

Counting Trees

DRIVING QUESTION: What method can we use to estimate the number of trees in a given area in a forest, without counting the trees?

TEKS:

- Use proportional relationships to analyze and solve mathematical and real-world problems.
- Identify and resolve angle measurement, area, surface area, and volume mathematical and real-world problems.
- To make assumptions about a population, employ random sampling.

OBJECTIVES:

The goal of this lesson unit is to make it easier for you to gauge how effectively your students can:

- Resolve straightforward issues involving ratio and direct proportion.
- Pick a suitable sampling technique.
- Gather discrete data and use a frequency table to record it.

MATERIALS:

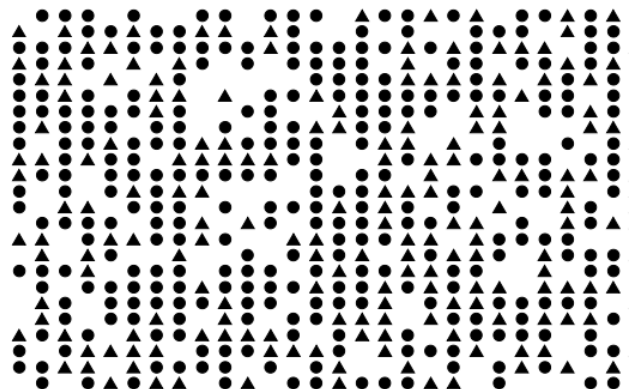
- Mini whiteboard, pencil, an eraser.
- A large sheet of paper, two sheets of light, letter-sized cardboard, scissors, a sticky stick, highlighters.
- Plain paper, poster papers, marker
- Calculator, square paper

Counting Trees

The diagram shows some trees in a tree farm.

The circles show old trees, and the triangles show young trees.

Tom wants to know how many trees there are of each type, but says it would take too long counting them all, one by one.



Analysing Sample Responses to Discuss

1. Does the approach make mathematical sense?
2. What assumptions has the student made?
3. How could the solution be improved?
4. What questions could you ask the student, to help you understand their work?

Sample Responses to Discuss: Laura

- ① You could multiply the number of trees in the length by the number of trees in the width and then of half your answer.
- ② a. Old trees - 644
Young trees - 644
- width - 33
length - 39
- $33 \times 39 = 1287$
 $1287 \div 2 = 643.5 = 644$

Sample Responses to Discuss: Wayne

2 columns has 21 young trees
55 old trees

50 columns is approx

$$50 \div 2 = 25$$

$$25 \times 21 = \text{amount of young trees} = 525$$

$$25 \times 55 = \text{amount of old trees} = 1,375$$

rounded up

young 530
old 1,380

Sample Responses to Discuss: Amber

Counting trees

1. If Tom draws a 10x10 square round some trees and counts how many old and new there are. There are 50 rows and 50 columns altogether so he must multiply by 25. He could do this a few times to check and then take the average.

2.

$$\begin{array}{rcl} 53 \text{ old} & \times 25 & = 1325 \text{ old} \\ 28 \text{ new} & \times 25 & = 700 \text{ new} \\ \underline{19 \text{ spaces}} & \times 25 & = \underline{475 \text{ spaces}} \\ 100 & & 2500 \end{array}$$

$$1325 + 1200 \div 2 = 1262.5$$

$$700 + 875 \div 2 = 787.5$$

check

$$\begin{array}{rcl} 48 \text{ old} & \times 25 & = 1200 \text{ old} \\ 35 \text{ new} & \times 25 & = 875 \text{ new} \\ \underline{17 \text{ spaces}} & \times 25 & = \underline{425 \text{ spaces}} \\ 100 & & 2500 \end{array}$$

So about 1263 old trees
and 788 new trees