Comparing COVID Cases Across Montana's Demographic Populations

Teacher: Elizabeth Fisher

Lesson Date: 10/22/2020

Grade Level: 7

Timeframe: 60 minutes

Content Area: Math

Grouping Strategy: Small Group and Whole Class

Preparing for Lesson Development

What do you know about your students' current performance and educational needs?

Students have prior knowledge of calculating percentages in sixth grade (6.RP.3) using real-world and mathematical problems from a variety of cultural contexts, including those of the Montana American Indians to find a percent of a quantity as a rate per 100.

The students have learned about calculating percentages in a previous lesson. A common mistake when looking at percentages under 10% is to accidentally write 8% as .8 instead of .08. If you use .8 on accident, you will find 80%, not 8%. 8% means 8 out of every 100. It is anticipated some students will struggle with analyzing and comparing some of the data. Remind the students to always think about the reasonableness of their answer.

How will you differentiate the lesson to meet the needs of all learners in your classroom?

The students will work in small groups and the teacher will circulate the classroom to help as needed and formatively assess their progress with the worksheet. The small groups will have students with mixed abilities. The review of calculating percentages at the beginning of class will help the students to be more prepared to do the worksheets. As the students come up with their solutions for calculating the data, the teacher will write them on the board so the students can reference it if needed. Calculators will be provided for the students to use for calculating the percentages. Extra spots to transfer data were created in the worksheet so that the percentages can easily be compared. Suggestions are made within the worksheet to highlight or circle the relevant data so that it is easier to compare as well.

Lesson Plan Development

Lesson Title: COVID Case Percentages and Demographics
Common Core and/or State Standard(s): 7.RP.3 Use proportional relationships to solve multi-step ratio and percentage problems within cultural contexts, including those of Montana American Indians (e.g., percent of increase and decrease of tribal land). Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. MP3- Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments.

MP4- Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. This includes solving problems within a cultural context, including those of the Montana American Indians.

EU5- There were many federal policies put into place throughout American history that have affected Indian people and continue to shape who they are today.

Lesson Objective:	**Assessment of Learning:**
SWBAT calculate the percentages of current COVID cases for each demographic population in Montana.	Students will be assessed on their data calculated.
Lesson Objective: SWBAT analyze data and identify discrepancies in COVID rates among ethnic groups.	**Assessment of Learning:** Students will be assessed formatively throughout discussion within pairs and whole group, and also on completion of their worksheets. Students should recognize that the number of positive cases per each demographic is the same as the actual demographics of our state. The Caucasian population for MT is 88.9%, but the percent per positive cases is 40.89%, which is almost half as much as the actual population. The staggering statistic is the American Indian inclusive group that totals 6.8% of the population, but the positive case percentage is 12.94%, nearly double. (The death rate is also shocking)

Relevant Vocabulary:
Percentage: quantity of a rate per 100, one way of writing a ratio.
Reservation: an area of land set aside for American Indians to live.
Demographic: statistic characterizing human populations such as age, gender, ethnicity, or income.
Population: the whole number of people or animals living in a country, city, or area.
Trend: a general direction of change.

Teaching Model: 5 E's

Indian Education for All (IEFA) __ No _x_ Yes. If yes, describe how the lesson addresses one or more of the Essential Understandings Regarding Montana Indians:

Students will learn through math that there is something happening on the reservations that is causing them to have higher rates of COVID cases and subsequently more deaths. This lesson will help them to start conversations about why this is happening, how federal policy affects life on American Indian Reservations, and discuss what they can do to try to help change this.

Lesson Procedures/Activities:

ENGAGE: (10-15 MIN) Review of percent, ask the students:
What is a percent?
It means per hundred, think 100 cents in a dollar of 100 years in a century. It can be substituted for the term hundredth in fractions and decimals. For example, 56/100 = 56% and 0.23 = 23%.
Why do we use percentages?
We use percent to describe a part of a whole, just like fractions.
How do we calculate a percent?
Proportion: A percent is really just a fraction, how many you have out of 100. If you have a total that isn't 100, you can solve the proportion to figure out the percent of a number.

$$\frac{\text{Part}}{\text{Whole}} = \frac{\%}{100}$$

Changing a fraction to a percent, divide the numerator by the denominator, then change the decimal quotient to a percent.
2/5 ---> 2 ÷ 5 ---> 0.4 ---> 40%

EXPLORE: (10 MIN) We will be looking at recent COVID statistics to understand how it is affecting different demographics within our state. (Make sure everyone understands what demographics are) All students will get a worksheet and will need a pencil. After the students have completed page one of their worksheets, calculating percentages and the first question, they will be divided into mixed ability small groups.
Instruct the students to compare answers in the first section to make sure they all have the same percentages and have calculated them correctly. Circulate throughout the groups to provide help individually or to the small groups. Make sure that students are coming up with the right percentages, that they are moving their decimal point twice to make their percentage. Ask them if their answer seems right and have them have them double-check their answers. Ask questions such as, “What is the difference between each percentage in each of the demographic groups?”, “Is this percentage lower or higher than the other?”, “If you thought about the percentages as fractions, what would you estimate them to be?”. Peers can help each other as well. They will complete through number six together through discussion of ideas.

EXPLAIN: (5-10 MIN) As students begin to come up with their ideas of why the percentages are so different, have them explain what they conclude may be reasons. Ask questions such as, “Why do you think this?” or “What data led you to this conclusion?”.

ELABORATE: (15 MIN) Give the students their Chromebooks for them to research for reasons why there are more cases and deaths of COVID for certain demographics. There are a few websites for them to look up and then they can do their own research. Circulate throughout the groups to formatively assess how they are doing discovering the reasons why.

EVALUATE: (10 MIN) The students will be assessed formatively throughout the lesson with small group and whole class discussion.

Have the students come back together as a class to discuss last page of their worksheet. Be prepared to help continue the conversation by asking them questions such as, “What did you learn from your research?”, “How did the data that you discovered earlier compare what you learned in your research?”, “Did it shock you to learn these things?”, “Does this seem equitable or fair?”, “What do think needs to happen to help to change this trend?”, “How could we advocate, speak up for, these populations to try to make things better?”.

This is not equitable. Reaching out to our representatives at the state and federal level is a good way to voice our opinions. They are the ones that can help change things with funding.

Worksheets will be turned in for participation points at the end of the class and allow the teacher to gain more insight into what they have found, how they did with the math, and help to plan future lessons. The students will get all of their points if their work is complete and turned in at the end of class.

Lesson Materials:

Copy of worksheets for each of the students.
Pencils
Calculators
Chrome books

Classroom Management Needs:

Careful attention will need to be given to make sure that all of the students are getting the correct percentages. The activity will not have the same impact if their math is not correct. Encourage all of the students to participate and share their ideas. Circulate throughout the room often not only to help if needed, but to make sure they are all staying on task.

https://dphhs.mt.gov/publichealth/cdepi/diseases/coronavirusmt/demographics

https://www.census.gov/quickfacts/MT

Comparing COVID totals of the demographics of Montana

1. With the information provided below, calculate the percentage of cases per demographic group to the hundredth percent. (Example: 39.21% or .25%) Write those percentages in the space provided.

COVID Cases as of 10/22/20 Montana from the MT DPHHS

% of Cases	**Race**	**Number of cases**
_____	White (Caucasian)	10,485
_____	American Indian, Alaska Native, Native Hawaiian, and Pacific Islander	3,320
_____	Asian	64
_____	Black or African American	102
_____	Other Race	563
_____	Undetermined/Under investigation	11,106
	Total	25,640

2. Do any of these percentages surprise you?

Demographic Percentages for Montana as of 7/1/2019 from the US Census

Transfer your data from #1 to compare.

White (Caucasian)	88.9%	_____
Black or African American	0.6%	_____
American Indian, Alaska Native,		
Native Hawaiian, Other Pacific Islander	6.8%	_____
Asian	0.9%	_____
Two or More Races	2.8%	
Hispanic or Latino	4.1%	

3. Analyze and compare the percentages you calculated for the cases per demographic group to the overall demographic percentages for the Montana population. What do you notice?

4. Why do you think the percentages are so different between two charts?

County of Residence	Number of Cases	Number of Deaths	Community Transmission*
Beaverhead	247	1	Yes
Big Horn	1,225	34	Yes
Blaine	256	2	
Broadwater	52		
Carbon	216		
Carter	46		
Cascade	1,627	6	Yes
Chouteau	79		
Custer	233	3	Yes
Daniels	27	1	
Dawson	185	3	
Deer Lodge	365	1	
Fallon	47		
Fergus	172	2	
Flathead	2,823	23	Yes
Gallatin	2,500	6	Yes
Garfield	29		
Glacier	827	10	Yes
Golden Valley	12		
Granite	56		
Hill	644	16	
Jefferson	140		
Judith Basin	15		
Lake	485	1	
Lewis and Clark	740	5	Yes
Liberty	28		
Lincoln	267	3	Yes
Madison	152	1	Yes
McCone	58		

County of Residence	Number of Cases	Number of Deaths	Community Transmission*
Meagher	57	3	Yes
Mineral	15		
Missoula	1,846	8	Yes
Musselshell	81	1	
Park	206		
Petroleum	3		
Phillips	157		
Pondera	140	1	
Powder River	47	5	
Powell	89		
Prairie	31		
Ravalli	376	4	Yes
Richland	240	2	
Roosevelt	871	17	
Rosebud	739	20	Yes
Sanders	89	2	
Sheridan	54		
Silver Bow	483		Yes
Stillwater	165	3	
Sweet Grass	63	2	
Teton	75		Yes
Toole	305	6	
Treasure	11		
Valley	288	2	
Wheatland	60	2	
Wibaux	39		
Yellowstone	5,557	82	Yes
Total	25,640	278	

MT American Indian Reservations	County
Blackfeet	Glacier
Crow	Big Horn
Flathead	Lake
Fort Belknap	Blaine
Fort Peck	Valley/Roosevelt
Northern Cheyenne	Big Horn/Rosebud
Rocky Boy	Hill

5. Look at the numbers for each of the counties that are primarily where the reservations are located. You may want to circle or highlight each of the counties on the list first and then compare. Keep in mind, the population for these counties in not all American Indian but it is where the reservation is located. Do you see any connections to the data you calculated earlier?

6. After looking at more data, do you have any more educated guesses as to why the data in trending this way?

Here are some websites to research for fifteen minutes. Here are a few. Feel free to look up other information after you have looked at these.

- https://montanafreepress.org/2020/09/24/aca-meets-covid-in-indian-country/
- https://www.kulr8.com/news/crow-tribe-issues-statement-claiming-wrongful-exclusion-from-montana-coronavirus-relief-funds/article_cb309928-0b59-11eb-9034-73219a8f397f.html
- http://www.nativepartnership.org/site/DocServer/2017-PWNA-NPRA-Food-Insecurity-Project-Grow.pdf?docID=7106
- https://www.youtube.com/watch?v=RmLO9lj5bYg&feature=youtu.be&fbclid=IwAR3G5rpi3qnxbuMpwNOHYwf_HLukD2ig2nUmLLQmPja8Cy8ieglrV7ATQX8

7. What are some of the reasons you have seen on these websites?

8. What could be done to help change the trend we are seeing in the data?