The Turtle Joins Trees on Circles: An Activity for Younger Children

by Rudy Neufeld

> **Learning theories and evidence from research and classroom practice support the use of manipulative materials to help chidren learn and understand mathematics.**

In the following activity children walk on the floor joining 'trees' with a rope. This is to be followed by paper and pencil exercises, and eventually by doing it on the computer screen.

Directions for the student:

Part 1: Five trees stand on the outside edge of a circle. The trees are an equal distance apart. Tie the end of the rope to any tree. Walk around the circle. As you come to a tree, walk around it and tighten the rope. When you return to your starting tree, tie the rope to it. What shape does the rope make?

You walked around the circle. You turned around once. You turned through 360 degrees. Have the turtle draw the shape that the ropes make.

A possible solution might be:

```
TO PENTAGON
REPEAT 5 [FD 67 RT 72]
END
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Part 2: Use the same 5 trees as in part 1. Tie the end of the rope to a tree. As you walk around the circle, tie the rope around every second tree. Keep walking until the rope is attached again to the starting tree. Now teach the turtle to draw the rope design.
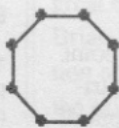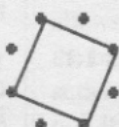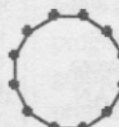
A possible solution is:

```
TO STAR
REPEAT 5 [FD 92 RT 144]
END
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Some Tree Joining Exercises:

For each of the entries on the chart that follow: (1) Make a sketch of the circle and rope design on paper. (2) Write a procedure that will teach the turtle to draw the rope design.

> *Rudy Neufeld (7 Conifer Crescent, London, Ontario) is a math-Logo consultant and author of* Learning Math with Logo.

# of trees	every Nth tree	design	procedure
		Rope	
8	1		to octagon repeat 8 [fd 40 rt 45] end
8	2		
12	1		
12	4		

> **Challenge:**
> Write a procedure with two inputs (no. of trees) and N (every Nth tree) that produces the design and preserves the distances.