ORDER OF OPERATIONS

When we talk to each other we need to have a common understanding of what the language means. It's the same in mathematics. We need to have rules in mathematics so everyone can understand what other people are doing.

The order of operations is:

BRACKETS INDICES DIVISION MULTIPLICATION ADDITION SUBTRACTION

Draw arrows to match the calculations to the correct answers. One is done for you.

1.	Answers in the wrong order
2(3 + 4)	34
2 x 3 + 4 x 7	70
2(3 + 4) x 7	34
(2 x 3 + 4) x 7	14
(2 x 3) + (4 x 7)	62
2 x (3 + 4 x 7)	98

2.	Answers in the wrong order
4(2 + 3)	100
4 x 2 + 3 x 5	55
4(2 + 3) x 5	23
(4 x 2 + 3) x 5	68
(4 x 2) + (3 x 5)	20
4 x (2 + 3 x 5)	23

Make your own table with similar calculations and then exchange it so you each solve a puzzle created by another learner.

BIDMAS GAME

This is a Pelmanism type game. **For two players**, cut out the cards on page 2 and put them on a table face down. Players take turns to turn over the cards and, if the cards chosen are a pair then the player keeps them. If the cards turned over are not a pair then they must be turned face down in the same position before the next player has a turn. The winner is the first to get two pairs. If they get one pair each then the winner is the player who gets the second pair because there are only 3 pairs.

For two or more players use the cards on pages 2 and 3 so that there are 6 pairs altogether. In this game the winner is the player who gets the most pairs.

HELP

Cut out the cards on pages 2 and 3 and match the pairs of cards.

NEXT   Draw arrows to match the calculations with the correct answers.

	Answers in the wrong order
$2^3 + 3^2$	4
$(2 + 3)^3$	64
$(3 \times 4^2)/12$	17
$(12 \times 4^2)/3$	625
$2^4 + 3^4$	125
$(2 + 3)^4$	97

Cut out the cards from page 4 of the worksheet and match each calculation to its answer.

BIDMAS NEXT GAME

Play the game as before with the cards on pages 2, 3 and 4 so that there are 9 pairs of cards.

Make more cards to make the game more interesting.

Cut out the cards and then match the calculations to their answers.

1.	Answers in the wrong order
2(3 + 4)	34
2 × 3 + 4 × 7	70
2(3 + 4) × 7	34
(2×3 + 4) × 7	14
(2 × 3) + (4 × 7)	62
2 × (3 + 4 × 7)	98

Cut out the cards and then match the calculations to their answers.

2.	Answers in the wrong order
$4(2 + 3)$	100
$4 \times 2 + 3 \times 5$	55
$4(2 + 3) \times 5$	23
$(4 \times 2 + 3) \times 5$	68
$(4 \times 2) + (3 \times 5)$	20
$4 \times (2 + 3 \times 5)$	23

Cut out the cards and then match the calculations to their answers.

	Answers in the wrong order
$2^3 + 3^2$	4
$(2 + 3)^3$	64
$(3 \times 4^2)/12$	17
$(12 \times 4^2)/3$	625
$2^4 + 3^4$	125
$(2 + 3)^4$	97

Make more BIDMAS matching cards

NOTES FOR TEACHERS

SOLUTION

1.	Answers in the wrong order
2(3 + 4)	34
2 x 3 + 4 x 7	70
2(3 + 4) x 7	34
(2 x 3 + 4) x 7	14
(2 x 3) + (4 x 7)	62
2 x (3 + 4 x 7)	98

2.	Answers in the wrong order
4(2 + 3)	100
4 x 2 + 3 x 5	55
4(2 + 3) x 5	23
(4 x 2 + 3) x 5	68
(4 x 2) + (3 x 5)	20
4 x (2 + 3 x 5)	23

NEXT

	Answers in the wrong order
$2^3 + 3^2$	4
$(2 + 3)^3$	64
$(3 \times 4^2)/12$	17
$(12 \times 4^2)/3$	625
$2^4 + 3^4$	125
$(2 + 3)^4$	97

Why do this activity?

This is an activity that will seem to learners like a puzzle or game while they get practice in using the order of operations rule correctly in making calculations. Then the BIDMAS game gives more practice through play.

Learning objectives

In doing this activity students will have an opportunity to:
- develop their number sense
- using the order of operations rule in practising calculations involving several operations
- develop their fluency in number work through playful learning.

Generic competences

In doing this activity students will have an opportunity to:
- develop their social skills in interacting with other people competitively and winning and losing with good grace.

Suggestions for teaching

If this is a revision lesson, then use the method of drawing arrows on a grid to match the calculations to their answers. Otherwise, or for learners who are struggling with the ideas, use the card matching method.

This type of exercise can always be done by matching cards but it's quicker for the teacher to prepare, and takes up less time in the lesson, if learners do the matching by drawing arrows in charts.

Ideally, split the class into groups of 4, have different sets of cards for different groups, and when they have finished the card matching, then ask learners from the different groups to show the rest of the class what they had done using much bigger cards and Blutak (or other putty like adhesive) to stick the cards on the board. This will help learners to develop their mathematical thinking and communication skills.

Learners can then play the BIDMAS game in pairs or small groups.

Finish the lesson with the Diagnostic Quiz.

Key questions

- How did you get that answer?
- Which operation did you do first?
- Can you explain to me each step in your calculation?
- Can you explain the way you did that calculation?
- How did you apply the BIDMAS rule when you did that calculation?
- Have you checked your arithmetic?
- Have you checked whether you did the operations in the right order?

Follow up

Number Sentences is an easy activity to use in introducing Order of operations.

Number Sentences https://aiminghigh.aimssec.ac.za/number-sentences/

Beautiful Numbers https://aiminghigh.aimssec.ac.za/beautiful-numbers/

Exponents https://aiminghigh.aimssec.ac.za/exponents/

Go to the **AIMSSEC AIMING HIGH** website for lesson ideas, solutions and curriculum
links: http://aiminghigh.aimssec.ac.za

Subscribe to the **MATHS TOYS YouTube Channel**

https://www.youtube.com/c/MathsToys/videos

Download the whole AIMSSEC collection of resources to use offline with the **AIMSSEC App** see https://aimssec.app or find it on Google Play.

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and school years up to Secondary 5 in East Africa.
New material will be added for Secondary 6.
For resources for teaching A level mathematics (Years 12 and 13) see https://nrich.maths.org/12339
Mathematics taught in Year 13 (UK) & Secondary 6 (East Africa) is beyond the SA CAPS curriculum for Grade 12

	Lower Primary Approx. Age 5 to 8	Upper Primary Age 8 to 11	Lower Secondary Age 11 to 15	Upper Secondary Age 15+
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13