



$$\sqrt{x-y}$$

Reimagining Estimation with Fermi Problems

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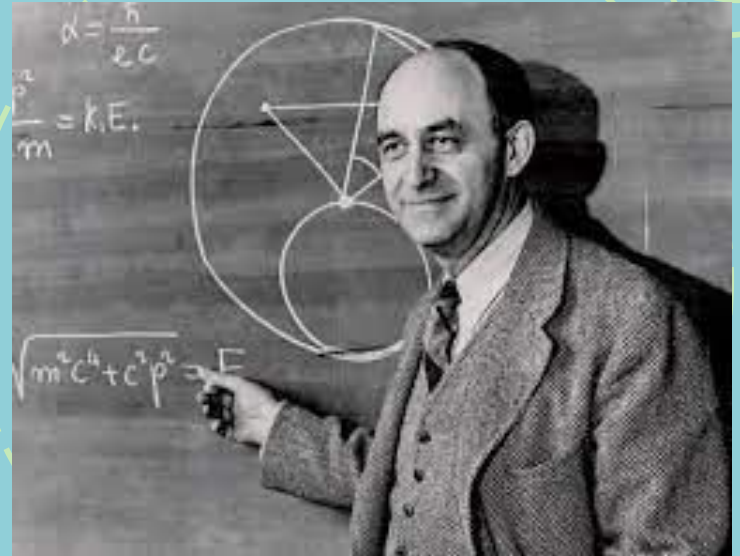
$$(x-y)^2$$



Quick Poll: Elementary, Middle, Secondary, or Post-Secondary?

Fermi Problems

- Named for Italian physicist Enrico Fermi
- A problem involving realistic estimation and order-of-magnitude calculation
- Focus on assumptions, estimation, and reasonableness





$$\sqrt{x-y}$$

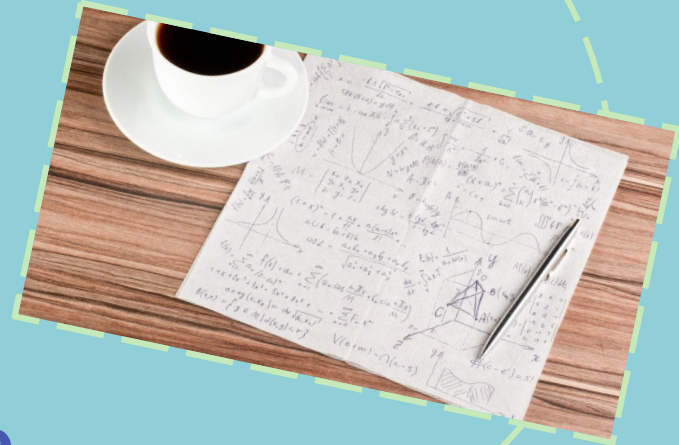


$$(x-y)^2$$

Let's Try One!

How many hot dogs can be carried on a standard stretcher?

When finished, write your own Fermi problem to share with the group.



Estimation Strategy



“Give me an estimate that is too small.”

“Give me an estimate that is too large.”

$$(x-y)^2$$

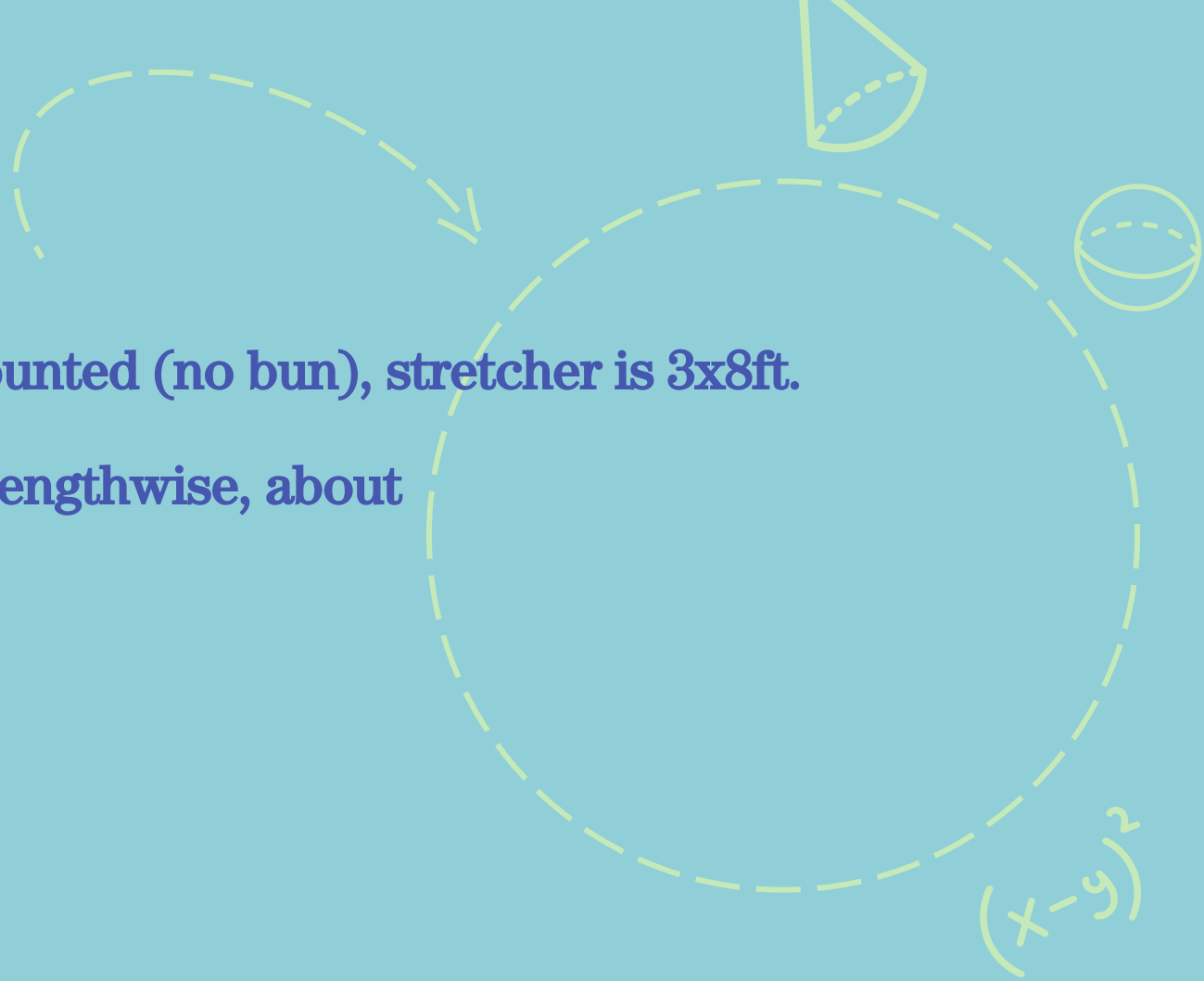
Fermi Main

Type solution here



Fermi 1

- Just hot dogs counted (no bun), stretcher is 3x8ft.
- 16 packages fit lengthwise, about



Fermi 2

If the standard stretcher is about 24 inches by 84 inches, and the hot dog is 6 inches long and 1 inch wide, then the 336 hot dogs can be carried on the standard stretcher.



$(x-y)^2$

The image features a large dashed yellow circle on a light blue background. Inside the circle, there are several yellow mathematical symbols and diagrams: a pi symbol (π) at the top, a small yellow cone with a dashed line for its hidden edge at the top right, a yellow sphere with a dashed line for its hidden equator at the middle right, and the algebraic expression $(x-y)^2$ at the bottom right. A dashed yellow arrow points from the top left towards the center of the circle.

Discussion Questions



1

What was your group's solution and how did you all arrive there?

2

How could these problems be useful in the classroom?

3

How can these questions be adjusted to meet all levels of learners/multiple grade levels?

Our Fermi Problems



Group 1:

Group 2: How many public school math teachers are there in Texas?

Group 3:

The background is a light blue color with various mathematical symbols and geometric shapes scattered around. In the top left, there are three overlapping circles labeled 'a', 'b', and 'c'. In the top right, there is a cone, a cube, and a sphere. In the middle left, there is a square root symbol containing 'x-y'. In the middle right, there is a dashed arc. In the bottom left, there is a pyramid. In the bottom center, there is the expression '(x-y)^2'. In the bottom right, there are two dashed arcs.

Thank You

Fermi Resource