

Making a Star Quilt

Fast Facts

Curriculum Area: Mathematics
Grade Level: Grade 4
Suggested Duration: two 50-minute periods

Stage 1 Desired Results

Established Goals

Montana Content Standards

Geometry 4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Geometry 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.

Geometry 4.G.3 Recognize a line of symmetry for a two-dimensional figure, including those found in Montana American Indian designs, 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 lines of symmetry.

Essential Understandings Regarding Montana Indians

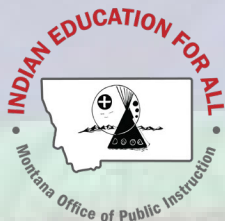
Essential Understanding 3 The ideologies of Native traditional beliefs and spirituality persist into modern day life as tribal cultures, traditions, and languages are still practiced by many American Indian people and are incorporated into how tribes govern and manage their affairs.

Understandings

- Many tribal nations mark important events through a star quilt ceremony.
- When making a star quilt, precision in cutting or folding is crucial.
- Geometric principles are involved.

Essential Questions

- What is the cultural significance star quilts?
- What are some tribal specific traditions related to giveaways and star quilts?
- How will the look of a quilt be affected if you do not use accurate measuring in your cutting or folding?



Students will be able to...

- use active listening skills to learn about the American Indian star quilt traditions.
- explain why star quilts are gifted as part of a giveaway ceremony.
- review geometric properties, e.g., parallel and perpendicular lines, parallelograms (specifically a rhombus), symmetry, supplementary and complementary angles.
- construct a star quilt block by folding paper into rhombi and piecing them together.

Students will know...

- the importance of precise and accurate angle measurement when folding the pieces of the quilt.
- how to fold a rhombus to be used as a pattern.
- the meaning of the star quilt and the ceremony where it is presented.

Stage 2 Assessment Evidence

Performance Tasks

1. Create a star quilt block by using rhombus pattern. Use this to trace and cut the number of rhombi needed to complete each quilt (pre-plan the size and difficulty level desired). Place the pieces as desired before gluing.
2. Present/display individual quilt blocks.

Other Evidence

1. Oral discussion of geometric vocabulary used for this project.
2. Neatness/accuracy in constructing the quilt block.
3. Verbal response to the Essential Questions.

Materials and Resources Needed

- [The Mathematics of Native American Star Quilts](#) – Lesson plan from NCTM with detailed instructional strategies for connecting math to star quilts.
- [A Spectacular Collection of Native American Quilts, Smithsonian Magazine](#)
- [Star quilt interview with Carrie McNab](#)
- [Star quilt video – Backroads of Montana](#)

Additional Information

- [How an Eskasoni tutor uses Mi'kmaw 8-pointed stars to teach math](#)
- [Essential Understandings Regarding Montana Indians](#)

Stage 3 Learning Plan

Learning Activities

The students will begin this lesson by learning the importance of a traditional star quilt ceremony. To set the stage, show students the Backroads of Montana video clip about star quilts and then share the interview clip with quilt maker Carrie McNab (Cree First Nations) and have students pay attention to key ideas shared to find out why star quilts are given, what they represent, and who might be the lucky recipient. Facilitate a class discussion regarding the two videos and ask students to identify key themes and concepts.

Bring in or display pictures of star quilts to show the students how beautiful the colors and details are. The quilting article from Smithsonian Magazine has numerous pictures of star quilts that can be shared with the students. In addition, images of star quilts are included at the end of the lesson plan. The teacher can refer to the quilts when reviewing the geometric principles involved in making a quilt. After showing a star quilt, ask the following questions:

- What are some geometric shapes you see in the star quilt? (rhombi, triangles)
- What basic shape was used to construct the star? (rhombi)
- What do you know about a rhombus? (parallelogram with 2 consecutive equal sides)

Review/introduce the basic geometric terms evident in a star quilt:

- What are parallel lines? Can you find an example of parallel lines?
- Does the star quilt have a line of symmetry? (yes)
- How many lines of symmetry does it have? (8)
- Use the pattern to draw in the lines of symmetry.
- Does the star quilt have rotational symmetry? (yes)

Look at several examples of quilts to view color options and difficulty levels. Some students may want to limit theirs to three colors.

Have students select colors to be used for the quilt blocks. Provide each with a straightedge, scissors, glue, and a template to piece the quilt.

Demonstrate how to fold paper into a rhombus (directions found below). At this point your students could use a protractor to measure the angles. You could also label the interior angles and discuss concepts such as vertical, supplemental, and complementary angles.

Trace and cut as many rhombi needed to fill in the planned Star quilt. Begin piecing on background paper (before gluing) and mention to students the importance of precise cutting.

When satisfied with appearance, begin gluing onto background paper. For those who finish early, they could look at adding more detail (such as a border).

Have students present quilt blocks and explain why they chose the colors they did or something they learned during the lesson.

Extension Ideas

1. Students could research various tribal customs regarding star quilts and compare and contrast them.
2. Students could make an actual quilt square to display.
3. Complete area and perimeter activities, i.e., find both, look for a relationship of the perimeter and area of the rhombus pattern to the finished quilt.
4. If the teacher, staff member, or a student has a star quilt ask if that person would be willing to bring it in and share the story behind it.
5. If you are fortunate to have a quilt maker in your community, bring that person in as a guest speaker to share cultural knowledge.
6. Conduct a read aloud of the book [*Shota and the Star Quilt*](#), a contemporary story of a young Lakota girl and the story of a community working together to create a beautiful quilt.

To Fold a Rhombus

1. Depending on how big/elaborate you want your quilt to turn out, use scratch paper to make your pattern.
2. Make a perfect square by folding and cutting (4" x 4" or smaller is suggested). Make sure you can see your diagonal fold.
3. Hold your bottom left vertex (where your diagonal starts) and bring the bottom right vertex to the diagonal; crease and leave folded.
4. Fold your top left vertex down to the diagonal; crease and leave folded. (Is it looking like a kite?)
5. Fold outside vertices into the diagonal to form a rhombus. This will be your basic pattern for creating the star quilt. You may adjust the size if desired.



Star quilt presented to OPI by Hays Lodge Pole Elementary School (2004)



Star quilts made by Carrie McNab