

Unit 2: Linear Inequalities

Content Area: **Math**
Course(s): **Algebra 1**
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Title Section

Department of Curriculum and Instruction



Belleville Public Schools

Curriculum Guide

Algebra 1 A

Unit 2: Linear Inequalities

Belleville Board of Education

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Unit Overview

- This unit is about solving and graphing inequalities and compound inequalities.
- The students should learn how to solve inequalities using different methods, graph their solution sets on number line, identify and solve compound inequalities.

NJSLS

| | |
|-------------------|--|
| MA.9-12.A-REI.B | Solve equations and inequalities in one variable |
| MA.9-12.A-REI.B.3 | Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. |
| MA.9-12.A-CED.A.1 | Create equations and inequalities in one variable and use them to solve problems. |

Exit Skills

By the end of Unit 2 Students Should be able to:

- Write, graph, and identify solutions of inequalities.
- Solve inequalities using addition or subtraction.
- Solve inequalities using multiplication or division.
- Solve multi-step inequalities involving the distributive property.
- To solve inequalities with coefficients represented by letters.
- Graph linear inequalities on the coordinate plane.
- Identify compound statements connected by the word and/or.
- Solve compound inequalities containing the word and/or and graph their solution set.
- Model real world problems using inequalities.

Enduring Understanding

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Model with mathematics.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Essential Questions

- How do you represent relationships between quantities that are not equal?
- How do you justify the solution to a linear inequality?
- Can inequalities that appear to be different be equivalent?
- How can you solve inequalities?
- How to distinguish between two types of inequalities: unions and intersection?
- What are real-life applications of inequalities?

Learning Objectives

Students will be able to:

- Represent relationship algebraically and evaluate them using properties.
- Interpret real-world examples into linear inequalities .
- Solve one-step inequalities in one variable using different operations.
- Solve multi-step inequalities and justify each step using properties.
- Solve inequalities with the variables on both sides by using like terms and the distributive property.
- Identify inequalities that are unions and intersections by analyzing the signs of inequalities.
- Graph solution sets on the number line using number theory .
- Solve inequalities by graphing.
- Investigate the graphs of inequalities by using a graphing calculator.
- Analyze the difference between the words phrases "at least" and " the most" and be able to use their symbols in inequalities.
- Model real-world situations using inequalities.
- Investigate and extend classroom activities into self research and long term projects.

Interdisciplinary Connections

Economics, business, financing, geometry, literacy, science.

| | |
|-----------------|--|
| CRP.K-12.CRP2 | Apply appropriate academic and technical skills. |
| CRP.K-12.CRP4 | Communicate clearly and effectively and with reason. |
| CRP.K-12.CRP11 | Use technology to enhance productivity. |
| CRP.K-12.CRP8 | Utilize critical thinking to make sense of problems and persevere in solving them. |
| CRP.K-12.CRP7 | Employ valid and reliable research strategies. |
| TECH.8.1.12.A.3 | Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue. |
| TECH.8.1.12.F.1 | Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs. |

Alignment to 21st Century Skills & Technology

Key SUBJECTS AND 21st CENTURY THEMES

Mastery of key subjects and 21st century themes is essential for all students in the 21st century.

Key subjects include:

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics

21st Century/Interdisciplinary Themes

- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness

21st Century Skills

- Communication and Collaboration
- Creativity and Innovation

- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

Suggested Activities & Best Practices

Videos on Solving Inequalities:

<https://mathtv.com/topic/algebra/35>

Quizlet, Inequalities:

<https://quizlet.com/307164262/flashcards>

Solving Linear Inequalities:

<https://whenmathhappens.com/2013/11/22/solveineqintro-50min/>

Equations and Inequalities , Basketball problem:

<https://www.illustrativemathematics.org/content-standards/HSA/CED/A/1/tasks/702>

Find Errors in Solutions to Inequalities

<https://www.illustrativemathematics.org/content-standards/HSA/REI/A/1/tasks/807>

Explore Linear Inequalities:

<https://teacher.desmos.com/activitybuilder/custom/57d9fdc6ebf48f73093807b2>

Simple and Compound Inequalities:

<https://teacher.desmos.com/activitybuilder/custom/57ed6233b22885ee08944fce>

Textbook, eAssessment, supplemental materials:

<https://my.mheducation.com/login>

AI Assessment and Learning System:

<https://www.aleks.com/>

Mindset:

<https://www.youtube.com/watch?v=3icoSeGqQtY>

<http://www.youcubed.org/wp-content/uploads/Positive-Classroom-Norms2.pdf>

Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students:

<https://ies.ed.gov/ncee/wwc/PracticeGuide/20>

Coaching Corner:

<https://sites.google.com/belleville.k12.nj.us/thecoachingcorner/home>

Algebra Tools - Functions:

<https://www.state.nj.us/education/aps/cccs/math/NJISTFunctions.pdf>

Algebra Tools - Algebra:

<https://www.state.nj.us/education/aps/cccs/math/NJISTAlgebra.pdf>

Misc Mathematics materials:

<http://www.mathnstuff.com/>

Algebra Kahoots:

<https://kahoot.com/explore/collections/math-kahoot-algebra/>

Technology Infusion

- Youtube
- Khan academy
- MS Excel
- Office 365
- MS Word

- PodCasts
- MS Powerpoint
- Wikipedia
- Skype
- Twitter
- Ted Talks
- QR Barcode Generator
- Calculator/Graphing calculator
- Desmos.com
- Geogebra.org

Differentiation

- Cooperative groups
- Board work
- Team work
- Classroom discussions
- Questions and Answers
- Study guide
- Tests/quizzes reviews
- Notes taking/transparencies
- Organizer
- Calculator/graphing calculator
- Posters display
- Extra time

Special Education

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format

- modified test content
- modified test format
- modified test length
- multiple test sessions
- multi-sensory presentation
- preferential seating
- preview of content, concepts, and vocabulary
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

ELL

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarify
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of work presented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

Intervention Strategies

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices

- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of work presented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Evidence of Student Learning-CFU's

Please list ways educators may effectively check for understanding in this section.

- Admit Tickets
- Anticipation Guide
- Common benchmarks
- Compare & Contrast
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Illustration
- Journals
- KWL Chart
- Outline
- Quickwrite
- Quizzes
- Self- assessments
- Socratic Seminar
- Study Guide
- Teacher Observation Checklist
- Top 10 List

- Unit tests

Primary Resources

Glencoe McGraw-Hill Algebra1 2014

Glencoe McGraw-Hill Algebra1 2010

Practice Glencoe Algebra1

Study Guide Glencoe Algebra1

Ancillary Resources

Houghton Mifflin Harcourt On core Mathematics Algebra1

Glencoe McGraw-Hill Science and Mathematics Lab Manual