**How Many HOUSES?**



Six carpenters can build six houses in six days.

Twelve apprentices can build 12 houses in 12 days.

**QUESTIONS:**

1) How many houses can 12 carpenters and 12 apprentices build in 12 days?

2) How many days would it take 3 apprentices to build 12 houses?

3) How many days would it take 12 carpenters to build 36 houses?

4) How many houses can 3 carpenters and 6 apprentices build in 24 days?

**Remember to:**

* Represent your work in as many ways as possible!
* Model your solution visually and/or algebraically
* Be prepared to share your solution strategy with your classmates!
* Be prepared to question the work of your classmates!
* Be precise ☺

Possible solution strategies:

1) - As stated in the problem, the 12 apprentices can build 12 houses in the 12 days.

- Also stated is that 6 carpenters can build 6 houses in 6 days, so then it follows that 12 carpenters would be able to build 12 houses in 6 days (double the number of carpenters, and you’ll get double the number of houses in the same number of days).

-Hence, in 12 days, 12 carpenters could build 24 houses.

So, the total number of houses in 12 days would be:

**12** + **24** = **36**

**# of houses built by** **# of houses built by**  **TOTAL**

**the apprentices** **the carpenters**

2) Think of 12 apprentices as a “team.” That team can build 12 houses in twelve days. If you cut the team in half, it would take them twice as long to build the same number of houses. Therefore, building 12 houses would now take them 24 days. Following the same logic, if there are only 3 apprentices working, that is one-fourth of the team, so doing the same amount of work will take them ***fou***r ***times*** as long, so for them to build 12 houses, it will take them **48 days**.

3) Again, if a “team” consisting of 6 carpenters can build 6 houses in 6 days, then if we have ***two*** teams (12 carpenters), they would be able to build twice as many houses in the same amount of time. *So, every 6 days our 2 teams of carpenters (12 carpenters) could build 12 houses.* Double the number of days to 12, and our teams of carpenters could now build 24 houses. Finally, 6 days after that, our teams would have built a total of 36 houses. Our carpenters have now been working for **18 straight days** (3 groups of 6 days).

6 carpenters 6 houses 6 days (Info given in the problem)

12 carpenters 12 houses 6 days

24 houses 12 days

36 houses 18 days

4) FIRST we will consider the carpenters…

6 carpenters 6 houses 6 days (Given info)

3 carpenters 3 houses 6 days

x 4 x 4

SO…

3 carpenters 12 houses 24 days

Now… on to the apprentices…

12 apprentices 12 houses 12 days (Given info)

6 apprentices 6 houses 12 days

x 2 x 2

SO… 6 apprentices 12 houses 24 days

Therefore, in 24 days there would be a total of **24 houses built.**

**12 + 12 = 24**

**# of houses built by 3 # of houses built by 6 TOTAL**

**carpenters in 24 days apprentices in 24 days HOUSES**