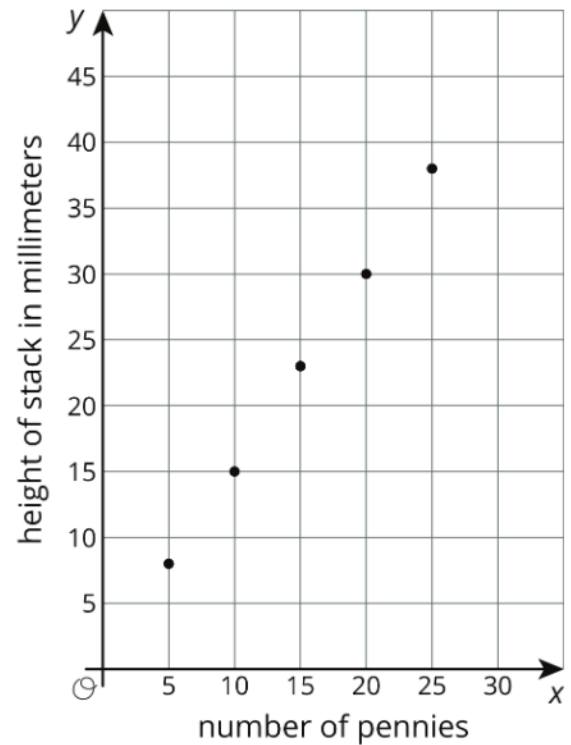


## Lesson 1 Summary

When we measure the values for two related quantities, plotting the measurements in the coordinate plane can help us decide if it makes sense to model them with a proportional relationship. If the points are close to a line through  $(0, 0)$ , then a proportional relationship is a good model. For example, here is a graph of the values for the height, measured in millimeters, of different numbers of pennies placed in a stack.

Because the points are close to a line through  $(0, 0)$ , the height of the stack of pennies appears to be proportional to the number of pennies in a stack. This makes sense because we can see that the heights of the pennies only vary a little bit.



An additional way to investigate whether or not a relationship is proportional is by making a table. Here is some data for the weight of different numbers of pennies in grams, along with the corresponding number of grams per penny.

| number of pennies | grams | grams per penny |
|-------------------|-------|-----------------|
| 1                 | 3.1   | 3.1             |
| 2                 | 5.6   | 2.8             |
| 5                 | 13.1  | 2.6             |
| 10                | 25.6  | 2.6             |

Though we might expect this relationship to be proportional, the quotients are not very close to one another. In fact, the metal in pennies changed in 1982, and older pennies are heavier. This explains why the weight per penny for different numbers of pennies are so different!