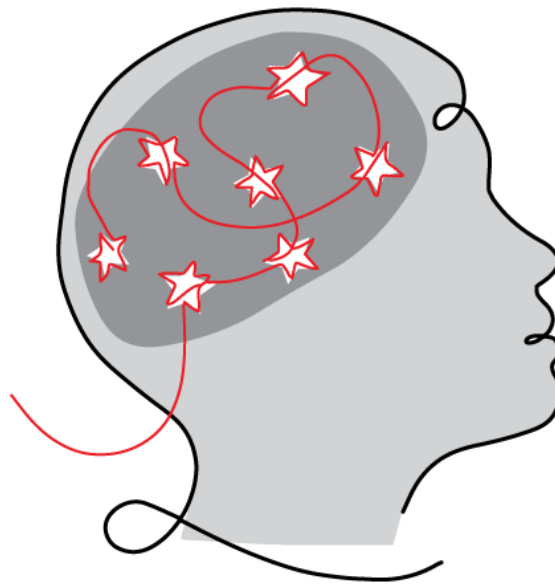




Let's think back to executive functions

- What do you remember about executive functions?
- What were some of the executive functions we talked about?
- Where do you remember being able to use executive functions in your lives?
- Where do you think you can use executive functions in math?



Ross usually makes bracelets for his friends. Usually, he can make 2 bracelets in the 30 minutes he has after school before practice.

One day, he has a free period and has 75 minutes to make bracelets. How many bracelets can Ross make?



1. How would you solve this problem?

**Ratio Tables and Executive Function in Math**

- In 30 minutes, Ross makes 2 bracelets.
- One day, he has a free period and has 75 minutes to make bracelets.
- How many bracelets can Ross make?



**Recognize when you need to stop and think - go off autopilot.**

- Rather than just calculate with numbers right away, what is the question you are trying to answer?
- What are the different ways to find the answer?

**When you are trying to make sense of lots of information, writing things down can help.**

- Using a ratio table can help you organize information so you can see patterns and relationships with numbers.

Minutes	Bracelets
15	
30	2
60	
75	



2. Talk to a partner about different ways to see things.
  - a. Complete this ratio table.
  - b. How many bracelets can Ross make per hour?
  - c. How many bracelets can Ross make in 75 minutes?

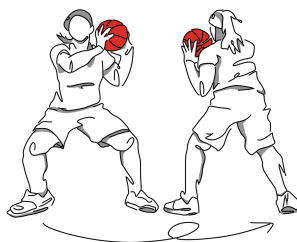
**Ratio Tables and Executive Function in Math**

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A ratio table can support your **working memory**. By writing down information you don't have to juggle so much information.

A ratio table organizes numbers and may help you see things that might be difficult to notice in a word problem. This supports **cognitive flexibility**.

When you organize information in this way, a path to find the answer may make more sense to you. Pausing to organize information and make sense of the situation is an example of **inhibitory control**.

**Working Memory****Cognitive Flexibility****Inhibitory Control**

You use executive functions when you do math, too.

Now that we know how executive function is important in math, we will learn about how they grow!

**Ratio Tables and Executive Function in Math**

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Let's take another look at Alexis' ratio table that was comparing the ratio of views to likes.

Views	Likes
200	40
50	10
250	50
300	
	1000

3. How would you use Alexis' ratio table to estimate the number of likes she might get for 300 views.

4. How many views might Alexis need to get 1000 likes?



5. Explain how you found your answers for 3 and 4.

As you can see, a ratio table is a helpful tool for solving problems involving ratios. You can make your own ratio table by starting with two numbers from a known ratio. You can then add new rows of equivalent ratios by using operations such as multiplication, division, addition and subtraction.

**Ratio Tables and Executive Function in Math**

Below are some examples of how you can use operations to make new, equivalent ratios:

A. Doubling (multiply by 2)

	followers	likes
$\times 2$	20	3
$\times 2$	40	6
$\times 2$	80	12

B. Multiplying by 10

	followers	likes
$\times 10$	20	3
$\times 10$	200	30
$\times 10$	2,000	300

C. Cutting in half (divide by 2)

	boxes	Candy Bars
$\div 2$	8	48
$\div 2$	4	24
$\div 2$	2	12

D. Multiplication Combo

	followers	likes
$\times 5$	20	3
$\times 5$	100	15
$\times 3$	300	45

For ratio tables A through D, look at how multiplication and division were used to find new ratios. For the ratio tables below, labeled E and F, look at how two rows were added or subtracted to make a new ratio. You can add and subtract two rows of ratios to make new equivalent ratios.

E. Adding Ratios

	views	likes
$\div 4$	200	40
$\div 4$	50	10
Row 1 + 2	250	50
Row 2 + 3	300	60

F. Subtracting Ratios

	views	likes
$\div 10$	200	40
$\div 10$	20	4
Row 1 - 2	180	36

**Ratio Tables and Executive Function in Math**

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Kayla has friends who have been using social media accounts like TikTok and Instagram. She has wondered about making her own account on one of these platforms.



6. What might be some things Kayla should think about before creating a social media account? Is there any advice you would give to Kayla?

Kayla talks with Sam, Alexis and Gabriel about this. Gabriel says he has a TikTok account. He said that one month after he posted a few dance videos, he had 15 followers and 10 likes. They all start wondering how long it will take Gabriel to have about 100 followers.

**Kayla**

Months	Followers
1	15
10	150
5	75
6	90
7	105

7. Describe the steps Kayla used.

**Sam**

Months	Followers
1	15
4	60
5	75
6	90
16	100

Something is wrong with the last row in Sam's ratio table.

8. How did Sam find the last row?

9. What mistake did Sam make?

**Ratio Tables and Executive Function in Math**

On the right is Alexis' ratio table.

10. Describe the steps Alexis used to find the number of months it might take for Gabriel to have 100 followers.

Months	Followers
1	15
2	30
20	300
$\frac{20}{3} = 6 \frac{2}{3}$	100



Dwayne "The Rock" Johnson has a large number of people who follow him on his TikTok account, with 56.7 million followers.

However, the person on TikTok with the most followers is 22-year old Khaby Lama, who has 148.7 million followers. According to Newsweek in 2021, 8 of the 25 most liked videos were made by Khaby Lama.



This screenshot shows Khaby Lama's TikTok data on August 21, 2022.

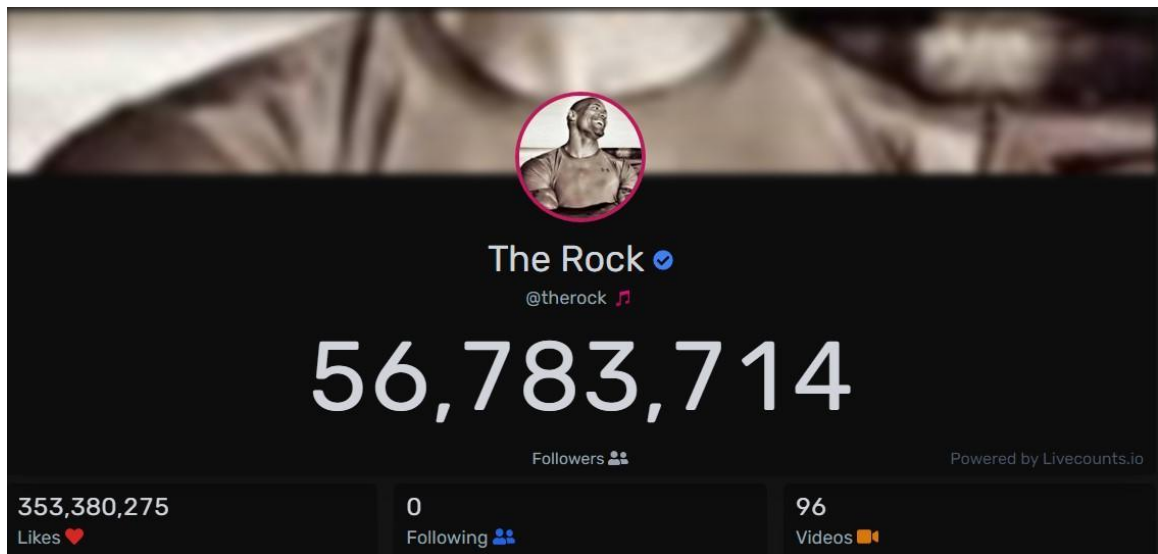
11. About how many videos has Khaby Lama posted to TikTok?
12. Estimate the number of likes for Khaby Lama's TikTok account.

**Ratio Tables and Executive Function in Math**

Khaby Lama's TikTok data has been rounded up in the ratio table below.

Likes	Followers
2,400,000,000	150,000,000
2,400	150
240	15
80	5
16	1

13. Label the ratio table above with the operations used to find Khaby Lama's ratio of likes to one follower.



14. Describe some differences between the data shown for Khaby Lama's and The Rock's TikTok accounts.



**Ratio Tables and Executive Function in Math**

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Let's estimate the number of likes and followers for The Rock to be 350,000,000 likes and 56,000,000 followers.

15. Use the ratio table below to find the ratio of likes to followers for Dwayne "The Rock" Johnson. Use as many rows as you need.

Also, label the ratio table with the operations you used.

Likes	Followers

**Summary**

A ratio table can be used to support our **working memory**, by organizing information when we solve problems involving ratios. When we make a ratio table, each column is labeled so we can keep track of what each number represents.

We can use many different combinations of operations to solve problems with ratio tables. Ratio tables can be written in different ways. Sometimes, you might see a ratio table written horizontally, like the example below.

Likes	2400	24	48	16
Followers	150	1.5	3	1