Name _____ Date _____

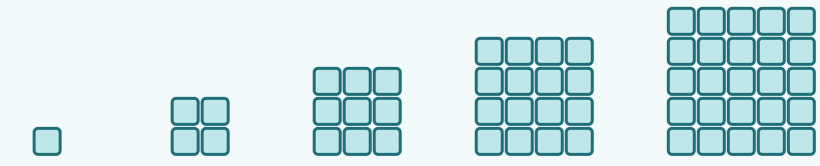
# Square facts

Multiply a number by itself to make a square number.

## 1 Learn



4 rows of 4 make a square: 4 × 4 = 16. We write this as **$4^2$** and say **"four squared"**. So 16 is a **square number**.



**$1^2 = 1$** **$2^2 = 4$** **$3^2 = 9$** **$4^2 = 16$** **$5^2 = 25$**

**Example: work out $7^2$**

$7^2$ means 7 × 7, a square with 7 in each row and 7 rows.

7 × 7 = **49**, so $7^2 = 49$, and 49 is a square number.

**Example: is 36 a square number?**

Look for a number times itself.

6 × 6 = 36, so **yes**: $36 = 6^2$.

**Flip's tip:** the little ² means "times itself". $7^2$ is 7 × 7 = 49. It is **not** 7 × 2 = 14.

**Warm up:** work these out.

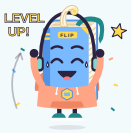
| | | | | |
|---|---|---|---|---|
| $3^2 =$ ☐ | $6^2 =$ ☐ | $10^2 =$ ☐ | $1^2 =$ ☐ | $9^2 =$ ☐ |

**Grown-ups:** ask your child to say each one as a times fact: "6 squared is 6 times 6, which is 36". Drawing a quick dot square helps if they get stuck.

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## 2 Try it together

a child and a grown-up, about 10 minutes




### Square patio

**You need:** about 25 small things that are all alike (coins, buttons, square crackers or sticky notes) and a table to work on.

1. Make the smallest square patio: **1** thing on its own.
2. Grow it into a **2 by 2** square. How many things now? How many did you add?
3. Grow it to 3 by 3, then 4 by 4, then 5 by 5. Fill in the table each time.
4. Look at the **added** column. What pattern can you see? Use it to predict a 6 by 6 patio without building it.

| Side length | Number sentence | How many in total? | How many did you add? |
|---|---|---|---|
| 1 | | | – |
| 2 | 2 × 2 | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |

**Grown-ups:** the numbers added each time are odd numbers that go up by 2. Ask: "Why does the patio need one more row and one more column, plus a corner?"

## 3 Practise

**A.** Draw a ring round every **square number**.

**14 16 18 24 36 50 64 80 81 90 100 121**

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**B.** Finish the table of square numbers.

| n | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $n^2$ | 1 | | 9 | | 25 | | 49 | | 81 | | 121 | |

**C.** Work backwards. Which number has been squared?

$\square^2 = 49$ $\square^2 = 100$ $\square^2 = 144$ $\square^2 = 9$

**D.** Solve these.

A square garden is **6 m** long on each side. How many 1 m square paving slabs cover it?

_____ slabs

I am a square number. I am more than 40 and less than 60. What am I?

_____

$3^2 + 4^2 =$ _____
Is the answer a square number? Which one?

_____

## Challenge

Sam says, "$7^2 = 14$." Is he right? What mistake has he made?

Draw $7^2$ as a square of dots if it helps.

## I can... Tick when you can.

- ☐ say what the little ² means
- ☐ work out square numbers up to $12^2$
- ☐ spot a square number