Objectives

● Solve inequalities and show the solution on a number line and using set notation.

Prior knowledge

● Understand inequality signs.
● Identify correct inequalities from given information.

Literacy objective

● Discuss and explore mathematical concepts.

Common errors and misconceptions

● Students may not be clear about which set includes the value in question and which one doesn't, e.g. the difference between > 4 and ≥ 4.
● Some students may exchange an inequality sign for an equals sign when solving inequalities, then forget to change it back. Discourage students from changing the sign.

Question tags

Q1 Fluency, **Q14** Problem-solving, **Q15c** Reflect

Pearson Progression Steps

6th – 9th

Resources

Rulers

Key words

Inequalities, set notation

Spec links

A3, A4, A5, A22

ActiveLearn Digital Service

Prior knowledge check

● Diagnostic test of the knowledge and skills students need to be fluent in to successfully tackle the unit.
● Questions are all A01 type and appear under one of these headings: numerical fluency, algebraic fluency, geometrical fluency, graphical fluency, fluency with measures, fluency with probability, and fluency with data. This helps identify where students' strengths and weaknesses lie, and where they may require additional practice and support.

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Starter

Start with an activity that emphasises the greater than or less than concept. Hand out one card to each student, with a number between –10 and +10.

Put a chair or another object as a reference point in the middle of your available space. Choose a value (start with +2). Tell the students to line up in order either side of the chairs, allocating one side for 'greater than 2' and the other side for 'less than 2'. Get students to check they are in the right place without talking, but by checking each other's cards. They may only communicate through gesture. Choose another value and repeat the process. After a couple of values, you may prefer to ask students to put their hands up to save time, rather than moving around.

If everyone seems confident then move on and if not keep trying different ones until they all seem happy with the idea.

Emphasise the difference between the inequality signs that include = and those that do not.

Alternative starter

Front-of-class resource – 9.1 Starter activity

Main lesson

Notes for non-specialist and NQTs

- Work through **Q2** in **Warm up** to revise correct notation for showing inequalities on a number line.

- Display the second **Key point** on page 284 to show how to use set notation. Explain that this is simply a shorthand way of writing inequalities e.g. $\{x : x > 3\}$ means 'values of x such that x is greater than 3'.

- Use the **Example** on page 284 to show how to solve a simple inequality and give the solution using set notation. *Use the same process as you would to solve an equation, but do not change the symbol in the middle.*

- Work through **Q8**. Discuss whether students prefer number lines of set notation to represent inequalities. Visual thinkers will probably find number lines extremely helpful. Try putting the students into groups to 'sell' the idea to others as a way of the facilitating discussion among peers.

- Display the first **Key point** on page 285 to explain how to solve double-ended inequalities. Work through **Q11** and **part of Q12** together to demonstrate and clarify any points raised by students.

- Display the second **Key point** on page 285 to explain the correct process to use when multiplying by a negative number. Ask students to work through **Q15** first and discuss their solutions before telling them the rule.

Question notes

Q15c Reflect Encourage the exploration of this idea. The fact that x is bigger than 8 means that $-x$ will be smaller than –8. Get the students to write some examples themselves and test them out. Use number lines to visualise the values if this helps.

Plenary

Ask students to write down one thing they have learned in the lesson that they didn't know before and share it with the person sitting next to them.

Use this task to highlight and work through any common misconceptions in your group.

More practice and homework

Homework, practice and support – 9.1 assignment

Homework worksheet 9.1

Purposeful Practice Book – Higher, Unit 9 Equations and inequalities

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