STEMscopes TEXAS MATH
POWERED BY ACCELERATE LEARNING

Grade 7

Teacher Guide Sample

Made for Teachers, by Teachers

Built for Texas Math

STEMscopes Texas Math™ Teacher Guides

As educators and math experts, we understand the demands of teaching math, so we've designed our teacher guides to provide you with the support you need. Whether you're a seasoned veteran or at the start of your journey as a math teacher, we equip you to create engaging, impactful learning experiences.

Our Teacher Guides are printed supplementary resources that support high-quality, meaningful math instruction.

Don’t Miss Out on Key Digital Features – Log In Now!

The entire STEMscopes Texas Math curriculum is online, including Teacher Guide content.

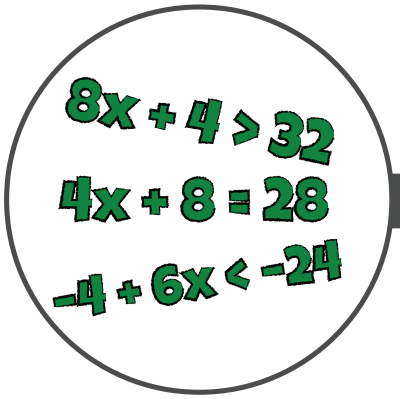
Access our full curriculum online in two easy ways:

1. Log in using your district's unique review URL and credentials.
2. Sign up at ***accelerateLearning.com/math/tx***.

SCAN ME TO REQUEST DIGITAL ACCESS

From our online platform, you can:

- Bookmark your favorite elements and craft lesson plans.
- Access detailed preparation instructions, facilitation prompts, discussion questions, and sample student answers.
- Preview assignments from the student’s view.
- Assign and grade activities while offering feedback through a user-friendly interface.
- Download and print handouts and resource files for added flexibility.
- Access all student resources in English and Spanish!



Two-Step Equations and Inequalities

Scope Introduction

Scope Summary

Students are able to model and solve one-variable, two-step equations and inequalities, represent the solutions on number lines, and determine whether a given value makes an equation or inequality true. They are also able to write one-variable, two-step equations and inequalities when given a problem to solve and write a real-world problem that represents a one-variable, two-step equation or inequality.

Student Expectations

7.10A

- Write one-variable, two-step equations and inequalities to represent constraints or conditions within problems.

7.10B

- Represent solutions for one-variable, two-step equations and inequalities on number lines.

7.10C

- Write a corresponding real-world problem given a one-variable, two-step equation or inequality.

7.11A

- Model and solve one-variable, two-step equations and inequalities.

7.11B

- Determine if the given value(s) make(s) one-variable, two-step equations and inequalities true.

Vertical Alignment

Background Knowledge

Students in 5th grade solve multistep equations, in which one variable takes the place of an unknown value. In 6th grade, students model and solve one-variable, one-step equations and inequalities. They represent solutions to equations and inequalities on number lines. They determine whether a value represents a solution to an equation or inequality by determining whether the substituted value for the variable makes the equation or inequality true. They also write one-variable, one-step equations and inequalities to represent constraints or conditions within a problem and write real-world problems when provided with a one-variable, one-step equation or inequality.

Future Expectations

Students continue modeling and representing equations. In 8th grade, students model and solve one-variable equations with variables on both sides of the equal sign, with rational number coefficients and constants. Students identify and verify x values and y values that simultaneously satisfy two linear equations in the form y = mx + b from the intersections of the graphed equations. They write one-variable equations and inequalities with variables on both sides that represent problems using rational number constants and coefficients. They also write a corresponding real-world problem when given a one-variable equation or inequality with variables on both sides of the equal sign.

Engage Activities

Accessing Prior Knowledge

In this activity, students actively engage in distinguishing between factual and fictional statements related to a previous standard. They listen to prompts read aloud, decide if each is fact or fiction, and then physically move to designated areas labeled “Fact” or “Fiction” in the classroom. This kinesthetic approach helps to identify and address misconceptions, as students discuss their reasoning with peers and participate in a guided group discussion to clarify their understanding.

If your students are struggling with previously taught concepts, use the Foundation Builder activity in this scope to reinforce ideas presented in the APK.

Hook

In this activity, students explore algebra by solving an equation to determine individual basketball players’ scores in a game. They use a given model to understand how the team’s total score was composed, including points from free throws. This activity involves identifying variables, constructing an equation (4p + 4 = 56), and solving it to find the unknown value, which represents the points scored by each player. This method helps students apply mathematical reasoning to a real-world scenario.

Home

Explore Activities

Explore 1

Solve Two-Step Equations Using Models

In this interactive activity, students work in small groups using algebra tiles and game booth scenarios to model and solve two-step equations derived from word problems. They utilize printed materials like Game Booth Cards and an Algebra Equations Mat to visualize and understand the relationships between variables and constants in equations. This hands-on approach helps students develop a deeper understanding of algebraic operations and their practical applications, enhancing their problem-solving skills and mathematical reasoning. After modeling the equations, students discuss their strategies and solutions, reinforcing their learning through collaborative and individual reflection.

Explore 2

Solve Two-Step Equations

In this activity, students work in small groups to solve real-world problems using two-step equations. They help a school arts and crafts booth determine costs, supply distribution, and profits. Through this process, students write and solve word problems, represent their solutions on number lines, and apply their understanding of equations to practical scenarios. This hands-on approach fosters critical thinking and mathematical communication, enhancing their ability to use algebra in everyday situations. After solving the equations, students share their strategies and insights during a class discussion, deepening their understanding of mathematical concepts and their applications.

Explore 3

Solve Two-Step Inequalities Using Models

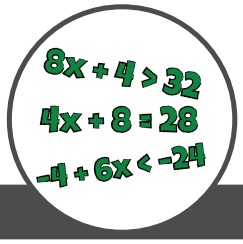
In this activity, students collaborate in groups to model and solve two-step inequalities related to running a school fundraiser cupcake booth. They utilize algebra tiles and an Algebra Inequality Mat to visually represent word problems, converting these scenarios into mathematical inequalities. This hands-on approach helps students deepen their understanding of inequality symbols and the methods for solving inequalities, including the importance of maintaining balance and correctly interpreting the signs. After modeling the problems, students discuss their strategies and justify their solutions, fostering a comprehensive grasp of solving inequalities in real-world contexts.

Explore 4

Solve Two-Step Inequalities

In this activity, students engage with two-step inequalities by writing and solving word problems, and representing their solutions on number lines. Working in small groups, they translate real-world scenarios at a school fundraiser into mathematical inequalities, solve them, and graph the solution sets. This exercise reinforces their understanding of open and closed circles on number lines to denote inclusion or exclusion of boundary values. Students discuss their reasoning and solutions, enhancing their ability to apply mathematical concepts to everyday situations.

Notes



Two-Step Equations and Inequalities

Accessing Prior Knowledge

Activity Preparation

Students listen to prompts about the prior standard, decide whether each prompt is fact or fiction, and communicate their decisions by walking to the designated sides of the classroom. This element is designed to uncover student misconceptions; it should not be taken for a grade.

Materials

Printed

- 1 Set of Fact or Fiction Prompts (per class)

Preparation

- Print one set of Fact or Fiction Prompts to read aloud to students.
- Another option is to project the prompts using a digital projector.

Procedure and Facilitation

FACILITATION TIP

If space is limited, students could lean and point to the fact or fiction side of the room.

FACILITATION TIP

Confirm correct answers and clarify misconceptions as needed.

1. Designate one side of your room as the Fact side of the room and the other side as Fiction. Explain to students that they will decide whether they think each prompt is fact or fiction and then move to the corresponding side of the room.
2. Display and read the prompt. Allow students to move to different sides of the room.
3. Have students discuss their reasoning among their peers.
4. Before reading the next prompt, allow students to move back to their starting points.
5. Facilitate a discussion about the handout. This provides an opportunity to gather an understanding of prior student knowledge before beginning the lessons. Encourage students to support their answers, and check for understanding and misconceptions. Repeat with each prompt. Sample student responses include the following:
   a. Prompt 1 is fiction.
   b. Prompt 2 is fact.
   c. Prompt 3 is fiction.
6. If students are struggling to complete this task, do the Foundation Builder to fill the gap in prior knowledge before moving on to other parts of the scope.

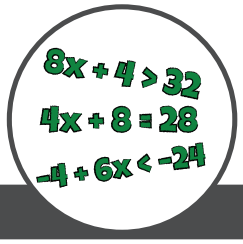
Identifying Misconceptions

- Students may not make the connection between solving equations and solving inequalities.
- Students may confuse the signs < and >.
- Students may not realize what an open circle or a closed circle on a number line means.

© Accelerate Learning Inc. - All Rights Reserved

Notes

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Hook: Scorer's Table

Activity Preparation

Students will determine an unknown value by using a model to create and solve an equation.

Materials

Printed

- 1 Scorer's Table (per class)

Reusable

- 1 Phenomena (per class)

Preparation

- Plan to show the Phenomena.
- Prepare to project Scorer's Table for the whole class to view.
- Prepare to introduce the scenario and to encourage students to think about how to solve it. Be prepared to move to the Explore activities, returning students to the Hook activity with newly gained knowledge after the Explores have been completed.

Procedure and Facilitation

FACILITATION TIP

Consider having students crumple a piece of scrap paper to use as a "basketball" and set up a recycle or trash bin across the room as the "basket." As each discussion question is posed, a student who voluntarily explains the correct answer can aim to shoot their basketball into the recycle bin.

FACILITATION TIP

Ask how this expression could be written another way. Use this as an opportunity to review the commutative property of addition (4p+4=4+4p)

Part I: Pre-Explore

1. Introduce this activity toward the beginning of the scope. The class will revisit the activity and solve the original problem after students have completed the corresponding Explore activities.
2. Show the Phenomena. Ask students the following questions: *What do you notice? Where can you see math in this situation?* Allow students to share all ideas.
3. Allow the students to ask questions and clarify the context as needed. Encourage them to share their thoughts and experiences with the class using the following questions:
    a. Have you ever played basketball or seen a basketball game?
    b. How do teams earn points in basketball? Are all baskets worth the same amount of points?
    c. What is a good score in a basketball game?
4. Explain the scenario to the class: *Fabio, Jason, Samuel, and Daniel play on the same basketball team. In their first game of the season, every member of the team scored a number of points. The team also scored additional points with some free throws. They celebrated when their team won the game with a score of 56. How many points did each player score in the game?*
5. Project Scorer's Table.
6. Explain to students that the team added 4 points to its total due to free throws the players made. The scorekeeper showed a model so they could determine how many points each basketball player scored. Discuss the following questions with the class:
    a. **DOK-1** What is a variable? A variable is a letter or symbol that stands for a value that is not known yet.
    b. **DOK-1** What does the variable *p* represent in the model? The number of points scored in the game by each player.
    c. **DOK-1** How could the number of points scored by the basketball team be represented? 4p + 4
7. Move on to complete the Explore activities.

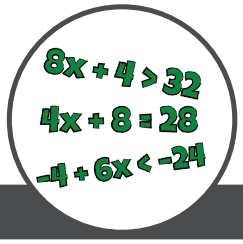
© Accelerate Learning Inc. - All Rights Reserved

Part II: Post-Explore

1. After students have completed the Explore activities for this topic, show the Phenomena again and repeat the scenario.
2. Refer to Scorer's Table, and discuss the following questions with the class:
   - **a.** **DOK-1** What is a variable? A variable is a letter or symbol that stands for a value that is not known yet.
   - **b.** **DOK-1** What does the variable p represent in the model? The number of points scored in the game by each player.
   - **c.** **DOK-1** How could the number of points scored by the basketball team be represented? $4p + 4$
     DOK-1 What is the equation that solves for p? $4p + 4 = 56$
   - **d.** **DOK-2** Solve the equation. How many points did each basketball player score? $4p + 4 = 56$, $4p = 52$, $p = 13$
3. As time allows, have students work in pairs to create their own scenario and model a two-step equation or inequality. Have them solve the problem and present their scenario to the class.

Notes

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Explore 1: Solve Two-Step Equations Using Models

Activity Preparation

Students draw pictures to model word problems. Students match their drawings to models and write equations to represent the word problems.

Mathematical Process Standards

- **(A)** Apply mathematics to problems arising in everyday life, society, and the workplace.
- **(C)** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- **(G)** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Materials

Printed

- 1 Student Journal (per student)
- 1 Exit Ticket (per student)
- 1 Set of Game Booth Cards (per group)
- 1 Algebra Equations Mat (per group)

Reusable

- 1 Set of algebra tiles (per group)
- 1 Resealable bag (per group)

Preparation

- Plan to have students work in groups of 2–3 to complete this activity.
- Print the Student Journal and Exit Ticket for each student.
- Print one set of Game Booth Cards for each group. Cut out the cards, and place each set into a resealable bag. If desired, print on card stock and laminate for future use.
- Print an Algebra Equations Mat for each group. If desired, print the mat on card stock and laminate for future use.
- Gather enough sets of algebra tiles for each group to have one set of each.
- Be prepared to display an Algebra Equations Mat and a set of algebra tiles or display the virtual algebra tiles for the class to see.
- **Go Digital!** Have students explore or present their solutions using virtual manipulatives! The manipulatives used in this lesson can be found in the Explore drop-down menu and can be digitally assigned to students (Algebra Tiles).

Procedure and Facilitation

1. Read the following scenario to the class: *Your school is hosting a fundraiser to benefit some areas around campus that need improvements. Several school clubs have volunteered to host booths to help. The athletics club will host a game booth to help raise money. Students will pay a fee to play games and win prizes. Help the game booth volunteers solve some problems that involve setting up and running the game booth.*
2. Help students access the task by using the following guiding questions:
   a. How do you represent an unknown amount in an equation?
   b. What experience do you have using algebra tiles?
   c. What do a green rectangle and a red rectangle represent?
   d. What do a yellow square and a red square represent?
3. **DOK-2** Ask students to share what experiences they have had working with algebra tiles.
4. Display the Algebra Equations Mat and set of algebra tiles, or display the virtual algebra tiles.

© Accelerate Learning Inc. - All Rights Reserved

5. Distribute a set of algebra tiles and an Algebra Equations Mat to each group of students.
6. Distribute a Student Journal to each student.
7. Have students model and solve the problem on page 1 of the Student Journal. (Note that students have already learned how to solve equations.) Monitor and talk with students as needed to check for understanding by using the following guiding questions:
   a. **DOK-1** How do you represent the variable? A white rectangle represents a positive variable.
   b. **DOK-1** How do you represent the integers? A white square represents the positive integers.
   c. **DOK-1** Which operation do you start with first when solving this problem? Subtraction
   d. **DOK-2** What steps should take place to solve the problem? First, subtract 2 from both sides, and then divide both sides by 3 to get the solution to the problem.
8. Explain that students will work cooperatively on the Game Booth Cards to analyze several math problems and create diagrams or drawings to model the situations.
9. Distribute a set of Game Booth Cards to each group. Allow groups time to talk through each problem and create a model using algebra tiles in the blank space at the bottom of each card.
10. When students have completed the Game Booth Cards, explain that students will now use their Game Booth Cards to complete their Student Journals.
11. Encourage students to notice the similarities and differences between the strategies used to create models when solving two-step equations.
12. After the Explore, invite the class to a Math Chat to share their observations and learning.

FACILITATION TIP

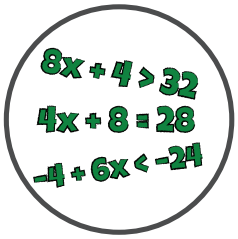
If using sets of algebra tiles, review proper use of manipulates and your system for clean up and storage so that everyone is accountable for helping maintain them.

FACILITATION TIP

Ensure that all students have access to the algebra tiles and that they take turns using them. Working with concrete objects before representing them on paper is essential to the development of conceptual understanding.

Notes

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Explore 1: Solve Two-Step Equations Using Models

FACILITATION TIP

Consider having students work with a partner to create a two-step equation. Then have pairs of students exchange their problems with another pair to solve them and then to check one another's answers.

Math Chat

- **DOK-2** Does it matter which side of the equal sign you put the variable? Explain. It doesn't matter which side the variable is on because both sides are equal.
- **DOK-2** How can you use algebra tiles to solve two-step equations? To use algebra tiles to model an equation, we place the relevant number of variable rectangle tiles and square tiles for each side of the equation. We divide the tiles into equal groups, and then we use the tiles to solve the given equation with the goal of ending up with the rectangle tiles by themselves on one side.
- **Choose a Structured Conversation routine to facilitate the following question:**

  DOK-2 Give an example of a two-step equation, and describe the steps you would use to solve it using algebra tiles. 3x – 2 = –20

  Step 1: Add 2 positive squares on each side to represent adding positive 2.
  Step 2: Remove zero pairs from both sides.
  Step 3: Divide each side into 3 equal groups.
  Step 4: The solution is –6.

Post-Explore

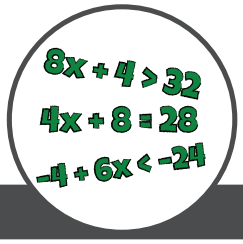
1. Have students complete the Exit Ticket to formatively assess their understanding of the concept.
2. Complete the Anchor Chart as a class.
3. Have each student complete their Interactive Notebook.

Notes

© Accelerate Learning Inc. - All Rights Reserved

Notes

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Explore 2: Solve Two-Step Equations

Activity Preparation

Students write and solve word problems with two-step equations and represent their solutions on number lines. They also use equations to write real-world scenarios.

Mathematical Process Standards

- **(A)** Apply mathematics to problems arising in everyday life, society, and the workplace.
- **(C)** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- **(G)** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Materials

Printed

- 1 Student Journal (per student)
- 1 Exit Ticket (per student)
- 1 Set of Arts and Crafts Booth Cards (per group)

Reusable

- 1 Resealable bag (per group)

Preparation

- Plan to have students work in groups of 2–3 to complete this activity.
- Print the Student Journal and Exit Ticket for each student.
- Print a set of Arts and Crafts Booth Cards for each group. Cut out the cards and place each set of cards in a resealable bag. If desired, print on card stock and laminate for future use.

Procedure and Facilitation

FACILITATION TIP

Review the term "profit" (money earned after expenses are paid).

1. Read the following scenario to the class: *The art club has volunteered to host a booth for the school fundraiser. The art club will host an arts and crafts booth with several crafts for sale. Help the arts and crafts booth volunteers understand the costs, distribution of supplies, and profits that are related to their booth.*
2. Help students access the task by using the following guiding questions:
   a. Have you ever helped with a booth for an event before?
   b. Have you ever helped with a school fundraiser?
   c. What arts and crafts could the students make to sell at their booth?
3. Distribute a Student Journal to each student.
4. Distribute a set of Arts and Crafts Booth Cards to each group.
5. Explain to students that they will work cooperatively to help the art club. They will use two-step equations to determine the cost of purchasing supplies for the booth, how supplies were distributed to customers, and the profit that was made.

© Accelerate Learning Inc. - All Rights Reserved

6. Monitor and talk with students as needed to check for understanding by using the following guiding questions:
   a. **DOK-2** What steps were needed to isolate the variable? Answers may vary. To isolate the variable, I had to use the inverse operation by subtracting 115 from both sides of the equation, and then I divided the equation by the coefficient.
   b. **DOK-2** How did you graph the solution to the equation on the number line? First, I numbered the number line using increments of 2 to make sure the solution would be included in the range of numbers to be graphed on the number line. Next, I graphed the point/number on the number line that represented the solution.
   c. **DOK-2** What process should be used to determine the total amount of money that is split among the clubs? First, use the inverse operation to subtract 17 from both sides. Since this equation includes division, I would need to multiply the denominator on both sides to isolate the variable and solve for the amount of money that was split among the clubs.
7. Allow time for students to complete their Student Journals and reflection questions.
8. Encourage students to notice the similarities and differences between the strategies used to solve two-step equations.
9. After the Explore, invite the class to a Math Chat to share their observations and learning.

FACILITATION TIP

Each number line uses different scaled intervals. Ask students why they vary (to account for different number ranges).

Math Chat

- **DOK-2** How would you explain the process that is used to solve a two-step equation? Compared to one-step equations, two-step equations include just one additional step to solve. We can solve a two-step equation by isolating the variable on one side of the equation and all other values on the other side. The general two steps to solve two-step equations are as follows:
- Step 1: Add or subtract to isolate the variable.
  Step 2: Multiply or divide to determine the value of the variable.
- **DOK-2** How can you verify that your solution is correct? I can verify that my solution is correct by replacing the variable with my solution and performing the operation in the problem. When both sides are equal, I know my solution is correct.
- **Choose a Structured Conversation routine to facilitate the following question:**

  DOK-2 Write a two-step equation that can be used in a real-world scenario You and two friends bake cookies for your community bake sale and get paid $20 for it. The three of you then spend $10 to buy some lunch. If you're splitting the money equally, how much does each person get?

FACILITATION TIP

Record these steps and reference them again during the Post-Explore activities.

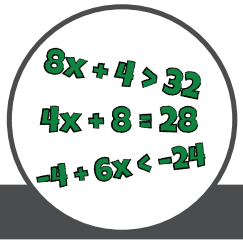
FACILITATION TIP

Consider having students write a problem and corresponding answer key. Then use student-written problems for a follow-up practice activity in the days ahead.

Post-Explore

1. Have students complete the Exit Ticket to formatively assess their understanding of the concept.
2. Complete the Anchor Chart as a class.
3. Have each student complete their Interactive Notebook.

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Explore 3: Solve Two-Step Inequalities Using Models

Activity Preparation

Students draw pictures to model word problems. Students will match their drawings to models and write inequalities to represent the word problems.

Mathematical Process Standards

- **(A)** Apply mathematics to problems arising in everyday life, society, and the workplace.
- **(C)** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- **(G)** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Materials

Printed

- 1 Student Journal (per student)
- 1 Exit Ticket (per student)
- 1 Set of Cupcake Booth Cards (per group)
- 1 Algebra Inequality Mat (per group)

Reusable

- 1 Set of algebra tiles (per group)
- 1 Set of colored pencils (per group)
- 1 Resealable bag (per group)

Preparation

- Plan to have students work in groups of 2–3 to complete this activity.
- Print the Student Journal and Exit Ticket for each student.
- Print a set of Cupcake Booth Cards for each group. Cut out the cards and place each set into a resealable bag. If desired, print on card stock and laminate for future use.
- Print an Algebra Inequality Mat for each group. If desired, print the mat on card stock and laminate it for future use.
- Gather enough sets of algebra tiles and sets of colored pencils for each group to have one set of each.
- Be prepared to display an Algebra Inequality Mat and a set of algebra tiles or display the virtual algebra tiles for the class to see.
- **Go Digital!** Have students explore or present their solutions using virtual manipulatives! The manipulatives used in this lesson can be found in the Explore drop-down menu and can be digitally assigned to students (Algebra Tiles).

Procedure and Facilitation

FACILITATION TIP

Students may not be familiar with the term "culinary." Clarify as needed.

1. Read the following scenario to the class: *The culinary club has volunteered to host a cupcake booth for the school fundraiser. The culinary club has several ideas planned. You are going to help the club solve some problems as they prepare for and run the fundraiser.*
2. **DOK-2** Ask students to share what experiences they have had working with inequalities.
3. Distribute a Student Journal to each student.
4. Distribute a set of Cupcake Booth Cards to each group of students.
5. Distribute a set of algebra tiles, colored pencils, and an Algebra Inequality Mat to each group of students.

© Accelerate Learning Inc. - All Rights Reserved

6. Monitor and talk with students as needed to check for understanding by using the following guiding questions:
   a. **DOK-1** What is an inequality? An inequality is a mathematical sentence that uses the concepts of greater than, less than, greater than or equal to, or less than or equal to.
   b. **DOK-1** What do the symbols <, ≤, >, and ≥ mean? They mean less than, less than or equal to, greater than, and greater than or equal to.
   c. Display an Algebra Inequality Mat. **DOK-1** What is the purpose of the Algebra Inequality Mat? The mat provides a place for you to solve inequalities using algebra tiles. The uneven balance scale reminds you that one side is greater than the other. The greater (heavier) side will be lower than the lesser (lighter) side.
7. Have students model and solve the problem on the first page of their Student Journals. (Note that students have already learned how to solve equations.) Monitor and talk with students as needed to check for understanding by using the following guiding questions:
   a. **DOK-2** How do you solve inequalities? We can solve inequalities using inverse operations in the same way we solve equations using inverse operations. It is important to pay attention to the rules related to multiplication and division by a negative integer and reciprocal and to flip the inequality sign when appropriate.
   b. **DOK-2** How can you alter the mat to show greater than or equal to? You can add a straight line under the greater than sign to change it to greater than or equal to.
   c. **DOK-2** Do you think your inequality is correct? Why? Answers will vary. Students should justify their inequalities. Provide feedback to ensure the inequalities are written correctly.
8. Explain to students that they will work cooperatively on the Cupcake Booth Cards to analyze several math problems and create diagrams or drawings to model the situations.
9. Distribute one set of Cupcake Booth Cards to each group. Allow groups time to talk through each problem and create a model using algebra tiles in the blank space at the bottom of each card.
10. When students have completed the Cupcake Booth Cards, explain that students will now use their Cupcake Booth Cards to complete their Student Journals.
11. Encourage students to notice the similarities and differences between the strategies used to model two-step inequalities.
12. After the Explore, invite the class to a Math Chat to share their observations and learning.

FACILITATION TIP

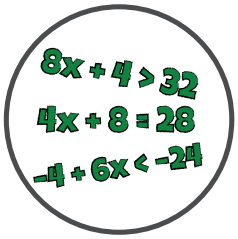
Practice symbol recognition. Provide student groups with index cards showing each symbol, and ask students to hold up each one as you call out their names.

FACILITATION TIP

Students with fine motor challenges may find it helpful to use the virtual tiles. These students could screen shot each model, copy them onto a separate page, and then print.

Notes

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Explore 3: Solve Two-Step Inequalities Using Models

FACILITATION TIP

Consider prompting students to record each symbol and its name along the margin of their student journal.

FACILITATION TIP

This is often a difficult concept for students to grasp. Prepare an example and display the answer in the classroom for students to reference.

Math Chat

- **DOK-1** What words help you know if you are using > or ≥? > means greater than. ≥ means greater than or equal to. The words exceeds and at least are some examples that represent ≥. The words more than and above are some examples that represent >.
- **DOK-2** How can you use algebra tiles to solve two-step inequalities? To use algebra tiles to model an inequality, we place the relevant number of variable rectangle tiles and square tiles for each side of the equation. We divide the tiles into equal groups, and then we solve the given equation with the tiles.
- **DOK-2** Why would the inequality sign need to change when you solve an inequality using algebra tiles? The reason you would need to change the inequality sign when you solve an inequality using algebra tiles is when the variable is negative. When the variable has a negative coefficient, the inequality sign needs to be changed.
- **Choose a Structured Conversation routine to facilitate the following question:**

  DOK-2 Give an example of a two-step inequality, and describe the steps you would use to solve it using algebra tiles. $6x + 4 > -20$

  Step 1: Subtract 4 by adding negative squares on each side to represent subtracting 4.

  Step 2: Remove zero pairs from both sides.
  Step 3: Divide each side into 6 equal groups.
  Step 4: The solution is $x > -4$.

Post-Explore

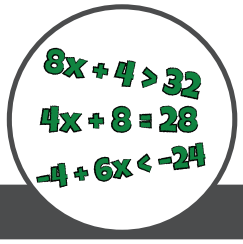
1. Have students complete the Exit Ticket to formatively assess their understanding of the concept.
2. Complete the Anchor Chart as a class.
3. Have each student complete their Interactive Notebook.

Notes

© Accelerate Learning Inc. - All Rights Reserved

Notes

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Explore 4: Solve Two-Step Inequalities

Activity Preparation

Students write and solve word problems with two-step inequalities and represent their solutions on number lines. They also use inequalities to write real-world scenarios.

Mathematical Process Standards

- **(A)** Apply mathematics to problems arising in everyday life, society, and the workplace.
- **(C)** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- **(G)** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Materials

Printed

- 1 Student Journal (per student)
- 1 Exit Ticket (per student)

Preparation

- Plan to have students work in groups of 2–3 to complete this activity.
- Print the Student Journal and Exit Ticket for each student.

Procedure and Facilitation

FACILITATION TIP

Provide access to a reference sheet showing each comparison symbol with corresponding rays/endpoints along the number line and shaded/unshaded circles.

1. Read the following scenario to the class: *The math club has volunteered to host a booth that allows players to select a rubber duck for a random chance to win a prize. They hope that their lucky duck booth will raise a lot of money for the school fundraiser. You are going to help the club solve some problems as they prepare for and run the booth.*
2. Help students access the task by using the following guiding questions:
    a. The solution to an inequality is known as a solution set. Why do you think it is a set?
    b. Using the example of a speed limit of 40 mph, how could you show all of the speeds allowed using a number line?
    c. Using the same example, how could you indicate that 40 would be included in the solution set?
    d. Using the same speed limit example, would you include negative numbers on your graph?
3. Distribute a Student Journal to each student.
4. Explain that students will work cooperatively to analyze four word problems, model the problems, and write inequalities to represent the problems. Groups will also solve the problems, graph the solution sets, and answer the reflection questions.

© Accelerate Learning Inc. - All Rights Reserved

5. Monitor and talk with students as needed to check for understanding by using the following guiding questions:
   a. **DOK-2** What are some key words that indicate you should use an open circle when you graph your solution set? Words like *less than* or *greater than* tell you to use an open circle. An open circle means that the number is not included in the solution set.
   b. **DOK-2** What are some key words that indicate you should use a closed circle when you graph your solution set? Words like less than or equal to, greater than or equal to, and equal to tell you to use a closed circle. A closed circle indicates that the number is included in the solution set.
   c. **DOK-3** Justify why you think your inequality is correct. Answers will vary. Students should justify their inequalities. Provide feedback to ensure the inequalities are written correctly.
6. Allow time for students to complete their Student Journals and reflection questions.
7. Encourage students to notice the similarities and differences between the strategies used to solve two-step inequalities.
8. After the Explore, invite the class to a Math Chat to share their observations and learning.

Math Chat

- **DOK-1** Why is it necessary to show your solution set with a ray? You don't know the exact answer when you solve an inequality. When you solve, you might find the highest possible answer, and all of the numbers that are lower than the highest possible answer are also in the solution set.
- **DOK-3** What are some ways to write inequalities differently that mean the same thing? You might combine terms or use the distributive property. You might swap the < for a > and swap the location of either side of the inequality.
- **DOK-2** Solve the problem. $14 - 7x > 42$ $x < -4$
- **Choose a Structured Conversation routine to facilitate the following question:**

  DOK-4 Can you think of a real-world example that could include a negative solution set? If someone is asking how much money you have, the solution set could include negative numbers if you are in debt. A question about winter temperatures might have a solution set with both positive and negative numbers. A question about elevation might have a solution set with negative numbers if the elevations are below sea level.

FACILITATION TIP

Challenge students to find more than one expression to represent one a given scenario.

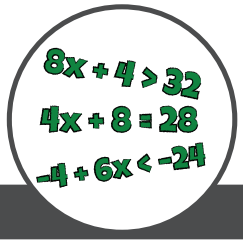
FACILITATION TIP

Generate a list of examples and post them in the classroom. Revisit this list in the days ahead and see if students have encountered more examples.

Post-Explore

1. Have students complete the Exit Ticket to formatively assess their understanding of the concept.
2. Complete the Anchor Chart as a class.
3. Have each student complete their Interactive Notebook.
4. Return to the Hook and instruct students to use their newly acquired skills to successfully complete the activity.

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Additional Scope Resources

Explain Elements

ELEMENT USE KEY ● Can be assigned digitally ■ Contains printable handouts ★ Can be done independently

Picture Vocabulary
A slide presentation of important vocabulary terms along with a picture and definition

● ■ ★

Anchor Chart
A guide to facilitating the creation of a chart with students for each scope.

● ■

Interactive Notebook
A cut-and-glue activity to process learning that can be added to a notebook for future reference

■ ★

Interactive Vocabulary
Students form definitions of mathematical vocabulary words used throughout the scope.

● ■ ★

Language Connections
Language Connections

An opportunity to use linguistic and cultural background knowledge to support connections to new skills, vocabulary, and concepts at different proficiency levels and linguistic domains.

● ■

Show What You Know, Part 1
Solve Two-Step Equations Using Models

Independent practice assignment that gives students an opportunity to demonstrate their learning

● ■ ★

Show What You Know, Part 2
Solve Two-Step Equations

Independent practice assignment that gives students an opportunity to demonstrate their learning

● ■ ★

Show What You Know, Part 3
Solve Two-Step Inequalities Using Models

Independent practice assignment that gives students an opportunity to demonstrate their learning

● ■ ★

Show What You Know, Part 4
Solve Two-Step Inequalities

Independent practice assignment that gives students an opportunity to demonstrate their learning

● ■ ★

Notes

© Accelerate Learning Inc. - All Rights Reserved

Elaborate Elements

ELEMENT USE KEY ● Can be assigned digitally ■ Contains printable handouts ★ Can be done independently

Spiraled Review

Planet E

A quick story to engage student interest along with four problems over previously learned skills.

● ■ ★

Fluency Builder

Two-Step Equations and Inequalities

Independent and partner games and other activities that provide students with an engaging way to practice the new concept

Interactive Practice

Starforce Academy

A game to practice the skills established by the standards in the scope.

● ★

PhET

Equality Explorer Basics: What Is an Equality?

Student activities using the PhET Interactive Simulations from the University of Colorado Boulder.

● ★

PhET

Equality Explorer: Balancing Equations with Inverse Operations

Student activities using the PhET Interactive Simulations from the University of Colorado Boulder.

● ★

PhET

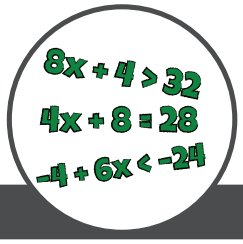
Equality Explorer: Introduction to Inequalities

Student activities using the PhET Interactive Simulations from the University of Colorado Boulder.

● ★

Notes

© Accelerate Learning Inc. - All Rights Reserved



Two-Step Equations and Inequalities

Intervention and Assessment

Student Intervention

1 *Use the Skill Review and Practice under the Intervention section to assess student mastery after this scope's content has been taught. Distribute a copy of Quick Check to each student. Each student should complete the Quick Check independently.*

	How to Use the Review	Students	Notes & Comments
Students who are still acquiring the concept and need remediation	❑ *Distribute a copy of the Review to these students.* ❑ *Meet with students individually or in a small group to assist them in working through the Review's concepts.* ❑ *Talk individually with each student about their thoughts in order to highlight strengths and roadblocks.* ❑ *Look out for possible misconceptions.*		
Students who are approaching mastery and need review	❑ *Distribute a copy of the Review to these students.* ❑ *Meet with students in a small-group to answer questions and identify areas where students are struggling.* ❑ *Look out for moments of possible reteaching.* ❑ *Release students to work independently once you see they're nearing mastery of the concept.*		
Students who have mastered the concept and need extension	❑ *Distribute a copy of the Review to these students.* ❑ *Confirm that students are on the right track.* ❑ *Direct students to work on materials in the Acceleration section, such as the Choice Board, while you work with the other students.*		

2

3 *Distribute a copy of Checkup to each student. Students should complete the Checkup independently. Watch out for students who need additional help.*

© Accelerate Learning Inc. - All Rights Reserved

Assessment Planner

Evaluate Resources

- ❑ *Standards-Based Assessment*
- ❑ *Skills Quiz*
- ❑ *Mathematical Modeling Task*
- ❑ *Technology-Enhanced Questions*
- ❑ *Heat Map*

Use this template to decide how to assess your students for concept mastery. Depending on the format of the assessment, you can identify prompts and intended responses that would measure student mastery of the expectation. See the beginning of this scope to identify standards and grade-level expectations.

Fundamental Questions	*What prompts will be used?*	*What does mastery look like?*
I can represent solutions for one-variable, two-step equations on number lines.		
I can represent solutions for one-variable, two-step inequalities on number lines		
I can model and solve one-variable, two-step equations.		
I can model and solve one-variable, two-step inequalities.		
I can determine if a one-variable, two-step equation is true.		
I can determine if an one-variable, two-step inequality is true.		
I can write one-variable, two-step equations to represent constraints or conditions within problems.		
I can write one-variable, two-step inequalities to represent constraints or conditions within problems.		
I can write a corresponding real-world problem given a one-variable, two-step equation.		
I can write a corresponding real-world problem given a one-variable, two-step inequality.		

© Accelerate Learning Inc. - All Rights Reserved

STEMscopes™ TEXAS MATH

POWERED BY ACCELERATE LEARNING

MADE FOR TEXAS

Our lessons and resources:

- Prioritize ease of use.
- Cater to the unique needs of Texas classrooms.
- Prepare students to become successful STEM leaders.

Everything you need is all in one place.

ASSESSMENTS AND REPORTING

- Make data-driven instructional decisions with various TEKS-aligned assessments and report types.
- Provide meaningful insight and feedback.

PROVEN RESULTS

The data speaks for itself.

- Research shows that implementing our program boosts math proficiency and overall performance.
- User testimonials reveal that Texas teachers and students *love* us.

Disclaimer: This sample is intended solely for review purposes. It is not to be distributed, reproduced, or used for any other purpose.

AccelerateLEARNING
THE LEADER in STEM EDUCATION

learn more at **AccelerateLearning.com**

© 2024 Accelerate Learning Inc. - All Rights Reserved I SAMPLE3392; 7/15/24