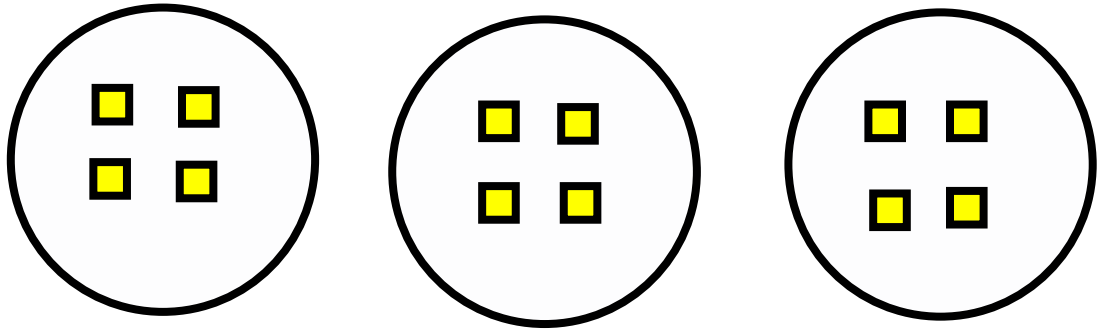
N7 Part B: Demonstrate an understanding of division of integers, concretely, pictorially and symbolically.

- Provide a context that requires dividing two integers.
- Model the process of dividing an integer by an integer using concrete materials or pictorial representations and record the process.
- Solve a given problem involving the division of integers (2-digit by 1-digit) without the use of technology.
- Solve a given problem involving the division of integers (2-digit by 2-digit) with the use of technology.

2.3 Using Models to Divide Integers (p. 77)

Read the following:

We can think of division as the opposite of mulitplication.
12 ÷ 4 = ? This division could be represented as:
How many sets of 4 will give a product of 12?
Note: Modelling division equations by finding its multiplication opposite is a good strategy to use.



There are 3 sets of 4.
So, 3 x 4 =12

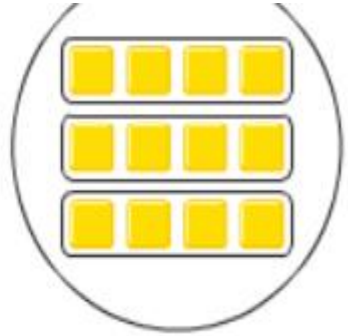
“Bank” model

We also discussed the bank model in class. **Review** this slide and the notes taken in class to refresh your memory.

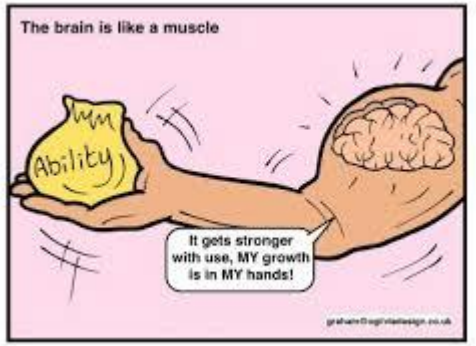
We can use a “bank” model to multiply 2 integers.

- A circle represents the “bank.”
  We start with the bank having zero value.
- The first integer tells us to deposit (put in) or to withdraw (take out).
- The second integer tells us what to put in or take out.
- We can use this model to multiply 3×4.

How can we use this model to find $12 \div 4$?

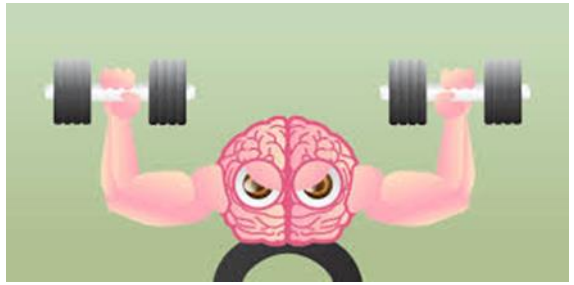


Make 3 deposits of 4 yellow tiles.
There are 12 yellow tiles.
So, $3 \times 4 = 12$



Watch the following video on dividing using models.
Note: the video explains it differently than the textbook.
Use the method that makes more sense to you.

https://www.youtube.com/watch?v=lDR-B_OhUQo

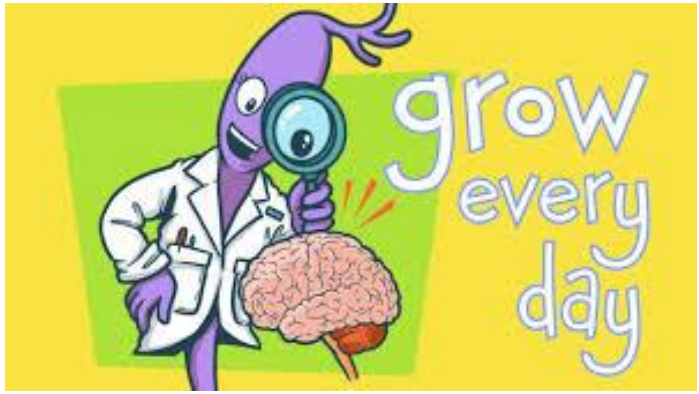


Dividing Integers - **copy** this rule into your scribbler.

- Dividing integers uses the same rules as multiplication did, that is:

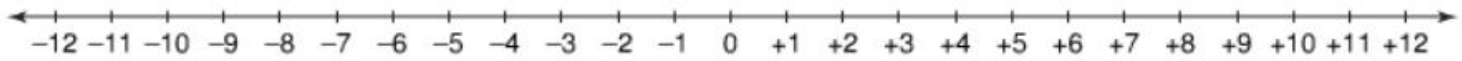
(+) ÷ (+) = (+)
(-) ÷ (-) = (+)
(+) ÷ (-) = (-)
(-) ÷ (+) = (-)

Odd number of signs = negative quotient
Even number of signs = positive quotient



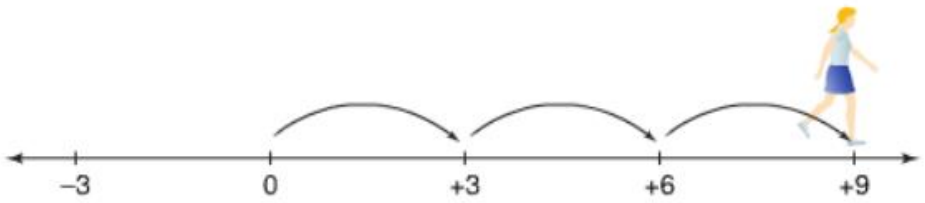
Modelling Division using Number Lines (**review** pages 78-79)

We can extend the use of a number line to model the division of two integers.



Visualize walking the line to divide integers.
This time, the direction you end up facing determines the sign of the quotient.

➤ Divide: (+9) ÷ (+3)
We need to find how many steps of +3 make +9.
The step size, +3, is positive; so, walk forward.
Start at 0. Take steps forward to end up at +9.



We took 3 steps. We are facing the positive end of the line.
So, (+9) ÷ (+3) = +3

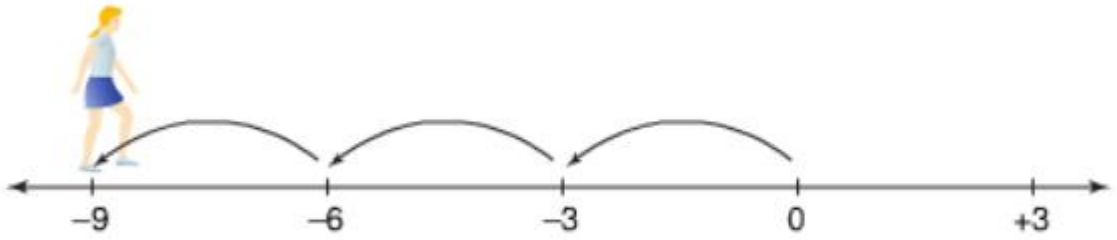
Modelling division using number lines continued…

Divide: $(-9) \div (-3)$

We need to find how many steps of -3 make -9.

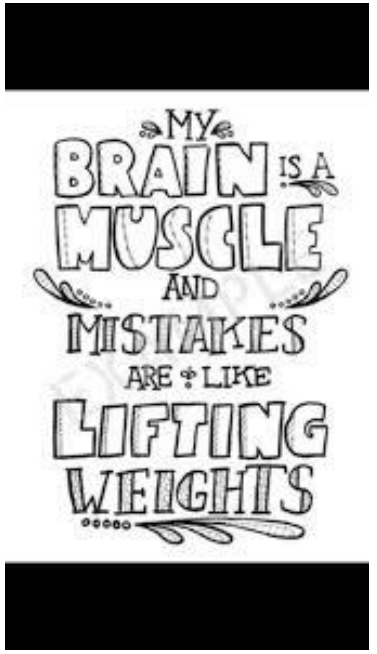
The step size, -3, is negative; so, walk backward.

Start at 0. Take steps backward to end up at -9.



We took 3 steps. We are facing the positive end of the line.

So, $(-9) \div (-3) = +3$



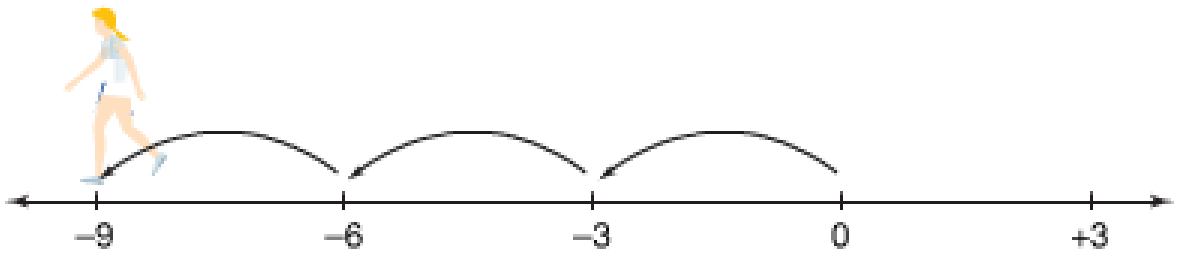
Modelling division using number lines continued…

Divide: $(-9) \div (+3)$

We need to find how many steps of +3 take us to –9.

The step size, +3, is positive; so, walk forward.

Start at 0. To end up at –9, we took 3 steps forward.



We are facing the negative end of the line.

So, $(-9) \div (+3) = -3$

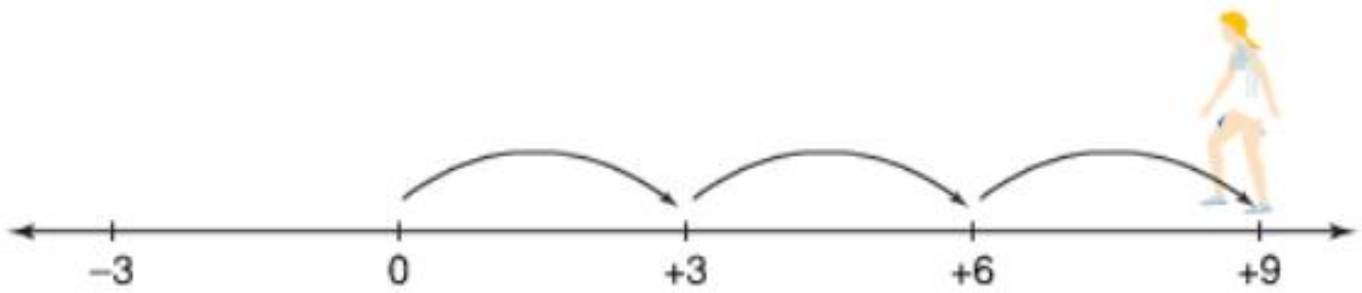
Modelling division using the number line continued…

➤ Divide: $(+9) \div (-3)$

We need to find how many steps of -3 take us to $+9$.

The step size, -3, is negative; so, walk backward.

Start at 0. To end up at $+9$, we took 3 steps backward.



We are facing the negative end of the line.

So, $(+9) \div (-3) = -3$

Practice Questions:
Do these questions in your math scribbler.
Note: Please remember to correct your work using the back of the math book.

Complete on pages 80-81

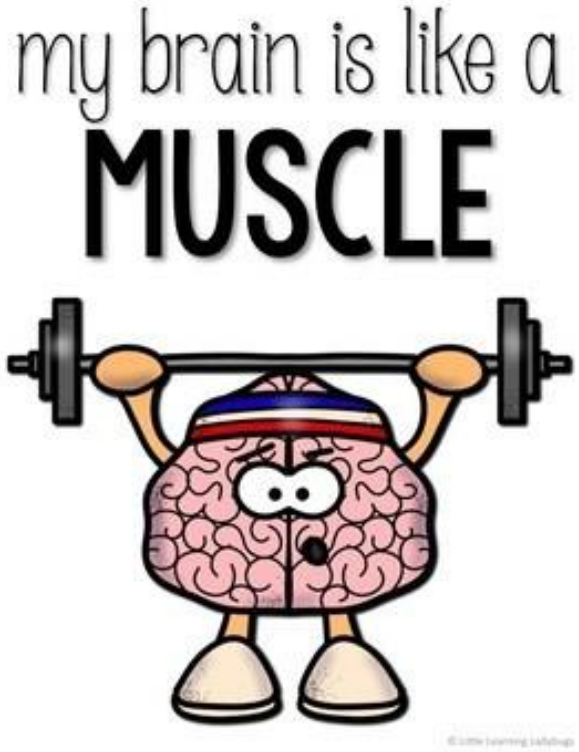
#3-all

#4-all

#6 a,c,e

8 a,c,e

#12



N7 Journal Question # 2

2.4 Developing Rules to Divide Integers-

Review Slides 12 and 13 which can be seen on page 85 in the math book, **take** notes as needed.

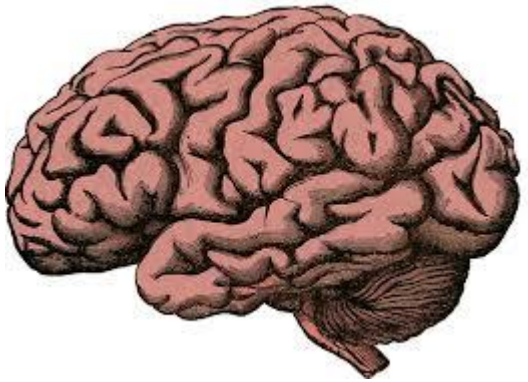
To divide integers, we can use the fact that division is the inverse of multiplication.

➤ We know that:
$(+5) \times (+3) = +15$

So, $(+15) \div (+5) = +3$ and $(+15) \div (+3) = +5$

dividend **divisor** **quotient**

When the dividend and the divisor are positive, the quotient is positive.



➤ We know that:
$(-5) \times (+3) = -15$

So, $(-15) \div (+3) = -5$ and $(-15) \div (-5) = +3$

The dividend is negative and the divisor is positive. The quotient is negative.

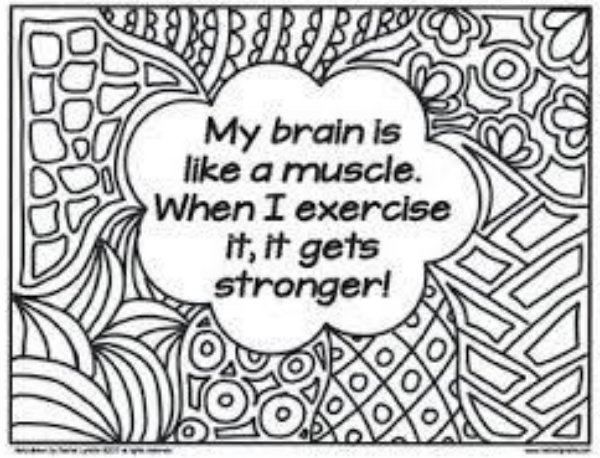
Both the dividend and the divisor are negative. The quotient is positive.

Developing rules to Divide Integers continued…

➤ We know that:
$(-5) \times (-3) = +15$

So, $(+15) \div (-5) = -3$ and $(+15) \div (-3) = -5$

When the dividend is positive and the divisor is negative,
the quotient is negative.



A division expression can be written with a division sign: $(-48) \div (-6)$;
or, as a fraction: $\frac{-48}{-6}$

When the expression is written as a fraction, we do not need to use brackets.
The fraction bar acts as a **grouping symbol**.
A grouping symbol keeps terms together, just like brackets.

Review all 3 examples from page 86, take notes as needed.

Please Note: The following two styles of division equations are the same even though they look so different!

(-10) ÷ (-2) is the same as $\frac{-10}{-2}$

- **Copy** these two examples and **solve** for each.

Practice Questions:

1) Complete the following questions from pages 87, 88, 89 in your scribbler: #4, #5, # 9, #11, #12, #18 and #19.

Remember to correct your work once you have completed them.

2) **Worksheet 2.4** – Developing Rules to Divide Integers

(pages 37 and 38 from the Practice and Homework Book)

N7 Journal Question # 3