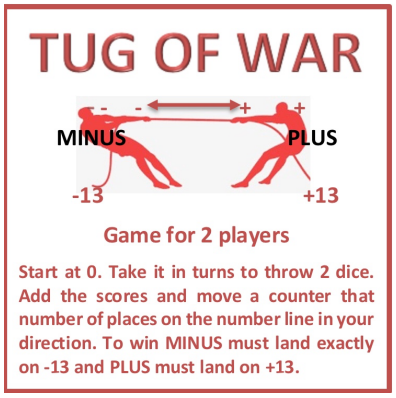
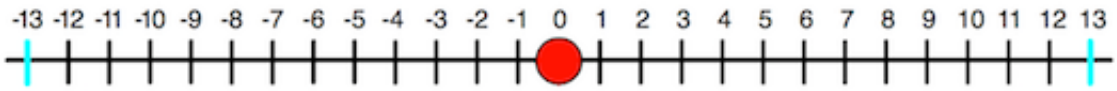
TUG OF WAR



This is a game for 2 players, call yourselves Minus and Plus. You need 2 dice or a spinner and a counter. Draw a number line from -13 to +13.

Place the counter on zero. Take it in turn to throw the dice, add the scores and move the counter that number of places on the number line in your direction. To win Minus must land exactly on -13 and Plus must land exactly on + 13. If your score would overshoot then you don't move at all. No calculators allowed.



You can play with different rules. Do you prefer the game so that you only have to reach +13 or -13, and it's OK to overshoot? Why?

In the **TUG MUCH HARDER** game you can choose whether to add, subtract, multiply or divide the 2 scores (in either order) and, if the answer is a whole number, you can use it to move the counter. If your opponent challenges you, and you have done the calculation wrongly, then the counter goes 3 spaces towards your opponent's goal.

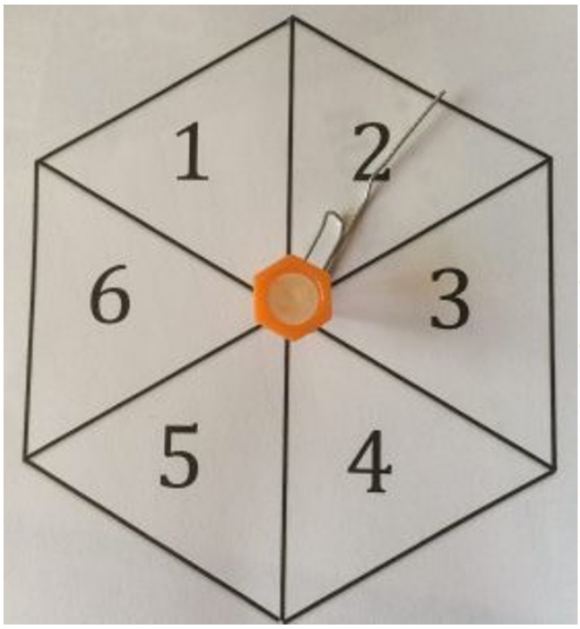
HELP

You can use a calculator, but only to check answers. If you are challenged and you got the calculation wrong, the counter goes 3 spaces towards your opponent's goal

NEXT

TWO-WAY WAR

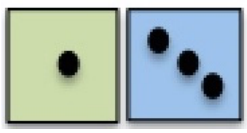
Make your own spinner if you don't have dice



You'll need a paper clip, a pin and scrap card.

Draw a regular hexagon or print this, prick through the corners and centre of the diagram, and join the points with straight line segments.

Write numbers in then cut out your spinner.



Use coloured dice. Make one die positive and the other negative. With a spinner, take the first spin to be positive and the second negative.

The rules for **TWO-WAY WAR** are that each player can use addition, subtraction, multiplication or division, in any order as long as the result is a whole number.

With green positive and the blue negative as shown, the possibilities are:

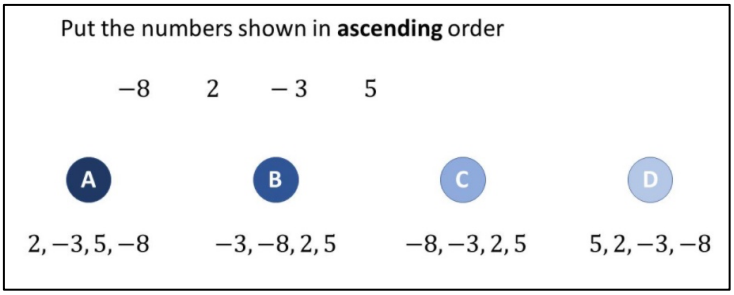
- Addition $^{+}1 + {}^{-}3 = {}^{-}2$ and $^{-}3 + {}^{+}1 = {}^{-}2$
- Subtraction $^{+}1 - {}^{-}3 = {}^{+}4$ (best choice for Plus) or $^{-}3 - {}^{+}1 = {}^{-}4$ (best choice for Minus)
- Multiplication $^{+}1 \times {}^{-}3 = {}^{-}3$ or $^{-}3 - {}^{+}1 = {}^{-}3$
- Division $^{-}3 \div {}^{+}1 = {}^{-}3$

NOTES FOR TEACHERS

DIAGNOSTIC ASSESSMENT This should take about 5–10 minutes.

Write the question on the board, say to the class:

"Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D".



1. Notice how the learners respond. Ask a learner who gave answer A to explain why he or she gave that answer. DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.
2. It is important for learners to explain the reasons for their answers. Putting thoughts into words may help them to gain better understanding and improve their communication skills.
3. Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.
4. Ask the class to vote again for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.

The correct answer is: C

Why do this activity?

Learners enjoy playing this game and they get practice in calculating with integers.

It can be played by the whole class split into 2 teams as a lesson starter, to enable the teacher to make an assessment of how well the learners understand and can carry out, the addition, subtraction, multiplication and division of integers.

The game has several stages of challenge. It can be used repeatedly for short times to give new challenges to some of the learners while enabling others to get the practice they need at a simpler level, thus optimising the progress of all the learners.

Learning objectives

In doing this activity students will have an opportunity to:

- practise calculations involving negative and positive integers;
- develop mental images of directed numbers (vectors) on the number line.

Generic competences

In doing this activity students will have an opportunity to:

- enjoy playing games that require mental effort, with a good attitude to losing and consideration for other players.

Suggestions for teaching

Start with the Diagnostic Quiz. Then draw the number line from -13 to + 13 and ask 4 learners to come and mark the numbers -8, 2, -3 and 5 on the number line to make the ordering clear. Then split the class into two teams and call them Minus and Plus. Play the game as a class to introduce and explain the rules. Then, if you have enough dice or

spinners, or the learners make spinners, they can play the game in pairs or one pair against another pair. The 'foursome' game works well because there are more people to check the arithmetic.

Key questions

- Which way do you move on the number line to add a positive number? Show me.
- Which way do you move on the number line to add a negative number? Show me.
- Which way do you move on the number line to subtract a positive number? Show me.
- Which way do you move on the number line to subtract a negative number? Show me.
- Imagine the only money you have is $100 in your pocket (positive) and you owe $150 (negative). What is the state of your finances?

Follow up

Target Game of Integers https://aiminghigh.aimssec.ac.za/years-7-10-target-game/

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

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