Formulae and number sequences

National Curriculum attainment targets

- Use simple formulae
- Generate and describe linear number sequences

Lesson objectives

- Use simple formulae
- Collect like terms and multiply brackets

Previous related lessons

Unit 5, Week 2, Lesson 1; Unit 5, Week 2, Lesson 2; Unit 5, Week 2, Lesson 3; Unit 5, Week 2, Lesson 4

Prerequisites for learning

Children need to:

- understand that addition and subtraction are inverses, and so are multiplication and division
- recall BODMAS
- look for patterns in number sequences by finding the difference between terms
- continue number sequences and understand the meaning of the n^{th} term

Vocabulary

expression, generate, group, BODMAS, sequence, difference, n^{th} term, rule

Future related lessons

Unit 9, Week 2, Lesson 2; Unit 9, Week 2, Lesson 3; Unit 9, Week 2, Lesson 4

Success criteria

Children can:

- group like terms and multiply brackets
- solve simple formulae for given values and generate a simple formula to fit a problem
- generate and describe number sequences and find a value for the n^{th} term

Getting Started

- Choose an activity from Algebra.

Collins Connect
Year 6, Unit 9, Week 2

Teach

Resources

mini whiteboard, pen and eraser (per child)

- Ask: **What comes into your mind when you hear the word 'algebra'?**
- Collect ideas e.g. letters for numbers, formulae, unknowns.
- Say: **We can use algebra to solve mathematical puzzles. The first thing we are going to do today is group 'like terms'.**
- Display: Slide 1. Say: **This illustration is to explain 'like terms' and to see how expressions like this can have meaning.** Click through the fruit bowl example and ask the children to explain how the words and expression relate to the story.
- Display: Slide 2. Ask: **What is the answer to this when you group 'like terms'?**
- Click through the other expressions, ask the children to do them on the whiteboards, and share their answers.
- Check that the children understand that in the third expression the terms all cancel one another out so that nothing is left.
- Say: **The second thing we are going to look at is removing brackets in algebra**.
- Ask: **Where do brackets come in BODMAS?** Agree that brackets come first.
- Say: **When multiplying expressions in brackets, make sure that the number outside the bracket multiplies everything inside the bracket.**
- Display: Slide 3. Ask: **What is the answer when we multiply the brackets?** Complete examples on the whiteboard.
- Say: **We may have both terms to group and brackets to multiply out.**
- Display: Slide 4. Ask: **What will you do first?** Agree that they need to group the terms inside the bracket first and then multiply it out.
- Say: **We are also going to revisit number sequences**.

- Ask: **When you see a number sequence how do you find the next terms?** Establish that you find the difference between terms.
- Ask: **How do you find the n^{th} term?**
- Display: Slide 5. Ask the children to continue these simple sequences to remind them of the methods. Click to show the rule and the n^{th} term.
- Say: **Write a number sequence of your own.** Share some of the children's sequences, find the rules and the n^{th} term.

Individualised Learning

Refer to Activity 1 from the Learning activities on page 368.

Pupil Book 6C – Page 12: Formulae and number sequences

Progress Guide 6 – Support, Year 6, Unit 9, Week 2, Lesson 1: Collecting terms and using brackets

Resources: 1–6 dice (per pair); scissors (per pair)

Plenary

- Say: **Look at Challenge 2 Question 2 in the Pupil Book. Some of the correct formulae were addition or subtraction sums and some were multiplication/division.**
- Ask: **Which words or phrases gave you clues to the operation required?** Ask the children to work in pairs to list the words. (Addition/subtraction – left, altogether; Multiplication/division – cut into pieces, average)
- Ask: **Can you write your question with your partner? Underline the words or phases that show the operation required.** Share some of the children's answers and answer the problems.
- Ask: **How do you find the n^{th} term in a number sequence?** Share the children's answers.

Homework Guide 6

Year 6, Unit 9, Week 2, Lesson 1: Pascal's triangle

Resources: coloured pencils

Overcoming Barriers

- Initially children may need reminding that the convention is to omit the multiplication sign in algebraic expressions, so that $2a$ means $2 \times a$. Excellent knowledge and recall of multiplication table patterns helps children spot patterns in number sequences that are close to known tables. Children who are less secure in their knowledge could use a multiplication tables square for support.