

# Equality

## Voting by Numbers

### TEACHER INSTRUCTIONS

**SUBJECT:** Math

**GRADE LEVEL:** 6-8

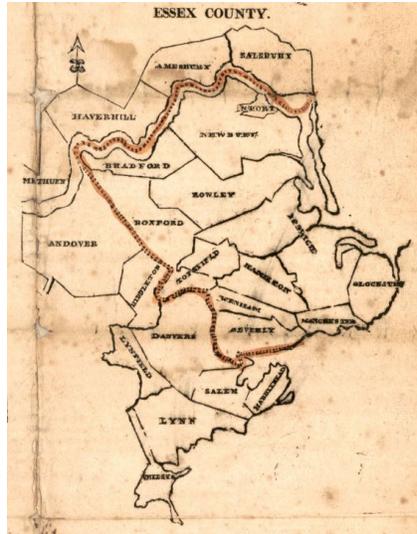
**TIME:** Two 30-40 minute lessons (Part I, II, and III)

#### Overview

In this lesson, students use primary sources to analyze how principles of math are important to applying justice and equality in voting.

#### Lesson Materials:

Library of Congress resources, slide pack, and discussion questions.



way for students to vote. Also give them the opportunity to see how gerrymandering processes could apply to the school setting.

- Guide** students in fulfilling their hypothetical tasks for the school. Discuss the ways that manipulating numbers and apportionment affect election outcomes. **(Connection and Action)**

#### PART I

#### Teacher Actions:

- Show** students the famous political cartoon “*The Gerrymander*” and have them analyze this source for clues about voting and to generate questions about what the lesson is about. **(Spark Inquiry)**
- Explain** the concept of gerrymandering to students. Ask students to write questions they may have about gerrymandering and put on post-its. Have students attempt to answer each other’s questions.

editorial from the *Boston Gazette* on voting districts

to students. Ask students to make observations about the voting map and complete source analysis. Ask students how math impacts the gerrymandering process. **(Deepen Inquiry)**

#### PART III

- Engage** students in a role-play scenario that has them helping the principal of a school create a student council election process. Focus students’ attention on creating a fair and just

#### ASSESSMENTS

- Formative Assessment:** At the conclusion of Part I, students think of alternative ways to divide the districts in Essex County (1812) so that they are equal to one another.
- Final Assessment. Problem-solving.** Students role-play legislators in fictional Gerryland to apportion districts (draw boundary lines) to achieve various ends (fair and unfair).

#### PART II

- Distribute** maps and

## Lesson Materials Library of Congress Resources

The materials below include **Library of Congress resources** to engage students in the inquiry process of using primary source materials. Additional supplemental materials are also included.

### Recommended Background Materials for Teacher's Content Knowledge

- How the electoral college gerrymanders the presidential vote:  
<https://www.washingtonpost.com/news/wonk/wp/2016/11/29/how-the-electoral-college-gerrymanders-the-presidential-vote/>
- This is the best explanation of gerrymandering you will ever see:  
<https://www.washingtonpost.com/news/wonk/wp/2015/03/01/this-is-the-best-explanation-of-gerrymandering-you-will-ever-see/>
- This is actually what America would look like without gerrymandering:  
<https://www.washingtonpost.com/news/wonk/wp/2016/01/13/this-is-actually-what-america-would-look-like-without-gerrymandering/>
- Quantifying Gerrymandering: <https://services.math.duke.edu/projects/gerrymandering/>
- Court orders North Carolina to redraw its legislative districts and hold 2017 special elections -  
<http://www.dailykos.com/stories/2016/11/29/1605387/-Court-orders-North-Carolina-to-redraw-its-legislative-districts-and-hold-2017-special-elections>

### Material Links

- Gerrymander Cartoon: <https://www.loc.gov/exhibits/treasures/tr22a.html#civil>
- “Essex County; Worcester County.” From: *Boston Gazette*, Monday, March 9, 1812.  
<https://www.loc.gov/resource/g3763e.ct004086/>.
- “Gerrymandering, explained.” *Washington Post*. Video.  
<https://www.youtube.com/watch?v=bGLRJ12uqmk&feature=youtu.be>.

*This lesson is part of a larger initiative, Citizen U, which aims to integrate civic learning across the curriculum for students in grades 2-12. For more lessons like it, in Language Arts, Math, Science, and Social Studies, or to learn more about related creative, community, and professional development opportunities, please visit our [Citizen U website](#)...*

## Math - Middle School

**Lesson Title:** Voting By Numbers

**Essential Question:** How can proportions of votes in different areas impact equality?

**Lesson Duration:** Two class periods (one for Parts I and II, and another for Part III).

### Lesson Overview

In this lesson, students learn about the application of ratios and proportions to the real political issue of gerrymandering. In Part I, students conduct a primary-source analysis of the original 1812 political cartoon about Elbridge Gerry’s redistricting in Massachusetts to build background knowledge. In Part II, students analyze a historical map of Massachusetts’s gerrymandered voting districts in 1812 and compare it to the political cartoon to discuss issues of fairness. In Part III, students solve a hypothetical problem about fair representation on a student council, using their knowledge and understanding of gerrymandering and ratios. Finally, students role-play state legislators in a hypothetical state to solve problems of representation, including gerrymandering.

### Lesson Objectives

- Review and discuss proportions.
- Analyze representative samples of voting districts for how they might give advantages to one political party or political group over others.
- Illustrate solutions to problems of fairness in voting representation using ratios and proportions.

### Lesson Materials

#### Part I

- [Handout A \(“The Gerrymander”\) with Source Analysis Questions](#) (1 per pair of students)
- [Slide pack for discussion questions](#)

#### Part II

- [Handout B \(“Essex County; Worcester County.”\) with selected text transcribed](#) (1 per pair of students)
- [Slide pack for showing the gerrymander in Essex County](#)

#### Part III

- [Handout C \(“A New Student Council”\)](#) (1 per student)
- [Handout D \(“The State of Gerryland”\)](#) (1 per student)
- [Slide pack for showing solutions to “The State of Gerryland” problems](#)

## Links Library of Congress Sources

- “The Gerrymander. A New Species of Monster.” From: *Boston Gazette*, March 26, 1812.  
<http://www.loc.gov/exhibits/treasures/tr22a.html#obj20>.
- “Essex County; Worcester County.” From: *Boston Gazette*, Monday, March 9, 1812.  
<https://www.loc.gov/resource/g3763e.ct004086/>.
- “Gerrymandering, explained.” *Washington Post*. Video.  
<https://www.youtube.com/watch?v=bGLRJ12uqmk&feature=youtu.be>.

## LESSON IMPLEMENTATION

### Part I: The Gerrymander

#### A. Spark Inquiry: Source Analysis

1. Divide students into pairs and distribute Handout A.
2. Have students discuss the questions on Handout A with each other and then use the image of “The Gerrymander” to complete the primary-source analysis questions on the handout.

#### B. Brief Discussion

1. After students have completed the questions on their handout, ask students to discuss this question with their partner: *What was most interesting about this source? Why?*

*NOTE: This question appears on slide 1 of the slide pack for this lesson.*

2. Show Slide 2 (Bibliographic Information) and have student pairs read the bibliographic information. Check for understanding to see that students can explain the source of the term “gerrymander” and what it means. Note: *Gerrymander* means to manipulate the boundaries of electoral districts to give one party or candidate an advantage over others in voting.

- **ger·ry·man·der** - 'jerē, mandər/ - manipulate the boundaries of an electoral constituency.

3. Show Slide 3 and have students discuss the following questions:
  - What important information did you learn about the source?
  - What did you learn from the bibliographic information about voting and geography?
  - What new questions do you have about the source?

4. Have students write down new questions about the sources on sticky notes. Have them post their questions on a wall or bulletin board in preparation for Part II.

*NOTE: The bibliographic information and questions are listed on slides 2 and 3, respectively, of the slide pack for this lesson.*

### Part II – What Happened in Essex County?

#### A. Deepen Inquiry: Where the “Monster” Came From

1. Distribute Handout B to the original pairs of students. Have students look at the maps and read the selected text transcribed from “Explanations” by the *Boston Gazette*’s editors on page 2 of the handout.

- Explain that the smaller divisions in each map are called *precincts*. Examples mentioned in the *Boston Gazette*'s editorial text include Leicester and Shrewsbury.

2. Have students discuss and then answer the source analysis questions.

3. Show Slide 4 to point out to students where the “single dotted” and “double dotted” lines are.

4. Show Slide 5 with added highlighting to show the dramatic change gerrymandering brought: The green highlighted line is the single-dotted line showing the previous boundary between the two districts in Worcester County; the other line is the double-dotted line showing the new boundary between the districts.

### **B. Brief Discussion**

1. Go back to Slide 4 and ask students where they might see the same shape as the “Monster” from the previous discussion. Ask what clues from the previous discussion might help them find the “Monster.” (Hint: “The Gerrymander” was from Essex County.)

2. Show Slide 6 which shows the “Monster” and Essex County. Click to lay the Monster over the appropriate section of Essex County.

3. Have students discuss the following question:

- Can you think of a way to re-draw the district line in Essex County to make the two electoral districts more of equal size? Use the editorial text from the *Boston Gazette* as a guide.

### **Part III: A New Student Council**

#### **A. Connection and Action: The Student Vote**

1. Distribute Handout C and read the following situation to your students:

The principal at Gerryland School needs to organize a student council to help make decisions for the school. This student council will be voted on by all students in grades 1 through 8.

#### **School background**

- Gerryland School has one classroom for each grade level (1st–8th grades).
- Each classroom has 20 students.

#### **Student Council**

- There will be four students elected to the student council.
- Elections will be held annually.

2. Have students read the directions. Check for understanding and see if students have questions. Then have students work on their solutions to the tasks posed.

### 3. Solutions

After students have worked on their solutions, share the following with them:

- *Solution for Task One:* The way to organize the students is to have one student represent every two grades (1st and 2nd; 3rd and 4th; 5th and 6th; and 7th and 8th).
- *Solution for Task Two:* To find the answer, first figure out how many students are now in each grade level, then how many students total. There are now 187 students at the school. 187 students divided by 4 council members = 46.75. Thus, there should be about 47 students represented by each council member. The new student council members could represent grades as follows:
  - Student Council member #1 represents 1st and 6th Grade.
  - Student Council member #2 represents 2nd and 8th Grade.
  - Student Council member #3 represents 3rd and 7th Grade.
  - Student Council member #4 represents 4th and 5th Grade.

#### **B. Debriefing and Assessment: Connection and Action**

1. Hold a brief discussion with students on the following questions:

- Would any students be happy with your solution to Task Two? Why?
- Would any students be upset with the outcome to Task Two? Why?
- Can you think of a way to justify your solution to Task Two to the principal of Gerryland School? Why would this system be better than the system in Task One?
- Why is equality important to vote distribution? What makes gerrymandering unfair?

2. **Assessment.** Provide Handout D to students. Have them complete the exercise as described in the instructions on the handout. (Remind them to draw their lines in pencil first.) Collect their work. When they are done, show Slides 6, 7, and 8 to demonstrate the solutions to each of the problems, respectively.

- *Solution to Problem One:* The five districts correspond to the five rows, so that the Circles get two seats in the legislature, and the Squares get three.
- *Solution to Problem Two:* The five districts will have two columns each, so that Squares have a majority in each district. This is blatantly unequal gerrymandering.
- *Solution to Problem Three:* Different combinations can be drawn to ensure that Circles will have a majority in only one district, so that Squares still maintain a four-fifths majority in the legislature. This is more like the way gerrymandering usually works.

3. Optional: Show students this video from the *Washington Post* that explains identical problems and solutions to the assessment.

## Standards

### ISBE Math Standards

- CC.K-12.MP.1
- CC.K-12.MP.3
- CC.K-12.MP.4
- CC.K-12.MP.6

### California Math Framework Standards

- MP.1 Make sense of problems and persevere in solving them.
- MP.2 Reason abstractly and quantitatively.
- MP.3 Construct viable arguments and critique the reasoning of others.
- MP.4 Model with mathematics.

### Common Core State Standards for Mathematical Practice

- [CCSS.MATH.CONTENT.6.RP.A.1](#)
- [CCSS.MATH.CONTENT.7.RP.A.2](#)

*This lesson is part of a larger initiative, Citizen U, which aims to integrate civic learning across the curriculum for students in grades 2-12. For more lessons like it, in Language Arts, Math, Science, and Social Studies, or to learn more about related creative, community, and professional development opportunities, please visit our [Citizen U website](#)...*