SD36/STA virtual Focus Day

Friday, February 25th

A NEW HOPE: Positive solutions for teaching in a changing world.

Workshops include climate change, anti-racism, inclusion, and Indigenous education as well as curriculum supports for Math, Science and Literacy.

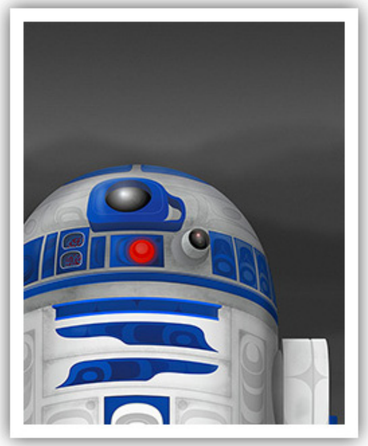
Key note speaker Len Pierre of the Katzie First Nation will be presenting "Decolonizing Education and Institutionalizing Cultural Safety."

If You Only Knew The Power of Visualizing:

A New Hope for Math Class

Ally

Andy Emerson (2018)



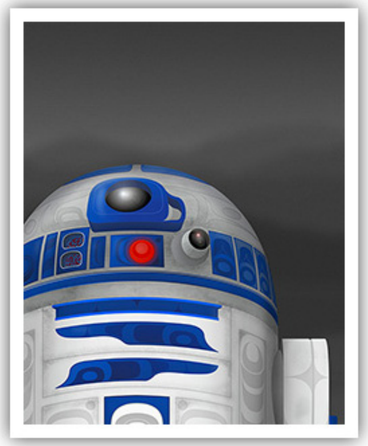
I belong to the K'ómoks First Nation and we are deep into the British Columbia treaty process. I truly have mixed feelings about our involvement in this. By choosing to engage in the process, we enter a world of consultants and negotiators and other strange, scary and wonderful creatures. We partake in a world of borrowing and debt; of meetings and fights. We enter without knowing whether we are journeying into the dark side or are on a path towards the light.

What I do know is that under the treaty process, our community has begun to fracture. Our very future as a people is at stake. Will treaty define who we are or will our culture do that? Will treaty lead us to form a "Treaty Empire" or a "Treaty Rebellion"?

When we look around us, we see plenty of people that are

form a "Treaty Empire" or a "Treaty Rebellion"?

When we look around us, we see plenty of people that are opposed to Indigenous peoples taking up their rights. They believe that we "get too much from the government already" or that we're always "looking for handouts". They believe that by simply saying that we're now on an "equal playing field" that somehow we are. We are not…and the modern Treaty system makes sure of that!



What Indigenous people need are allies—individuals who will use their positions of privilege to speak up for Indigenous peoples. Perhaps more importantly, we also need them to listen to what we have to say and not presume that their positions of privilege or authority somehow negate our voice. Indigenous peoples value our allies from all cultures and walks of life and encourage these friends to walk (or roll) together with us into the future…

Chris Hunter

K-12 Numeracy Helping Teacher

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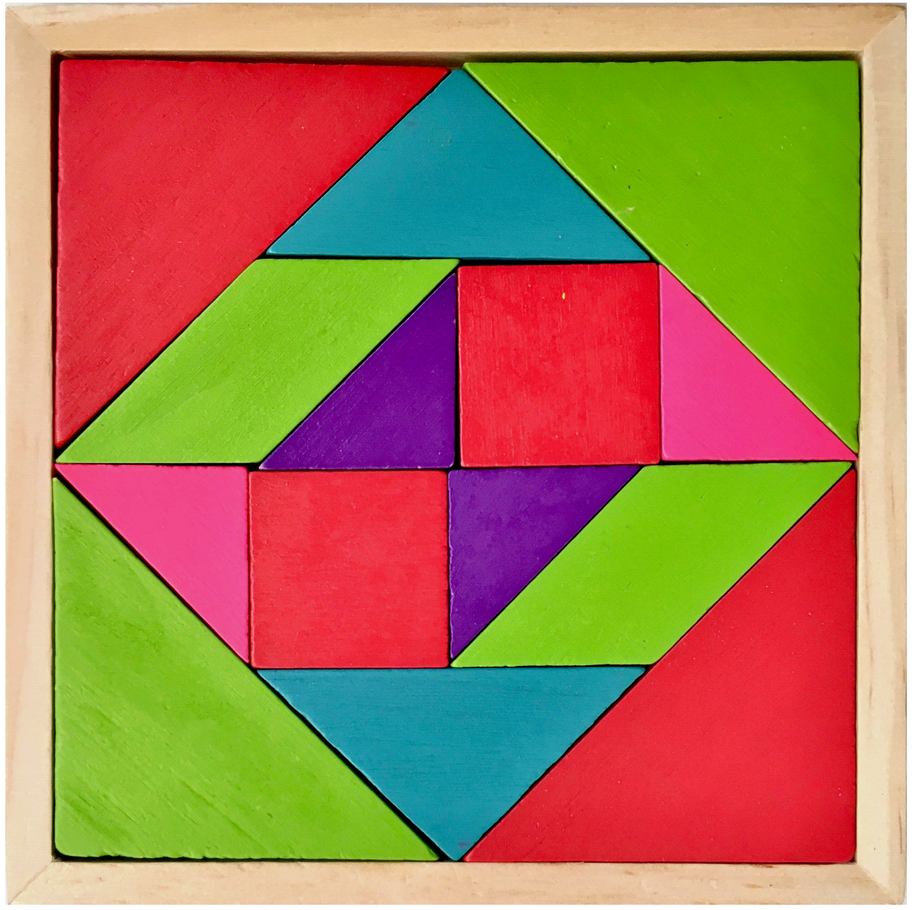
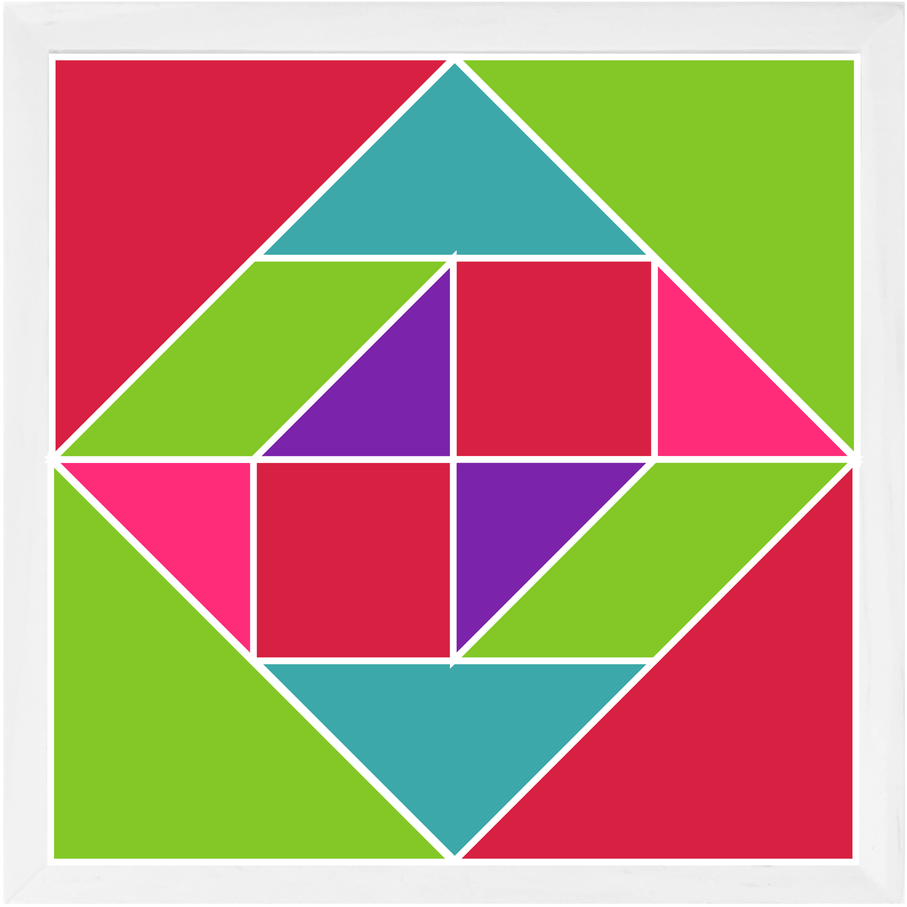
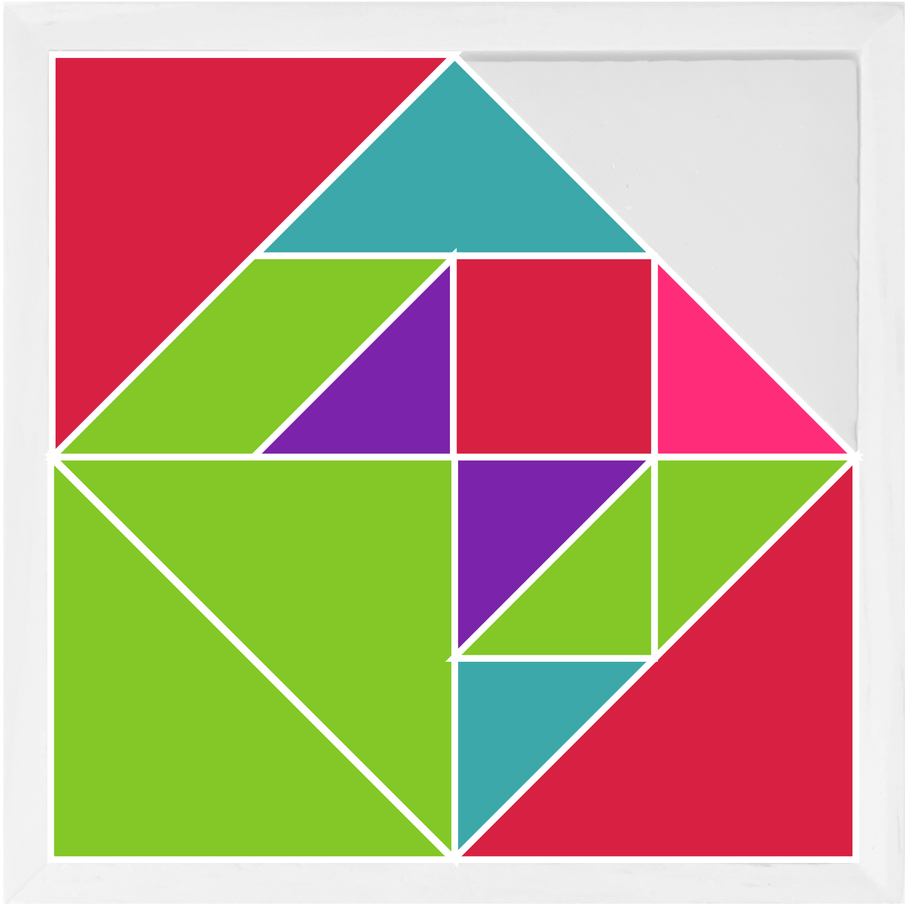
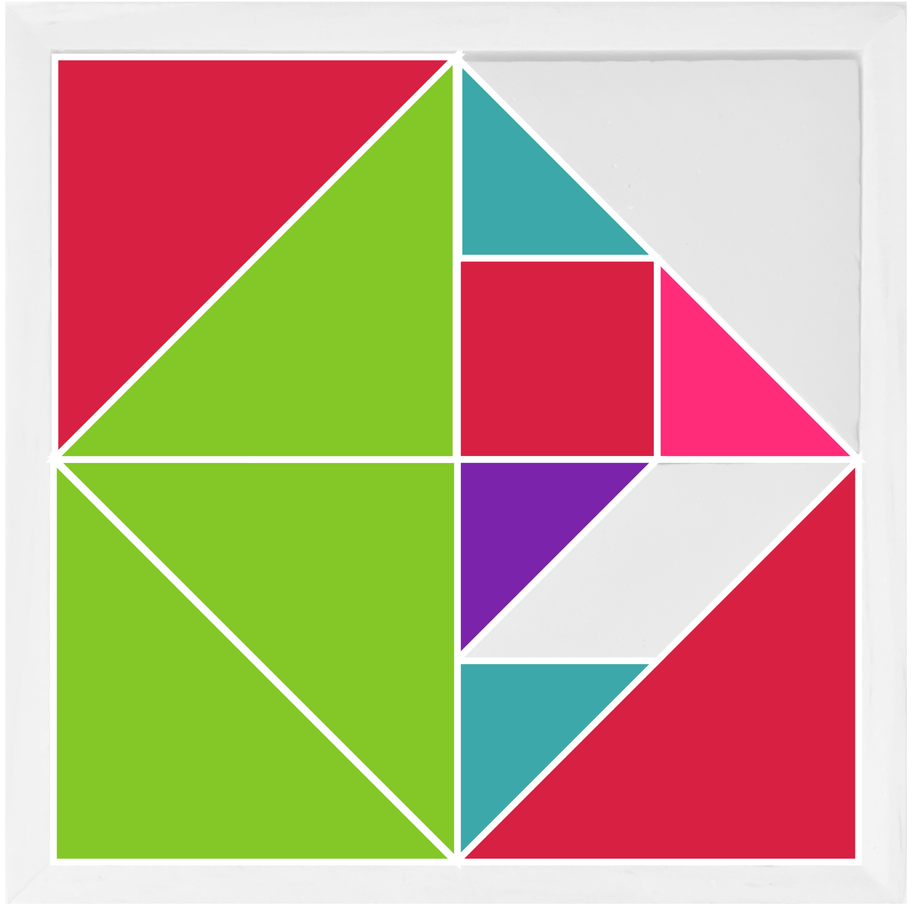
Twitter: @ChrisHunter36

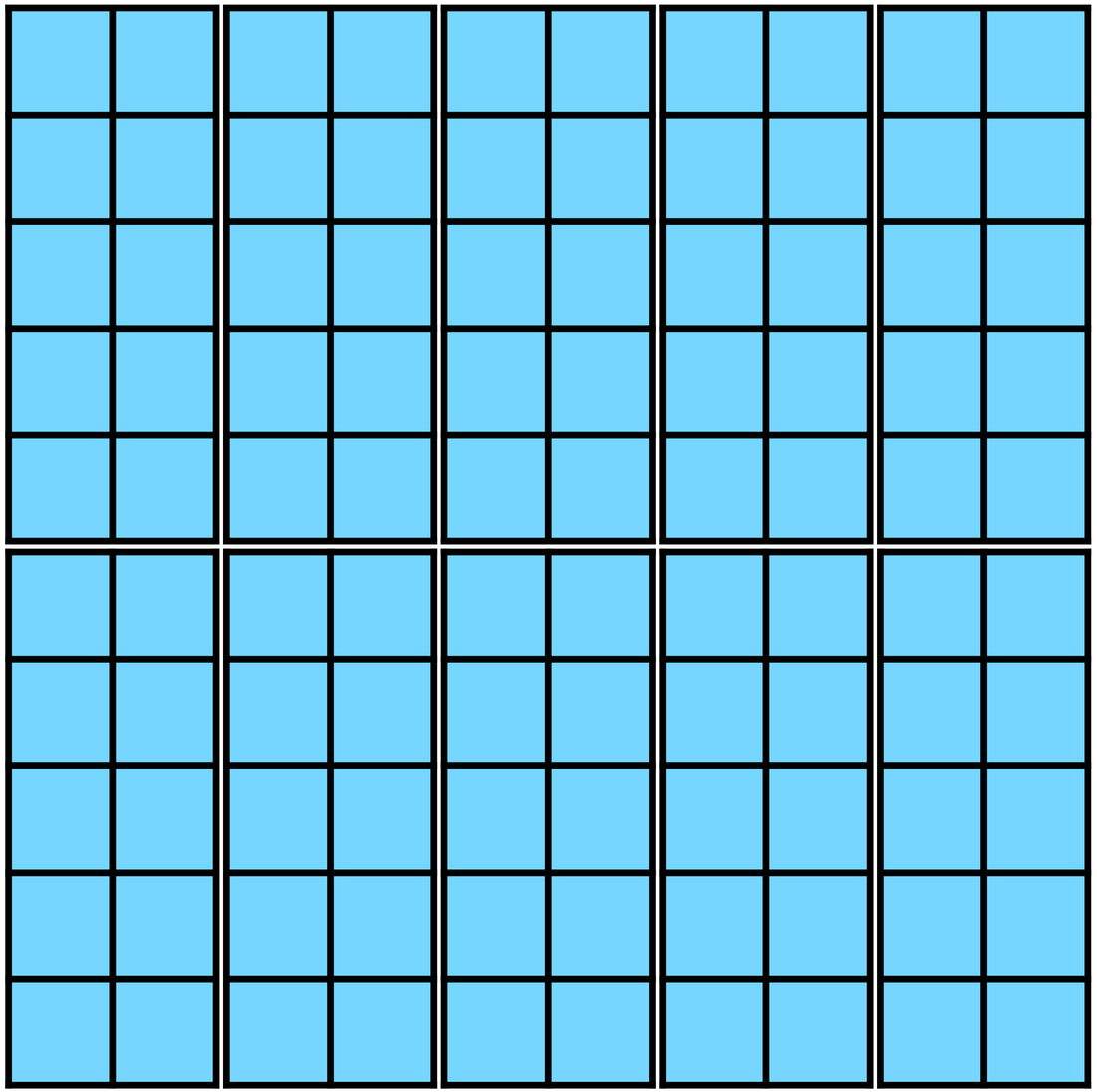
blog: chrishunter.ca

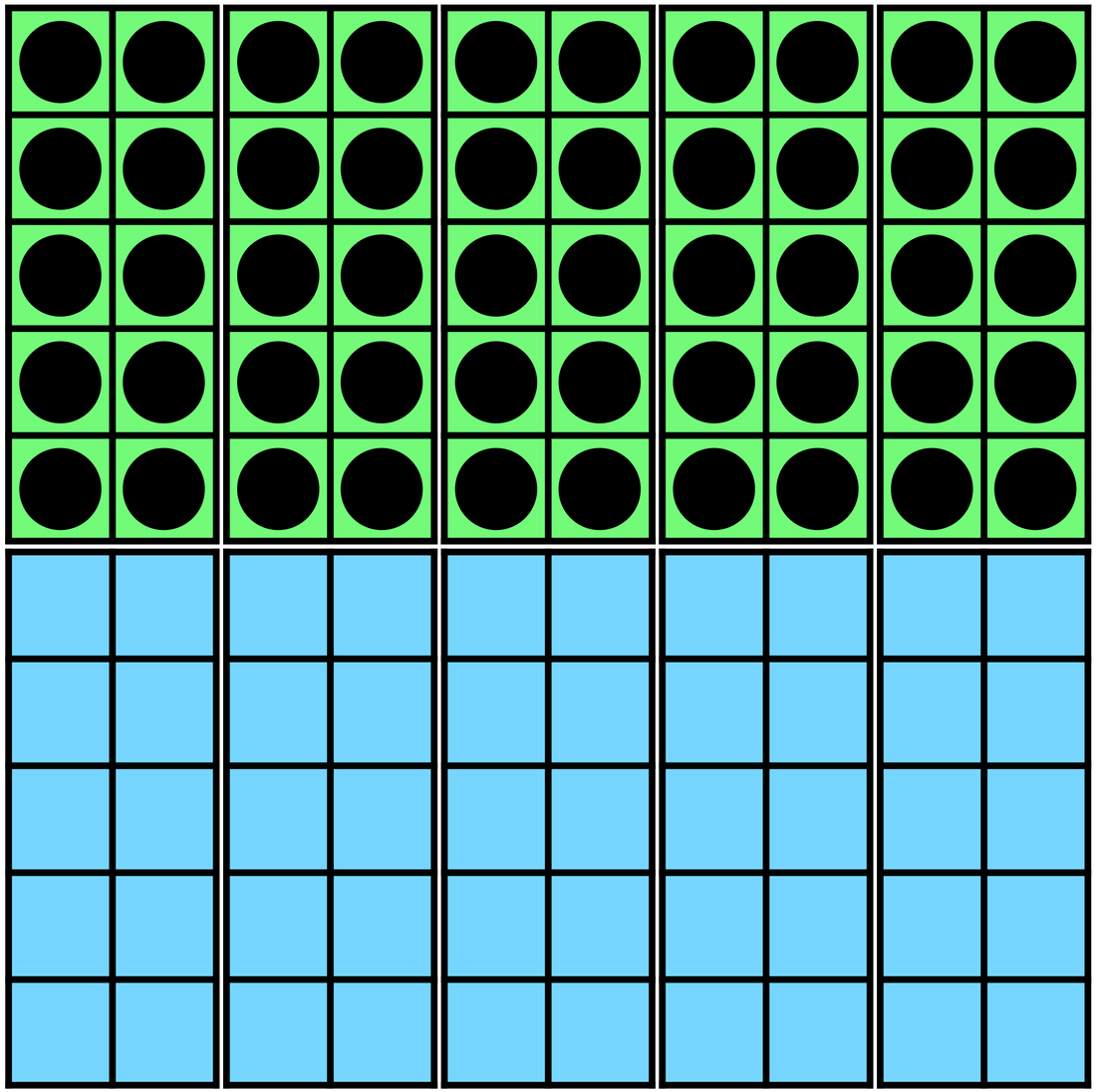






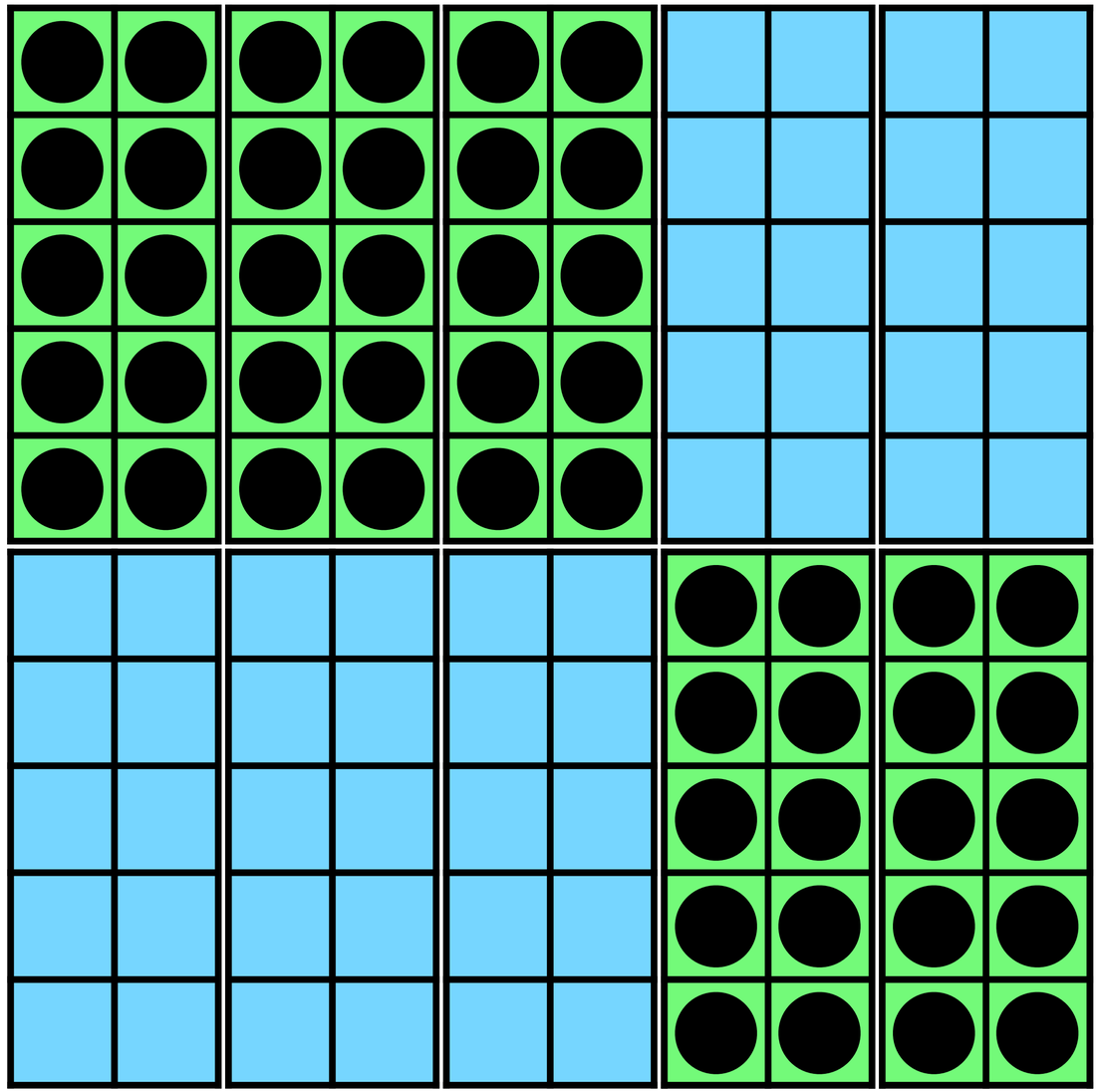






$$\frac{5}{10} = 0.5$$

$$\frac{50}{100} = 0.50$$



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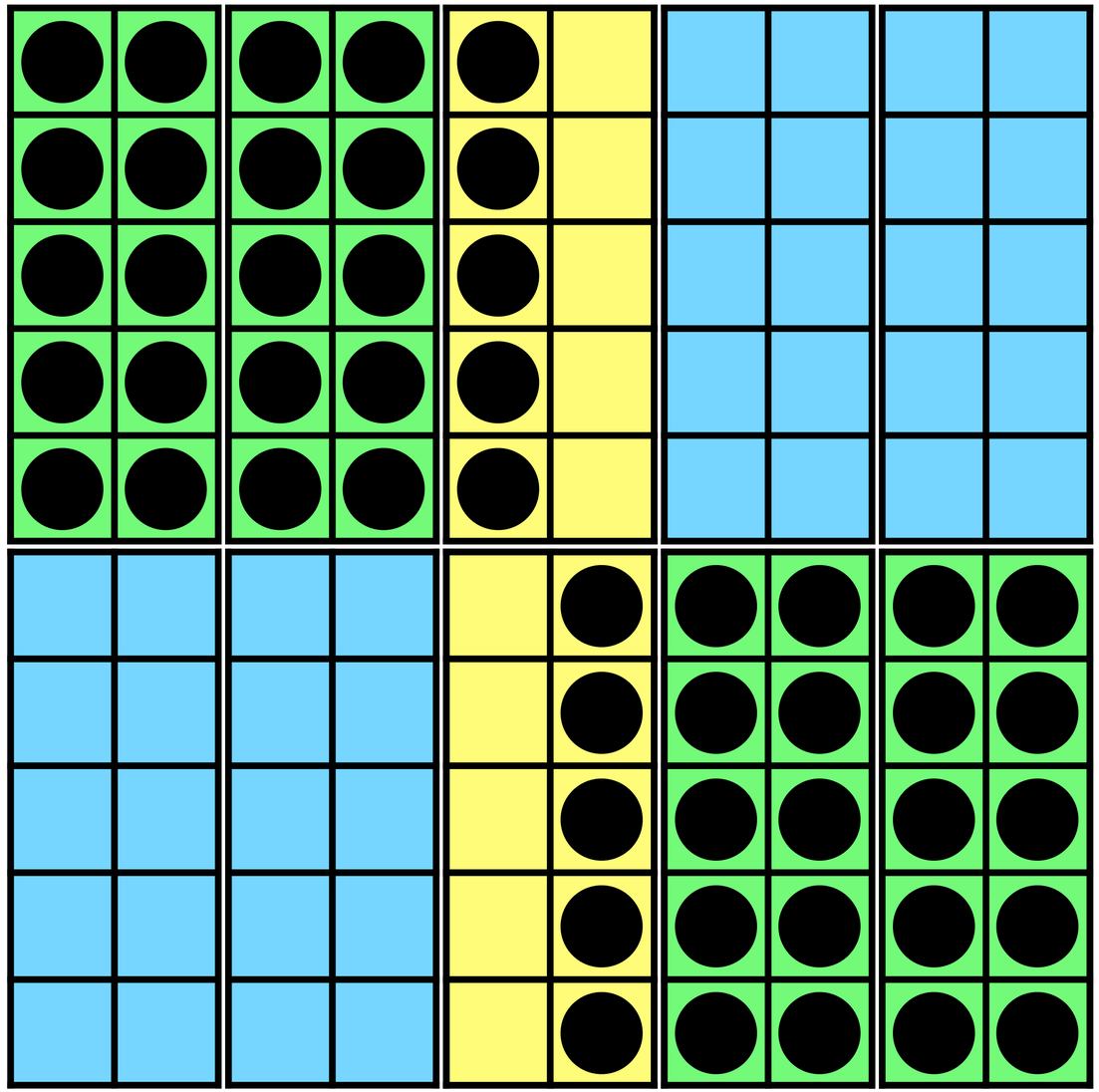
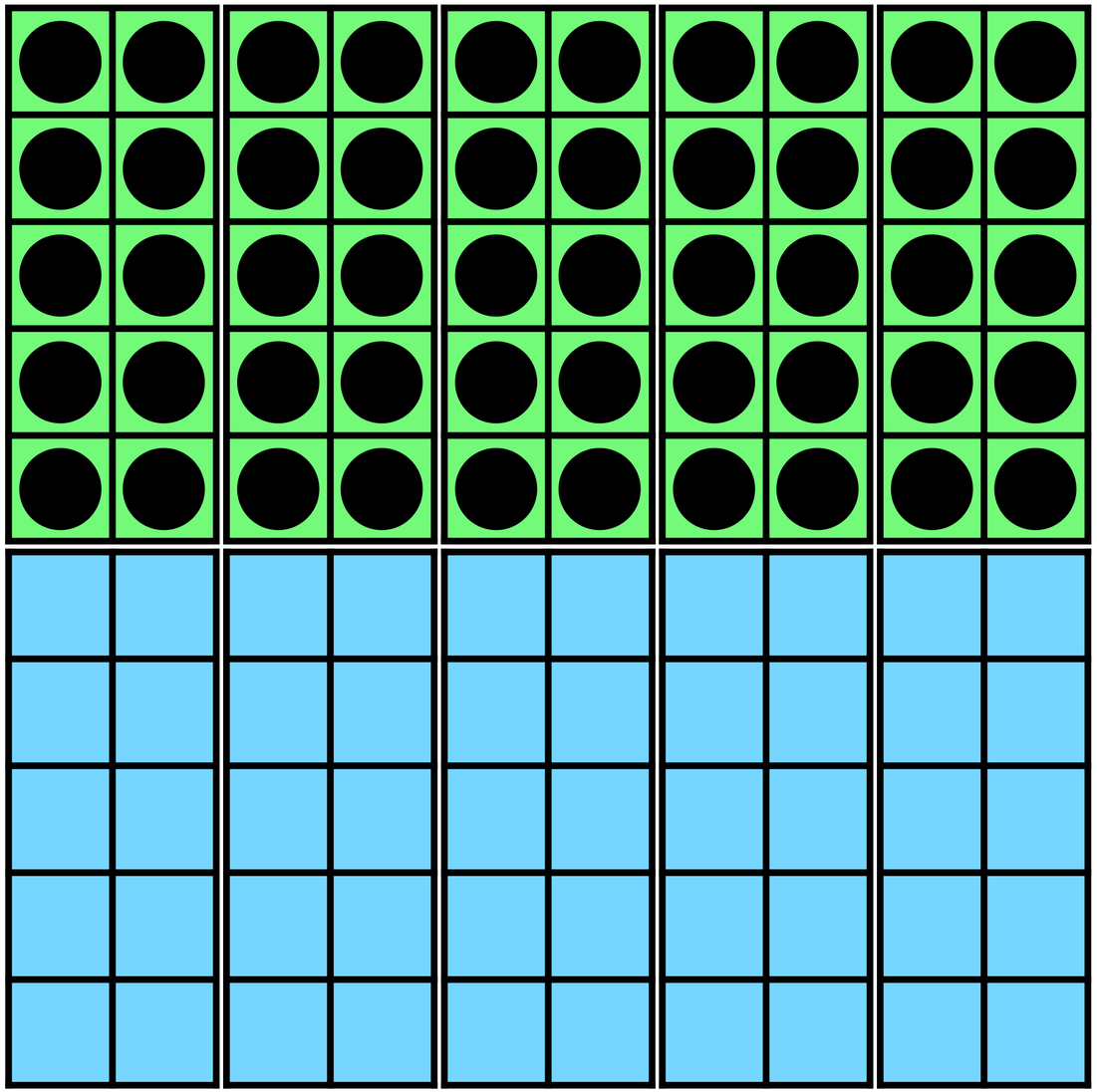


$$\frac{5}{10} = 0.5$$

$$\frac{50}{100} = 0.50$$

$$\frac{2}{4} = 2 \times 0.25$$

$$\frac{10}{20} = 10 \times 0.05$$



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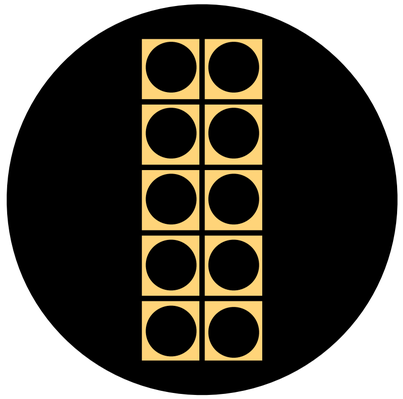

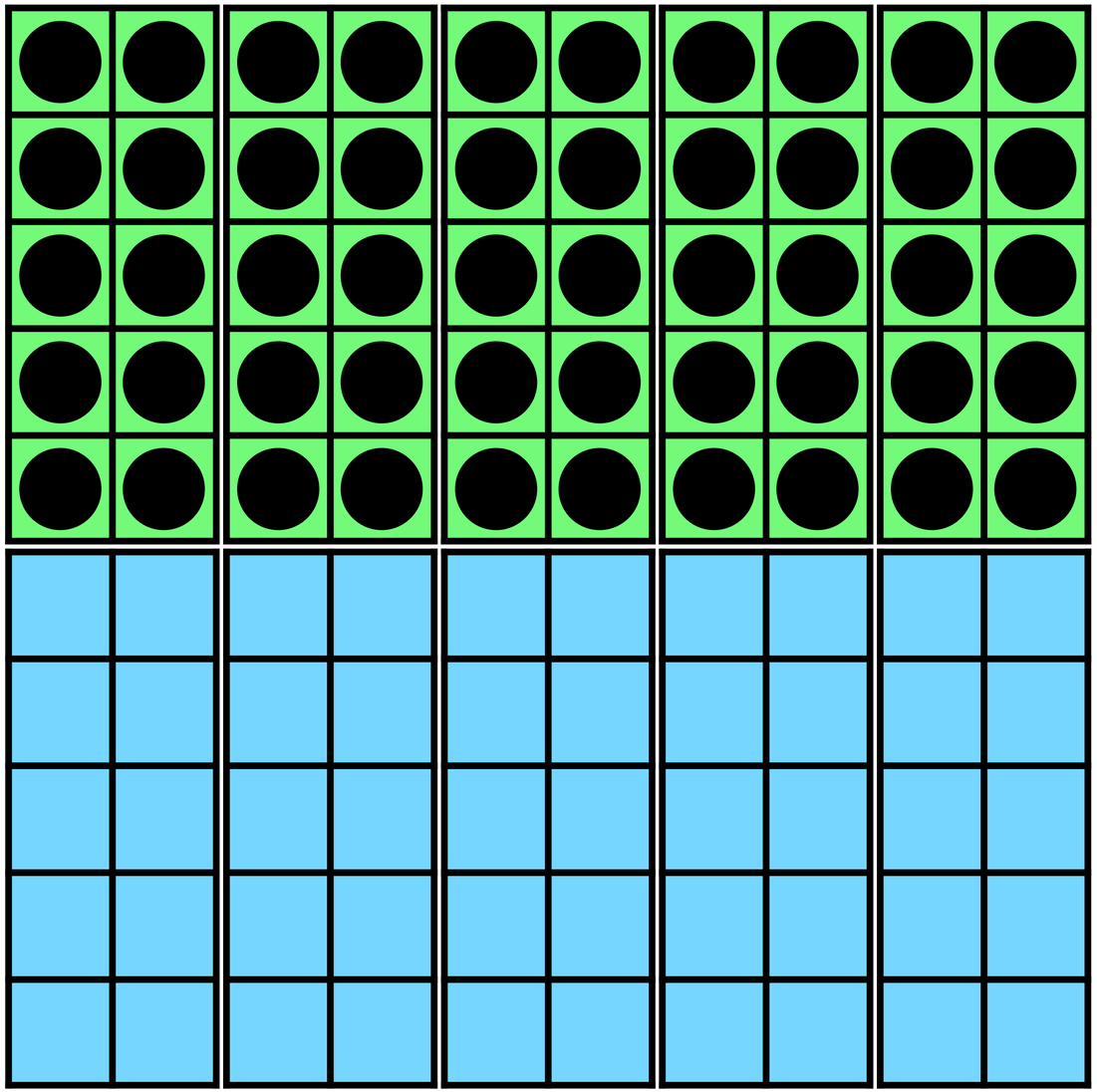

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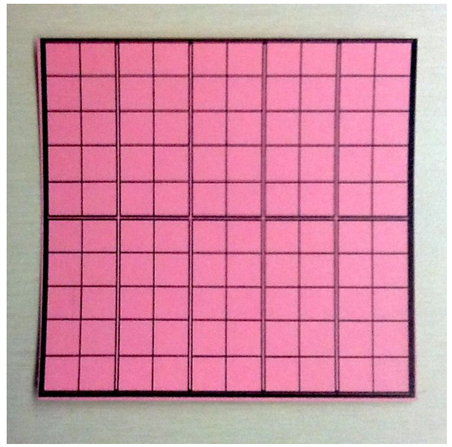
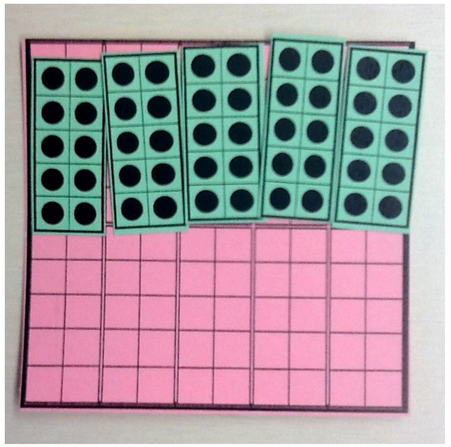
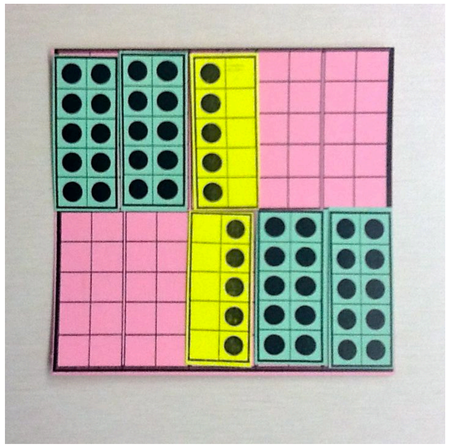
$$\frac{2}{4} = 2 \times 0.25$$

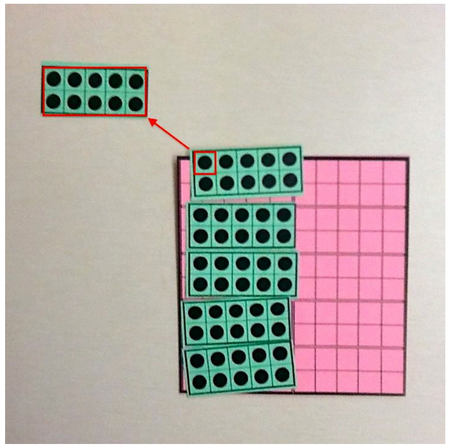
$$\frac{10}{20} = 10 \times 0.05$$

$$\frac{500}{1000} = 0.500$$





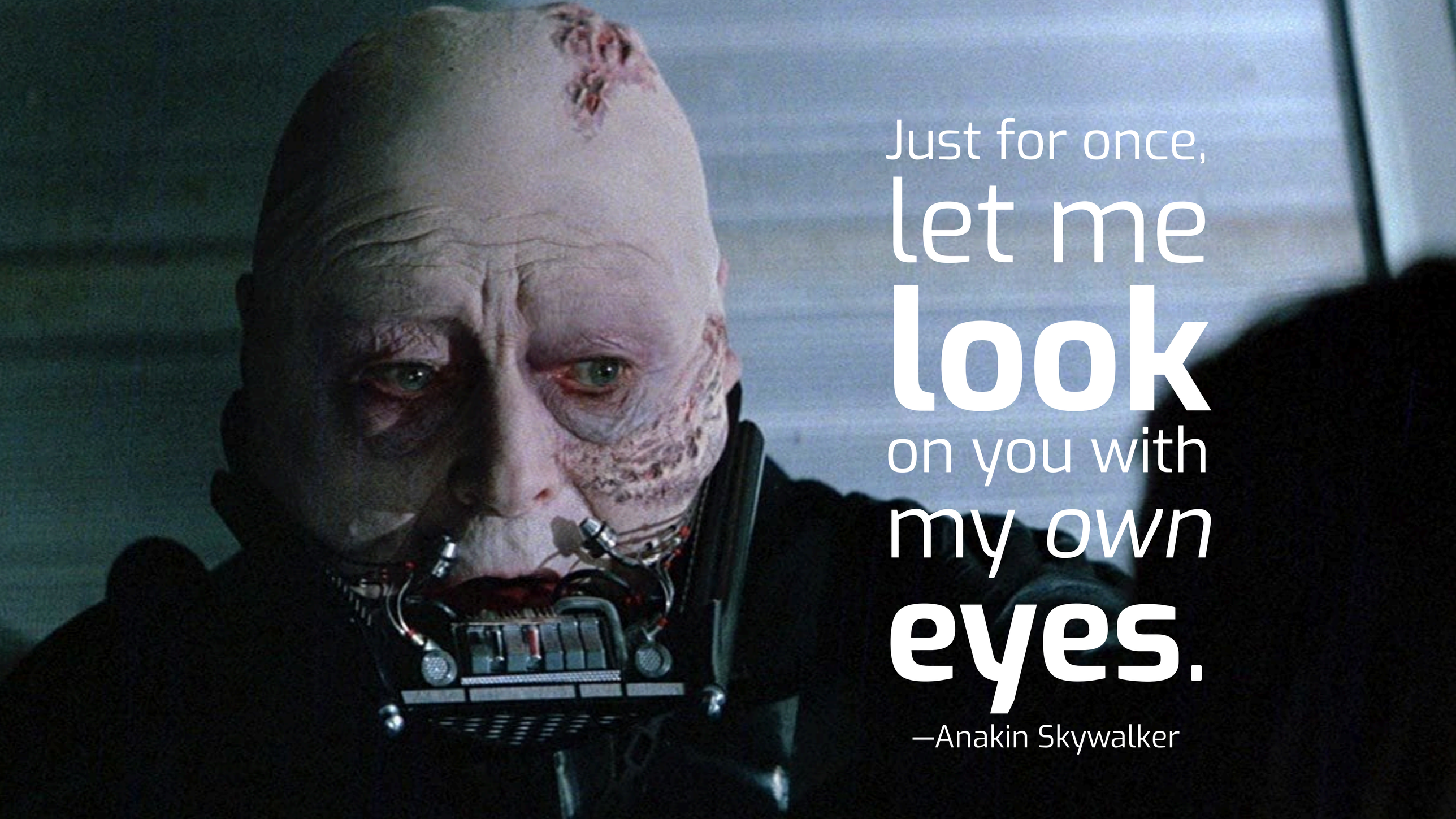




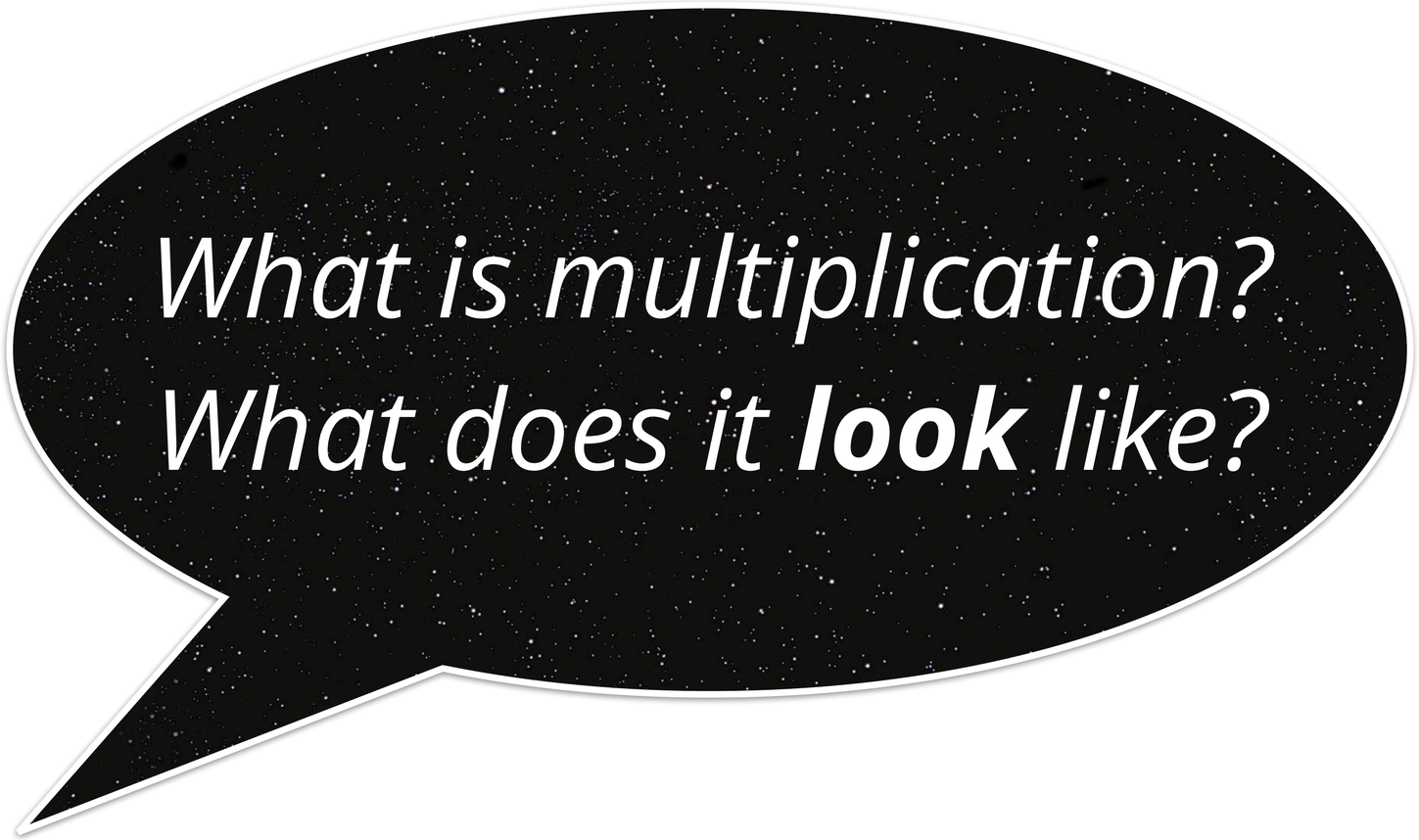

Truly
wonderful,
the mind of
a child is.
—Yoda

Visualization (WNCP) is the process of **thinking in images** to compose, decompose, or transform mathematical concepts.

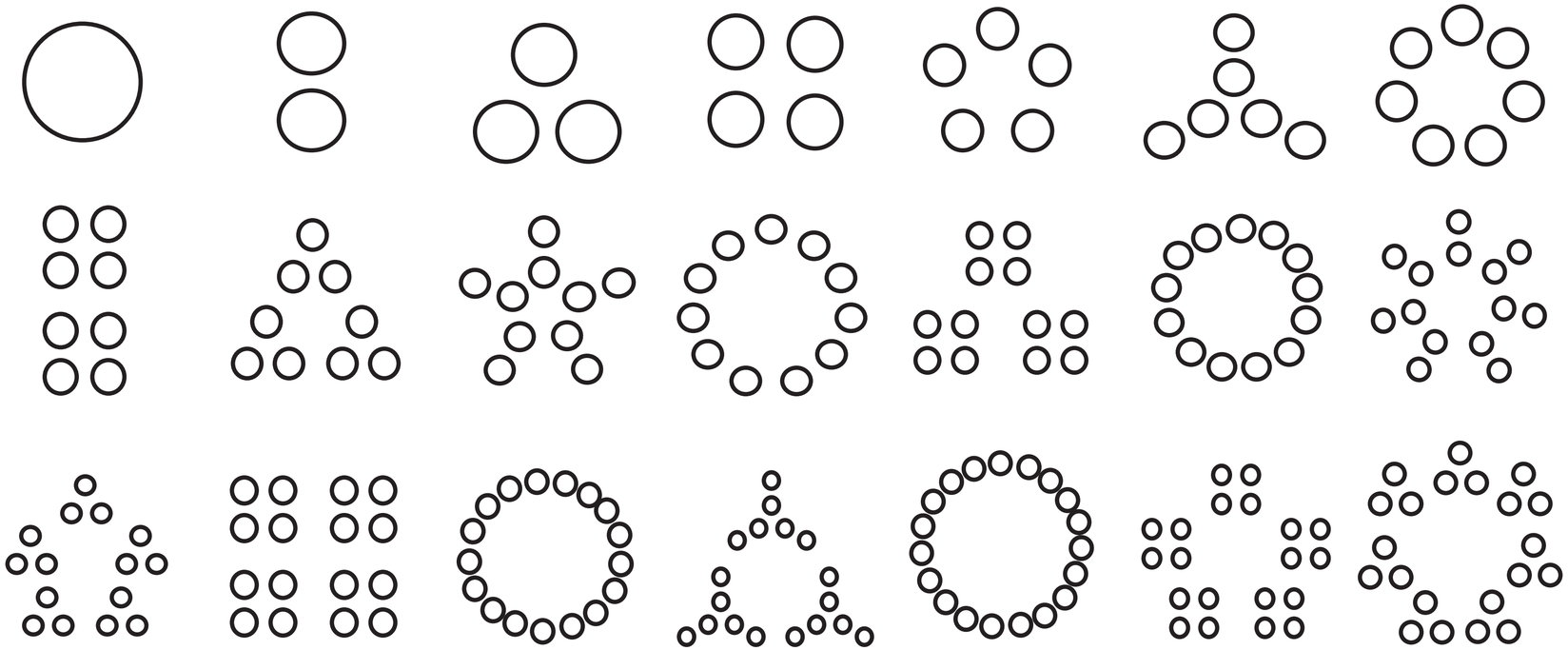
Van de Walle et al., 2018, p. 7


Just for once,
let me
look
on you with
my *own*
eyes.
—Anakin Skywalker


These aren't
the droids
you're
looking
for.
—Obi-Wan Kenobi

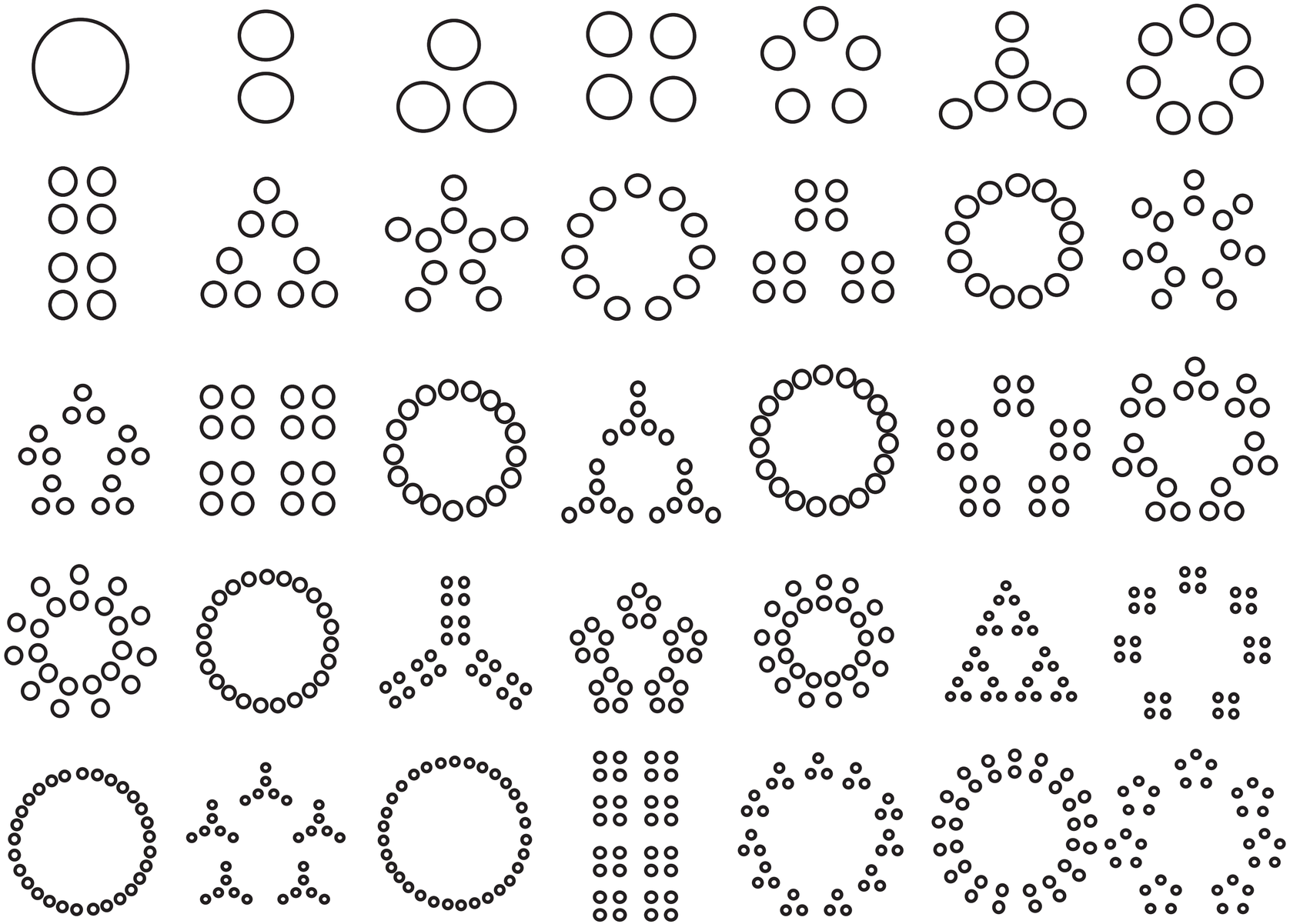

What is multiplication?
*What does it **look** like?*

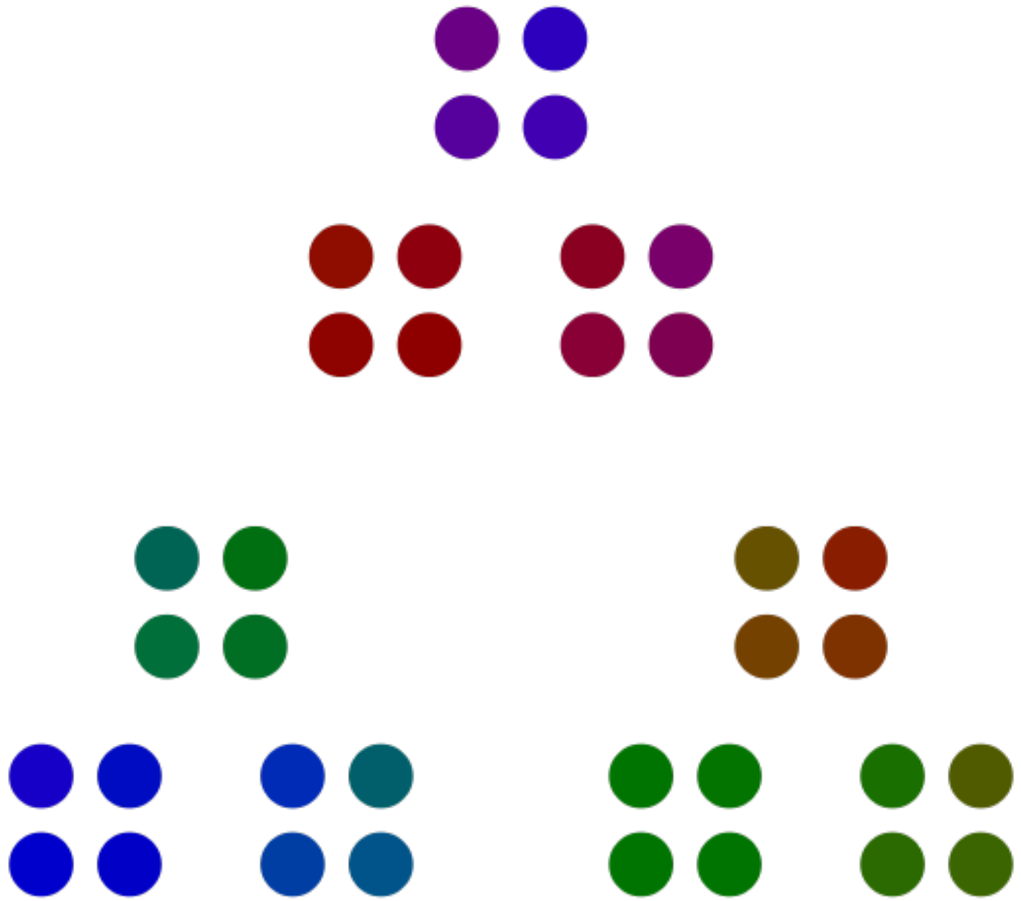
What do you **see**?



Look for patterns.

youcubed®





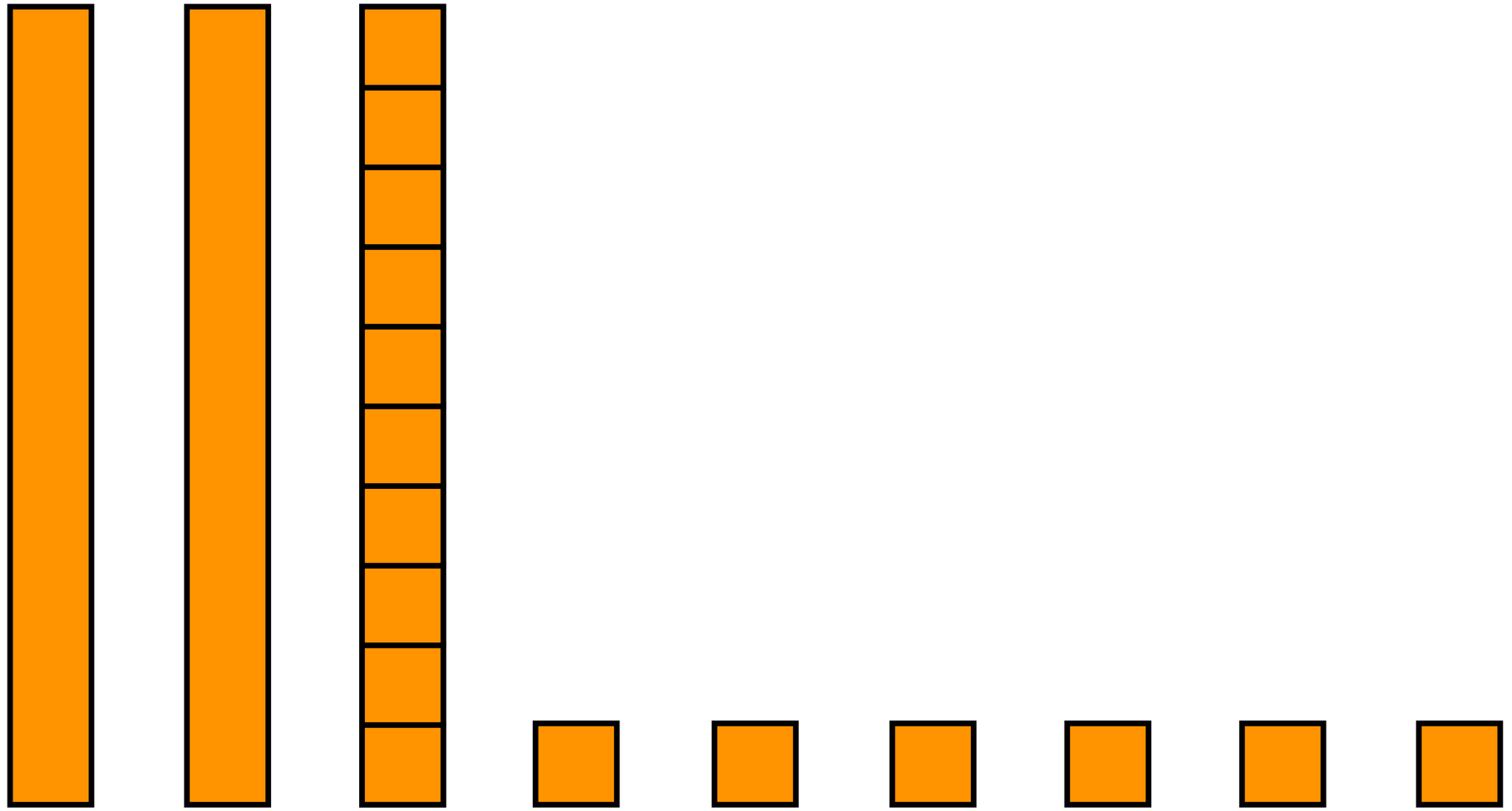
$$36 = 3 \times 3 \times 2 \times 2$$

“Using (…) **different representations** is like examining the concept through a variety of lenses, with each lens providing a **different perspective** that makes the picture (concept) richer and deeper.”

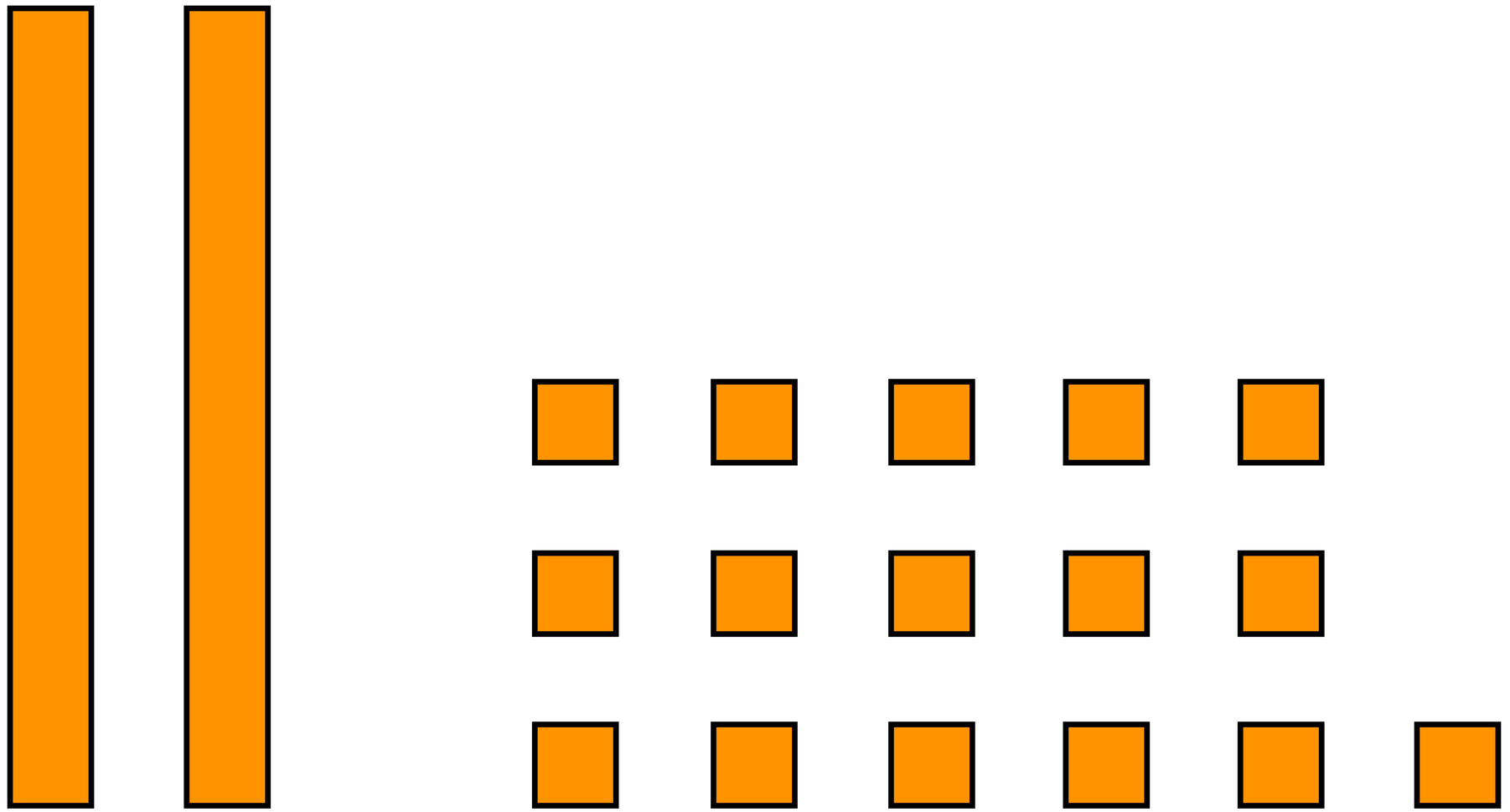
Tripathi, 2008, p. 439


Many of the
truths
we cling to
depend greatly on
our own
point of
view.
—Obi-Wan Kenobi

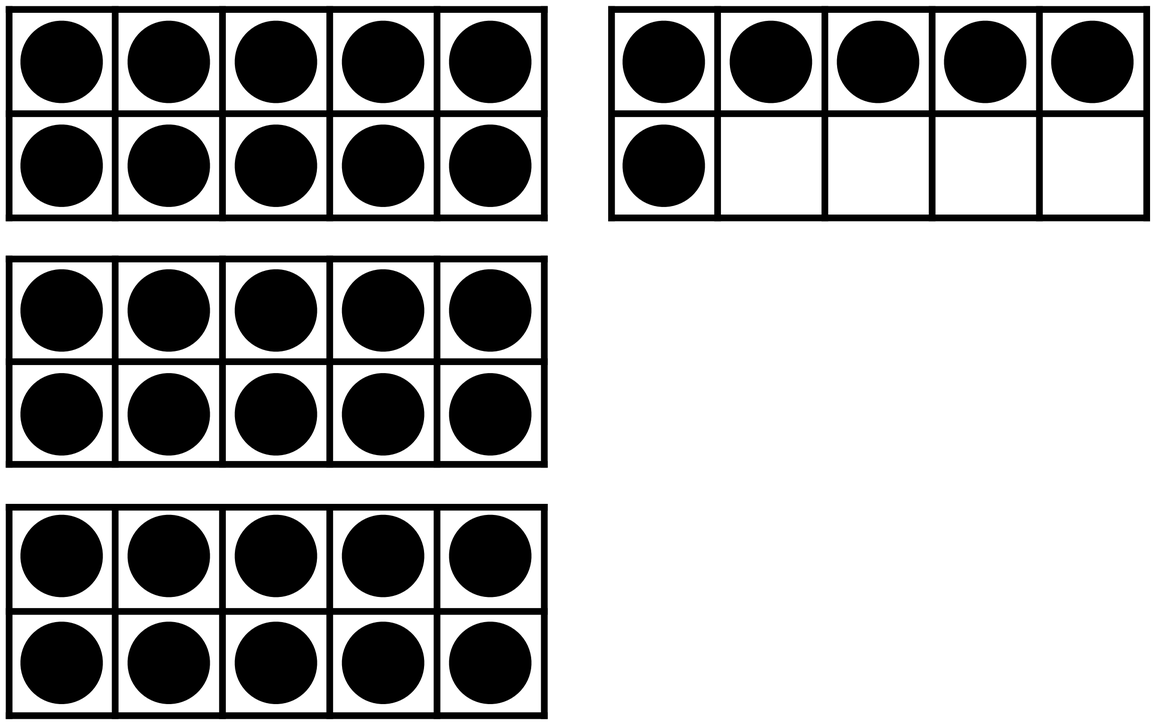

What does 36 look like?



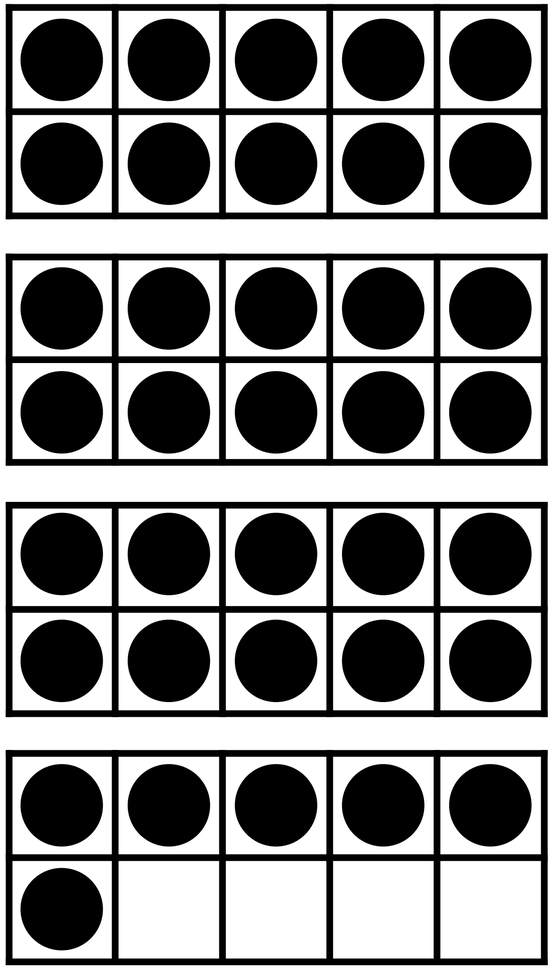
$$36 = 30 + 6$$



$$36 = 20 + 16$$



$$36 = 30 + 6$$



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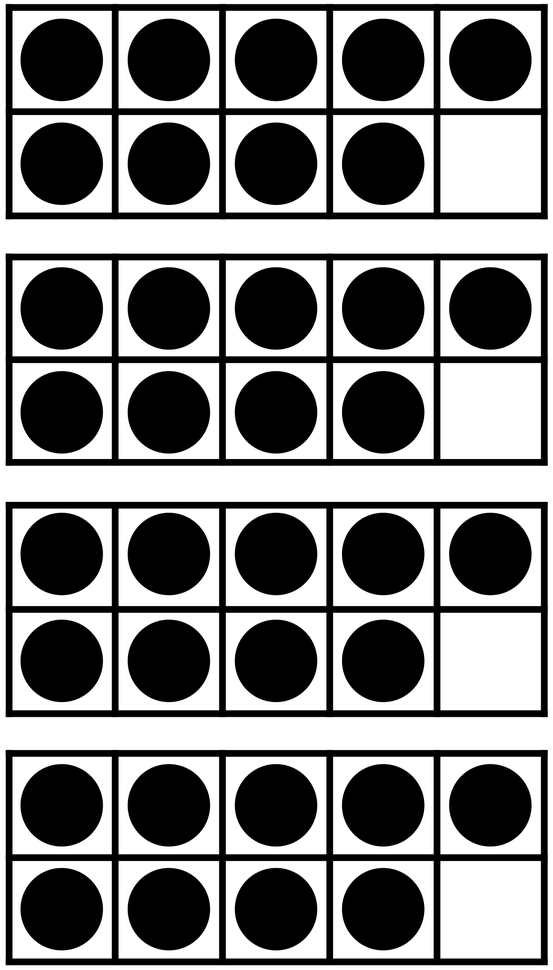
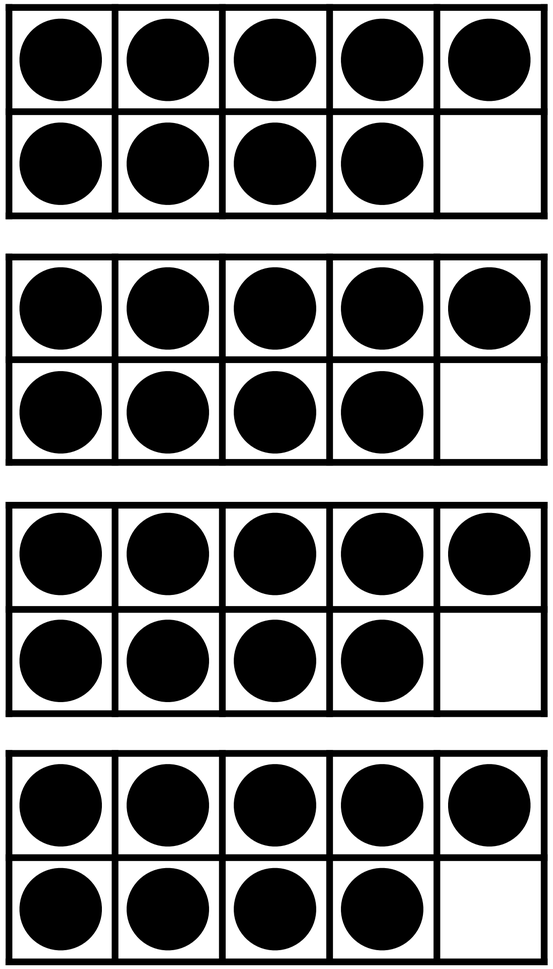


$$36 = 4 \times 9$$



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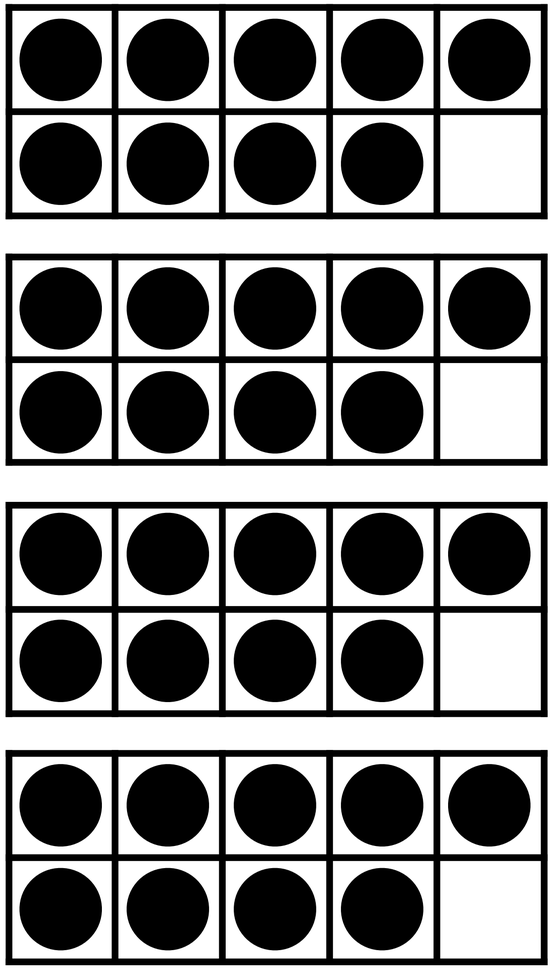
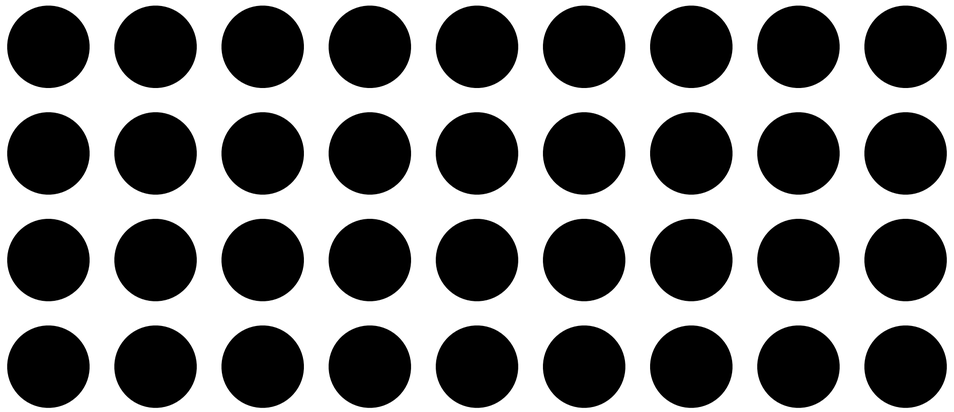
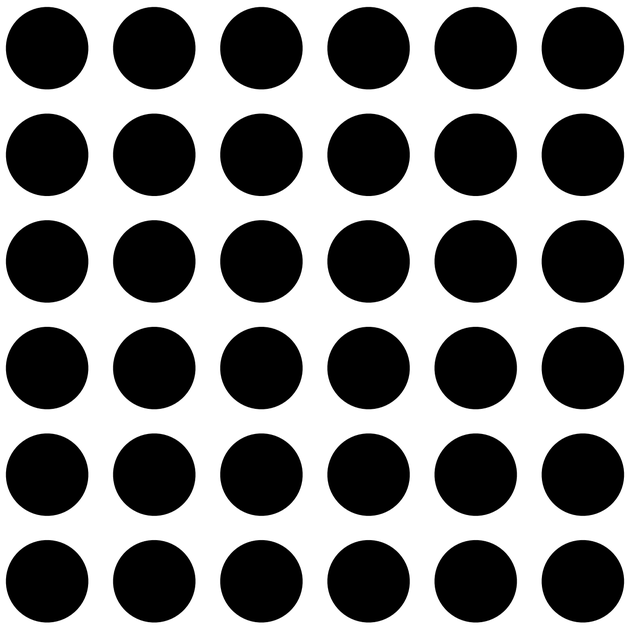


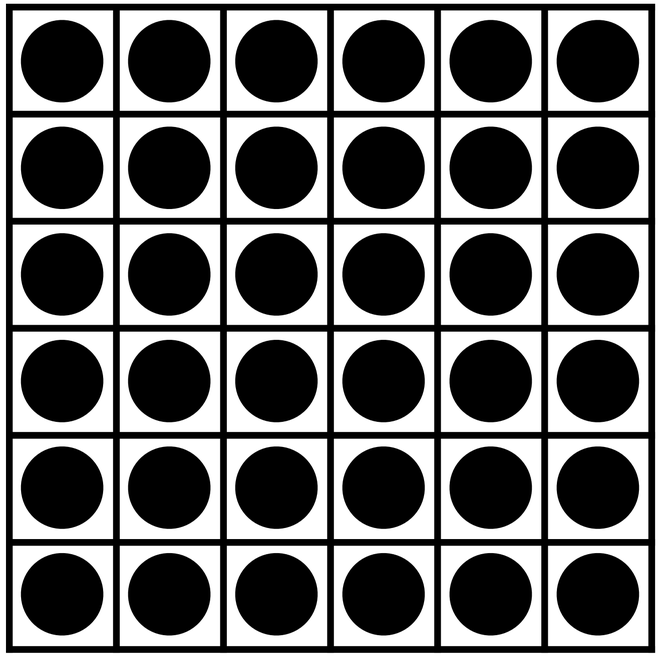
$$36 = 4 \times (10 - 1)$$



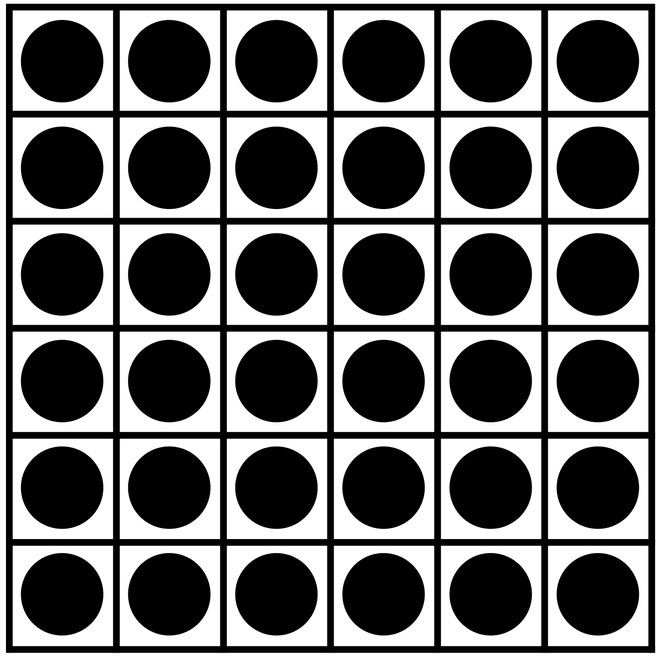
$$36 = 4 \times 9$$



$$36 = 6 \times 6$$



$$36 = 6^2$$



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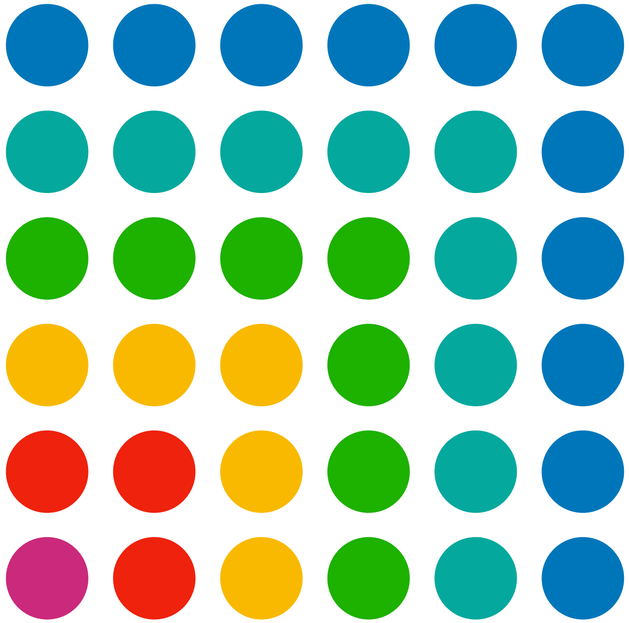
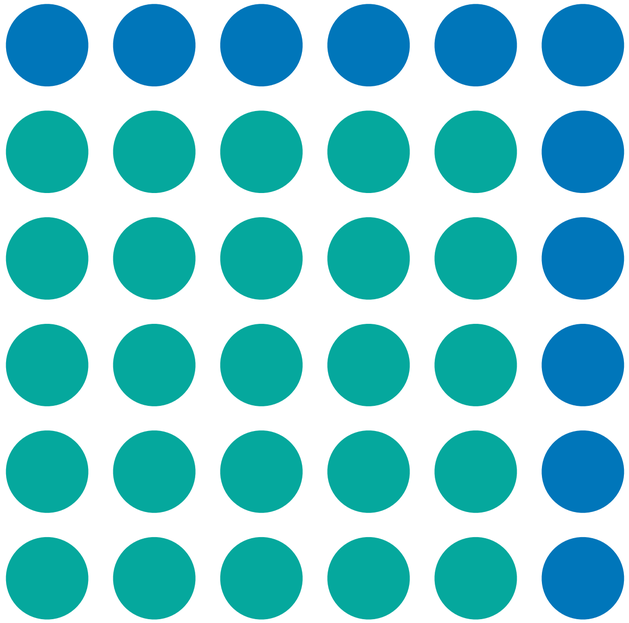
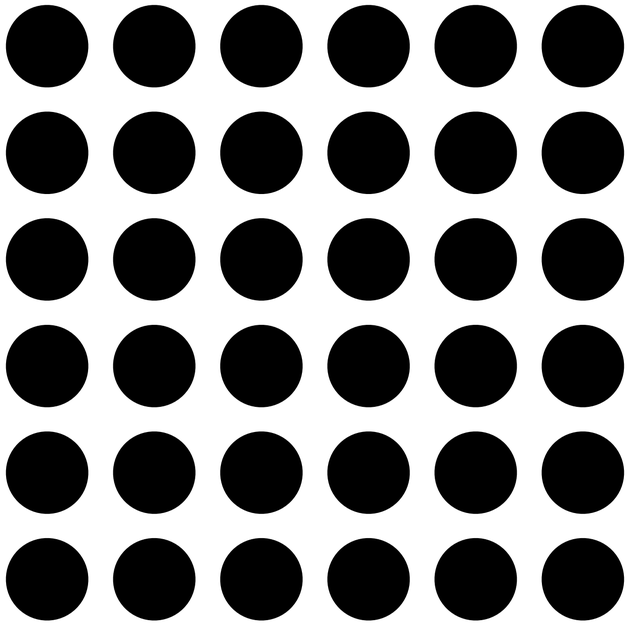


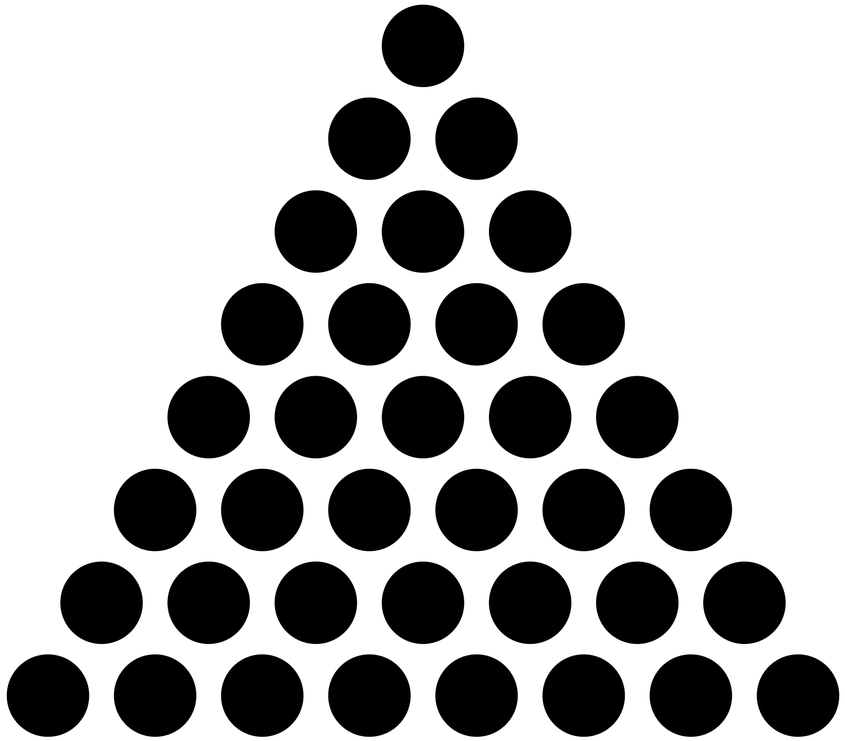
$$36 = 1 + 3 + 5 + 7 + 9 + 11$$



$$(11 = 6^2 - 5^2)$$

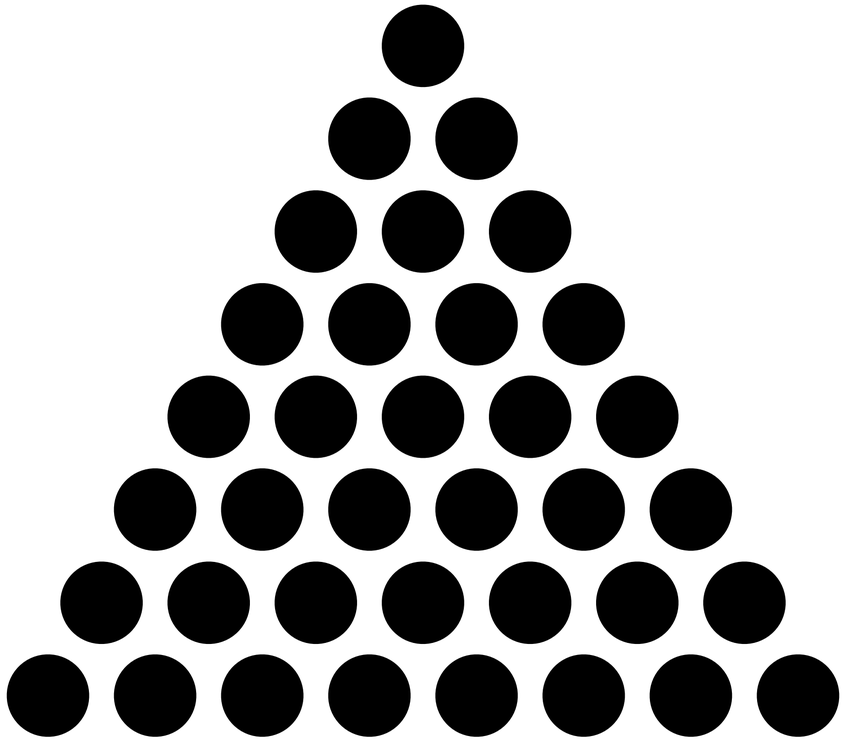


$$36 = 6^2$$

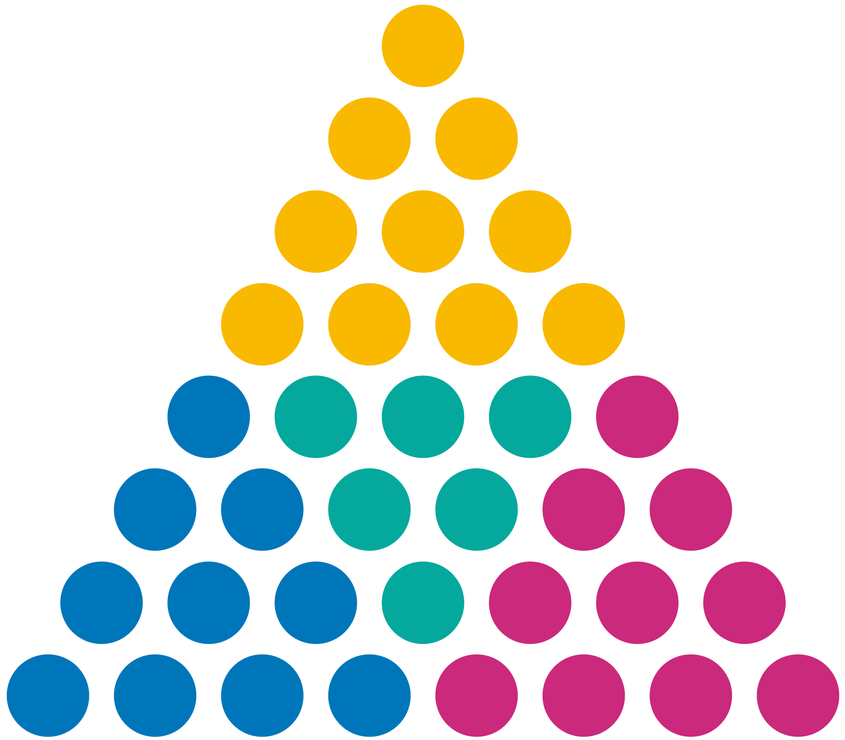


$$36 = T_8$$

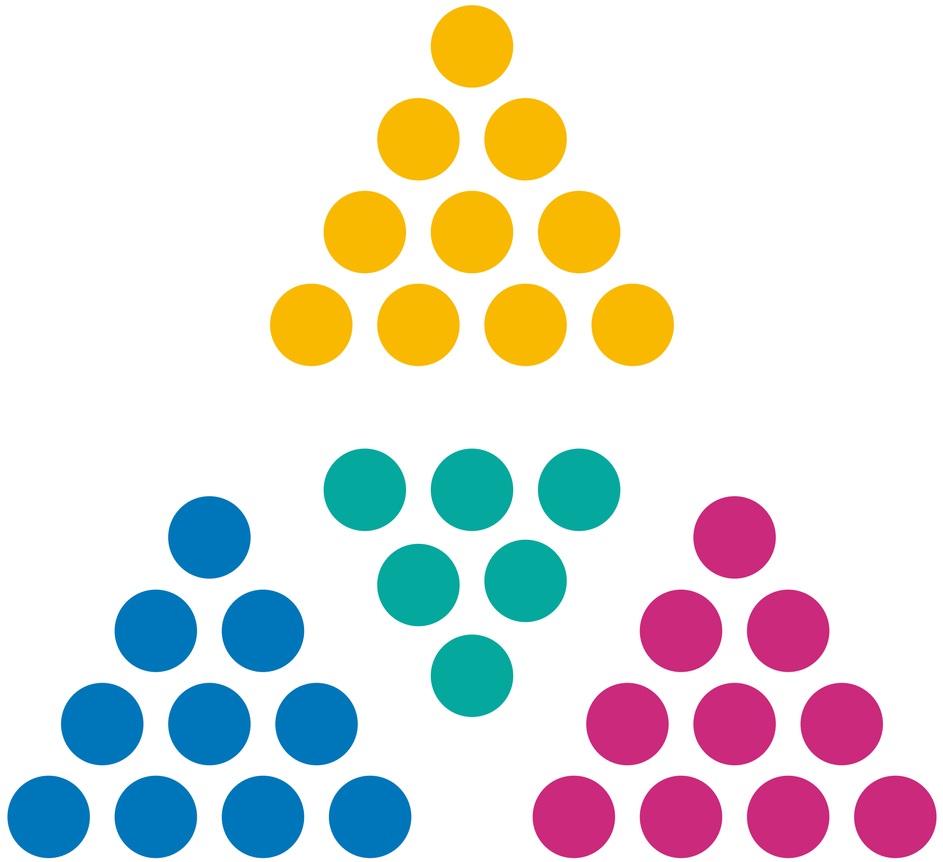
$$36 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8$$



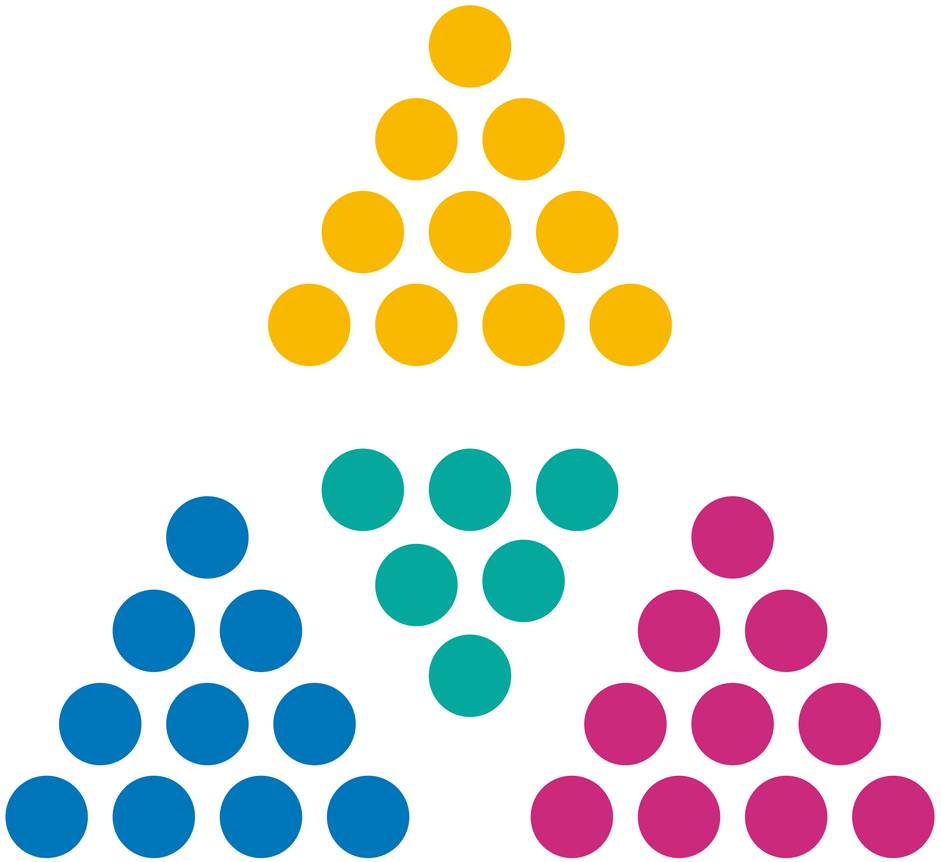
$$36 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8$$



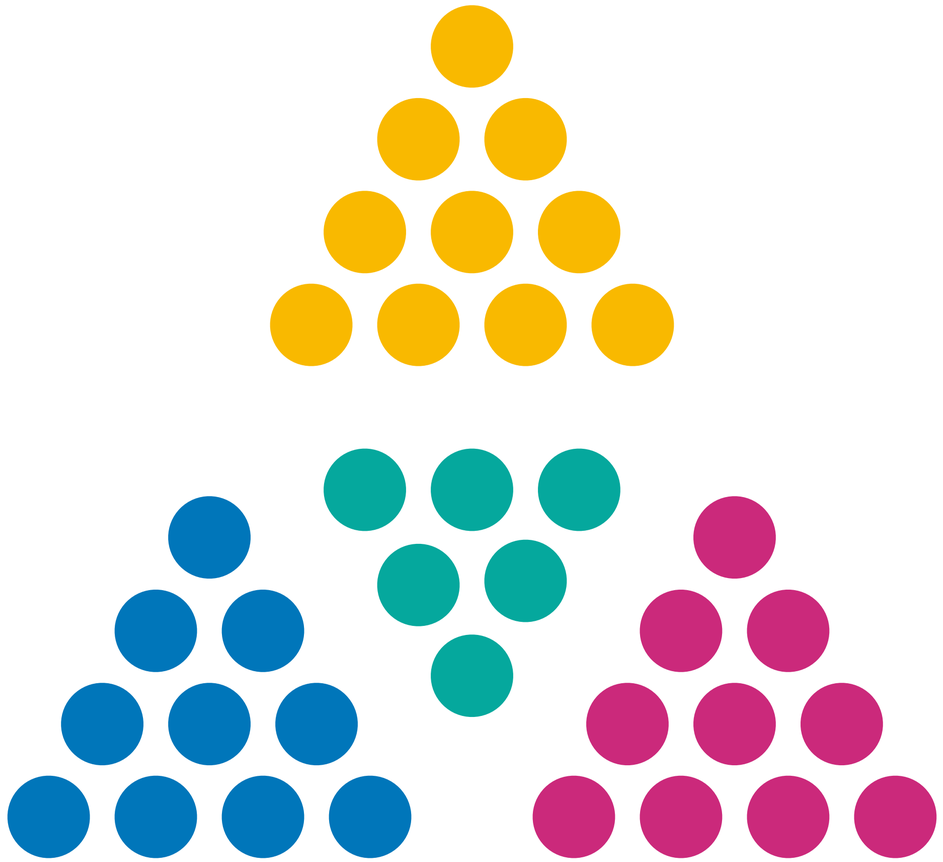
$$36 = 3 \times 10 + 6$$



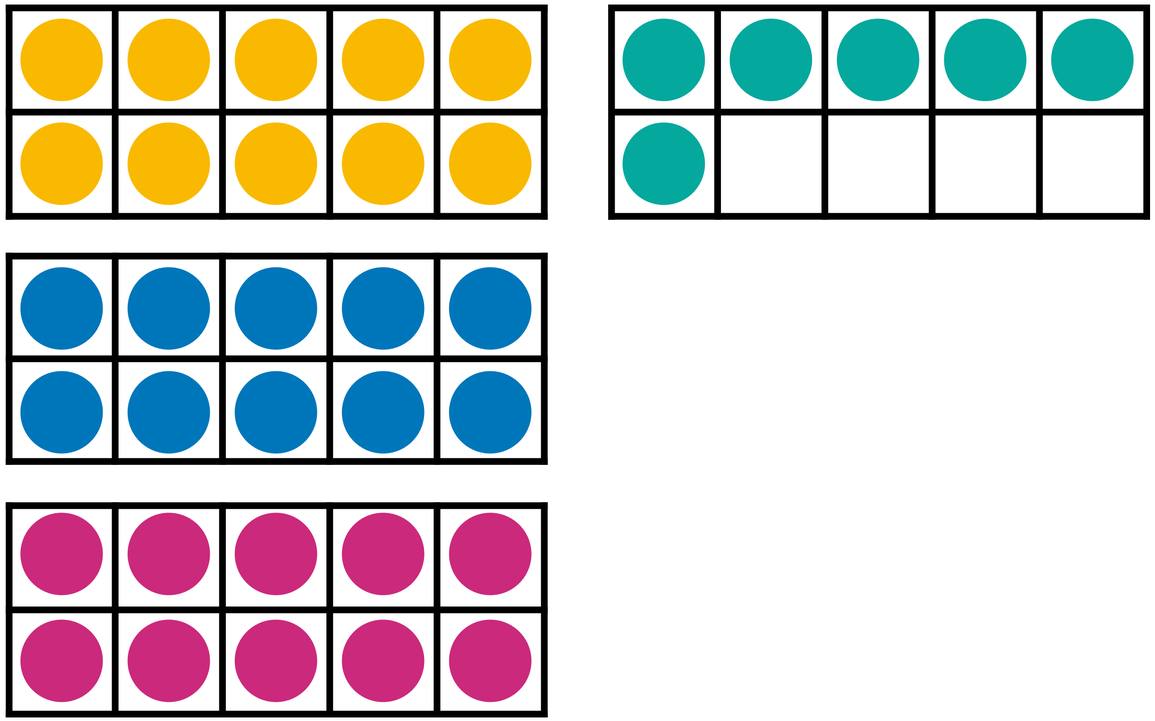
$$36 = 3 \times 10 + 6$$



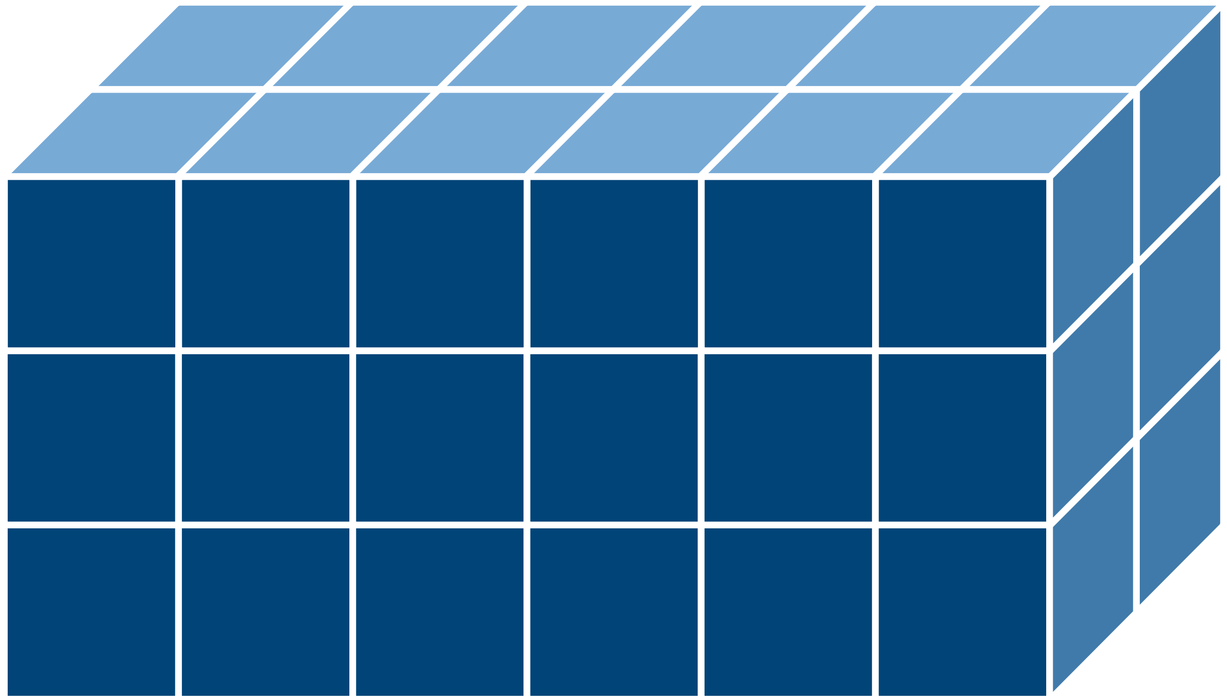
$$36 = 3 \times T_4 + T_3$$



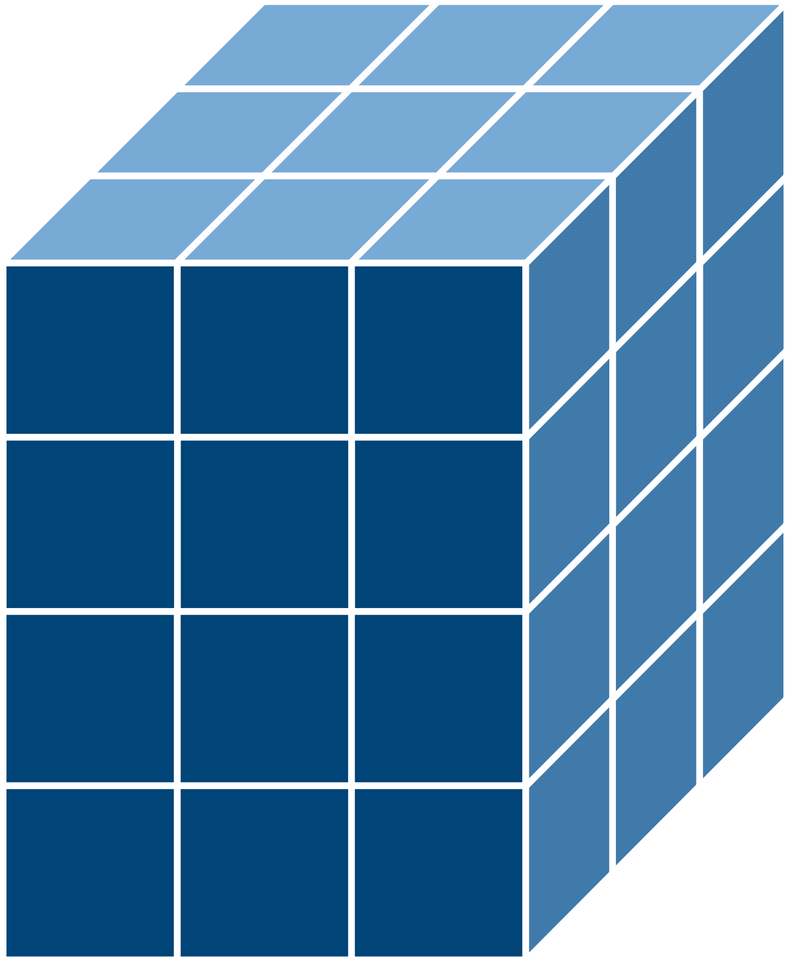
$$36 = 3 \times 10 + 6$$



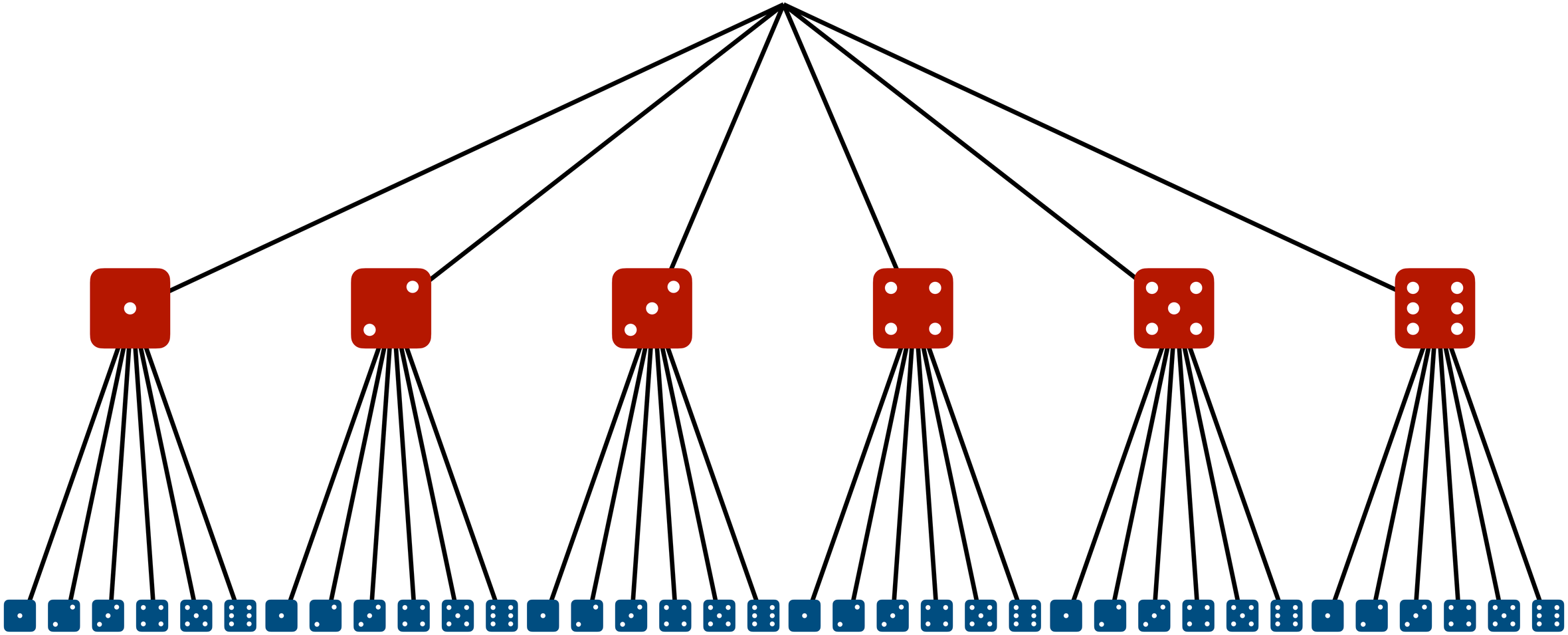
$$36 = 3 \times 10 + 6$$



$$36 = 6 \times 2 \times 3$$



$$36 = 3 \times 3 \times 4$$



$$36 = 6 \times 6$$

$9

$$\$36 = 4 \text{ lbs} \times \$9/\text{lb}$$

$9

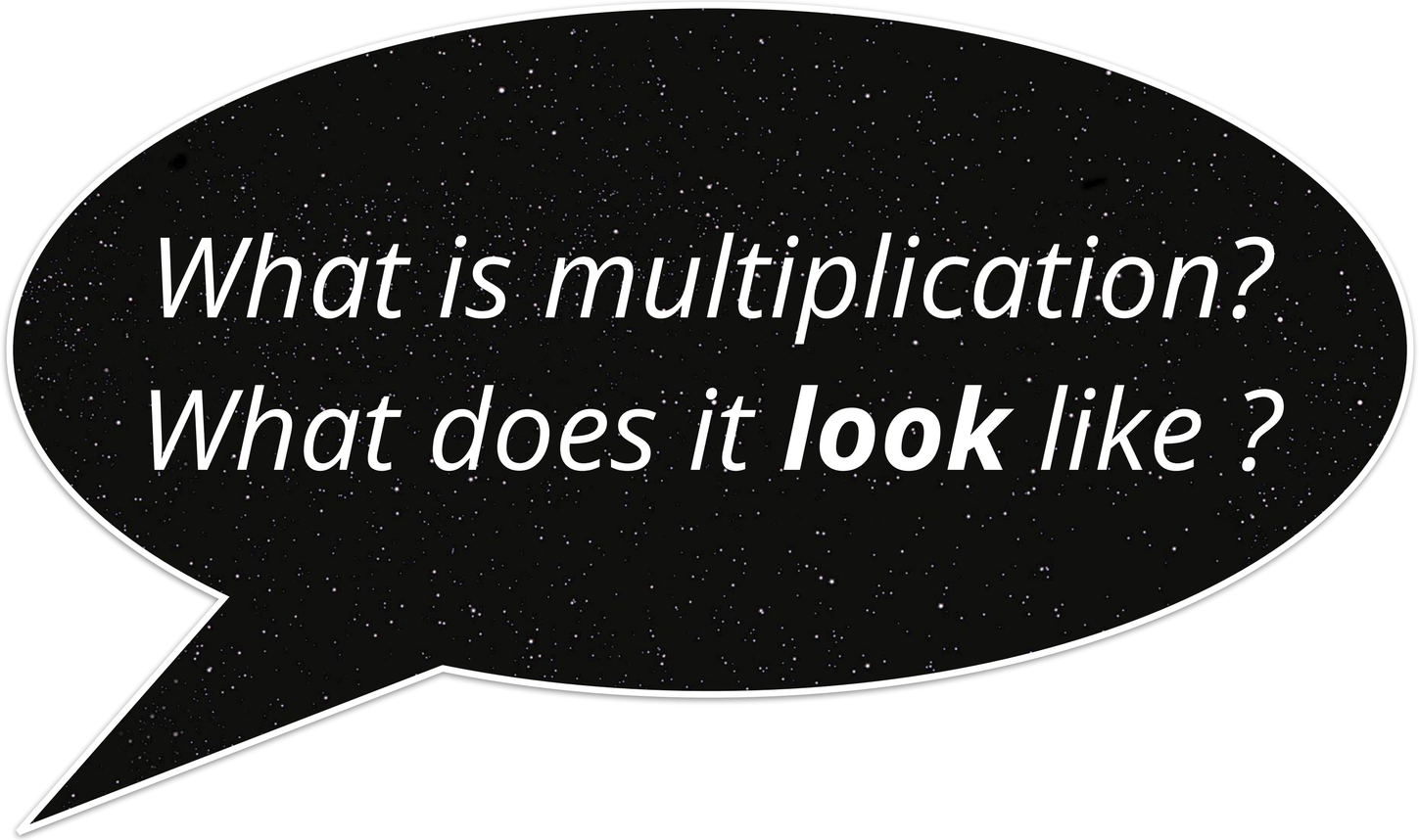
$36

$$\$36 = 4\ \text{lbs} \times \$9/\text{lb}$$

“Using (…) **different representations** is like examining the concept through a variety of lenses, with each lens providing a **different perspective** that makes the picture (concept) richer and deeper.”

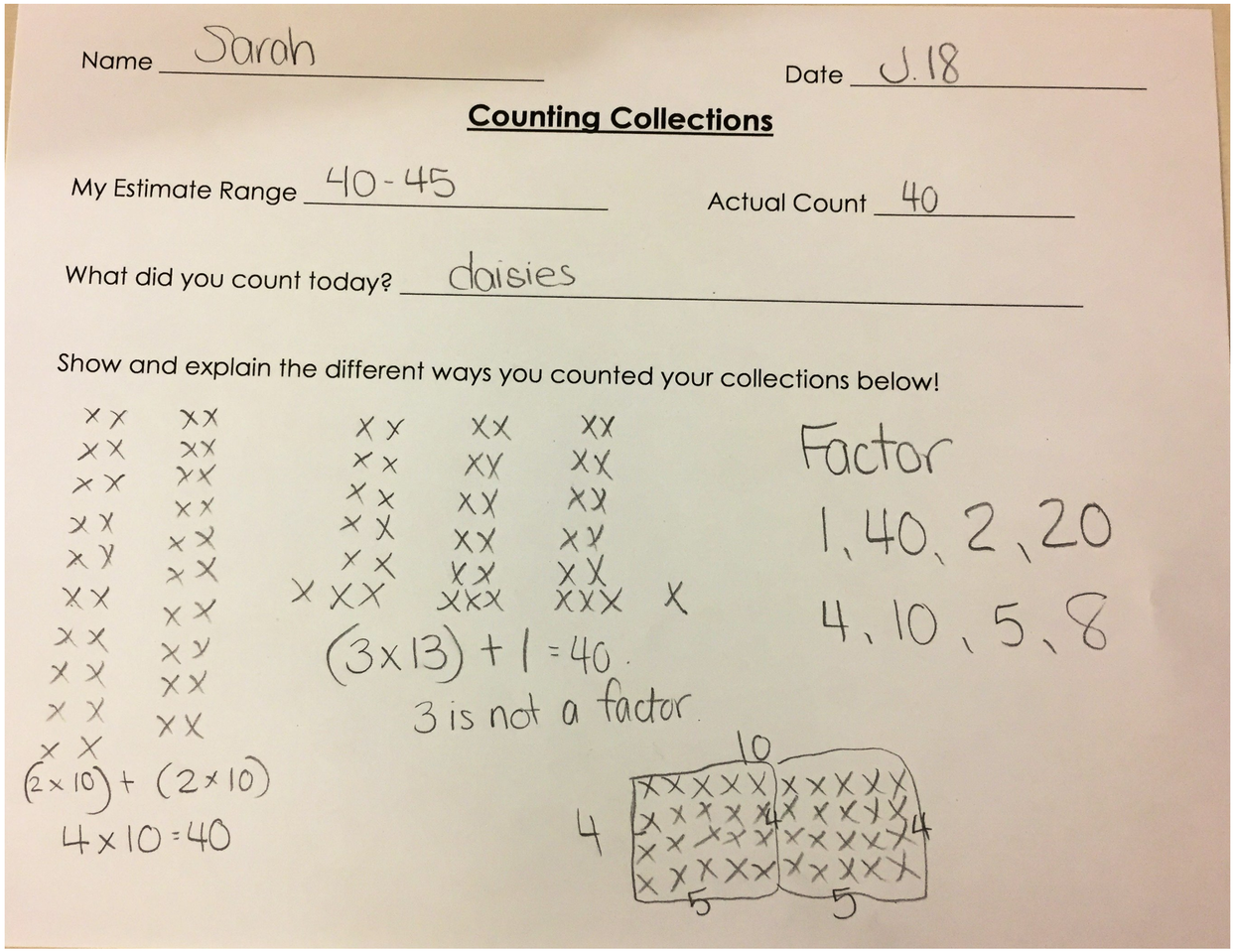
Tripathi, 2008, p. 439


Your
focus
determines
your
reality.
—Qui-Gon Jinn


What is multiplication?
*What does it **look** like ?*

Counting Collections

Counting Collections



Counting Collections

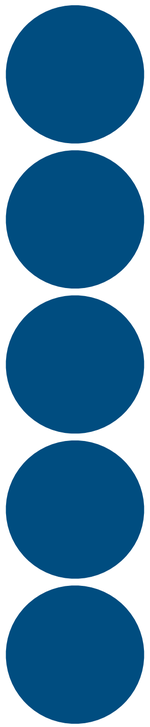
“Using (…) **different representations** is like examining the concept through a variety of lenses, with each lens providing a **different perspective** that makes the picture (concept) richer and deeper.”

Tripathi, 2008, p. 439

Different representations can reveal the **same mathematical idea**.

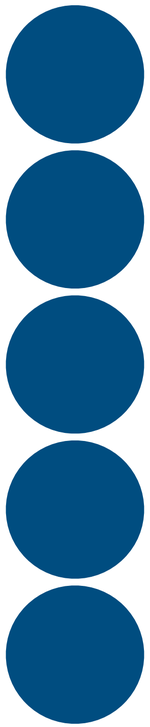

If you live
long enough, you
learn to **see**
the *same* **eyes**
in *different* people.
—Maz Kanata

Visual Pattern



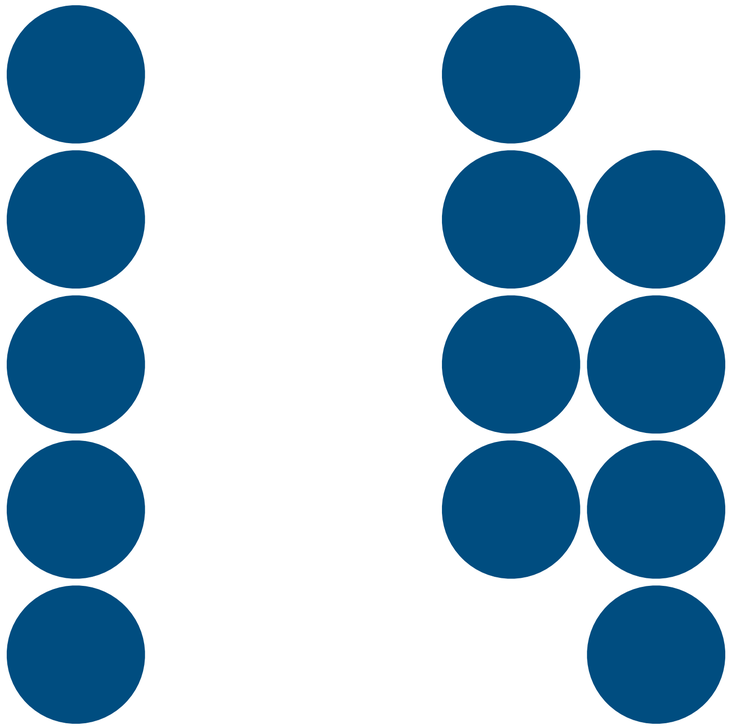
What comes *next*?

Visual Pattern



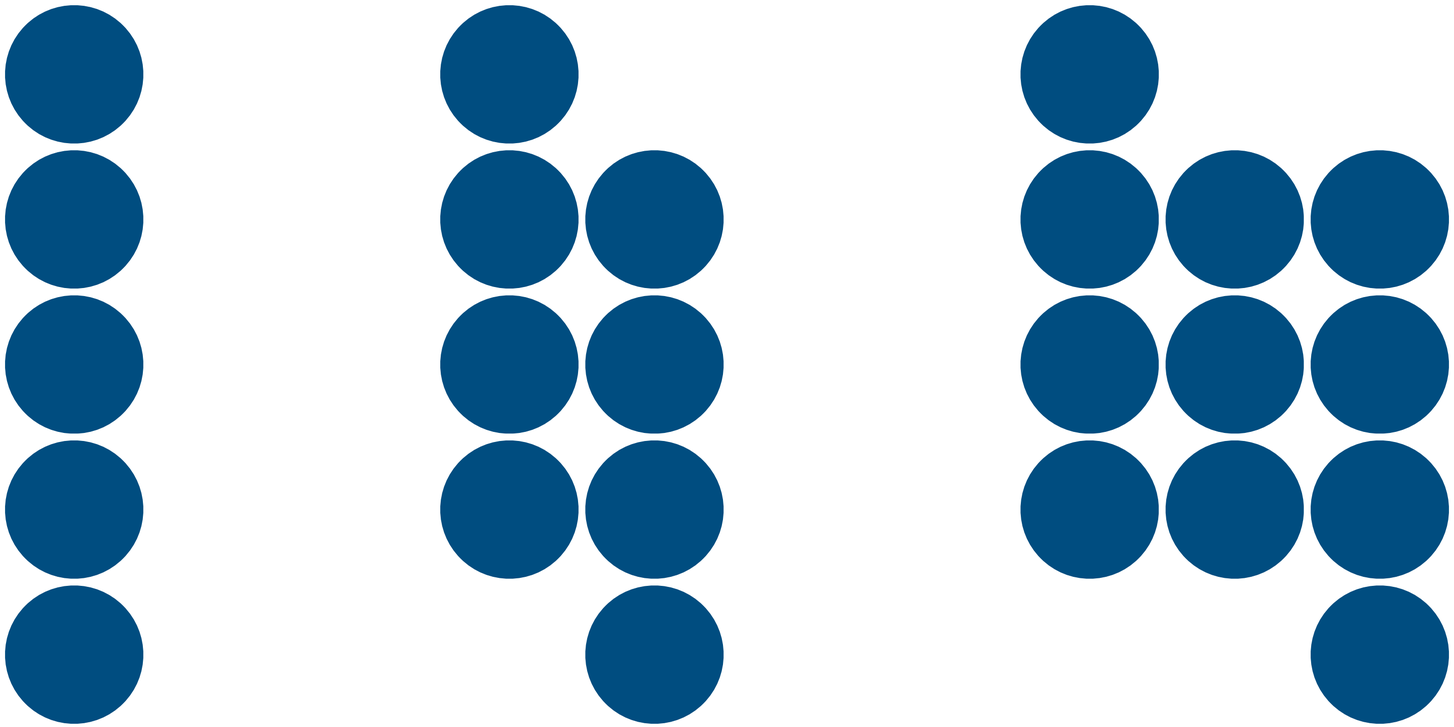
What *else*?

Visual Pattern



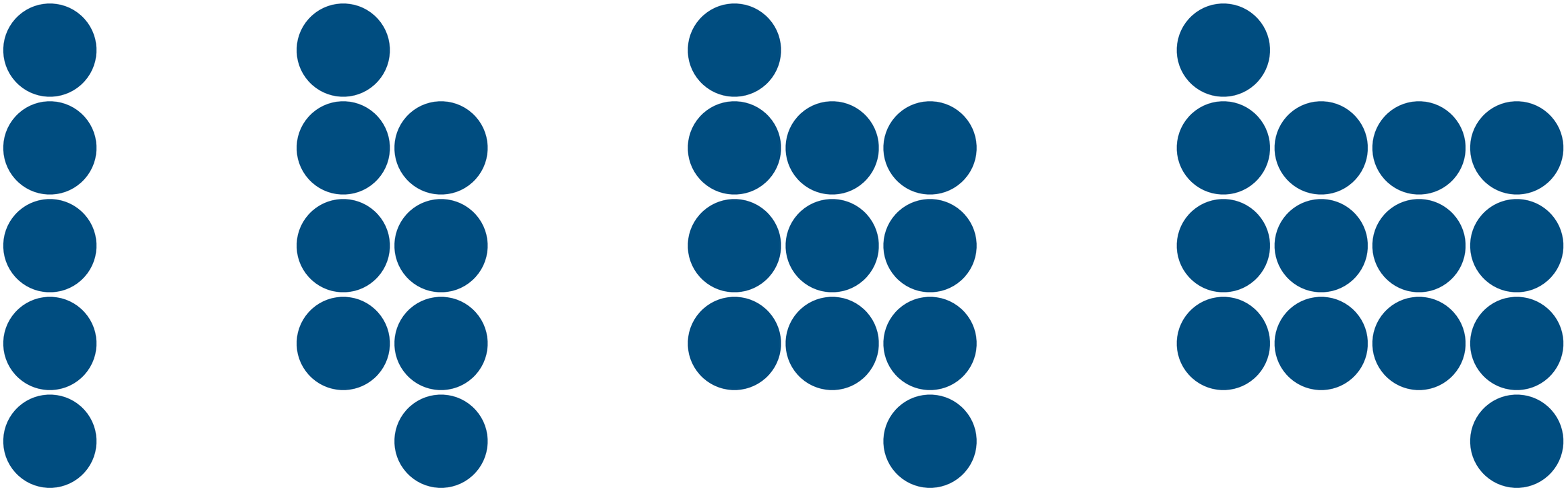
What comes *next*?

Visual Pattern

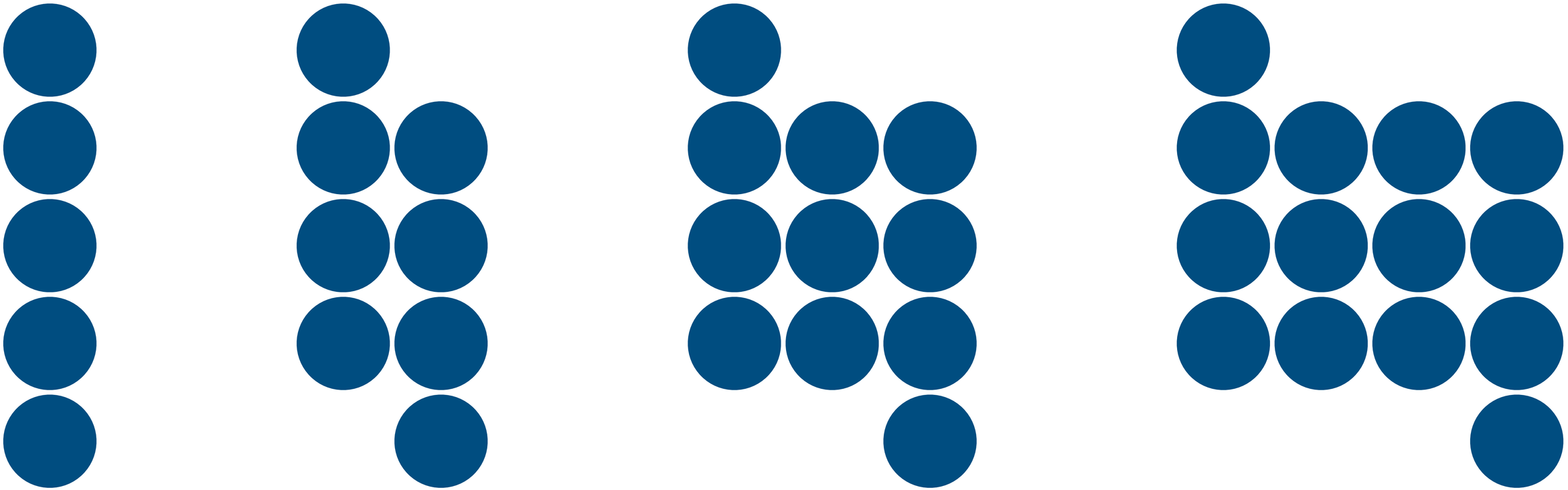


What comes *next*?

Visual Pattern

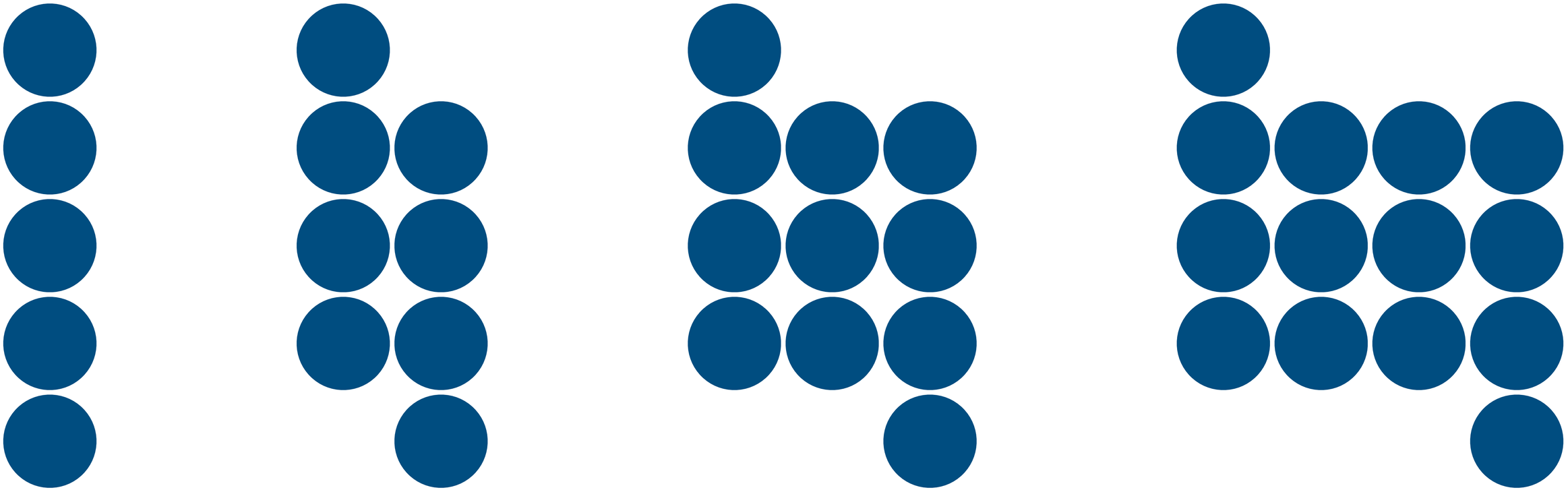


Visual Pattern



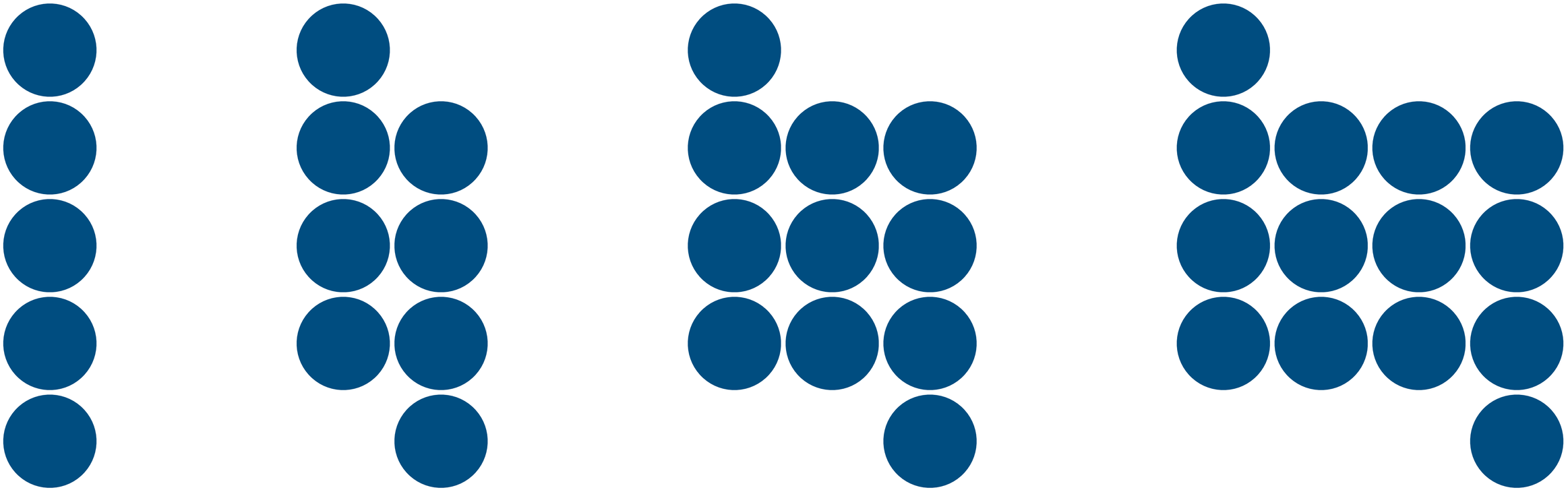
How many in Figure 10?

Visual Pattern



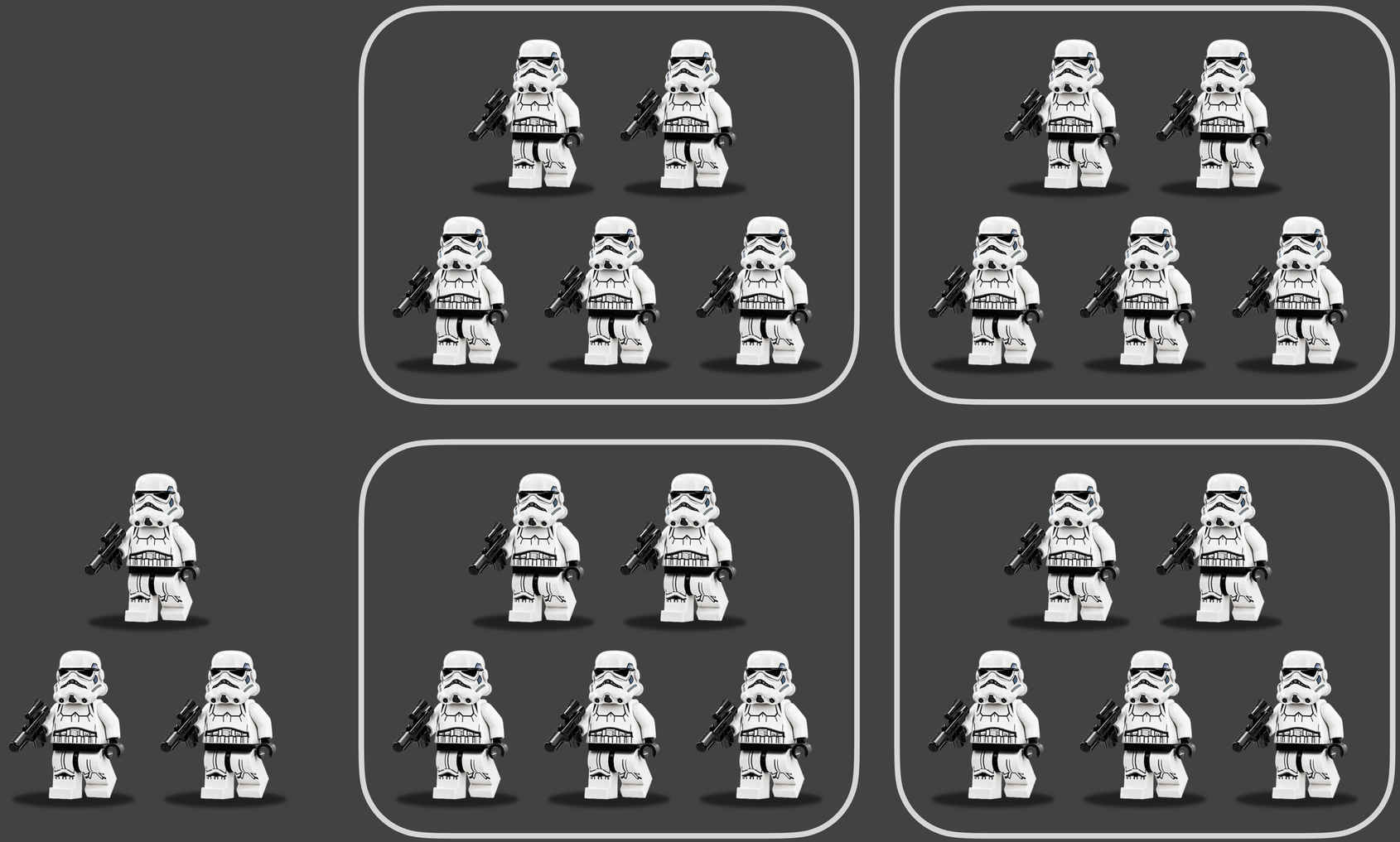
How many in Figure *n*?

Visual Pattern



How do you **see** it?

Different representations can reveal the **same mathematical idea**.



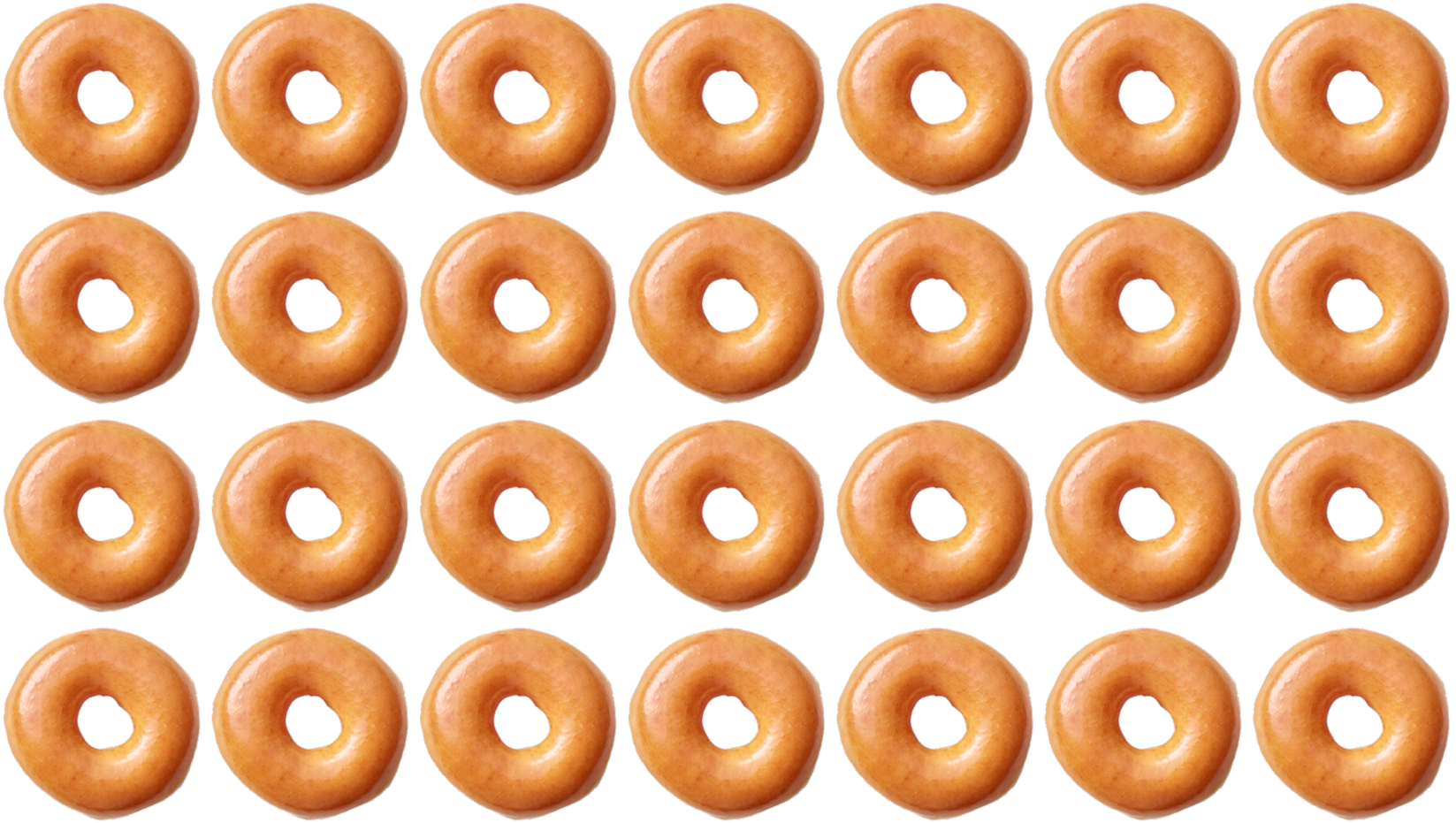
$$3 + 4 \times 5$$

$$3 + 4 \times 5$$

$$5 + 3 \times 6$$

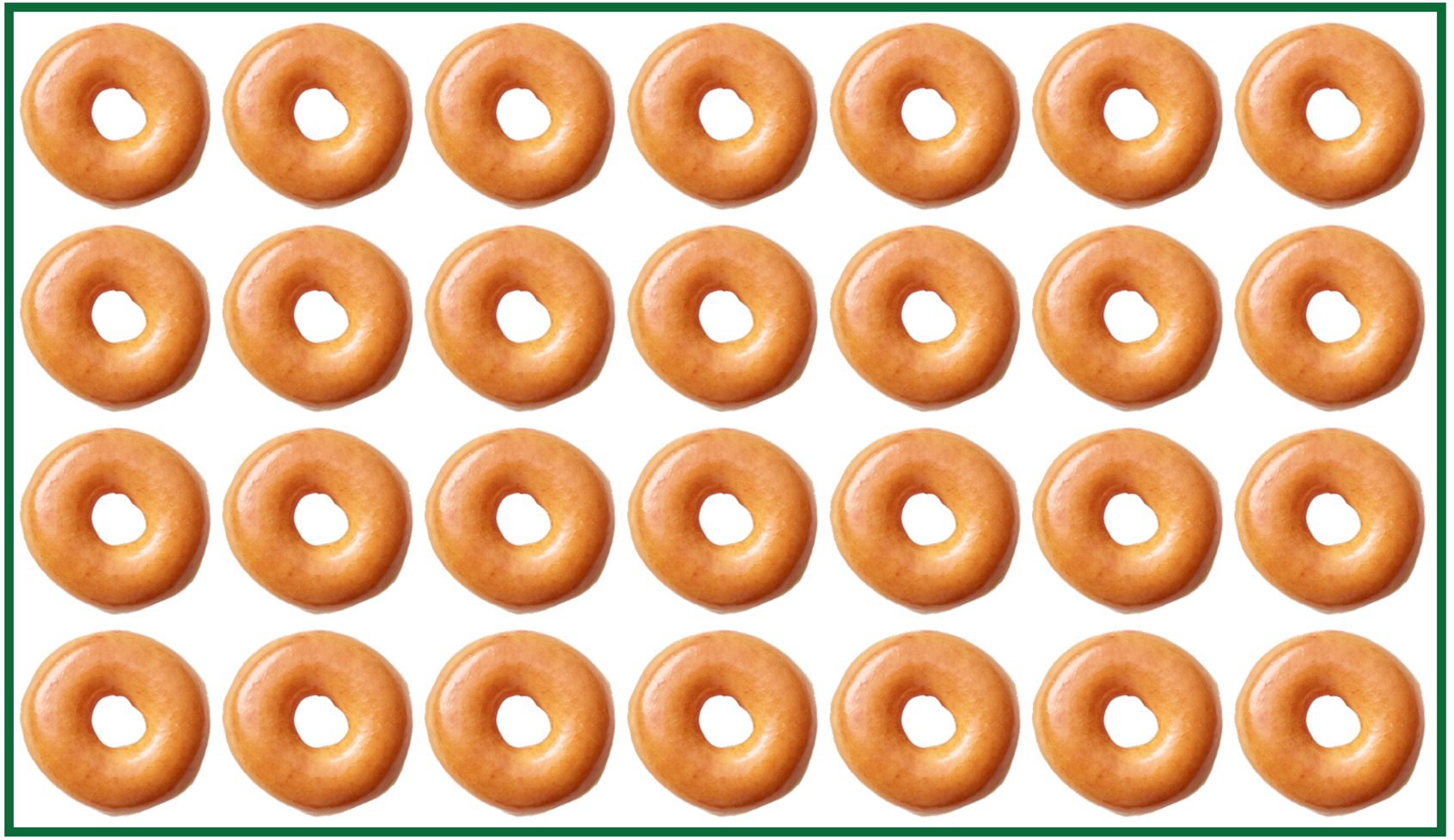
$$4 \times 6 - 1$$

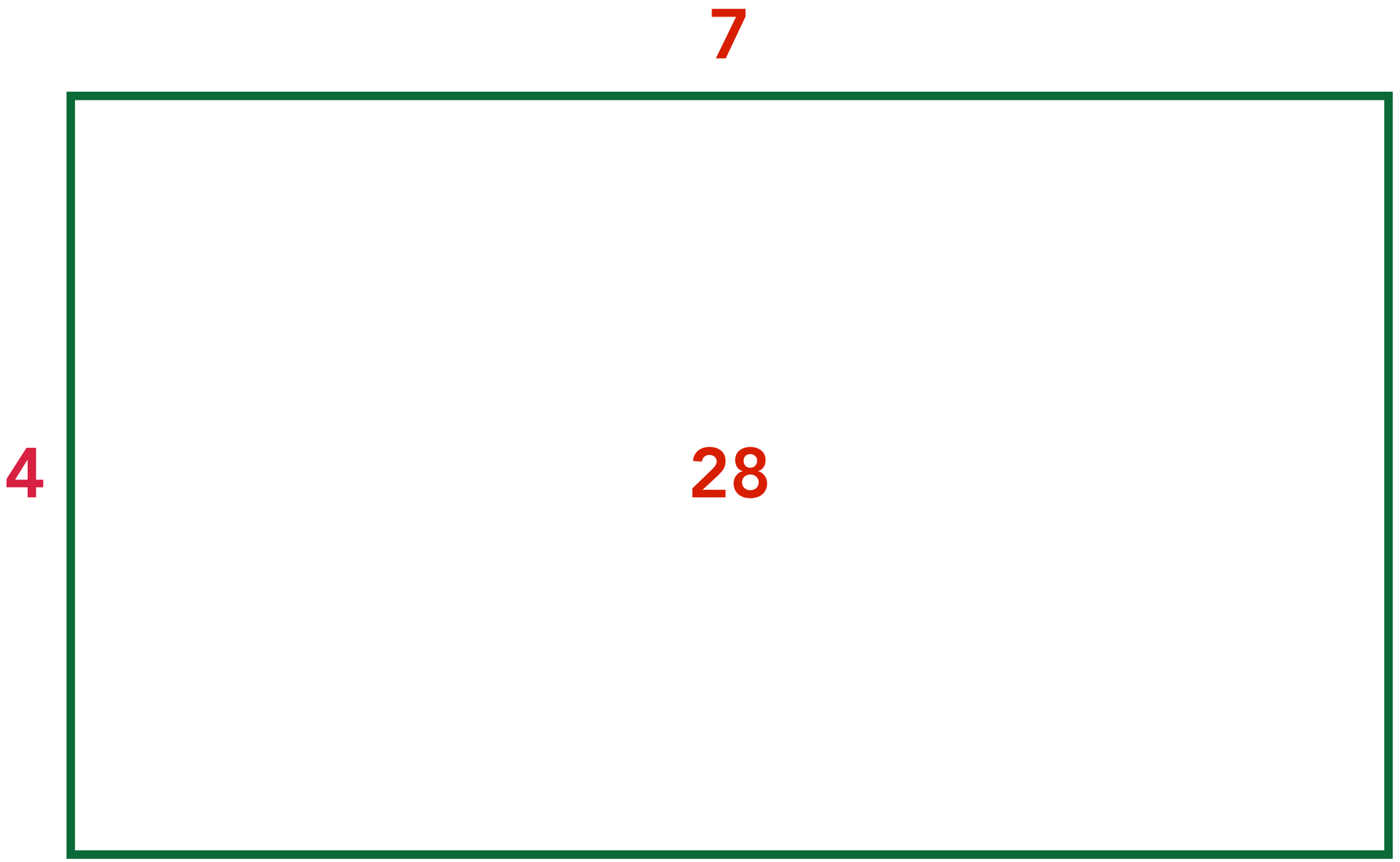
Different representations can reveal the **same mathematical idea**.



7

4

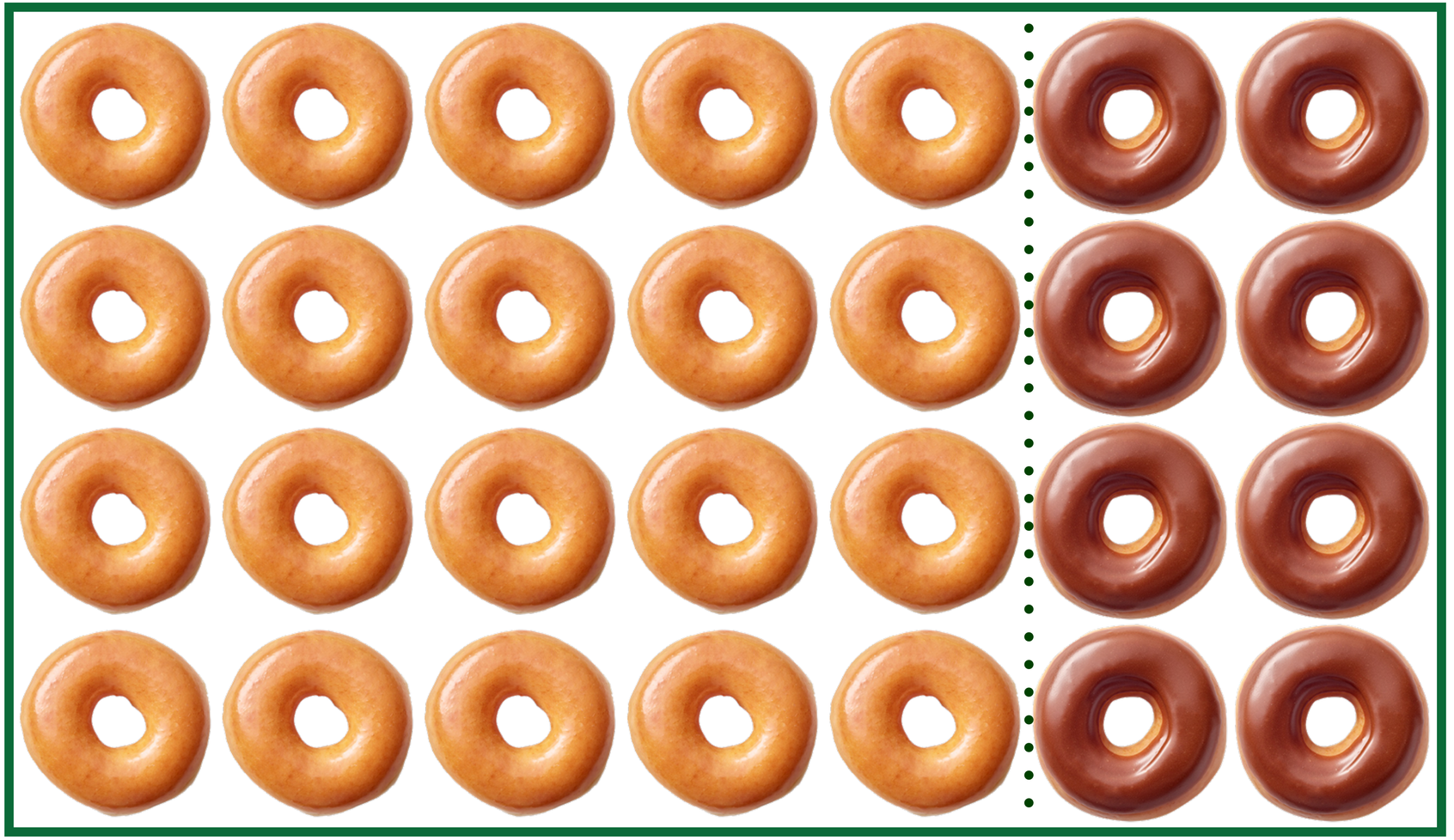


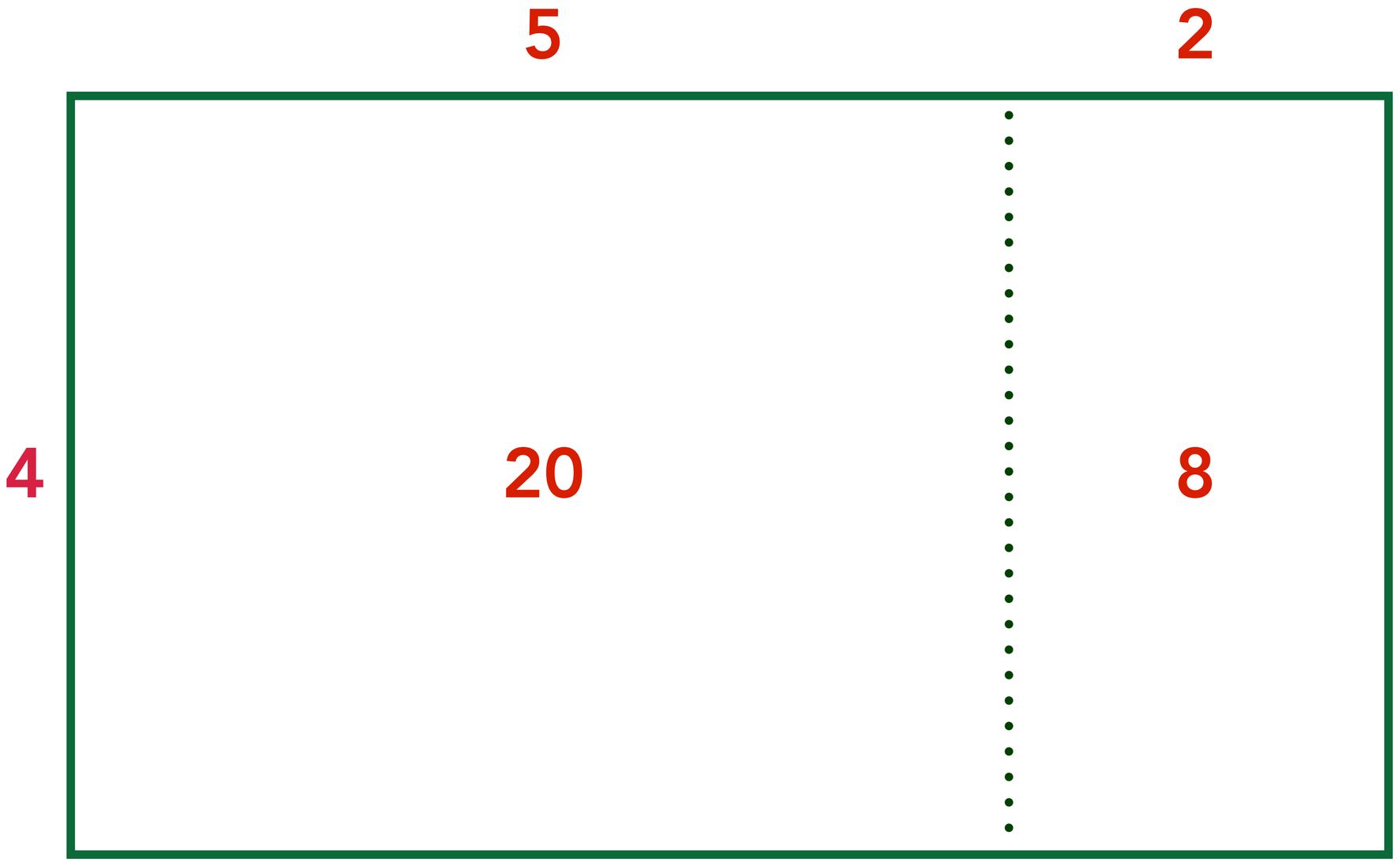

7
4
28

5

2

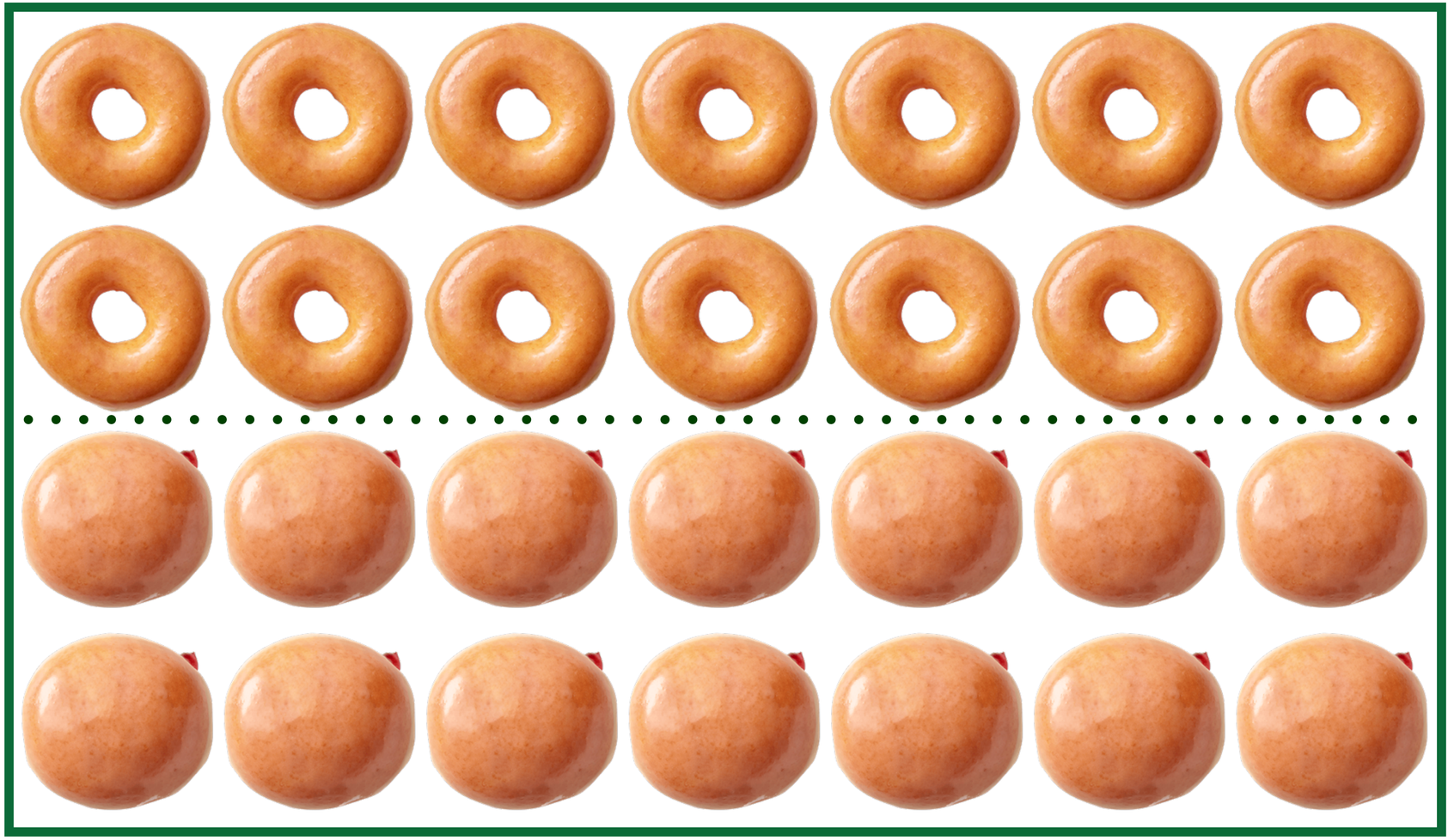
4



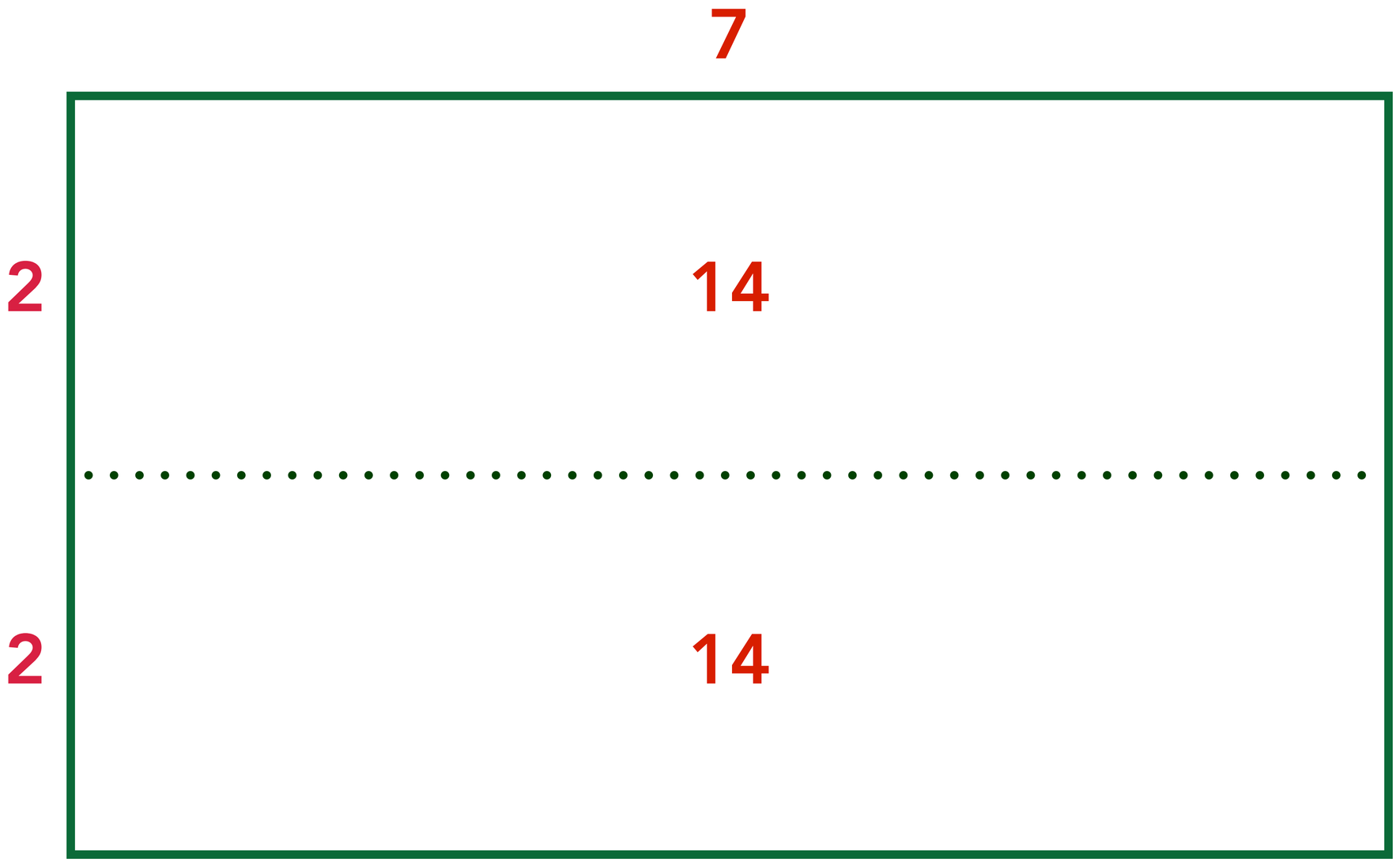

5
2
4
20
8

7

2



2


7
2
14
2
14

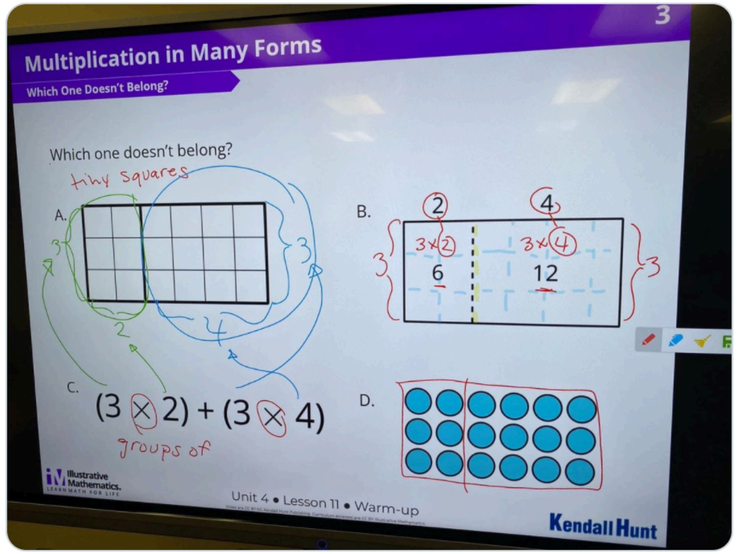
Colleen Williams
@SubitizeThis

Me: Fielding student responses and explanations about which one doesn't belong.

Student, blurting, suddenly thunderstruck: "They all belong because they all represent the same thing!"

The rest of the class: *collective gasp of realization, excited chatter*

I love to see it.



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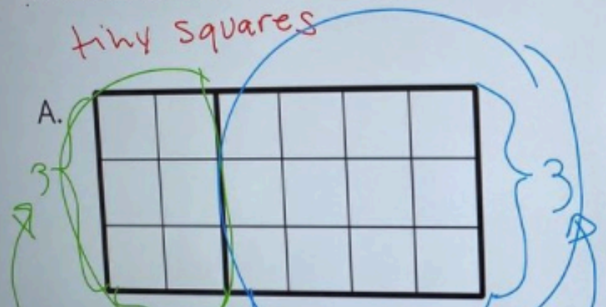
Multiplication in Many Forms

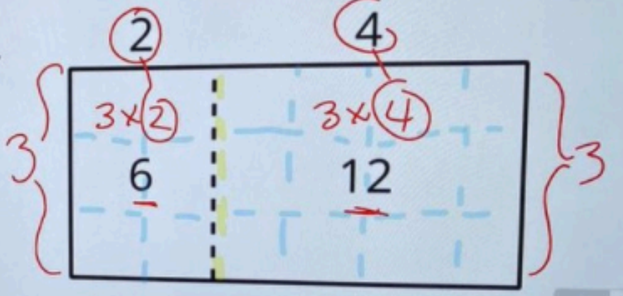
Which One Doesn't Belong?

Which one doesn't belong?

A.



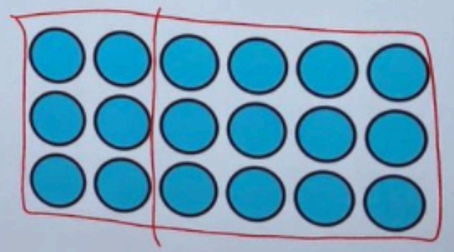
B.



C. $(3 \times 2) + (3 \times 4)$

groups of

D.



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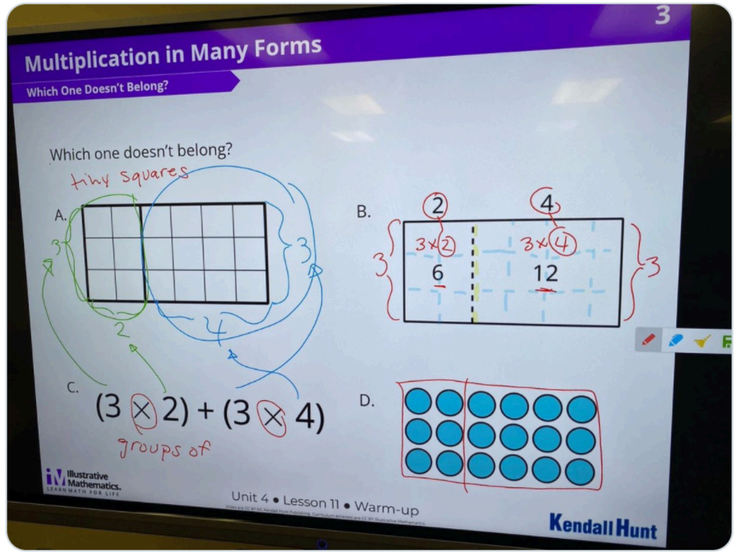

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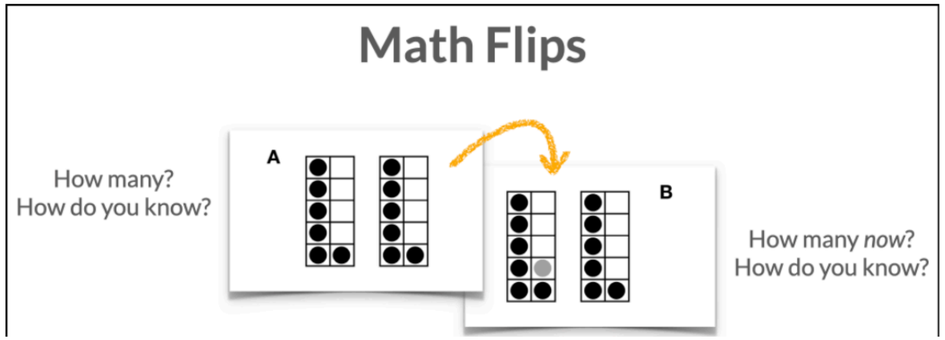
https://mathvisuals.wordpress.com/
https://berkeleyeverett.com/

Math Flips are flashcards with a problem on the front and a similar problem on the back (instead of a problem and an answer) to encourage relational thinking rather than answer-getting.



How many do you **see**?

How do you see them?

NUMBER TALK IMAGES

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http://ntimages.weebly.com/

Different representations can reveal the **same mathematical idea**.

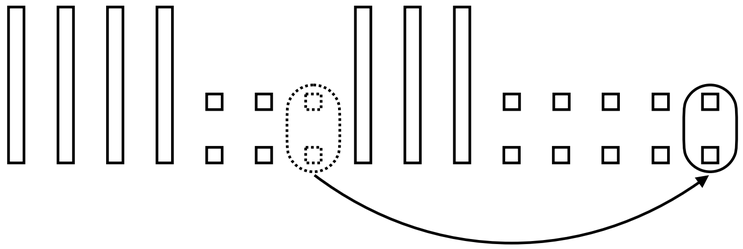
The **same representation** can reveal **different mathematical ideas**.

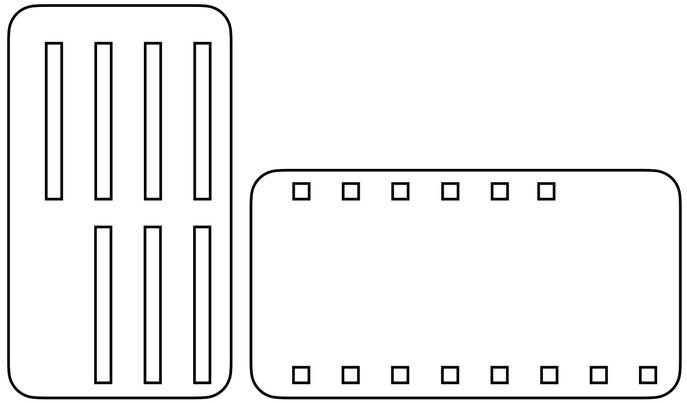
Number Talk

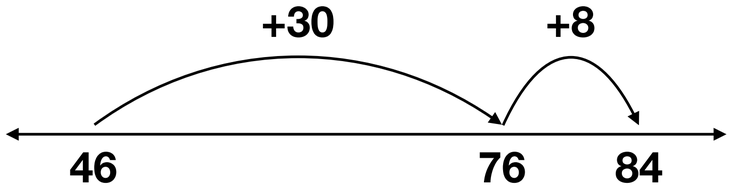
46 + 38

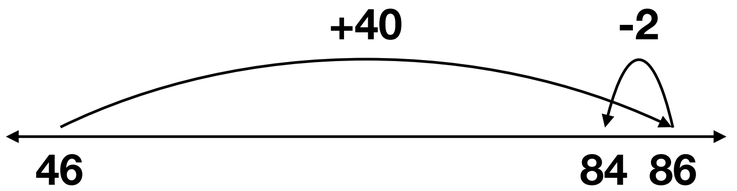
What strategies might you use?

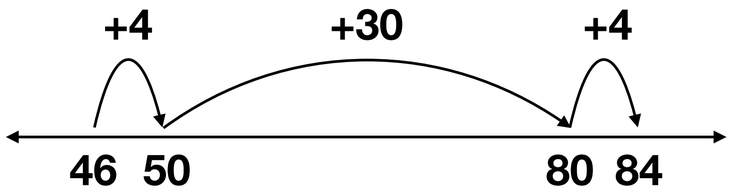
Representations: 46 + 38



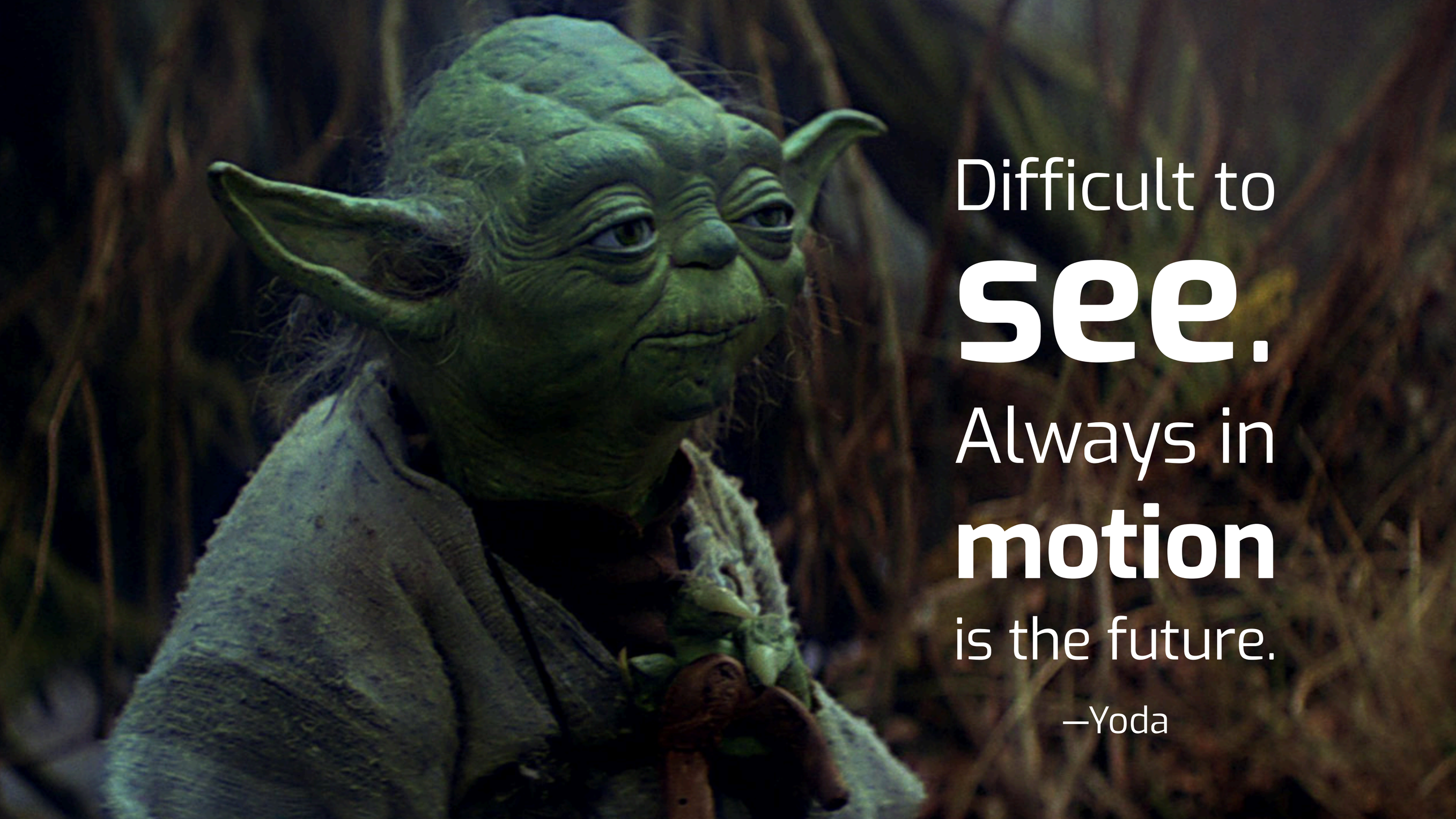


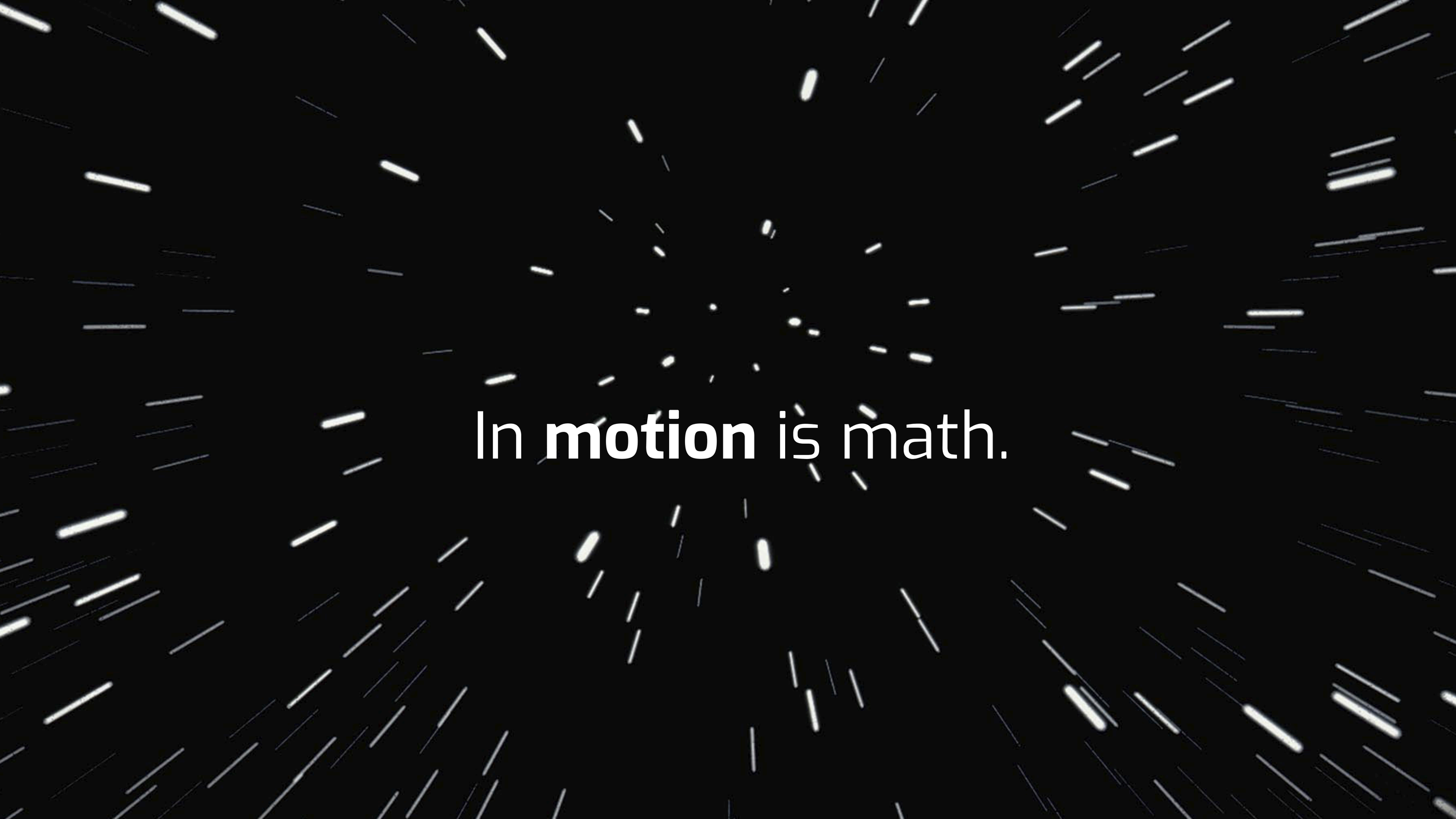




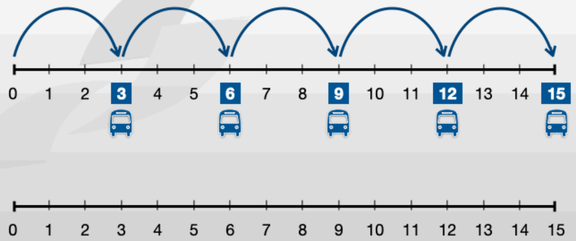


The **same representation** can reveal **different mathematical ideas**.

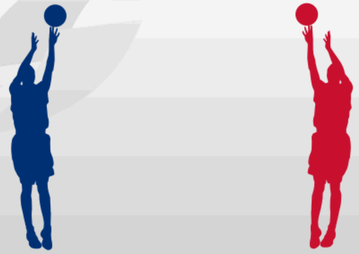

Difficult to
see.
Always in
motion
is the future.
—Yoda


In **motion** is math.

Exploring Multiples



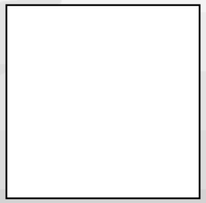
Applying Percents



Applying Percents

What is 78% of 49?

Exploring Percents



Exploring Ratios

Exploring Ratios

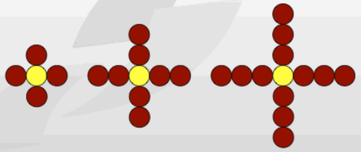
Applying Ratios

Exploring Equations

$3x + 2 = 14$

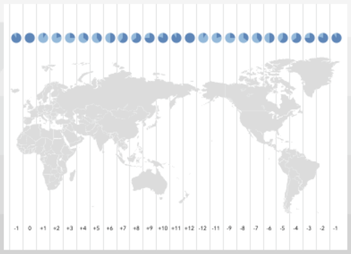
https://chrishunter.ca/2020/11/23/principles-of-math-videos/

$3x + 2 = 14$



(-5) – (-3)

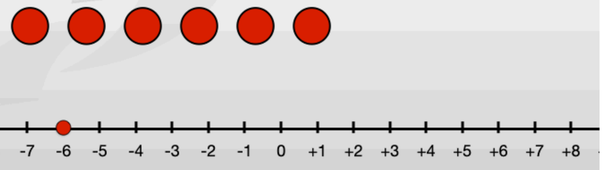
Applying Integers



Exploring Division

Exploring Division

$(-6) \div (+3)$

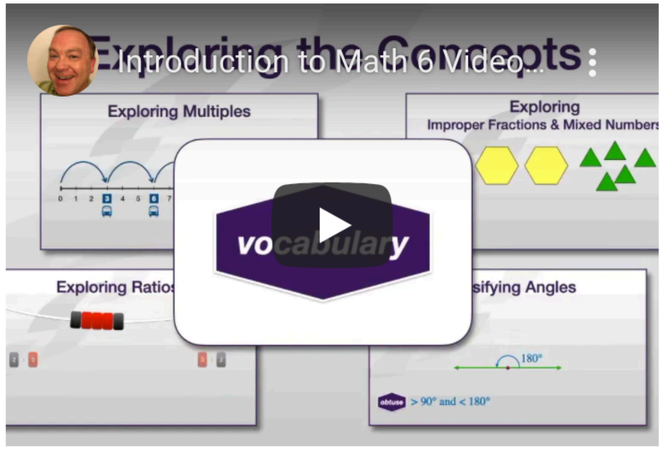


Applying Integers

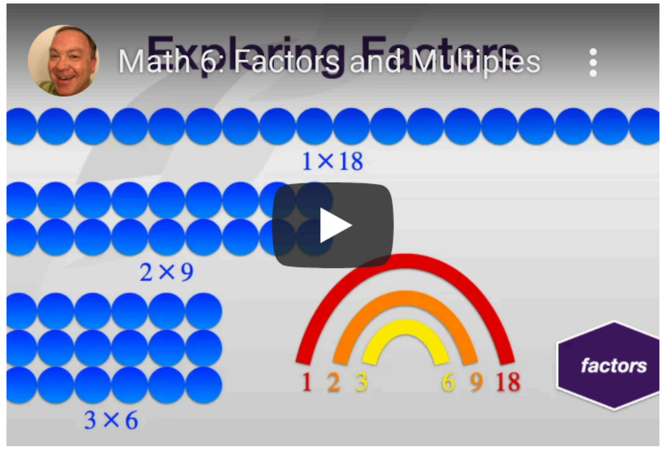
Grade 6

https://sites.google.com/view/sd36clnumeracy/

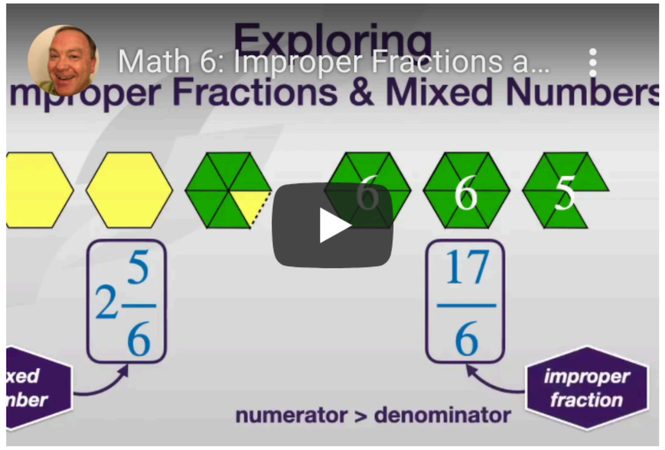
Introduction



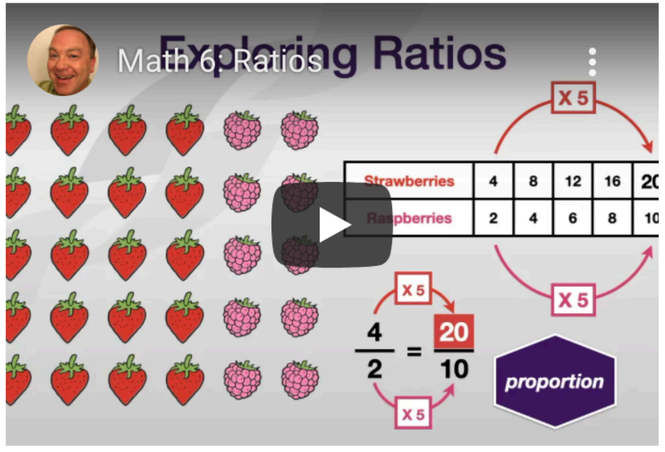
Factors and Multiples



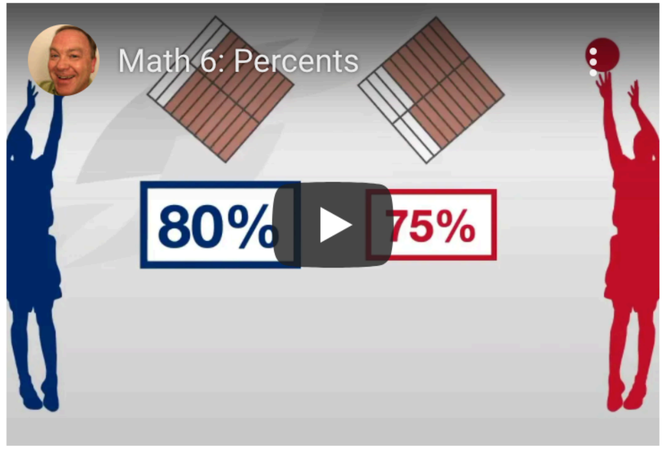
Improper Fractions and Mixed Numbers



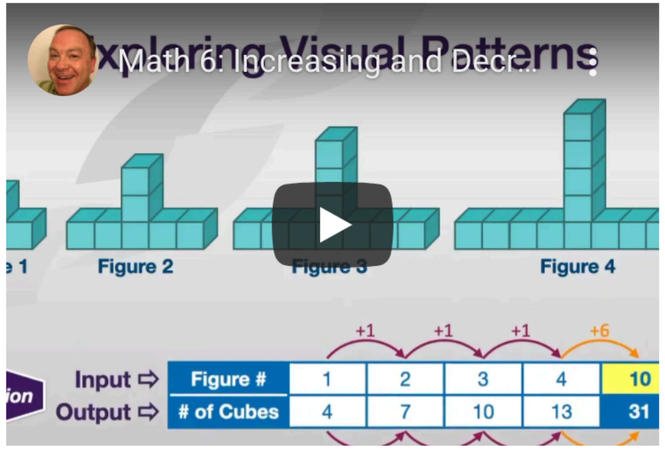
Ratios



Percents



Increasing and Decreasing Patterns



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NUMBER SENSE

Partitive Division of Whole Numbers Revealing a Fractional Quotient

7 days ago

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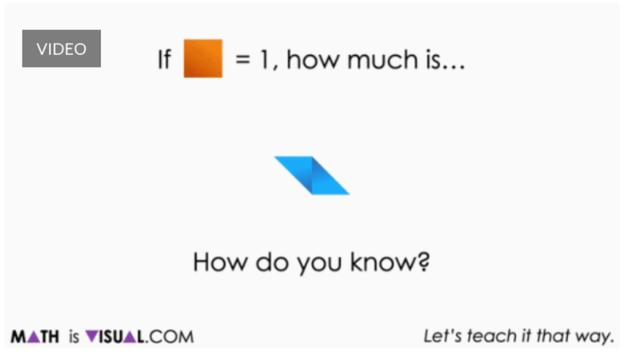
CINEMA MODE

https://mathisvisual.com/

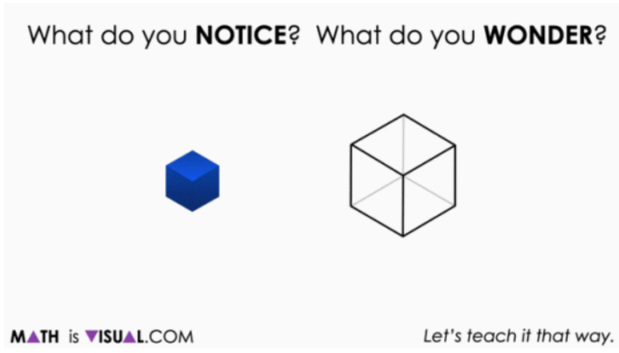
NUMBER SENSE

Partitive Division of Whole Numbers



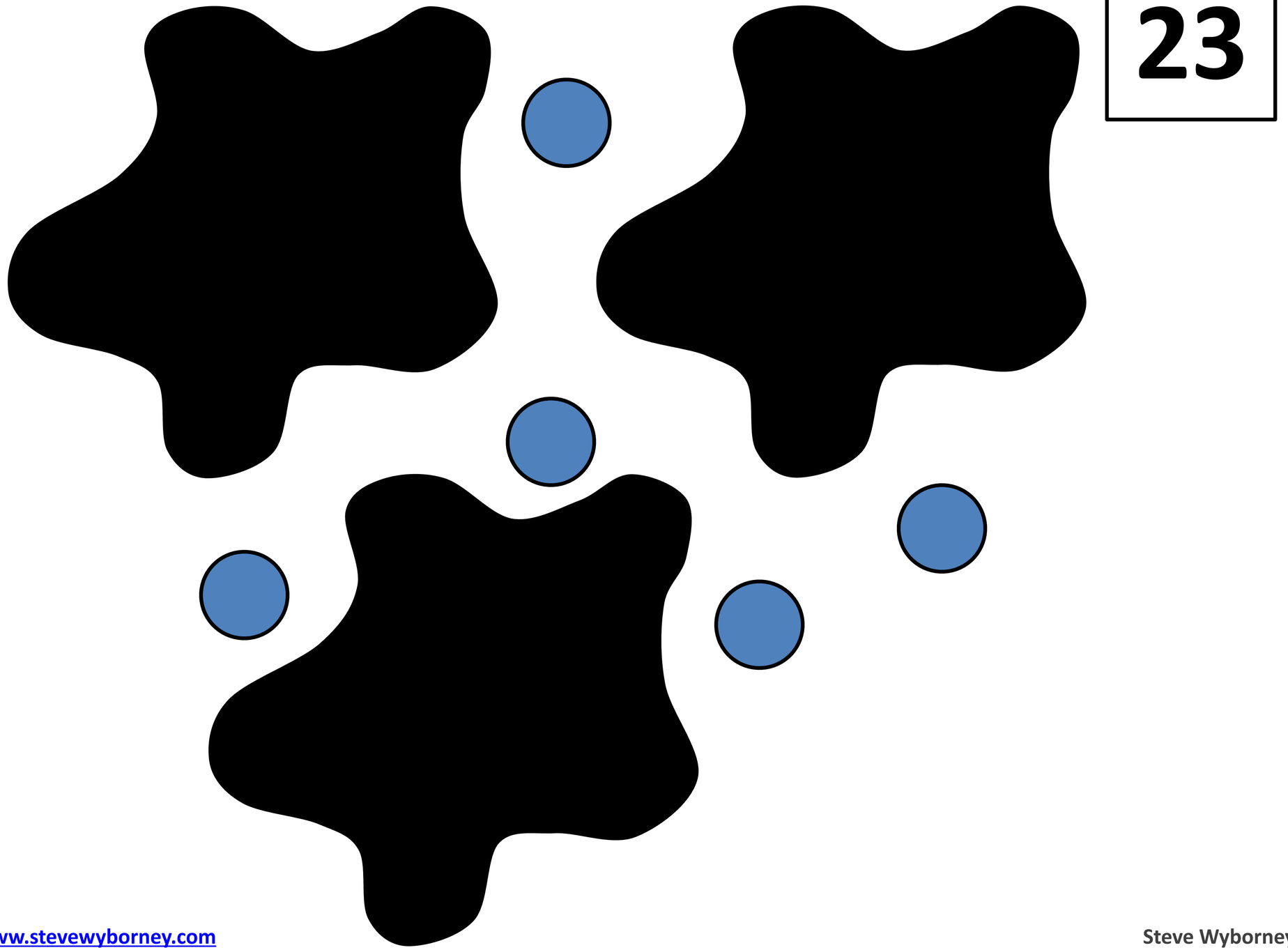
MEASUREMENT, NUMBER SENSE

Area of Composite Figures With Non-



MEASUREMENT, NUMBER SENSE

Multiplicative Comparison With



23


Truly
wonderful,
the mind of
a child is.
—Yoda

Chris Hunter

K-12 Numeracy Helping Teacher

email: hunter_c@surreyschools.ca

Twitter: @ChrisHunter36

blog: chrishunter.ca