1. Find the total number of stamps each student has. Draw tape diagrams with a unit size of 4 to show the number of stamps each student has. The first one has been done for you.

Dana: \[ \begin{array}{c}
\hline
4 & 4 & 4 & 4 \\
\hline
\end{array} \]

Tanisha: \[ \begin{array}{c}
\hline
4 & 4 \\
\hline
\end{array} \]

Raquel: \[ \begin{array}{c}
\hline
4 & 4 & 4 & 4 & 4 \\
\hline
\end{array} \]

Anna: \[ \begin{array}{c}
\hline
4 & 4 & 4 & 4 & 4 & 4 & 4 & 4 \\
\hline
\end{array} \]

Each \( \square \) represents 1 stamp.

2. Explain how you can create vertical tape diagrams to show this data.

"I can create vertical tape diagrams by just turning these. They would show the same data but in a different way. For example:

\[ \begin{array}{c}
\hline
4 & 4 \\
\hline
\end{array} = \begin{array}{c}
\hline
4 \\
\hline
\end{array} \]"
3. Complete the vertical tape diagrams below using the data from Problem 1.

\[ \text{Dana} \quad \text{Tanisha} \quad \text{Raquel} \quad \text{Anna} \]

\[ \text{Dana} \quad \text{Tanisha} \quad \text{Raquel} \quad \text{Anna} \]

\[ \begin{array}{cccc}
\text{4} & \text{4} & \text{4} & \text{4} \\
\text{4} & \text{4} & \text{4} & \text{4} \\
\end{array} \quad \begin{array}{cccc}
\text{4} & \text{4} & \text{4} & \text{4} \\
\text{4} & \text{4} & \text{4} & \text{4} \\
\end{array} \quad \begin{array}{cccc}
\text{8} & \text{8} & \text{8} & \text{8} \\
\end{array} \quad \begin{array}{cccc}
\text{8} & \text{8} & \text{8} & \text{8} \\
\end{array} \\
\text{Anna} \\
\text{Anna} \\
\text{Anna} \\
\text{Anna} \\
\end{array} \]

\( c. \) What is a good title for the vertical tape diagrams?

A good title might be "Number of Stamps Collected".

\( d. \) How many total units of 4 are in the vertical tape diagrams in Problem 3(a)?

There are 20 units of 4 in Problem 3(a).

\( e. \) How many total units of 8 are in the vertical tape diagrams in Problem 3(b)?

There are 10 units of 8 in Problem 3(b).

\( f. \) Compare your answers to Parts (d) and (e). Why does the number of units change?

Units of 4 are smaller than units of 8, so it takes more of them.

\( g. \) Mattaeus looks at the vertical tape diagrams in 3(b) and finds the total number of Anna and Raquel's stamps by writing the equation, \( 7 \times 8 = 56 \). Explain his thinking.

He was thinking that Raquel has 3 units of 8 and Anna has 4 units of 8. \( 3 + 4 = 7 \), which means there are 7 units of 8. This is why he wrote \( 7 \times 8 = 56 \).