

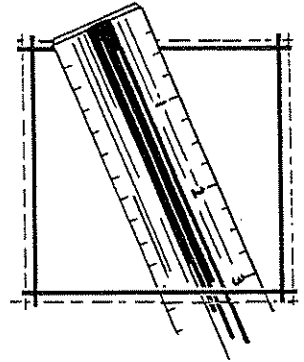
# LESSON 12

## TOPIC

Quilt Math

## TIME

1 hour (These activities may be broken up into smaller lessons)



## MATERIALS FROM TRUNK

Feed Sack Quilt  
Quilt (Full-size)  
Worksheets #4, #5, #6, and #7

## OBJECTIVES

- 1) Students will be able to calculate the number of blocks found in a quilt.
- 2) Students will be able to describe five different types of triangles and will be able to locate and describe the triangles found in specific quilt blocks.
- 3) Students will be able to apply simple arithmetic calculations in determining the cost of the materials for a quilt and the time involved in making the quilt.
- 4) Students will be able to locate the three basic angles used in quilt patterns.
- 5) Students will understand the concept of symmetry and will be able to apply it to quilt blocks.

## BACKGROUND

Quiltmaking is an example of applied mathematics. When a quiltmaker follows a published pattern she must, at a minimum, calculate the number of blocks needed for the size quilt she wishes to complete and the number of yards of fabric needed to complete the quilt. When a quiltmaker designs her own pattern, or even drafts a traditional design (many published patterns must be redrafted to enlarge or reduce the pattern) a great deal of mathematical skill can come into play. The quiltmaker must be familiar with such concepts as angles and symmetry.

## VOCABULARY

- Acute Angle                      Angle that measures less than 90 degrees.
- Acute Triangle                  A triangle where all three angles are acute.

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Angle	A figure formed by two lines extending from the same point.
Block	The basic unit of a quilt top. Blocks, often pieced squares, are stitched together to form the quilt top's design.
Equilateral Triangle	A triangle where all three sides are of equal length and all angles are of equal measure.
Isosceles Triangle	A triangles where at least two sides are of equal length and two angles are of equal measure.
Obtuse Angle	Angle that measures more than 90 degrees.
Obtuse Triangle	A triangle where one angle is an obtuse angle.
Repeat	The arrangement of quilt blocks to form a pattern. An overall repeat uses the same quilt block for the entire top.
Right Angle	An angle that measures 90 degrees.
Right Triangle	A triangle where one angle is a right angle.
Triangle	A plane figure with three straight sides. Triangles can be described by their angles.
Symmetrical	A figure that can be divided by a line into two identical and matching halves.

## ACTIVITIES

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1) Explain to the students that the block is the basic unit of a quilt. Most patchwork quilts are made by repeating a basic block over and over again. Show the students the *feed sack quilt*. Four blocks are in this quilt. Help the students to determine what the basic block looks like. Ask the students how you could calculate the number of blocks in the quilt. Show them that if you multiply the number of blocks across by the number of blocks down you can achieve the total number of blocks without counting each block. Explain to the students that you can also calculate the number of fabric pieces in the quilt. To do this, count the number of pieces in an individual block and then multiply that times the number of blocks in the quilt.



2) Show the students the full-size *quilt*. Have the group calculate the number of blocks in the *quilt*. Then have the students calculate the number of fabric pieces in the *quilt*.

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3) Provide each student with a copy of *worksheet #4* (Quilt Math). These exercises can be done individually or as a group. The bonus question may be quite hard. To illustrate the point of this question, an 8 1/2 inch square could be cut out of cardboard. Bring in a half yard of 45 inch fabric. Illustrate to the students how this question could be calculated. Another idea would be to draw the size of the fabric on the blackboard and then draw in the 8 1/2 inch squares.

4) Provide each student with a copy of *worksheet #5* (Angles in Quilt Blocks). If the students have not already been introduced to the concept of angles, review the definitions of right, acute, and obtuse angles. This exercise can be completed as a group or as an individual activity.

5) Provide each student with a copy of *worksheet #6* (Triangles in Quilt Blocks). Ask the students to name the type of shapes that might be found in a quilt. Explain that although all types of shapes might be found, the triangle is a very popular shape in quilts. Review the definitions of the angles discussed in *worksheet #5*. Review the definition of acute, right, obtuse, isosceles, and equilateral triangles. Explain that some triangles have two names. This exercise can be completed as a group or as an individual activity.

6) Provide each student with a copy of *worksheet #7* (Symmetry in Quilt Blocks). This worksheet may be difficult for some students. Explain the concept of symmetry. You might want to start out by explaining that our faces are basically symmetrical. How many lines of symmetry can be found through the human face (1)? What other type of things are symmetrical? To illustrate the point that many quilt blocks are symmetrical, use the quilt squares in the manual. Show the students how they can be folded to reveal two identical halves. This exercise can be completed as a group or as an individual activity.

## *ASSESSMENT*

Answer sheets are provided for the activities described above. All the questions have only one correct answer. One mark or one point could be given for each correct answer.