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Visualize the Vastness 3 Billion Trees - Applied Math proof

One of FDR's most successful New Deal projects was called the Civilian Conservation Corps (CCC). The Civilian Conservation Corps was established to renew America's natural resources and employ young men who had fallen victim to the nation's greatest economic disaster, the Great Depression. During its nine years of existence from 1933 to 1942, the CCC enrollees planted nearly 3 billion trees in forests, shelterbelts, parks, and private erosion projects. How do we visualize the numbers associated with this massive national tree planting project?

Helpful hints:

There are 43,560 square feet in a square acre
There are 640 acres in a square mile
There are 5280 feet in a linear mile
The circumference of the earth around the equator is 24,902 miles

1 **An ordinary box of toothpicks contains 250 toothpicks. How many boxes would you need to pack up 3 billion tooth picks for shipping?**
3,000,000,000 divided by 250 = 12,000,000 boxes 12,000,000
Answer: 12 Million Boxes

2 **If the tractor trailers in your fleet are 48 feet long x 8 feet wide x 9 feet in height, how many trailers would you have to own to haul 3 billion tooth picks if they were packed in boxes that are 2.75 inches x 2 inches x 1 inch?**

48' x 8' x 9' = 3456 cubic feet in the trailer 3456
12"x12"x12"=1728 cubic inches in a cubic foot 1728
3456 cubic feet x 1728 cubic inches in a cubic foot = 5,971,968 cubic inches in one trailer 5,971,968
A tooth pick box is 2.75 x 2x 1 inches = 5.5 cubic inches in a toothpick box 5.5
Tooth pick boxes that fit into one tractor trailer: 5,971,968 divided by 5.5=1,085,812 1,085,812
Number of Tooth picks in one trailer: 1,085,812 x 250 271,453,000
The number of toothpick in one trailer divided into 3,000,000,000=271,453,000 11.1
Answer: You have to own 11.1 or 12 trailers to haul 3 Billion tooth picks

3 **If each seedling was planted in an area that was 4 inches square, how many seedlings would be planted in an acre?**

$12 \times 12 = 144$ sq inches in a square foot 144
 $4 \times 4 = 16$ sq inches in a 4 inch square space 16
 Divide 144 by 16 = 9 seedlings per square foot 9
 $9 \times 43,560$ sq ft in an acre = 392,040 seedlings in a sq acre 392,040

Answer: 392,040 seedlings would be growing in an acre if each seedling was planted in an area that is 4 inches square.

3b How many square miles would you need to plant 3,000,000,000 seedlings in the same nursery?

$392,040 \times 640$ acres in a square mile = 250,905,600 trees per one square mile 250,905,600
 $3,000,000,000$ (Billion) divided by 250,905,600 = approx 12 square miles of seedlings. 11.95668809

Answer: Approximately 12 square miles of land would be needed to plant 3 billion seedlings if they were planted in squares that are 4"x4" inches.

4 If each seedling had grown to the height of 6", how many times would they encircle the earth?

The circumference of the earth at the equator is 24,902 miles
 There are 5,280 feet in a mile.

$5,280 \text{ ft.} \times 2 = 10,560$ (2 seedlings a foot times 5,280 feet in a mile = 6" seedlings in a mile) 10,560

$10,560 \times 24902 = 262,965,120$ (Multiply the number of 6" seedlings in a mile by the number of miles around the circumference of the earth at the equator= the number of seedlings that will go around the earth one time.) 262,965,120

$3,000,000,000$ divided by 262,965,120= 11.41 times around the earth 11.4

Answer: 11.4 times around the earth at the equator

5 If each seedling had grown to the height of 12 inches, how many times would they encircle the earth?

One 12" seedling is 1 foot in height.

There are 5,280 feet in a mile or 5,280 seedlings per one mile.

Multiply the number of seedlings in a mile x the number of miles around the earth $5,280 \times 24,902$ 131,482,560

Divide the number of seedlings that go around the earth one time, 131,482,560 into 3 Billion ($3,000,000,000$ divided by 131,482,560) 22.8

Answer: 22.8 times around the earth

6 During reforestation projects, one seedling was planted in an area that was 6 x 6 feet square, how many seedlings would be grown in an acre?

$6 \times 6 = 36$ square feet 36

$43,560$ square feet in a acre divided by 36 = 1210 seedlings in an acre 1210

Answer: There would be 1,210 seedlings planted in one acre if they were planted in an area of soil that was 6 x 6 foot square.

6b How many seedlings would grow in a square mile?

There are 640 acres in a square mile.

1210×640 acres in a sq mile = 774,400 774,400

Answer: There would be 774,400 seedlings growing in a square mile if they were planted in an area that was 6 x 6 feet square.

7 **How many square miles would you need to plant 3 billion trees in 6x6 feet squares?**

3873.966942
3874 square
miles

3 Billion divided by 774,400 = the number of seedlings that would grow in a square mile

Answer: You would need 3,874 square miles to plant all 3 billion trees in one area if they were planted in 6' x 6' squares.

The combined size of Virginia counties :

	Square Miles
Augusta	972
Clark	177
Frederick	415
Highland	416
Page	311
Rockingham	851
Shenandoah	512
Warren	214
	3868

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