningful within the students' lives. For most students pioneer life, war and the need to move because of war is not relatable to their everyday lives. Thus, without the relevance to the grade three pioneer unit some students may find themselves uninterested in the book. Given the context in which we chose this book we give this book a score of 5/6 on the connections level.

*Audience:* As we just wrote in relation to connections, Selina and the Bear Paw Quilt is limited in its audience range. Without the direct connection between the book and the grade three pioneer unit, this book lacks a wide audience range. We believe that younger grades would have difficulty understanding the concepts within the book. Furthermore, the book lacks an appeal to both genders and diverse backgrounds. In particular we believe that males would find it difficult to connect to the book because all of the main characters are female (Selina, her grandmother, her mother, her aunt, and her cousins) which is undoubtedly because quilting and quilting bees were solely done by females. The book does not cater to diverse backgrounds but is instead representative of white North American pioneers. Overall, we give Selina and the Bear Paw Quilt a mark of 3/6.

*Wow Factor:* We believe that within the context that we set up our lesson plan, Selina and the Bear Paw Quilt is entitled to a wow factor mark of 4/6. When used appropriately, the

book connects to the students' learning within the pioneer unit, is meaningful to students' lives because of its connectedness to social studies, and is visually and verbally appealing.

**Self-Assessment:** When carefully examining the rubric we self-assess ourselves with a grade of 20/20. We have completed all components of the assignment in great detail and have worked tremendously hard to do so. We paid close attention to detail in our lesson planning and ensured that we were asking a combination of a few close-ended questions and open-ended, higher-level thinking questions. The higher-level thinking questions are intended to actively engage students and get them thinking about patterns and problem solving. For example, the questions related to how the pattern would change if one attribute was altered forces students to use their knowledge about patterns and attributes in a problem-solving way. There are multiple answers to this question based on which attribute is changed and how it is changed, thus students are using their problem-solving skills. In regards to our book critique we ensured that we incorporated all five categories from Hellwig, Monroe, and Jacob's article. We discussed in detail our rationale behind the book's score on each of these five categories. In regards to the quality of writing, we both edited our assignment to ensure that it reflected a professional style and appropriate grammar conventions.



**Activity Planning Format**  
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<b>1. Lesson Plan Information</b>	
<b>Subject/Course:</b> Mathematics	<b>Name:</b> Jennifer Hawkins & Kristen Miller
<b>Grade Level:</b> 3	<b>Date:</b> Thursday, February 5, 2009

<b>Topic:</b> Patterning & Algebra	<b>Time and Length of Period:</b> 9:30-10:30 (60 minutes)
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<b>2. Expectation(s) and Learning Skills</b>
<b>The students will:</b>
<ul style="list-style-type: none"> <li>Identify, extend, and create a repeating pattern involving two attributes (e.g., size, colour, orientation, number), using a variety of tools (e.g., pattern blocks, attribute blocks, drawings) (<i>Sample problem:</i> Create a repeating pattern– identify, extend, and create a repeating pattern using three colours and two shapes).</li> </ul> <p><b>Today, students will:</b></p> <ul style="list-style-type: none"> <li>Focus on the concept of a quilting bee and how it builds on the notion of working together to accomplish a task. Students will reference the story <u>Selina and the Bear Paw Quilt</u> to make the connection to the making of quilts with patterning and attributes. There is also a connection to the geometry unit, specifically in relation to properties of 2-D shapes, symmetry, fractions, and transformations (flips, slides and rotations) can be addressed as students make quilts in the classroom out of coloured paper.</li> </ul>

<b>3. Pre-assessment</b>
<b>A. (i) Students:</b>
<ul style="list-style-type: none"> <li>Students are familiar with and comfortable with the concept of patterns</li> <li>Students are familiar with and understand the notion of an attribute</li> <li>Students have worked with pattern blocks throughout this unit</li> <li>Students have completed geometry unit and are familiar with the ideas of flips, slides, and turns</li> <li>Students have been learning about pioneers in their Social Studies unit and are familiar with the making of quilts during that time period</li> </ul> <p><b>(ii) Differentiation of content, process, and/or product (may be accommodations and/or modifications)</b></p> <ul style="list-style-type: none"> <li>Have sets of shapes pre cut for students having gross motor difficulty and for students having difficulties creating their own block</li> <li>Encourage some students to use online quilt patterning software to manipulate their designs on the screen before transferring them to paper.</li> </ul>
<b>B. Learning Environment:</b>
<ul style="list-style-type: none"> <li>Students will be seated at the carpet for the reading of <u>Selina and the Bear Paw Quilt</u></li> <li>Students will be seated at their seats for the patterning activity</li> </ul>

### C. Resources/Materials:

- Selina and the Bear Paw Quilt by Barbara Smucker
- Chart paper
- One or two actual quilts
- Pattern blocks
- Scraps of coloured paper (some with patterns and/or textures, some without; perhaps use wrapping paper, wall paper samples, recycled greeting cards, etc.)
- Several print resources with pictures of quilt block designs
- Pencils/pens, scissors, rulers, glue, scrap paper for rough sketches if desired

### 4. Content ( The What)

- Identify a repeating pattern as combination of attributes that are arranged in a consistent, predictable and repetitive manner
- Understand an attribute as a characteristic such as colour, size, shape, thickness, number, occurrence
- Understand that by changing a component of one of the attributes the pattern no longer exists unless this cycle is repeated
- Create a repeating pattern based on two attributes
- Cross-curricular: understand the importance of quilt-making for pioneer society
- Cross-curricular: identify why quilt-making was vital for pioneer society (no heat or electricity so quilts were required for warmth)

### 5. Teaching/Learning Strategies ( The How)

#### Teacher Role

#### (i) Introduction of the Activity, Routines and Procedures

(15 minutes for teacher introduction and read aloud)

- Teacher will hang various quilts around the classroom and tell the story behind one or two of the quilts on a large piece of chart paper
- Teacher will orally explain the story behind the one or two quilts and the notion that all quilts are made with an intended story or purpose in mind
- Ask if any of the students have a special quilt story to share with the class
- Teacher will read the story Selina and the Bear Paw Quilt by Barbara Smucker
  
- *Before* reading the story activate students' prior knowledge about patterning and attributes:
- Ask: "Looking at the cover of the book, what do notice about the quilt? How many colours and shapes do you see? If we remember that an attribute is a characteristic such as

colour, size, shape, thickness, number, and occurrence, then how many different attributes do you see on the quilt? What is the pattern?"

- *Before* reading the story activate students' prior knowledge about pioneers and quilting:
- Ask: "What do you think a quilting bee is? Why would pioneers have quilting bees?"
  
- *During* the story tap into new knowledge by building on previous knowledge through the use of effective questioning:
- Turn to inside cover page and ask: "What patterns do you see in the quilts on this page? How do you know it is a pattern? What types of attributes do you see in the quilt patterns? What would happen if I changed the colour of the square in this quilt (point to top right hand quilt)? Can you explain another way to change the quilt's pattern other than changing the square's colour?"
- Turn to the first page, read it and then ask students to describe what is consistent about the quilt. Ask students to identify what the repeating pattern is and how they figured it out. Ask students what would happen if one of the red floral squares was taken out. Discuss how the pattern is no longer complete now.
- Turn to the fifth page, read it and then ask students what the pattern of the quilt is and how they know that is the pattern. Ask students how many different attributes exist within the quilt. Ask students how the pattern would change if the additional attribute of size was introduced. Discuss how there are numerous ways that size could be included in the pattern and how these different ways would change the look of the quilt.
  
- *After* the story, ask students: "What material did the grandmother use for her quilt?"
- Ask students: "If you were going to make a quilt, which pieces would you include?"

(35 minutes for exploratory activity)

- Explain to the students that they will each make their own quilt today, which you will then put together to make a large classroom quilt.
- Invite them to look at the books and internet websites to find a pattern they would like to recreate for themselves.
- Tell students that they will be working independently to create a 10 inches x 10 inches quilt piece that will then form one square on a large class constructed quilt. Tell students that they must include the following: two *different* attributes; a border surrounding the quilt that includes an additional two *different* attributes; and the use of a geometric flip.
- Have students create their quilt design using pattern blocks first. Students may manipulate the pattern blocks on their desk and then sketch a design of their quilt on white paper with pencil.
- Once students have completed their rough design they will cut out coloured paper into the shapes that they need and then glue the shapes into the pattern they have selected.
- Assemble the blocks into a large quilt by gluing them to several pieces of chart paper taped together to provide a backing

**(ii) Lesson Conclusion**

(10 minutes)

- Hang the class quilt on one of the classroom's bulletin boards or in the hallway outside the class for students to continue to enjoy.
- Ask students if anyone would like to make up a story about the class quilt to explain certain blocks.
- Review what makes a repeating pattern; what attributes may be found in a repeating pattern; how a quilt can be altered if an attribute is added and/or if an attribute is removed.
- Review the connection of quilt making to the students' Social Studies unit on pioneers.

**6. Assessment (Collection of Data) / Evaluation (Interpretation of Data)**

- Take notes of your anecdotal observations, specifically with regard to students' problem solving skills, co-operation, contributions to class discussion, willingness to follow instructions. These anecdotal observations will be considered in the learning skills section of the report card.

References:

Hellwig, S. J., Monroe, E. E., & Jacobs, J. S. (2000). Making informed choices: Selecting children's trade books for mathematics instruction. *Teaching Children Mathematics*, 7(3), 138-143.

Smucker, Barbar, and illustrated by Janet Wilson. Selina and the Bear Paw Quilt. Toronto: Lester Publishing. 1995.