Lesson plan

Algebra notation and collecting like terms

1. Lesson objectives

- Recognise the difference between simplified and non-simplified expressions.
- Introduce the use of algebra tiles to represent terms in expressions.
- Add and subtract variables, including those with indices.
- Simplify expressions by collecting like terms.

2. GCSE curriculum

A1 Use and interpret algebraic notation
A4 Simplify and manipulate algebraic expressions by collecting like terms

3. Lesson plan

This is an overview of the lesson. More notes can be found in the notes in the lesson slides.

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Introduction	To introduce the concepts of algebraic notation and unknowns, using images which learners will recognise	10	Tutor to lead discussion using images of bananas, apples and oranges to introduce algebra, its purpose, and how notation is used as a placeholder for unknown variables. Slide 5 continues this introduction.	Slides 2–5 Whiteboards and pens
Discussion	To apply the concept of algebraic notation in a new way to further understanding of unknowns	10	Tutors and learners, using images of knives, forks, dessert spoons, and teaspoons, discuss sorting the cutlery, to learn how to use algebraic notation to represent many different items in shorthand. This shows that different letters represent different things and cannot be added together.	Slides 6–12 Whiteboards and pens
Explore	To introduce learners to modelling expressions using algebra tiles	10	Tutors should provide learners with sets of algebra tiles and explain what each of the tiles is and its purpose. Tutors then ask learners to use their tiles to model expressions. The tutors should show what these should have looked like. Learners are asked to leave the example from slide 18 on their desks as it will be used to demonstrate zero pairs.	Slides 13–18 Sets of algebra tiles

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Explanation	To introduce the concept of zero pairs and to simplify expressions using algebra tiles	5	Three examples will be shown on the board to demonstrate zero pairs and how they can be used to collect like terms (simplify).	Slides 19–22
Learner Review Question	To get learners to think about and discuss what mistakes someone could make in this type of question	5	Tutors to facilitate discussion or ask learners to use whiteboards to demonstrate the mistakes Dev made to get the last example incorrect. Use questioning to ensure learners' understanding of the topic.	Slide 23 Whiteboards and pens
Explore	To apply their knowledge of algebra tiles to match and simplify algebraic expressions	30	Tutors will guide learners through a card matching activity in which they will match an algebra tile picture with the expression it represents and its simplified version. The difficulty of this card sort varies to allow for extension and challenge. Guidance notes and an answer scheme are available.	Slides 24–26 Card sort (cards are cut up ahead of time) Guidance notes Answer scheme
Exam questions	Learners to check and consolidate their understanding by answering exam questions	15	Learners work individually to answer one, two or three exam questions (which are varied in difficulty). This is followed by class feedback. Guidance notes and an answer scheme are available.	Slides 27–31 Exam questions handout
Lesson closure	To review lesson objectives and recap key learning points.	5	The tutor should end the lesson by looking at the objectives and recapping the key learning points with the class.	Slide 32