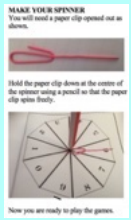
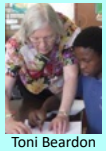
Global Teacher Empowerment Network

Saturday 31 July 2021

TARGET GAMES




Toni Beardon


Caroline Ainslie


Zach Mbasu

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Be closest to 1000 to win. With each spin of the 0-9 spinner pick one of the 6 boxes to place the number in. Thinking about the probabilities and understanding the division algorithm will help you to win.

TARGET DIVISION

TARGET 1000

Play as a class or with any number of players.
Spin to choose digits randomly.
Players write the digits in one of the top 9 boxes and once written they can't be changed.
When all 9 boxes are filled the players find their totals and the closest to 1000 is the winner.

TARGET 100

H T U

Spin a 1 to 9 spinner. Each player must write the digit in one of the top 4 squares. Once written the number cannot be changed. Spin 3 more times.
The winner is the one whose total is closest to 100.

GAME OF INTEGERS

With two integers and one operation, get as close to the target as possible.
For -7 and +9 the nearest to the target of -35 is (-7)-(+9)=-16 and the nearest to the target zero is (+9)+(-7)=(+2)

0	+1	+2	+3	+4
+5	+6	+7	+8	+9
-1	-2	-3	-4	-5
-6	-7	-8	-9	
-10	+75	0	-7	
-35	-60	+15	-45	-8

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AIMS

African Institute for Mathematical Sciences
SCHOOLS ENRICHMENT CENTRE

MATHS TOYS

Global Teacher Empowerment Network (GTEN)

Programme for Target Games Workshop 31 July 2021

PREPARATION: How to make spinners https://bit.ly/HowToMakeSpinners

Play for Fun
Think to Win
Play and Learn

Improve knowledge and understanding of:
Number, Estimation
Mental Maths,
Operations + - × ÷
and Probability

The Learning Spiral

Target Game with Integers
https://aiminghigh.aimssec.ac.za/target-game-with-integers/

Target Multiplication or Target Division
https://aiminghigh.aimssec.ac.za/target-4-by-2-division/

Target Subtraction
https://aiminghigh.aimssec.ac.za/target-subtraction/

Target 500 or Target 1000
https://aiminghigh.aimssec.ac.za/target-1000/

Target 50 or Target 100
https://aiminghigh.aimssec.ac.za/target-100/

Spin High Spin Low
https://aiminghigh.aimssec.ac.za/spin-high-or-low/

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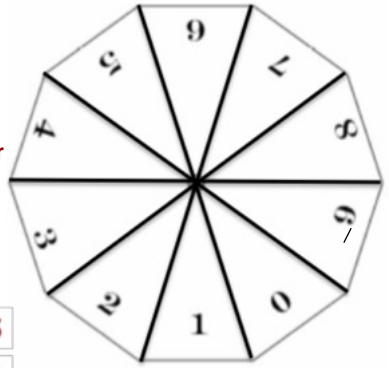
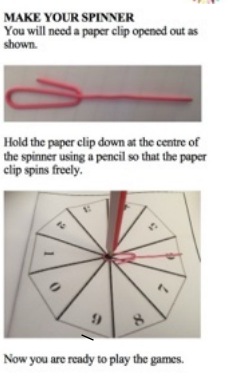
TARGET GAMES FOR AGES 4 TO 18+

PREPARATION
To play the games we must generate random digits.
Use a 0 – 9 spinner or 10 cards in a box or bag.



1	2	3	4	5
6	7	8	9	0



https://bit.ly/HowToMakeSpinners
https://bit.ly/SpinnerMovie

Virtual spinner https://wordwall.net/resource/1861548/spinner-0-9

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TARGET GAMES * STARTER FOR EVERYONE

Spin 4 times.
Each time write the digit in one of the boxes.
The winner is the player with the highest number.
Vary the game by aiming low.

Let's play this game.
Draw your grid.
Caroline will spin her spinner.

To make the game easier for young learners use 2 digits and spin twice or 3 digits and spin 3 times.

https://aiminghigh.aimssec.ac.za/spin-high-or-low/

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HOW TO PLAY TARGET GAMES – THEY ARE ALL SIMILAR

Play with 2 – 6 players or as a group or class
when each player competes with everyone else.
Play for Fun * Think to Win * Play and Learn

Improve: **Understanding** of operations + - × ÷ and Probability
Skills - Number Sense, Mental Maths, Estimation

1. Decide on the rules.
2. Each player draws a grid according to the chosen rules.
3. One person spins or chooses a card giving a random digit 0, 1, 2, 3,..., 9.
4. Players write that digit in one of the boxes in their grid and when written down it can't be changed.
5. Repeat steps (3) and (4) until all the boxes in the grid have been filled.
6. The player (or players) closest to the target wins.

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TARGET GAMES * TARGET 100 ADDITION

TARGET 100

H T U

Spin a 0 to 9 spinner. Each player must write the digit in one of the top 4 squares. Once written the number cannot be changed. Spin 3 more times. The winner is the one whose total is closest to 100.

Everyone play this game.
Draw your grid.
Toni will pick a card to get a random digit.
Choose the best place to put each digit to get close to the target.

https://aiminghigh.aimssec.ac.za/target-100/

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CHAIN GAMES * ADD TO 100 ACTIVITY

A GAME FOR MANY PLAYERS

Take it in turns to give a number.
The first person starts with **one number** less than 100.
After that each person gives **two numbers**,
the number to be added to get a total of 100,
then another number less than 100.

For example:

37 → (63, 77) → (23, 15) → (85, 54) →… and so on…

Everyone plays as quickly as possible.
Optional rule: Players win a point if they spot a mistake and lose a point if they make a mistake.

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TARGET GAMES * TARGET 1000 ADDITION

TARGET 1000

Make a 0-9 spinner. Each player draws a grid. Spin the spinner. Players write the digit in one of the top nine boxes. Once written a number cannot be changed. Repeat 8 times. Add the three 3 digit numbers.

The nearest to 1000 wins.

Another addition game
Draw your grid.
Zach will generate random digits.
Choose the best place to put each digit to get close to the target.

Virtual spinner https://wordwall.net/resource/1861548/spinner-0-9 https://aiminghigh.aimssec.ac.za/target-1000/

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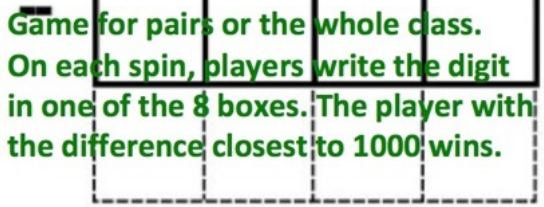
TARGET GAMES * TARGET SUBTRACTION

TARGET SUBTRACTION

Game for pairs or the whole class.
On each spin, players write the digit in one of the 8 boxes. The player with the difference closest to 1000 wins.



Let's play this game.
Draw your grid.
Zach will generate a random digit.
Choose the best place to put each digit to get close to the target 1000.

https://aiminghigh.aimssec.ac.za/target-subtraction/

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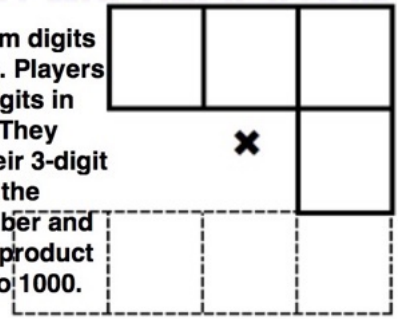
TARGET GAMES * TARGET MULTIPLICATION

TARGET MULTIPLICATION

Four random digits are chosen. Players write the digits in the boxes. They multiply their 3-digit number by the 1-digit number and win if their product is closest to 1000.



Draw your grid.
Toni will generate random digits.
Choose the best place to put each digit to get the product close to the target 1000.

https://aiminghigh.aimssec.ac.za/target-multiplication/

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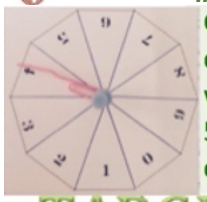
TARGET GAMES * TARGET DIVISION



Game for pairs or whole class. On each spin, players write the digit in one of the 5 boxes. The quotient closest to 1000 wins.

TARGET DIVISION

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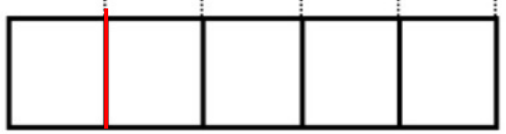

Draw your grid
Zach will generate random digits.
Choose the best place to put each digit to get the quotient close to the target 1000.

Virtual spinner https://wordwall.net/resource/1861548/spinner-0-9 https://aiminghigh.aimssec.ac.za/years-5-7-target-division/

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TARGET GAMES * 2 PLAYERS

Player 1 Player 2

GAME 1 - BIG NUMBER Take turns to spin or pick a card. Write the digit you get in one of your four boxes. Do this four times each until all your boxes are full.
Read the four digits as a whole number. Whoever has the larger 4-digit number wins.

There are two possible scoring systems:
1) A point for a win. The first person to reach 10 points wins the game.
2) Work out the difference between the two 4-digit numbers after each round. The winner keeps this score. First to 10000 wins.

Choose the game and decide on the rules to suit your class. Play different games as lesson starters, and to review and reinforce the maths you teach.

GAME 2 – SMALL NUMBER
Whoever makes the smaller 4-digit number wins. You'll probably want to change the scoring system.

GAME 3 - TARGET NUMBER Set a target and choose an operation and grid for recording the calculation. Spin or pick a card to generate the digits. Participants do calculation. Whoever is closer to the target number wins.
Work out the differences from the target. Keep a running total of these differences. First to 10000 loses.

GAME 4 – DECIMAL TARGET introducing a decimal point. Choose a target. The decimal point takes up one of the cells. Spin or pick a card to generate digits. The winner is the one closest to the target.
Version A Each player decides in advance where to put his or her decimal point before starting the game.
Version B All digits are called. Then players spins decide where to place the digits and the decimal point.
Again, two different scoring systems are possible.

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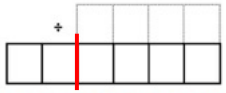
TARGET GAMES * TARGET 4 BY 2 DIVISION

TARGET

4 BY 2 DIVISION



Be nearest to 100 to win.

Place each random digit drawn in one of the boxes.

Thinking about probabilities and understanding the division algorithm will help you to win.

https://aiminghigh.aimssec.ac.za/target-4-by-2-division/

Draw your grid
Zach will generate a random number.
Choose the best place to put each digit to get the quotient close to the target 100.

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TARGET GAMES * TARGET HALF A MILLION

HALF A MILLION GAME

https://aiminghigh.aimssec.ac.za

How big is a million?

What could you buy with half a million dollars?

You need 10 cards numbered 0, 1, 2, … 9.
The leader picks cards one at a time, calls out the number then puts that card aside. Six different digits are drawn in random order. Players write the numbers in the boxes as they are read out and cannot change them.
The player with the number closest to half a million wins.

https://aiminghigh.aimssec.ac.za/half-a-million-game/

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THINKING BIG * THOUSANDS AND MILLIONS

If you have been alive for a million seconds, how many birthdays have you had?

How many minutes? 1 million seconds is 1,000,000/60 minutes.

Quick calculation:1,000,000/60 = 50,000/3 = 16666.6… minutes
or 1,000,000/60 = 100,000/6 = 10/6 x 10000 =1.6666… x 10000 or just over 16666 minutes.

How many hours? 16666 minutes is 16666/60 hours.
Estimate it as less than 18000/60 = 300 hours
or do the calculation to give just over 277 hours.
How many days? 277 hours is less than 12 days.

So how many seconds have you been alive?

If you've been alive for a million seconds you've not had any birthdays.

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THINKING BIG * THOUSANDS AND MILLIONS

Try these yourself and use these questions in your lessons:

- Could you run one thousand metres in one minute?
- Could you walk as much as one hundred thousand kilometres during your lifetime?
- Could one thousand drink cans fit into one cubic metre?
- How long would it take to count to a million ?
- Do human beings live for as long as a million hours?
- What year was it one billion minutes ago?
- Could you eat exactly one metric tonne (1000 kg) of food in a year without getting either very thin or very fat?
- https://aiminghigh.aimssec.ac.za/thousands-and-millions/

Make up your own question of this sort

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TARGET GAMES * NASTY AND COOPERATIVE VERSIONS

GAME 5 – HOW NASTY Play any of the games 1 to 4 with a change of the rules.
This time you can choose to keep your digit and put it in one of your own cells,
OR give it to your opponent and tell them which cell to put it in.
You might lose a friend this way!
It's important to take turns to start each round if this game is to be fair.

The game becomes even nastier when you play games with more than two people.
We'll play both the nasty and the cooperative versions of Game 4 Decimals
GAME 6 – COOPERATION Cooperative rather than competitive games
For 3 or more people.
Choose any of the games 1 to 4.

Decide in advance which of you will get the closest to the target,
who will be second closest, third, fourth etc.
Work together to decide in whose cells the digits should be placed, and where.

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TARGET GAME WITH INTEGERS

0	+1	+2	+3	+4
+5	+6	+7	+8	+9
-1	-2	-3	-4	-5
-6	-7	-8	-9	MINIMUM
NEAREST TO -10	NEAREST TO +75	NEAREST TO 0	NEAREST TO -7	MAXIMUM
NEAREST TO -35	NEAREST TO -60	NEAREST TO +15	NEAREST TO +45	NEAREST TO +8

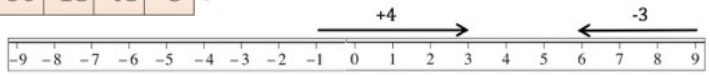
Think of numbers defined by both LENGTH and DIRECTION
positive numbers with a direction to the right →
and negative numbers with a direction to the left. ←

ADDITION Start at 1st number. Move distance and direction of 2nd number
(-1) + (+4) = +3 (+9) + (-3) = +6

SUBTRACTION Reverse the direction of the 2nd number
(-1) - (+4) = -5 (+9) - (-3) = +12

MULTIPLICATION Start at zero.
(-1) × (+4) = -4 Repeat (-1) 4 times
(+4) × (-1) = -4 Do +4 once reversing direction

DIVISION Think of the inverse of multiplication
(+9) ÷ (-3) = (-3) because (-3) × (-3) = +9



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TARGET GAME WITH INTEGERS

0	+1	+2	+3	+4
+5	+6	+7	+8	+9
-1	-2	-3	-4	-5
-6	-7	-8	-9	MINIMUM
NEAREST TO -10	NEAREST TO +75	NEAREST TO 0	NEAREST TO -7	MAXIMUM
NEAREST TO -35	NEAREST TO -60	NEAREST TO +15	NEAREST TO +45	NEAREST TO +8

Make and cut out a set of 30 cards to play the game. Place cards face down and mix so cards are picked randomly.

Use the four operations + - × ÷

In turn players randomly pick 2 integer cards and one pink target card and combine the integers, choosing the operation and order to get as close as possible to the target.

All cards are placed face down and mixed before the next player picks their cards.

The player with the number closest to target at the end of the round wins that round.

https://aimminghigh.aimssec.ac.za/target-game-with-integers/

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MORE DETAILED RULES FOR THE TARGET GAME WITH INTEGERS

This game can be played by a whole class with the teacher deciding on the best answer, or by any number of players who agree between themselves on the best answer for each round.

Make your set of cards. Mix up the numbered cards and place them face down.
Also mix the target cards and place them face down.
Turn over two number cards and one target card.
All the players must write down the two numbers and choose an operation to combine them to get as near to the target as possible.
Then the players check their answers and record the scores.

The aim is to get as close to the target as possible.
Players score 5 points if they hit the target.
If nobody hits the target, players getting nearest to the target score 2 points.
The first player to reach 20 points wins the game.

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Global Teacher Empowerment Network (GTEN)

NEW SKILLS
NEW HOPES
NEW HORIZONS
for teachers and learners worldwide

TARGET GAMES MATHS RESOURCES

Play For Fun
Think To Win
Play And Learn

Improve
Number Sense,
Mental Maths,
Understanding
of Arithmetic Operations

Target Games Inclusion and Home Learning Guide
https://bit.ly/TargetGamesInclusionHomeLearningGuide
How to make spinners
https://bit.ly/HowToMakeSpinners
Spin High Spin Low
https://aiminghigh.aimssec.ac.za/spin-high-or-low/
Target 50 or Target 100
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Target Multiplication or Target Division
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Target Game with Integers
https://aiminghigh.aimssec.ac.za/target-game-with-integers/

AIMSSEC GTEN YouTube Channel

MATHS TOYS

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AIMSSEC

NEW SKILLS NEW HOPES NEW HORIZONS

for teachers and learners worldwide

Need for in-service training.

Underqualified teachers in rural and disadvantaged communities.

Inequalities in educational opportunities

ADDRESSING THE ISSUES

Need for different teaching methods and new skills to thrive in the 21st century

Lack of teaching materials to engage learners & develop understanding & skills

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LET'S PLAY MATHEMATICALLY AND LEARN

Order from AMAZON or TARQUIN https://www.tarquingroup.com/products/aiming-high-lets-play-mathematically

Play Mathematically
- to develop a love for mathematics
- to unlock knowledge and understanding
- to improve numeracy and visualisation skills
- to practise mathematical procedures
- to motivate concentration and critical thinking
- to boost confidence in mathematical ability.

This **first book** in this AIMING HIGH series provides 36 games that are easy to learn and enjoyable to play for any age. Each comes with reflective questions and materials designed to bring out mathematical thinking and provide a deeper understanding of the topic that underlies the game. Even for the youngest players, this can be transformational.

The **second book** offers suggestions for teachers for using games and puzzles in lessons to teach the regular curriculum with different ideas for different age groups.. It is due to be published in mid 2026.

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AIMS African Institute for Mathematical Sciences SCHOOLS ENRICHMENT CENTRE

Thanks for coming to this workshop.
Use the AIMSSEC ideas on AIMING HIGH and add comments.
Share what you have learned with other teachers.
Try to help all your learners to have a 'Yes I Can' attitude to mathematics.

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