

# BODMAS

## National Curriculum attainment target

- Use knowledge of the order of operations to carry out calculations involving the four operations

## Lesson objective

- Use BODMAS to carry out calculations involving the four operations, with brackets and powers

### Previous related lessons

Unit 5, Week 1, Lesson 3; Unit 9, Week 1, Lesson 3

### Prerequisites for learning

Pupils need to:

- calculate mentally with all four operations
- use BODMAS with all four operations

### Vocabulary

brackets, orders, BODMAS

### Future related lesson

Unit 11, Week 1, Lesson 2

### Success criteria

Pupils can:

- read the calculation
- apply the BODMAS rule



## Getting Started

- Choose an activity from Number – Addition and subtraction.
- Choose a game or activity from *Fluency in Number Facts: Y5/Y6* – Addition and subtraction.

**Collins**  
Connect

Year 6, Unit 11,  
Week 1

## Teach

### Resources

mini whiteboard, pen and eraser (per child)



- Write BODMAS on the board. Ask: **Who can remember what the BODMAS rule is?** Ask individual children to explain the meaning of the letters B, DM and AS.
- Say: **BODMAS is a word which helps us remember the order of operations. Brackets then division and multiplication, then addition and subtraction. We will learn what the O stands for in a few minutes.**



- Display: Slide 1. Ask: **Where should we begin when working out this calculation?** Ask some pairs to share their answers.

- Establish that brackets show the parts of the calculation that need to be worked out first.  $[(23 + 7) = 30 \text{ and } (75 - 15) = 60]$

- Work through the calculation as a class.

- Ask: **What do we need to work out next?** (the multiplication  $30 \times 60 = 1800$ )

- Ask: **What is the final step?** Establish that the addition of 23 completes the calculation, making an answer of 1823.



- Display: Slide 2. Say: **The O in BODMAS stands for orders, although we usually use the term powers. This means operations such as squaring numbers and taking square roots. In this calculation we have seven to the power of two minus six to the power two so we need to work out the powers before we can do the subtraction.**

- Work through the calculation as a class, recording the steps. ( $7^2 = 49$ ;  $6^2 = 36$ ;  $49 - 36 = 13$ )



- Display: Slide 3. Say: **In this calculation we have nine to the power of two so this needs to be worked out before the multiplication and the subtraction.**

- Work through the calculation as a class, recording the steps. ( $9^2 = 81$ ;  $12 \times 4 = 48$ ;  $81 - 48 = 33$ )



- Display: Slide 4.



- Say: **Discuss with your partner how you use the BODMAS rule to work out this calculation.** Ask some pairs to share their ideas.

- Establish that as there are brackets this part of the calculation has to be worked out first, followed by the power of two and then the multiplication.  $[(81 - 53) = 28$ ;  $3^2 = 9$ ;  $28 \times 9 = 252]$



- Display: Slide 5. Say: **Work out this calculation using the BODMAS rule.**



- Ask children to compare their working out and answer with a partner, then work through it as a class. Make sure that children understand that the power is worked out before the division, and the addition completes the calculation. ( $5^2 = 25$ ;  $225 \div 25 = 9$ ;  $243 + 9 = 252$ )
- Display: Slide 6. Say: **Work out this calculation using the BODMAS rule, showing each step clearly.**
- Give time for the children to work through the calculation on their own. Then get them to display their calculations and answers on their whiteboards. Invite a child who has the correct answer to explain their method to the class.
- If there are many children with the incorrect answer, recap the method emphasising the meaning of each element of the BODMAS rule and the correct order of the steps for this calculation. [ $(250 - 246) = 4$ ;  $4^2 = 16$ ;  $16 \times 15 = 240$ ;  $650 - 240 = 410$ ]
- Repeat with other calculations as appropriate.

## Individualised Learning

Refer to Activity 1 or 2 from the Learning activities on page 426.

**Pupil Book 6C** – Page 52: BODMAS

**Progress Guide 6** – Extension, Unit 11, Week 1, Lesson 1: BODMAS challenge

## Plenary

### Resources

mini whiteboard, pen and eraser (per child)



- Say: **Make a group of three or four and start to discuss what would make a good BODMAS song. Jot down any key phrases you would like to include.**
- Ask groups to share their ideas. Record some phrases on the board.
- Discuss the important mathematical phrases suggested by the children emphasising in particular those key phrases or words that encourage children to remember the order of operations and the BODMAS rule. Drawing particular emphasis to brackets and then 'orders' as being the first two parts of any calculation that need to be solved.

## Overcoming Barriers

- Children will find this challenging if they are not confident using all four operations mentally and with written methods. Use calculations with only two operations and one set of brackets to provide them with focussed practice.
- Children may confuse the word 'orders' in BODMAS with the order in which calculations should be done. Be sure to explain that when we say 'orders' we mean 'powers', like square and square root.