

Grade 7 Unit 6: Expressions, Equations, and Inequalities

Lessons 1–6: Representing Situations of the Form of $px + q = r$ and $p(x + q) = r$

Explore, Play, and Discuss	- I can think of ways to solve some more complicated word problems. - I can explain how a tape diagram represents parts of a situation and relationships between them. - I can use a tape diagram to find an unknown amount in a situation. - I can match equations and tape diagrams that represent the same situation. - If I have an equation, I can draw a tape diagram that shows the same relationship.	
	Activity Suggestions: ➤ Lesson 1: Focus on making diagrams or tables or reason in some other way. The main goal of this lesson is for students to realize different strategies for efficiently solving problems are needed. <i>Activity 4 is an optional card sort.</i> ➤ Combine Lesson 2 and Lesson 3: Students should represent and reason about contexts using tape diagrams. They should use tape diagrams to find unknown amounts in given situations. <i>There are digital versions of Lesson 2, Activity 3 and Lesson 3, Activity 3. Grouping may need to be adjusted for situations.</i>	Assessment Suggestions: ➤ Check Your Readiness assessment: Administer all items within the first or second day of this section. Use the guidance provided with each problem to adjust instruction so that students can access the math in the unit. ➤ Lesson 1 cool-down ➤ Lesson 2 cool-down ➤ Lesson 3 cool-down

Deep Dive	- I can draw a tape diagram to represent a situation where there is a known amount and several copies of an unknown amount and explain what the parts of the diagram represent. - I can find a solution to an equation by reasoning about a tape diagram or about what value would make the equation true. - I can draw a tape diagram to represent a situation where there is more than one copy of the same sum and explain what the parts of the diagram represent.	
	Activity Suggestions: ➤ Combine Lesson 4 and Lesson 5: Focus on drawing and finding solutions to an equation by reasoning about tape diagrams. In Lesson 4, students primarily use the form of the equation $px + q = r$ while in Lesson 5, students	Assessment Suggestions: ➤ Lesson 4 cool-down ➤ Lesson 5 cool-down

	use the form of the equation $p(x + q) = r$ to solve for unknown amounts. <i>Lesson 4, Activity 2 and Lesson 5, Activity 2 have a digital version.</i>	
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Synthesize and Apply	- I understand the similarities and differences between the two main types of equations we are studying in this unit. - When I have a situation or a tape diagram, I can represent it with an equation	
	Activity Suggestions: ➤ Lesson 6: The purpose of this lesson is to distinguish equations of the form $px + q = r$ and $p(x + q) = r$. Corresponding tape diagrams are used as tools in this work, along with situations that these equations can represent. <i>Lesson 6, Activity 2 is a card sort that may need to be adjusted for groupings.</i> ➤ Teach and encourage students to study the lesson summaries (at the end of every lesson) and refer back to them.	Assessment Suggestions: ➤ Lesson 6 cool-down ➤ revisions to previous assessment prompts ➤ Students use learning targets to decide what additional practice they need.

Ongoing Practice	- Assign one or more of the distributed practice problem sets from Lessons 1–6 to be completed over the time period that the section is being worked on. - These could also be lagging, so that students are working on practice problems from the previous section or unit during this section or unit. - Specify which problems students should submit, or let them choose. - Note: Several existing platforms already have IM's practice problems loaded so that students can complete and submit them online. Some can be autoscored.
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Anytime Resources	• Delve into any of the skipped optional activities of Lesson 2, Lesson 3, Lesson 4, and Lesson 5. • Use any of the lessons from Grade 6, Unit 6 that focus on solving equations.
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Lessons 7–12: Solving Equations of the Form $px + q = r$ and $p(x + q) = r$ and Problems That Lead to Those Equations

Explore, Play, and Discuss	• I can explain how a balanced hanger and an equation represent the same situation. • I can find an unknown weight on a hanger diagram and solve an equation that represents the diagram. • I can write an equation that describes the weights on a balanced hanger.	
	Activity Suggestions: ➤ Combine Lesson 7 and Lesson 8: In Lesson 7, focus on approaching equations of the form $px + q = r$ by subtracting q from each side and dividing each side by p (or multiplying by $\frac{1}{p}$). In Lesson 8, focus on the two different ways to solve an equation of the form $p(x + q) = r$ efficiently. <i>Grouping options may need to be adapted in Lesson 7, Activity 2.</i>	Assessment Suggestions: ➤ Lesson 7 cool-down ➤ Lesson 8 cool-down

Dive Deep	• I can use the idea of doing the same to each side to solve equations that have negative numbers or solutions. • For an equation like $3(x + 2) = 15$, I can solve it in two different ways: by first dividing each side by 3, or by first rewriting $3(x + 2)$ using the distributive property. • For equations with more than one way to solve, I can choose the easier way depending on the numbers in the equation.	
	Activity Suggestions:	Assessment Suggestions: ➤ Lesson 9 cool-down

	➤ Combine Lesson 9 and Lesson 10: Focus on solving equations of the form $px + q = r$ or $p(x + q) = r$ with negative numbers and practice finding the most efficient way to solve equations based on the numbers in the equation. <i>There is a digital version of Activity 3.</i>	➤ Lesson 10 cool-down
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Synthesize and Apply	- I can solve story problems by drawing and reasoning about a tape diagram or by writing and solving an equation. - I can solve story problems about percent increase or decrease by drawing and reasoning about a tape diagram or by writing and solving an equation.	
	Activity Suggestions: ➤ Combine Lesson 11 and Lesson 12: Focus on strategies for solving word problems in Lesson 11 and percent increase or decrease in Lesson 12. <i>Groupings may need to be adjusted.</i>	Assessment Suggestions: ➤ Lesson 11 cool-down ➤ Lesson 12 cool-down ➤ revisions to previous assessment prompts ➤ Students use learning targets to decide what additional practice they need.

Ongoing Practice	- Assign one or more of the distributed practice problem sets from Lessons 7–12 to be completed over the time period that the section is being worked on. - These could also be lagging, so that students are working on practice problems from the previous section or unit during this section or unit. - Specify which problems students should submit, or let them choose. - Note: Several existing platforms already have IM's practice problems loaded so that students can complete and submit them online. Some can be autoscored.
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Anytime Resources	Delve into any of the skipped activities of Lessons 1–12.
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Lessons 13–17: Inequalities

Explore, Play, and Discuss	- I can explain what the symbols $\leq$ and $\geq$ mean. - I can represent an inequality on a number line. - I understand what it means for a number to make an inequality true. - I can describe the solutions to an inequality by solving a related equation and then reasoning about values that make the inequality true. - I can write an inequality to represent a situation.	
	Activity Suggestions: Combine Lesson 13 and Lesson 14: In Lesson 13, reintroduce $<$ and $>$ from Grade 6 and build on this knowledge to introduce $\leq$ and $\geq$. Focus on substitution to determine whether given values of x satisfy inequalities. In Lesson 14, build on this knowledge having students write inequalities representing given situations.	Assessment Suggestions: Lesson 13 cool-down Lesson 14 cool-down

Dive Deep	- I can graph the solutions to an inequality on a number line. - I can solve inequalities by solving a related equation and then checking which values are solutions to the original inequality.	
	Activity Suggestions: Lesson 15: Focus on solving inequalities using a number line. Emphasize reasoning asking, “Does this make sense?”	Assessment Suggestions: Lesson 15 cool-down

Synthesize and Apply	- I can match an inequality to a situation it represents, solve it, and then explain what the solution means in the situation. - If I have a situation and an inequality that represents it, I can explain what the parts of the inequality mean in the situation. - I can use what I know about inequalities to solve real-world problems.	
	Activity Suggestions: Combine Lesson 16 and Lesson 17: Students apply their knowledge of solving inequalities to real word problems. <i>Group presentations may need to be modified for individual learning. Lesson 17, Activity 3 involves problem and data cards. Activity may need to be modified for grouping.</i>	Assessment Suggestions: Lesson 16 cool-down Lesson 17 cool-down - revisions to previous assessment prompts - Students use learning targets to decide what additional practice they need.

Ongoing Practice	- Assign one or more of the distributed practice problem sets from Lessons 13–17 to be completed over the time period that the section is being worked on. - These could also be lagging, so that students are working on practice problems from the previous section or unit during this section or unit. - Specify which problems students should submit, or let them choose. - Note: Several existing platforms already have IM’s practice problems loaded so that students can complete and submit them online. Some can be autoscored.
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Anytime Resources	Delve into any of the skipped activities of Lesson 13, Lesson 14, Lesson 16, or Lesson 17.
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Lessons 18–23: Writing Equivalent Expressions

Explore, Play, and Discuss	• I can organize my work when I use the distributive property. • I can rewrite subtraction as adding the opposite and then rearrange terms in an expression. • I can use the distributive property to rewrite expressions with positive and negative numbers. • I understand that factoring and expanding are words used to describe using the distributive property to write equivalent expressions.	
	Activity Suggestions: ➤ Lesson 18: This lesson builds on using the equations $px + q = r$ and $p(x + q) = r$. Focus on the pitfalls when the expression has negative numbers or subtraction. ➤ Lesson 19: Some of the expressions in this lesson are in preparation for understanding combining like terms in terms of the distributive property, coming up in the next lesson.	Assessment Suggestions: ➤ Lesson 18 cool-down ➤ Lesson 19 cool-down

Dive Deep	• I can figure out whether two expressions are equivalent to each other. • When possible, I can write an equivalent expression that has fewer terms. • I am aware of some common pitfalls when writing equivalent expressions, and I can avoid them.	
	Activity Suggestions: ➤ Combine Lesson 20 and Lesson 21: Students should focus on gaining fluency in writing expressions. Highlight the common pitfall of mishandling subtraction in an expression. <i>Grouping in Lesson 20, Activity 3 may need to be adjusted.</i>	Assessment Suggestions: ➤ Lesson 20 cool-down ➤ Lesson 21 cool-down

Synthesize and Apply	- Given an expression, I can use various strategies to write an equivalent expression. - When I look at an expression, I can notice if some parts have common factors and make the expression shorter by combining those parts. - I can write algebraic expressions to understand and justify a choice between two options. Activity Suggestions: ➤ Lesson 22: Encourage students to make use of structure to apply the distributive property in more sophisticated ways. ➤ Lesson 23: Students should apply their strategies to help them solve real world strategies. Focus on making connections between these situations and the previously used equations. Assessment Suggestions: ➤ Lesson 22 cool-down ➤ revisions to previous assessment prompts ➤ Students use learning targets to decide what additional practice they need.
Ongoing Practice	- Assign one or more of the distributed practice problem sets from Lessons 18-23 to be completed over the time period that the section is being worked on. - These could also be lagging, so that students are working on practice problems from the previous section or unit during this section or unit. - Specify which problems students should submit, or let them choose. - Note: Several existing platforms already have IM's practice problems loaded so that students can complete and submit them online. Some can be autoscored.
Anytime Resources	Delve into any of the skipped activities of Lesson 20 or Lesson 21.