

Unit 2 - Lesson C1

Likes, Shares and Who Cares?

Overview of Lesson Goals: Content, Context, & Reasoning

This lesson uses a social media context to introduce students to ratio tables. Other parts of the lesson focus on proportional reasoning using large numbers and use of ratio language to describe related quantities.

CCSSM content goals:

CCSS.MATH.CONTENT.6.RP.A.1

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

CCSS.MATH.CONTENT.6.RP.A.3

Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

Standards for Mathematical Practice: MP1, MP2, MP3

Student Friendly Objective:

- I can use ratios and proportional reasoning to solve problems in real world contexts.

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| Estimated total time for lesson = 50 min | |
| 3 min | Welcome Students and Objectives <ol style="list-style-type: none"> 1. Display Unit 2 Lesson C1 slidedeck. 2. Review the objectives. |
| 5 min | Slide 3 - Launch: Setting the context <p>The first two questions should be discussed in pairs or groups. The questions focus on students' knowledge of social media and their familiarity with various apps. Students do not need to have their own social media account to engage in this work.</p> <p>After about 3 minutes of group discussion, select students to share their descriptions of social media (Question 1), and identify social media apps they are familiar with. The slide will showcase 10 different social media icons (for Question 2); you could have students name the different apps as you click through each.</p> |
| 3 min | Slide 4 - Individual writing: Measuring popularity <p>Popular is used as an intentionally vague term to gauge how students understand popularity and consider ways social media data could be used to measure popularity.</p> <p>Encourage students to consider how social media reports data from users. If students are struggling with how to respond to this question, you could ask, "How do likes, shares, followers, comments, etc., suggest if something is popular? What do you think are ways to measure popularity?" Students might also consider forms of data that are not generated by social media, such as what their friends and family are talking about.</p> |
| 2 min | Group discussion. Teacher listening. Have students share their responses to Question 3 in pairs or groups after they have had some time to think and write on their own. During this time the teacher should circulate to listen to student conversations. |
| 3 min | Slides 5-8 - Engage & Explore: YouTube Data Whole Class Discussion <p>Slide 5 Show students the slide with the YouTube data. They also have the same copy of the bar graph in their student book. Pick some select</p> |

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| 2 min | <p>data to verbalize out loud as some of the text might be difficult to read. Make sure to notice the Top 3 and the associated numbers to the right of the bar graph.</p> <p>Ask students: “Look at the videos with the top three views by July 29, 2022. How many views did the top three videos have?”</p> <p>Listen to students' responses to see if they notice that the scale is in billions; encourage students to read the scale.</p> <p>Slides 6, 7 & 8 prompt students to think about similarities among these most watched videos (Question 4). Also ask students if they have watched any of these videos. If so, their views are included in this data!</p> <p>(Question 5abcde) The purpose of this question sequence is to have students consider the magnitude of very large numbers, and compare different population groups to the number of views in the bar graph.</p> |
| 5 min (20) | <p>It is doubtful that students will know the estimated populations. Write down their estimates on the board, and then have students look up the data on the internet. A search of “population of {place}” should be enough to reveal the current population estimates. For Question 5e, students might look at the school or district website, or you may want to have this information available to share with students. (some states may have data repositories that include enrollments for each school.</p> <p>For example, Ohio has a website with downloadable Excel files: https://education.ohio.gov/Topics/Data/Frequently-Requested-Data/Enrollment-Data</p> <p>The state of Mississippi has a Data Explorer that shows school level enrollment data: https://mdereports.mdek12.org/</p> |
| 5 min (25) | <p>Slide 9 - Engage & Explore: Proportional Reasoning Task</p> <p>Question 6ab is a problem solving task that focuses on proportional reasoning. It is also an informal introduction to finding a unit rate.</p> <p>Give students time individually or in groups to identify strategies to figure out how much larger the population of the USA and the world are compared to their school.</p> <p>Some students might attempt an additive strategy. For example, for a school population of 500 they might write 500 + 500 + 500 ... etc. And</p> |

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| | <p>keep adding. If so, make note of this for formative purposes, but encourage students to use a strategy that uses “bigger chunks” of numbers -- such as 1,000 schools would have 500,000 students, so 2,000 schools would have 1,000,000 people.</p> <p>Prior to Question 6b, you could have students first share their strategies for Question 6a before you ask them to solve Question 6b.</p> <p>Identify a few multiplication and division strategies for students to share with the rest of the class.</p> |
| 5 min (30) | <p>Slides 10 and 11 – Ratios in Social Media</p> <p>Have students read through the context information in Slides 10 and 11. You could choose to play the “Baby Shark Dance” video in class.</p> <p>Questions 7 - 9 (Slide 11) focus on identifying ratios from a fictional screen. Yet, the data for this particular video are real; if you show the video in class you might still see 36M likes (this was the value in early Sept 2022). For Question 7, students should take the information directly from the rendering of the video screen. Ideally, they would use the raw data 36 million : 15 million. However, some students might write the equivalent ratio of 36 : 15.</p> <p>Question 8 asks students to write equivalent ratios. Students can use powers of 10 to write 360 : 150, 3600 : 1500, or use common factors to write ratios such as 12 : 5, or identify equivalent ratios that use decimal numbers, like 18 : 7.5 or 6 : 2.5.</p> <p>Question 9 revisits students’ interpretation of “popular” to consider how likes and dislikes together may reveal information about a video. As it turns out, “Baby Shark Dance” is one of the most disliked videos on YouTube. It is more important that students provide a reasonable justification of what they mean by popular, and how it might be measured.</p> |
| 5 min (35) | <p>Slides 12 and 13 - Alexis’ Video</p> <p>These slides shift to a video posted by Alexis, in which she projects how the growing number of views for her video might translate to likes and dislikes. These numbers should be more manageable for students and they should be encouraged to leverage their number sense and mental math as they look over Alexis’ ratio table.</p> |

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| | <p>Have students read through Alexis' explanation. As students are reading through the explanation, they can label the corresponding ratio table with the operations Alexis used. This labeling should be encouraged as students use and make sense of ratio tables.</p> <p>Question 10 asks students to propose a strategy Alexis might have used to find the last ratio in her table. The strategy that most students might see is to divide the ratio in Row 4 by 10.</p> |
| 5 min (40) | <p>Slide 14 - Is it more or less popular? Pair/Group Discussion to Whole Class Debrief</p> <p>In Question 11, students are asked to compare ratios. Which of the ratios of Likes to Dislikes is more favorable – Alexis' or Baby Shark Dance. If there is time, have students discuss Question 11 in pairs or groups before sharing some of their explanations to the whole class.</p> |
| 2 min (42) | <p>Slides 15 & 16 - Summary and Exit Ticket</p> <p>Have students take turns reading through different parts of the summary slide. For this introductory lesson to ratio tables, students should recognize that you can create new ratios using operations like multiplication and division. If there is time, also point out how the ratio table in Slide 14 shows that you can add ratios together (i.e., you can add Row 1 and Row 2 to get Row 3).</p> <p>(Likewise, in the Exit Ticket, students may notice you can add the first two ratios to get the third ratio -- although let them identify this on their own). The use of operations with ratio tables will be explored further in Lesson C2.</p> |
| 5 min (47) | <p>Briefly introduce the problems in the Exit Ticket. Students should explain in writing how they think Alexis found the second and third rows in her ratio table. Students might also find it helpful to label the operations along the side of the ratio table.</p> <p>For Question 13, students need to add a 4th row to the ratio table. They should place 600 in the 4th row of the Views column. From this, they should identify how they could use a previous row, and an operation, to get the 4th row. Several strategies are possible for Question 13.</p> |

Student Responses

1. *Student answers will vary depending on their familiarity with social media. The intent of this question is to set up exploration of the social media context and examination of ratios and an informal introduction to unit rates.*

Some possible student answers may focus on particular apps:

- “TikTok and Insta are social media. You can share things and see what others are doing.”
- “Friends sharing videos and what’s going on”
- “Where you can see what your family is up to.”

Students might respond to the second part of the question with

- “Social media is used to sell stuff”
 - “If my mom wants to see what’s going on right now she looks at Twitter”
 - I can look People like to show off
2. *This is an opportunity for students to share social media platforms they are familiar with.*

The various social media icons in the slide are (in order by row):



Instagram



Meta
(aka Facebook +)



Twitter



Snapchat



WhatsApp



Pinterest



YouTube



Twitch



TikTok



Facebook

We have no idea what they might say the most popular YouTube video is, but we are curious to hear what your students say!

3. *Student responses will vary.*

Students might count likes or views. Others might say it is important to read

the comments and subtract the negative comments from the positive comments and likes.

4. *Students might notice that most of these videos are music videos. Others might notice that at least half of the videos are for young children: “Baby Shark Dance,” “Johnny Johnny Yes Papa,” “Bath Song,” “Learning Colors,” and “Phonics Song.”*

Some students will be familiar with these videos for young children from their own experience watching them, or younger siblings or relatives. Others students may be somewhat familiar with Ed Sheeren, Charlie Puth and Bruno Mars’ songs.

5. a. *Student responses will vary.*

Possible student responses include:

“How is that possible. Ten billion views is more than the number of people on our planet!”

“Even though it’s a very large number, my younger brother has seen Baby Shark Dance at least 100 times! It makes sense because we watch videos we like more than one time.”.

b. *The current estimated population of the world is over 7,700,000,000 people. (or almost 8 billion)*

c. *The current population of the United States is about 330,000,000 people.*

d. *Answers will depend on your state. Below is some approx. population data*

| State | Population |
|-------------|------------|
| California | 39,300,000 |
| Colorado | 5,700,000 |
| Ohio | 11,700,000 |
| Michigan | 10,000,000 |
| Mississippi | 3,000,000 |

| | |
|--------------|-----------|
| New Jersey | 8,900,000 |
| Rhode Island | 1,100,000 |
| Wyoming | 580,000 |

e. (have students look up the student enrollment for their school)

6. *a. Assuming the population of your school is 500 students, one strategy would be using multiplication to build up to 330 million*

I know 500 students x 2 schools = 1000 students.

If I multiply 1,000 by 330,000 I get 330,000,000 students.

So, you would need 330,000 x 2, or 660,000 of our schools to approximate the U.S. population.

Some students might see this as a division problem:

330,000,000 divided by 500 is 660,000 schools

b. Using the same two strategies (multiplication and division), students might write

I know 2 schools have 1000 students. If I multiply 1000 by 7 million people, I get 7 billion people. So we would need over 2 x 7 million, or 14 million schools to approximate the world population. (give some allowance for rounding)

A division strategy:

7,700,000,000 divided by 500 students would be 15,400,000 schools

7. The ratio of likes to dislikes is 36,000,000 : 15,000,000
(some might abbreviate this as 36M : 15M)
8. Other equivalent ratios are 36 : 15, 360 : 150, 12 : 5, etc
9. *Some students might say: "I think it is still very popular. There are a large number of dislikes, but there are still 21 million more likes than dislikes. And my sister still watches it!"*

Other students might say: "I don't think this video is popular. That is more disliked than most videos. People are hating on this one. I don't think it is as

popular as people think. Also, I can't stand it!"

10. Alexis found the ratio 120 : 30 by multiplying the first ratio (row) by 3. Then she multiplied that by 3 again to get the ratio 360 : 90. To get the last row she divided 360 and 90 by 10 to get 36 : 9.

Students should provide a written explanation. However, some might label the ratio table above with the operations Alexis used with an arrow from Row 4 to Row 5 marked with "x 10.")

| | Likes | Dislikes |
|-------|-------|----------|
| Row 1 | 40 | 10 |
| Row 2 | 80 | 20 |
| Row 3 | 120 | 30 |
| Row 4 | 360 | 90 |
| Row 5 | 36 | 9 |

Handwritten annotations: On the left, a bracket from Row 1 to Row 2 is labeled "x2", and a bracket from Row 2 to Row 3 is labeled "x3". On the right, a bracket from Row 1 to Row 2 is labeled "x2", and a bracket from Row 2 to Row 3 is labeled "x3". Below Row 4, a bracket from Row 4 to Row 5 is labeled "÷10".

11. Students should see that Alexis' video is more favorably "reviewed." Explanations will vary from general to specific:

"The ratio of likes to dislikes is better for Alexis' video compared to Baby Shark Dance.

"The Baby Shark Dance video has a like : dislike ratio of 36 : 15. Alexis is 36 : 9"

"Alexis has fewer dislikes for every like."

12. To get the 2nd row, Alexis divided the first ratio by 4.
To get the 3rd row, Alexis multiplied the second ratio by 5.

Another explanation for the 3rd row would be:

To get the 3rd row, Alexis added the ratios in the 1st and 2nd rows

| Views | Likes |
|-------|-------|
| 200 | 40 |
| 50 | 10 |
| 250 | 50 |
| | |
| | |
| | |

Handwritten annotations: On the left, a bracket from Row 1 to Row 2 is labeled "÷4", and a bracket from Row 2 to Row 3 is labeled "x5". On the right, a bracket from Row 1 to Row 2 is labeled "÷4", and a bracket from Row 2 to Row 3 is labeled "x5".

together.

13. If I multiply the first ratio by 3, I get 600 views to 120 likes.

| Views | Likes |
|-------|-------|
| 200 | 40 |
| 50 | 10 |
| 250 | 50 |
| 600 | 120 |
| | |
| | |

$\times 3$ $\times 3$

Some students might also notice that you can multiply the second ratio (50 : 10) by 12 to get the ratio in the 4th row.