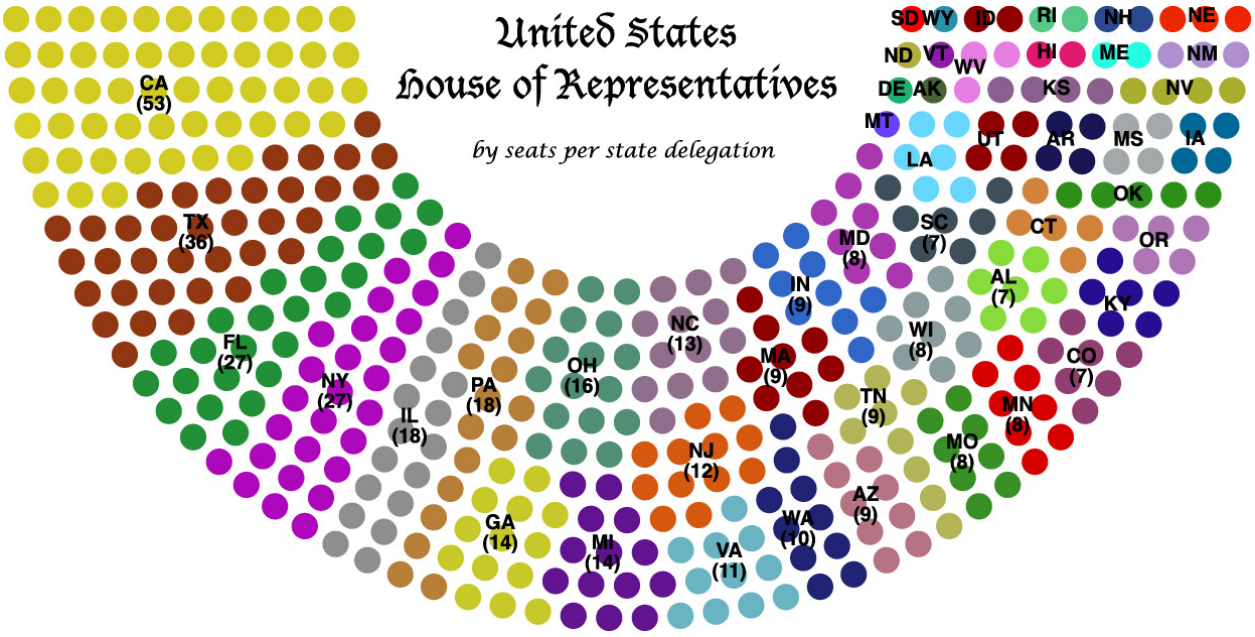
WHY AMERICA IS *Free*

Apportionment Math

In this lesson students will learn about Congressional apportionment in our federal government, and after using math skills to compare the ratio of US Representatives to the populations in several state, will discover that apportionment gives similar but not identical ratios of representation to citizens in every state.



GRADES	4th and 5th
TIME	1 class period
SUBJECTS	Civics, Social Studies, Math
STRATEGIES	Class participation
CONSTITUTION	Article I § 2
TAGS	Federal, Constitution, apportion, apportionment, US House of Representatives, census, states, ration, reapportionment, representation

Glossary

- Apportionment – the act of dividing and sharing out according to a plan; the act of making a proportionate division or distribution of US Representatives among the states
- Congress - the legislative branch of the US Government made up of the House of Representatives and the Senate
- decade - a span of 10 years
- House of Representatives - one of the two houses of the bicameral United States Congress, whose 435 elected members are apportioned among the states according to the proportion of US citizens in each state at the time of the last census.
- Legislative Branch - Congress; national lawmakers elected to Senate and House to serve for a set period of time.
- population - people living in a given area
- reapportionment - the adjustment of the number of US Representatives each state can have based on its proportion of the US population measured in the last census
- representation - one person speaking and acting on behalf of others or another
- US Census - a nationwide counting of population mandated by the US Constitution.

Objectives

Students compute ratio to determine if some states' populations are better represented than others.

Students will know that:

- a smaller ratio of population to representatives indicates better representation.
- the US Constitution created two federal legislative houses to balance the needs for representation that would give fair representation to the people of the nation (House of Representatives) and to each state, no matter the size (Senate).
- In the House of Representatives, the number of elected members from every state is set by the proportion of the US population living in that state, but no state can have fewer than 1 representative.
- the assignment of how many US Representatives a state is entitled to send to Congress is called apportionment.

- the House of Representatives can have no more than 435 voting members because more would make the day to day running of Congress too difficult.
- the Constitution requires a new census every 10 years to determine, among other things, how many people live in each state and the total population of the United States.
- based on each new census, every ten years the number of US representatives from each state must be reviewed and may change if the population of that state increases or decreases significantly more than in most states.
- after each census, the changes in the number of US Representatives that each state can send is called reapportionment.
- the ratio of US Representatives to population in each state is supposed to be roughly equal.
- though that ratio is supposed to be roughly equal among all states the ratios are not precisely the same, though most are close

Setting the Stage

After students know how to compute ratio, use this lesson to apply that skill to determine the present ratio between population of a state and the number of representatives sent to US Congress by that state. Read the following, and explain it to students in your own words:

To protect the interests of both states and "we the people", the Constitution established 2 "houses" of lawmakers in the federal government. The Senate has two members (Senators) for every state, so each state has the same power in the Senate. For the other group of legislators, though, the number of representatives (US Representatives) each state can send to the House of Representatives in Congress varies according to the population of the state. Determining how many representatives come from each state is called apportionment.

Because populations of states change, the Constitution also requires that every decade a national census is held to learn the populations of each state. Adjusting the number of representatives from each state according to each census is called reapportionment, and that happens every 10 years as well.

The country has grown greatly in size and population, but no matter how big the population gets, the House of Representatives can have no more than 435 voting lawmakers because more people make getting the work of Congress too difficult to manage. It is essential to apportion that total number of 435 as fairly as possible. With the possible exception of states with tiny populations that the Constitution guarantees

at least 1 Representative, the ratio of representatives to people represented is supposed to be roughly equal in all states.

Do you think they really are about equal? As a class we are going to see if, after this last census, our country really is giving equal or close to equal representation of its citizens in every state. We will find the ratio of representatives to people in every state.

Why does having a near equal ratio matter? Thinking about ratio, if you want a teacher to pay attention to your needs, would you want that teacher to have 30 other students or 10 other students? Why? If the teacher has 30 other students, the teacher to student ratio is 1:31. If she has only 10 other students, the teacher to student ratio is 1:11. Schools try to keep the teacher to student ratio roughly equal in each normal classroom in each grade to be fair to all teachers and all students. Congress tries to do keep the number of people represented by each IS Representative the same in every state for the same reason.

Setting the Stage

Using the map and chart below, assign students to write out the population of and number of representatives of 48 assigned states, but exclude the ones you use as examples below.

Demonstrate what to do, using these two states as examples:

> Using information from the map and chart, compute with the students the ratio of US Representatives to people represented in each state.
>
> > Texas - pop. 29,183,290; 38 representatives = 767,981 people: 1 Representative
> > Wyoming - pop. 577,719; 1 representative = 577,719 people: 1 Representative

Assign states to students and allow them time to do the work. Review answers with students.

Discussion

Discuss with students:

- The mechanics of finding ratio.
- Whether a low or high ratio is better for the people of a state and why.
- The ratios of their assigned states (see answer sheet below)
- Which of all the states had the lowest ratio; therefor best representation per person? (Montana)
- Which had the highest ratio, therefor worst representation per person? (Delaware)

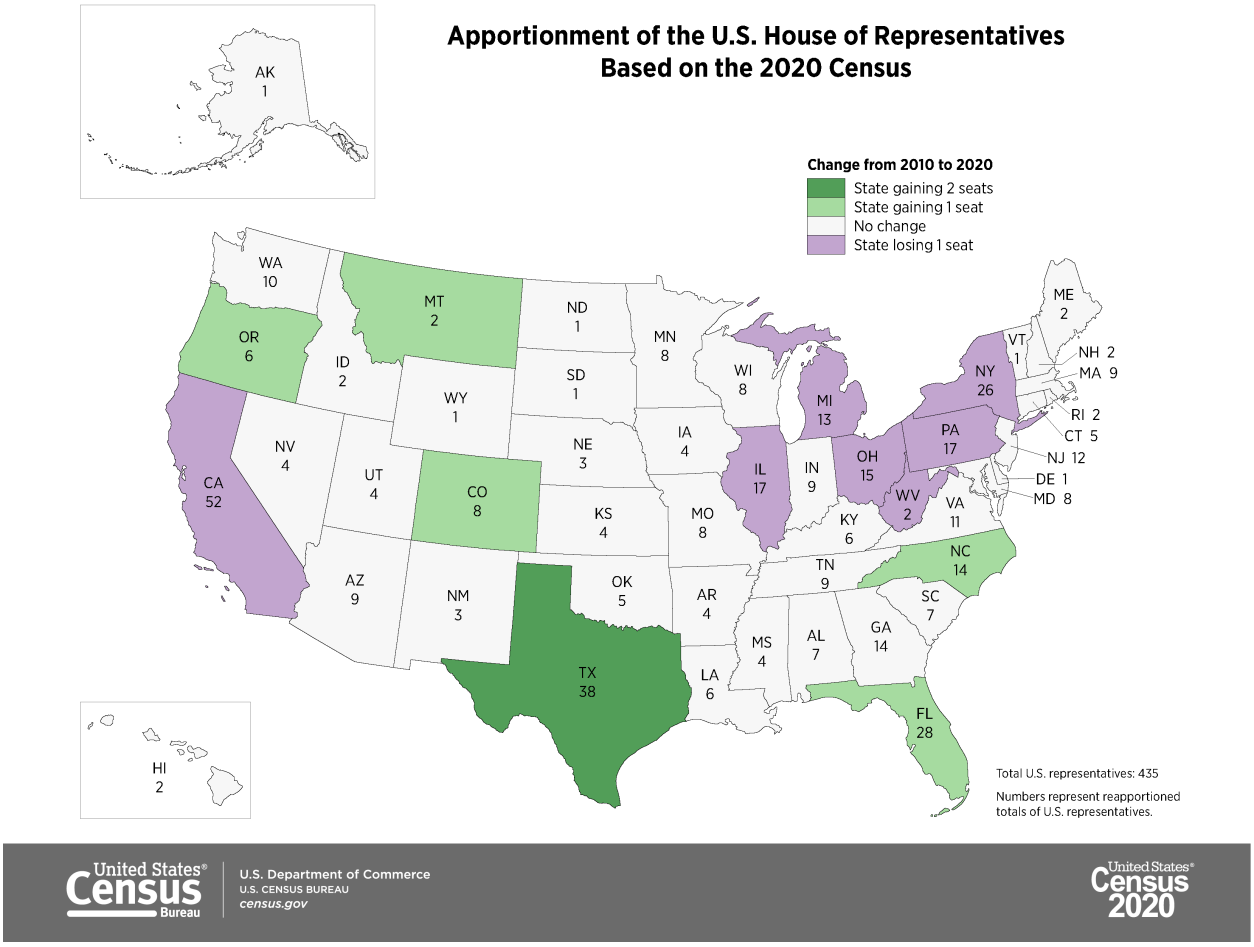
- The fact that the differences between ratios of representation are small compared to the differences in population.
- The fact that residents of Washington, DC have no representation.

Answer Sheets for Teachers

State	Population	US Reps	Number represented by each US Representative	Ratio
AL	5,030,053	7	718,759	718,759:1
AK	736,081	1	736,081	736,081:1
AZ	7,157,923	9	795,436	795,436:1
CA	39,576,757	52	761,091	follow this pattern
CO	5,782,171	6	722,771	
CT	3,608,298	5	721,660	
DE	990,837	1	990,837	
DC	683,545	0	0	
FL	21,580,527	28	770,376	
GA	10,725,274	14	776,091	
HI	1,460,137	2	730,069	
ID	1,841,377	2	920,689	
IL	12,822,739	17	754,279	
IN	6,790,280	9	754,476	
IA	3,192,406	4	798,102	
KS	2,940,865	4	735,216	
KY	4,509,342	6	751,557	
LA	4,661,468	6	776,911	
ME	1,363582	2	681,791	
MD	6,185,278	8	773,160	
MA	7,033,469	9	781,497	
MI	10,084,442	13	775,726	
MN	5,709,752	8	713,719	
MS	2,963,914	4	740,979	
MO	6,160,281	8	770,035	
MT	1,085,407	2	542,764	
NE	1,963,333	3	654,444	
NV	3,108,462	4	777,116	
NH	1,379,089	2	689,545	
NJ	9,294,493	12	774,541	
NM	2,120,220	3	706,740	
NY	20,215,751	26	777,529	

Answer Sheet for Teachers (continued)

State	Population	US Reps	Number represented by each US Representative	Ratio
NC	10,453,998	14	746,771	
ND	779,702	1	779,702	
OH	11,808,848	15	787,257	
OK	3,963,516	5	793,703	
OR	4,241,500	6	706,917	
PA	13,011,844	17	765,403	
RI	1,098,163	2	549,082	
SC	5,124,712	7	732,102	
SD	887,770	1	887,770	
TN	6,916,897	9	768,544	
TX	29,183,290	38	767,981	
UT	3,275,252	4	818,813	
VT	643,503	1	643,503	
VA	8,654,542	11	786,777	
WA	7,715,946	10	771,595	
WV	1,795,045	2	897,523	
WI	5,897,473	8	737,184	
WY	557,719	1	577,719	



Source

US Constitution
Article I Legislative Branch § 2 The House of Representatives
Representatives and direct Taxes shall be apportioned among the several States which may be included within this Union, according to their respective Numbers, …

Census Information: https://www.census.gov/data/tables/2020/dec/2020-apportionment-data.html

U.S. Department of Commerce U.S. Census Bureau

Table 1. APPORTIONMENT POPULATION AND NUMBER OF REPRESENTATIVES BY STATE: 2020 CENSUS
https://www2.census.gov/programs-surveys/decennial/2020/data/apportionment/apportionment-2020-table01.pdf

STATE	APPORTIONMENT POPULATION (APRIL 1, 2020)	NUMBER OF APPORTIONED REPRESENTATIVES BASED ON 2020 CENSUS[2]	CHANGE FROM 2010 CENSUS APPORTIONMENT
Alabama	5,030,053	7	0
Alaska	736,081	1	0
Arizona	7,158,923	9	0
Arkansas	3,013,756	4	0
California	39,576,757	52	-1
Colorado	5,782,171	8	1
Connecticut	3,608,298	5	0
Delaware	990,837	1	0
Florida	21,570,527	28	1
Georgia	10,725,274	14	0
Hawaii	1,460,137	2	0
Idaho	1,841,377	2	0
Illinois	12,822,739	17	-1
Indiana	6,790,280	9	0
Iowa	3,192,406	4	0
Kansas	2,940,865	4	0
Kentucky	4,509,342	6	0
Louisiana	4,661,468	6	0
Maine	1,363,582	2	0
Maryland	6,185,278	8	0
Massachusetts	7,033,469	9	0
Michigan	10,084,442	13	-1
Minnesota	5,709,752	8	0
Mississippi	2,963,914	4	0
Missouri	6,160,281	8	0
Montana	1,085,407	2	1
Nebraska	1,963,333	3	0
Nevada	3,108,462	4	0
New Hampshire	1,379,089	2	0
New Jersey	9,294,493	12	0
New Mexico	2,120,220	3	0
New York	20,215,751	26	-1
North Carolina	10,453,948	14	1
North Dakota	779,702	1	0
Ohio	11,808,848	15	-1
Oklahoma	3,963,516	5	0
Oregon	4,241,500	6	1
Pennsylvania	13,011,844	17	-1
Rhode Island	1,098,163	2	0
South Carolina	5,124,712	7	0
South Dakota	887,770	1	0
Tennessee	6,916,897	9	0
Texas	29,183,290	38	2
Utah	3,275,252	4	0
Vermont	643,503	1	0
Virginia	8,654,542	11	0
Washington	7,715,946	10	0
West Virginia	1,795,045	2	-1
Wisconsin	5,897,473	8	0
Wyoming	577,719	1	0
TOTAL APPORTIONMENT POPULATION[1]	331,108,434	435	

[1] Includes the resident population for the 50 states, as ascertained by the Twenty-Fourth Decennial Census under Title 13, United States Code, and counts of U.S. military and federal civilian employees living overseas (and their dependents living with them overseas) allocated to their home state, as reported by the employing federal agencies. The apportionment population excludes the population of the District of Columbia. The counts of overseas personnel (and dependents) are used for apportionment purposes only.

[2] The U.S. Census Bureau prepared these calculations using the existing size of the U.S. House of Representatives (435 members) and the Method of Equal Proportions, as provided for in Title 2, United States Code, Sections 2a and 2b.