

Properties of Number

Here are some examples of activities, games or puzzles which can be used to support mathematics learning.

These examples are taken from the properties of number packs. There are three packs in this collection. The mathematical demand increases as you work through the packs. The complete packs can be downloaded at <https://www.stem.org.uk/rxze2>

Answers to cards can be found at <https://www.stem.org.uk/rxxo5>

You will need a dice, red counters and blue counters

Lines

— a game for 2 players

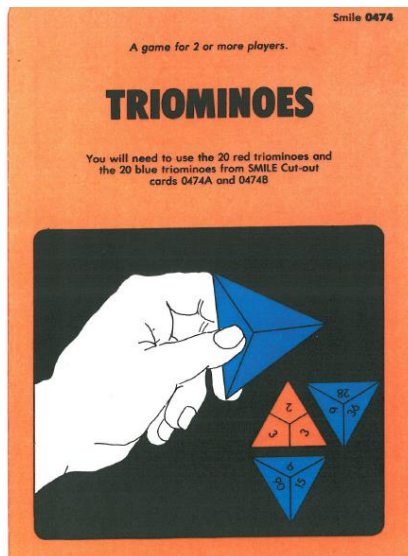
1. Each player chooses a colour.
2. Take turns to roll the dice.
3. Cover a multiple of your score if you can.
Only one counter on each square!

Example:
With you could cover 4, or 8, or 12, ...

4. The winner is the first person to cover 4 numbers in a line.

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1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36



RULES

1. Share out the triominoes.
2. Take turns to place a triomino on the table.
3. Each red triomino must be placed next to a blue one (and vice versa), so that the **product** of 2 red numbers is equal to a blue number — see facing page.
4. Any player who cannot go misses that turn.
5. The winner is the first player to use up all his triominoes.



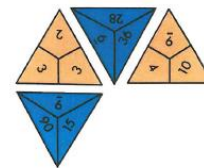
The first four moves of a new game:



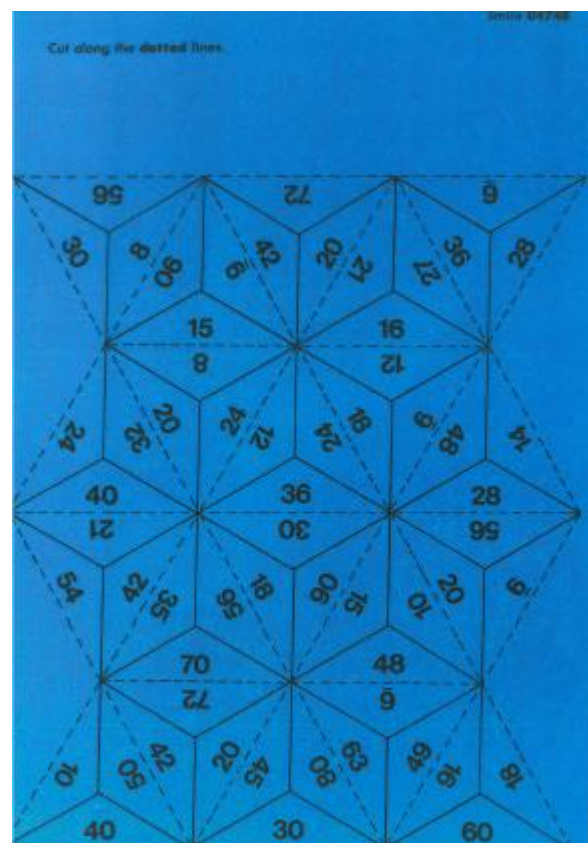
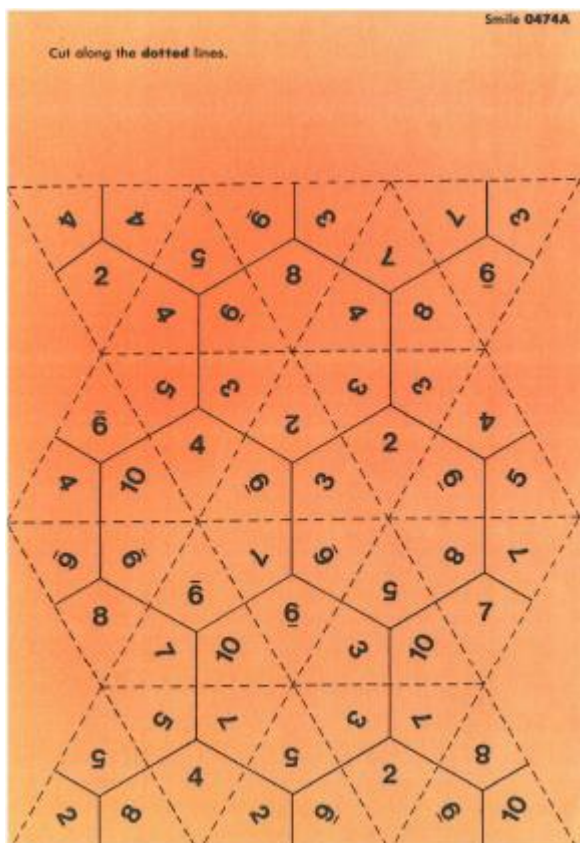
$$(6 = 2 \times 3)$$



$$(9 \times 4 = 36)$$



$$(9 = 3 \times 3)$$

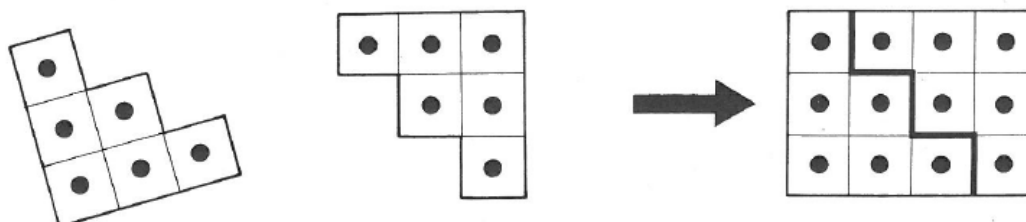


Triangle Numbers 2

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When you add a triangle number to itself you get a rectangle number.

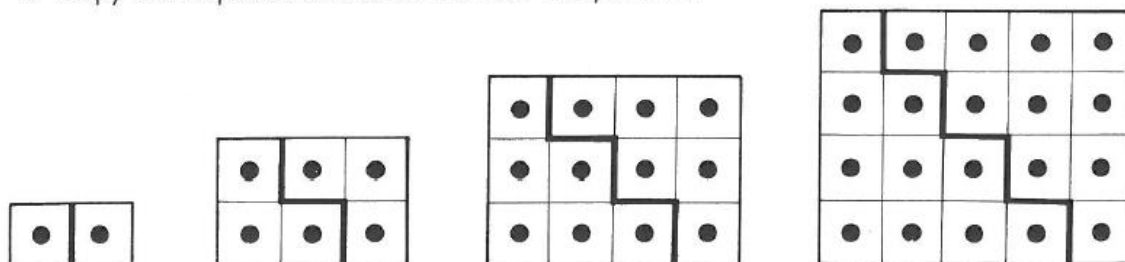
For example, with the 3rd triangle number:



$$2 \times 3\text{rd triangle number} = 3 \times 4 = 12$$

$$\text{So, } 3\text{rd triangle number} = \frac{1}{2} (3 \times 4) = 6$$

1. Copy this sequence and draw the next two patterns.



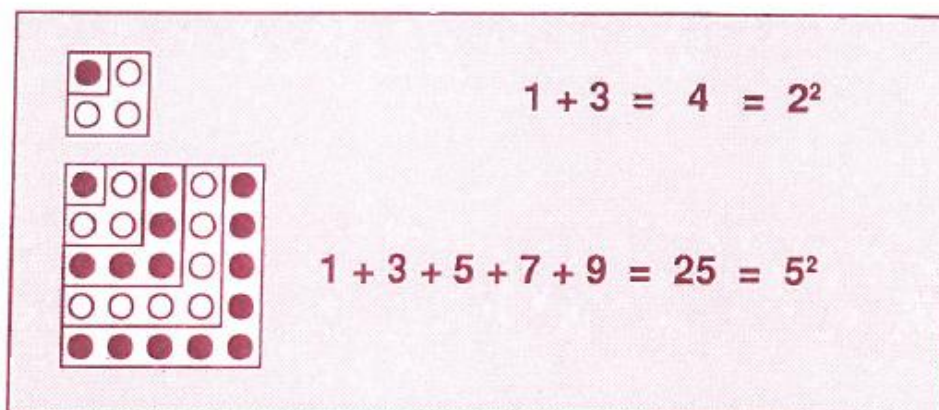
2. Use your drawings to complete this table.

- 1st triangle number is $\frac{1}{2} (1 \times 2) = 1$
- 2nd triangle number is $\frac{1}{2} (2 \times 3) = 3$
- 3rd triangle number is $\frac{1}{2} (3 \times 4) = 6$
- 4th triangle number is
- 5th triangle number is
- What is the 10th triangle number?

Do your answers agree with those you got for Triangle Numbers 1?

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Summing the Odds



Investigate some more square number patterns like this.

Explain how you can work out the sum of the first 25 **odd** numbers.

Can you make this into a general rule?