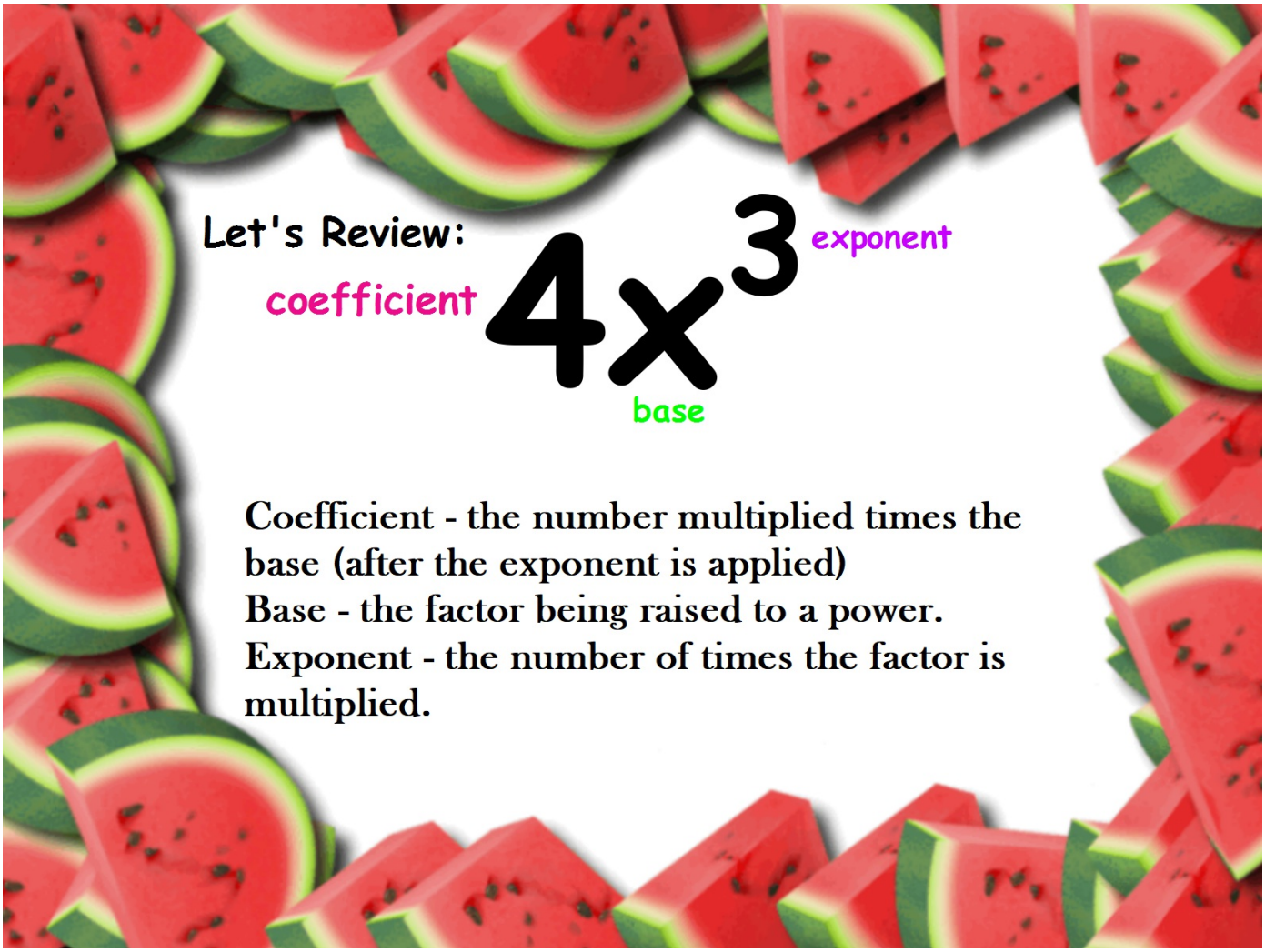
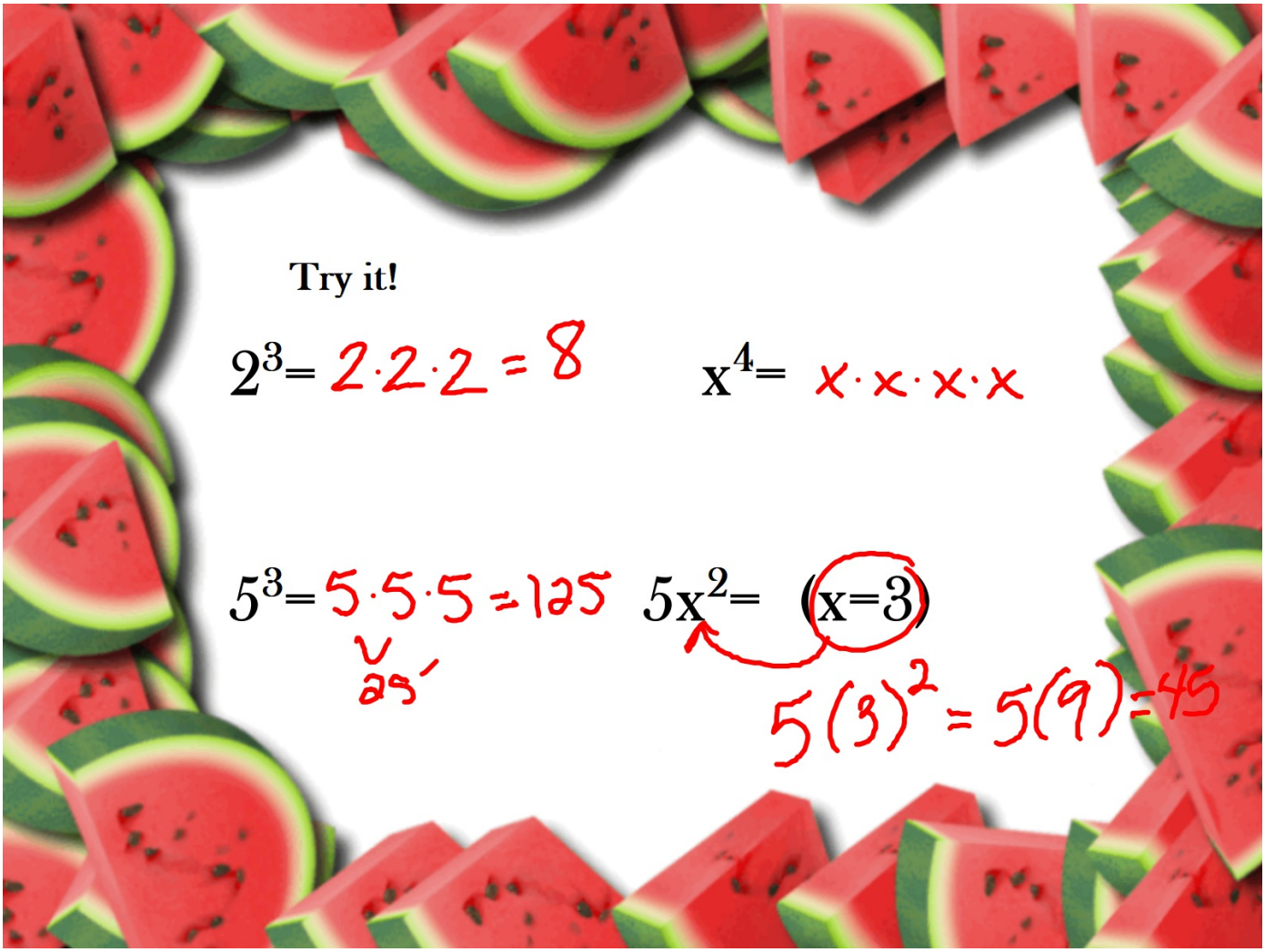
Warm - up

Product of Powers
&
Power to power


Let's Review:
coefficient
4x^3
exponent
base
Coefficient - the number multiplied times the base (after the exponent is applied)
Base - the factor being raised to a power.
Exponent - the number of times the factor is multiplied.


Try it!
$2^3 = 2 \cdot 2 \cdot 2 = 8$
$x^4 = x \cdot x \cdot x \cdot x$
$5^3 = 5 \cdot 5 \cdot 5 = 125$
as
$5x^2 = (x=3)$
$5(3)^2 = 5(9) = 45$

Solve the half sheet on your own.

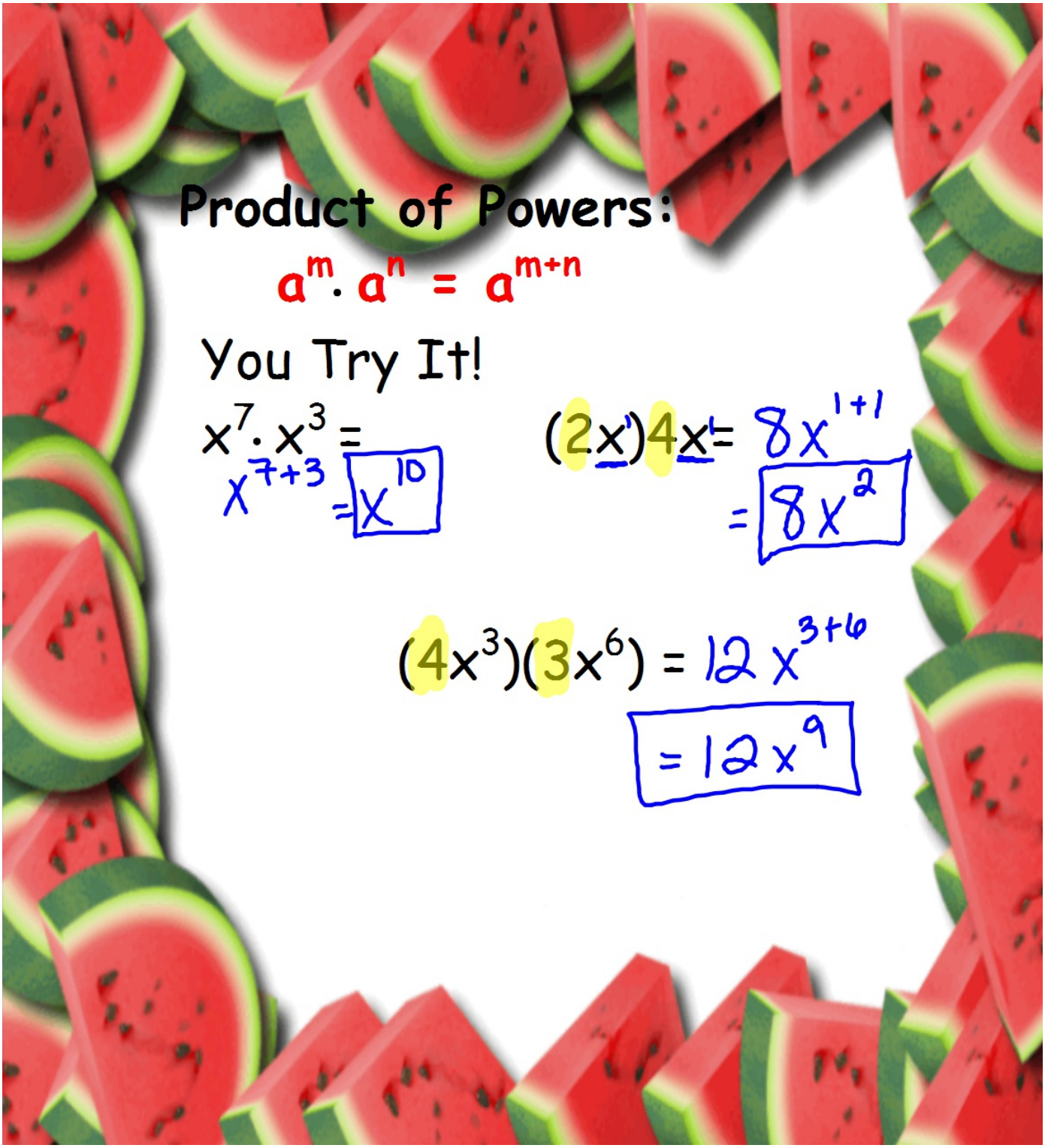
	Value		Value		Value
$2 \cdot 2 =$	4	$2^1 \cdot 2^1$	4	2^2	4
$4 \cdot 4 \cdot 4 =$	64	$4^2 \cdot 4^1$	64	4^3	64
$5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 =$	3125	$5^2 \cdot 5^3$	3125	5^5	3125

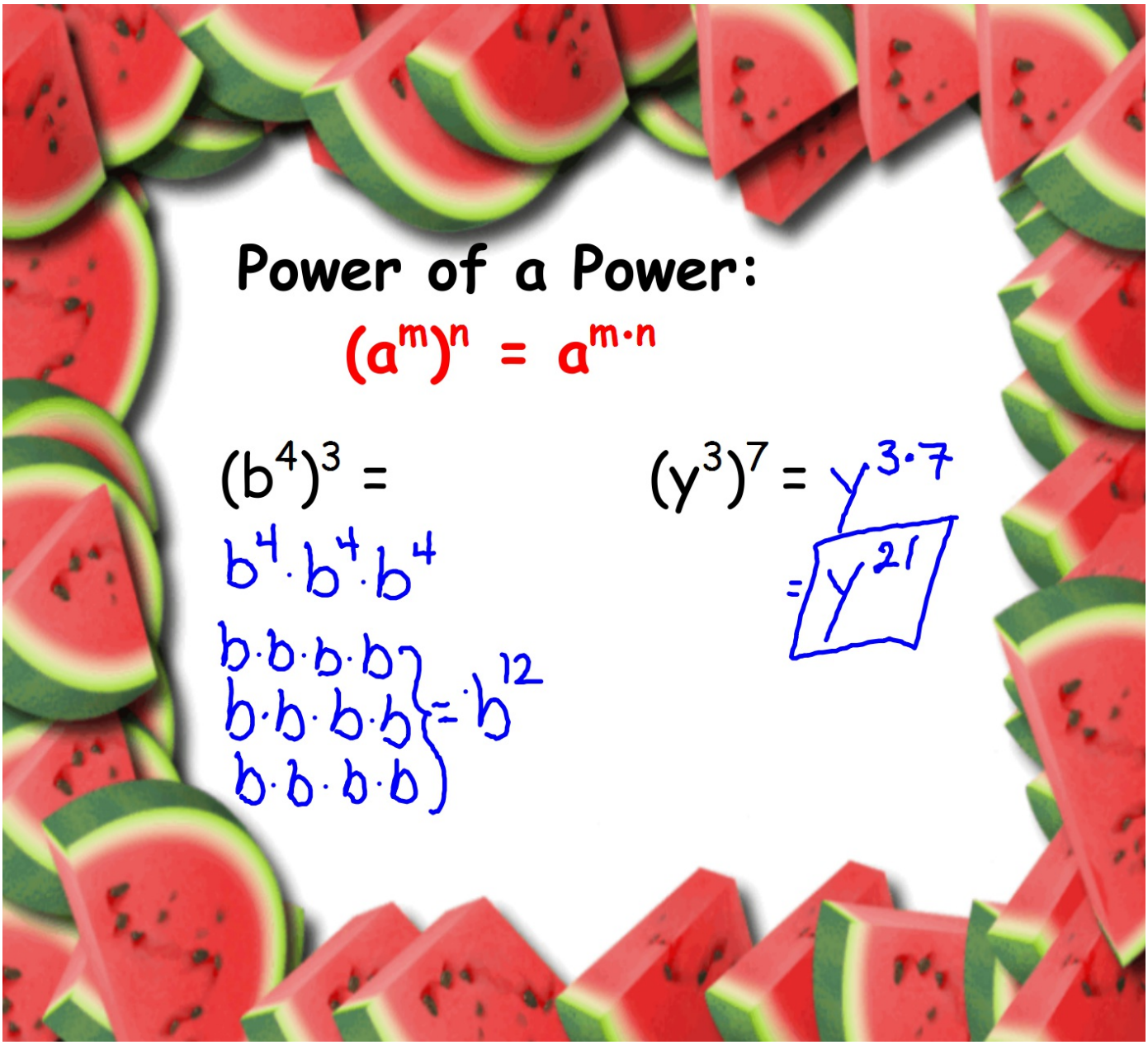
What pattern did you notice about multiplying exponents? Discuss with your group. How would you simplify $a^3 \cdot a^4$?

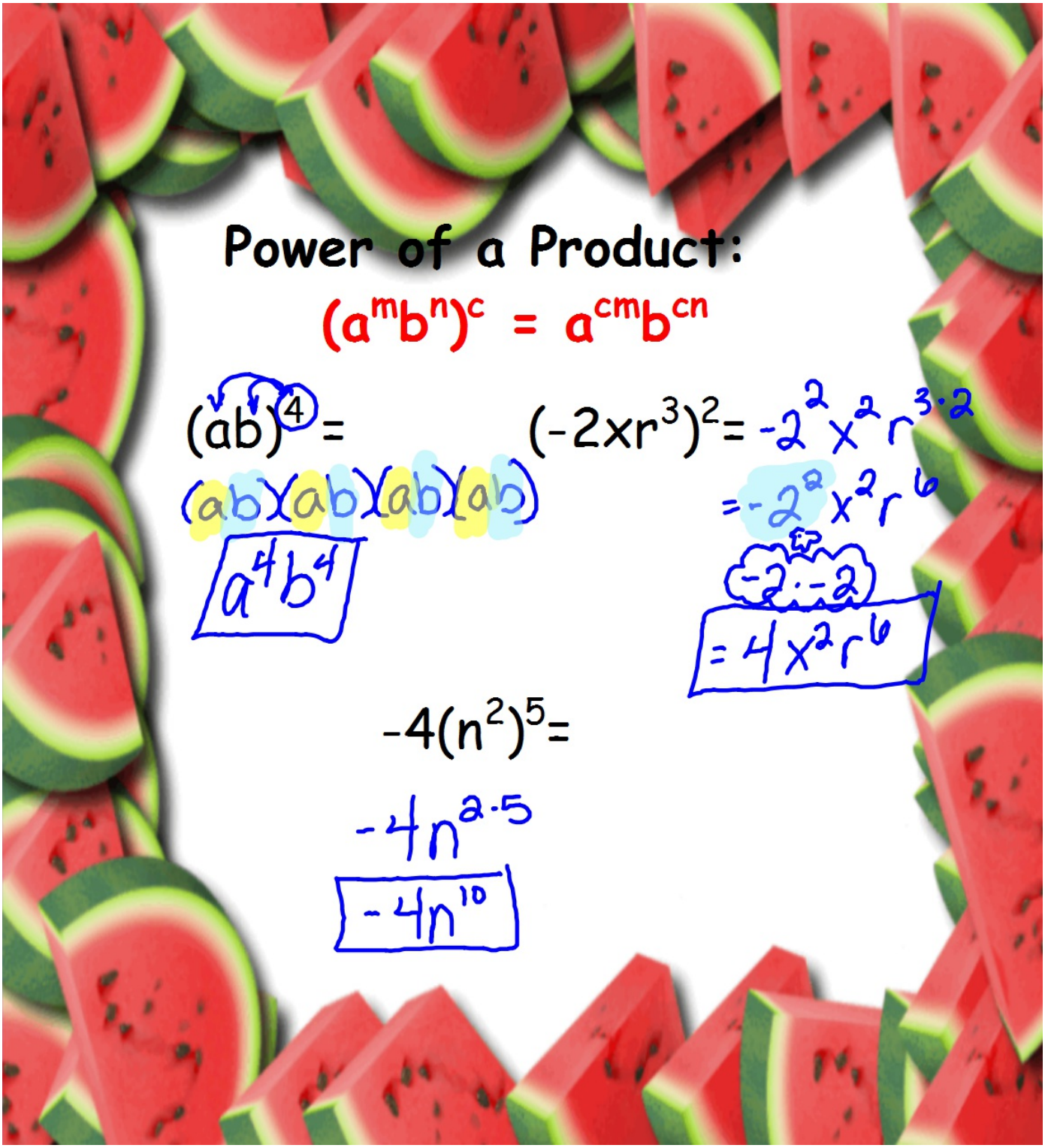
When multiplying bases that are the same, add the exponents

$a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a = a^7$

$a^{3+4} = a^7$


Product of Powers:
$a^m \cdot a^n = a^{m+n}$
You Try It!
$x^7 \cdot x^3 =$
$x^{7+3} = x^{10}$
$(2x)4x =$
$8x^{1+1}$
$= 8x^2$
$(4x^3)(3x^6) =$
$12x^{3+6}$
$= 12x^9$


Power of a Power:
$(a^m)^n = a^{m \cdot n}$
$(b^4)^3 =$
$b^4 \cdot b^4 \cdot b^4$
$b \cdot b \cdot b \cdot b$
$b \cdot b \cdot b \cdot b$
$b \cdot b \cdot b \cdot b$
$= b^{12}$
$(y^3)^7 = y^{3 \cdot 7}$
$= y^{21}$


Power of a Product:
$(a^m b^n)^c = a^{cm} b^{cn}$
$(ab)^4 =$
$(ab)(ab)(ab)(ab)$
$a^4 b^4$
$(-2xr^3)^2 = -2^2 x^2 r^{3 \cdot 2}$
$= -2^2 x^2 r^6$
$-2 \cdot -2$
$= 4x^2 r^6$
$-4(n^2)^5 =$
$-4n^{2 \cdot 5}$
$-4n^{10}$