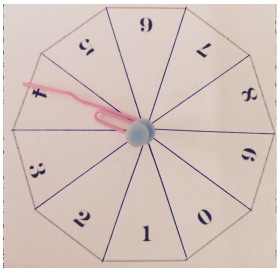
SERIES OF TARGET GAMES FOR ALL AGES



GAMES FOR A GROUP OR CLASS OF ANY SIZE

All the games are played in a similar way:

You will need a 0 to 9 spinner or ten cards.

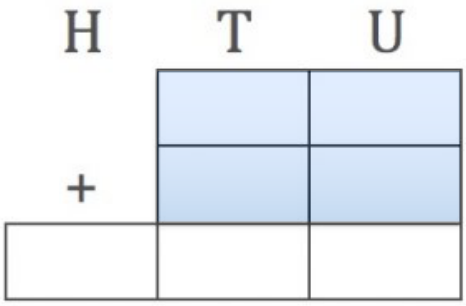
See instructions for making spinners below.

Each player draws a grid.

The first illustration shows a grid for adding two 2-digit numbers and entering the first 4 digits that come up on the spinner in the shaded boxes (also called cells).

Players then enter the sum of the two 2-digit numbers in the unshaded boxes.

Each game has a **TARGET** number.



This is a grid for the TARGET 100 GAME

1. Draw the grid for your game.
2. The player (or players) who get closest to the target win the point.
3. Spin the spinner and all the players must write the digit in one of the shaded boxes.
4. Once a number is written it cannot be changed.
5. Repeat the spins until all the shaded boxes are filled in.
6. The learners may need to do some calculation and decide how close their answer is to the **TARGET** number.
7. Score 1 point for a win. Repeat several times.

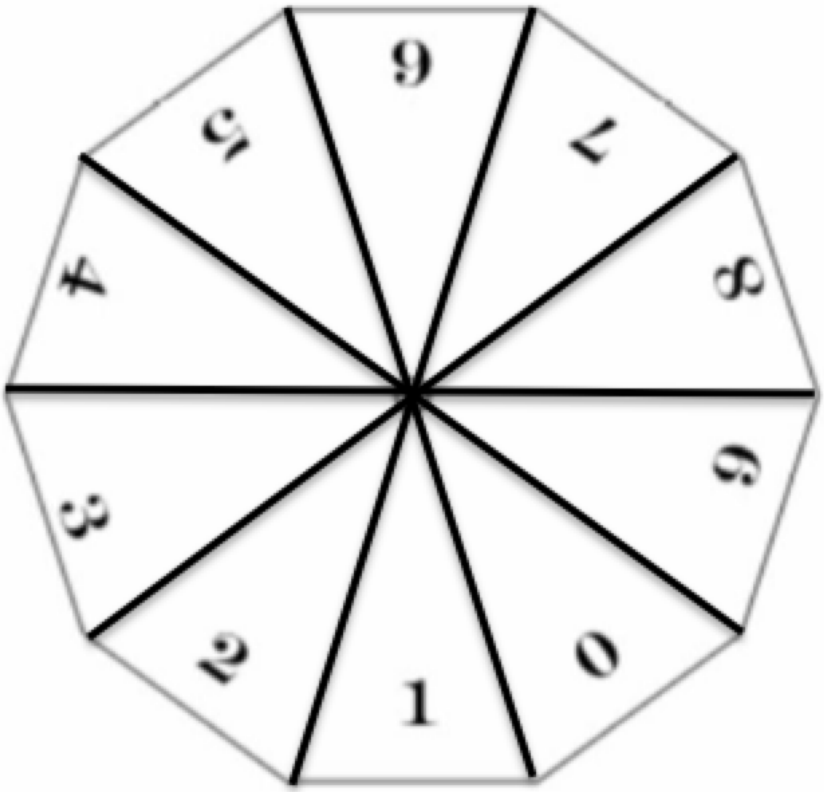
GAME FOR 2 PLAYERS

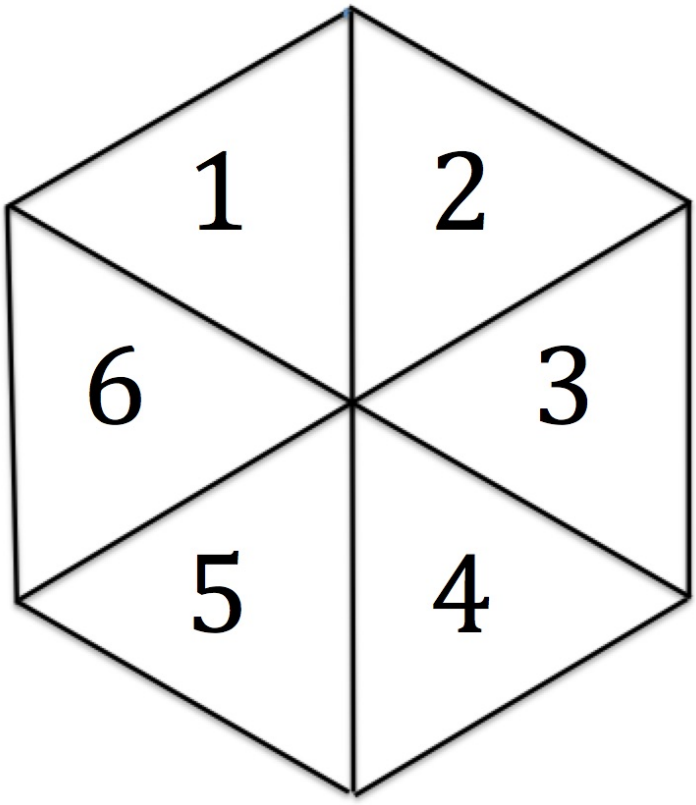
1. Each player draws a grid.
2. Players take turns to spin the spinner and each player decides which of their cells to fill in and can't change the position of the digit once it is written in.
3. After filling the top boxes, the players do some calculation and decide how close their answer is to the **TARGET** number.
4. The player who gets closest to the target win.

HOW TO WIN

This game offers practice in number skills but also an incentive to improve those skills in order to win.

Chance is a big factor. Players need to think for example 'if I put a 7 in that box how likely am I to get a better number for that position on the remaining throws?' So learners get experience of reasoning about probabilities before meeting a formal definition of probability.





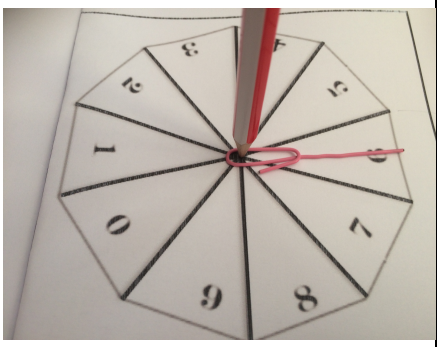
MAKING SPINNERS

You need a paper clip opened out as shown and some thick card or plastic.

Put the template on the left onto the card and hold it in place with selotape. Prick through the template in the centre and at the 10 points around the edge to mark out your spinner. Write in the numbers and draw the lines as shown. Cut out your spinner.

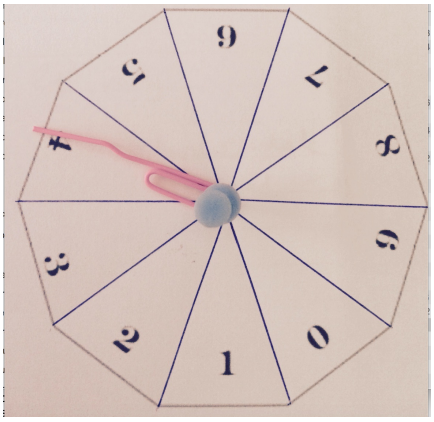
SPIN TO GET A RANDOM DIGIT

Hold the paper clip down at the centre of the spinner using a pencil so that the paper clip spins freely.

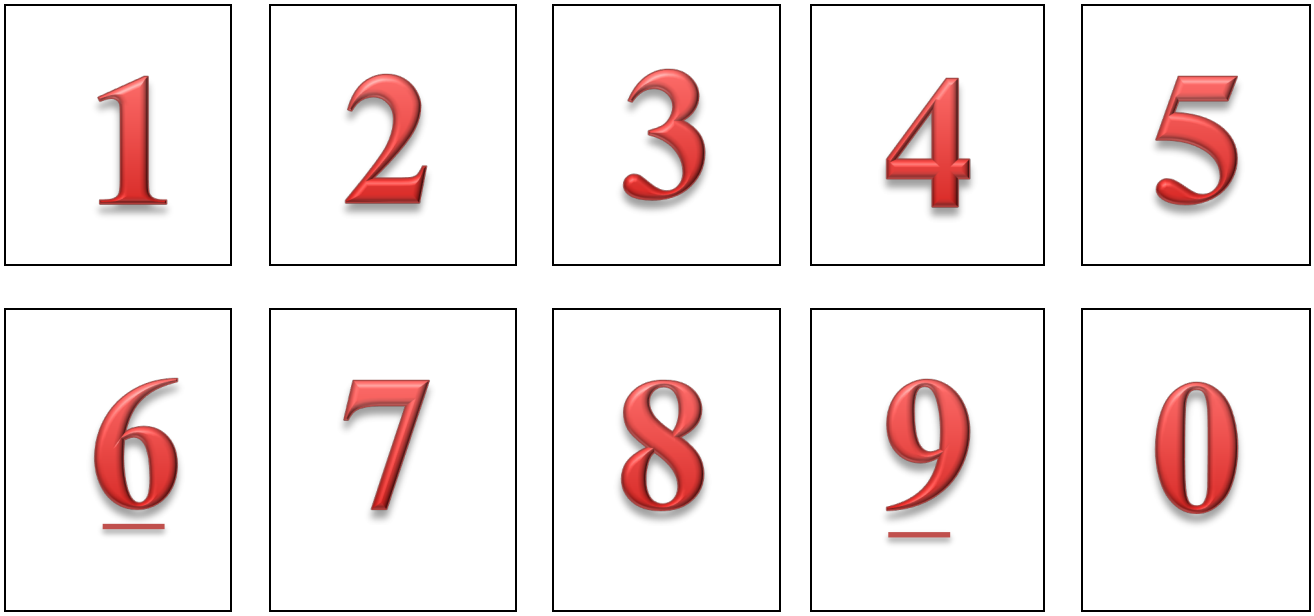


Now you are ready to play the games.

If you wish you can use a pin to hold the paper clip instead of a pencil.



Alternatively make 10 cards that can be shuffled so the you can draw one digit randomly from the pack of ten.



Choose the game that best suits the ages of the players. All the games are played in the same way but there are variations of scoring systems.

AS A TEAM GAME: If you are a group then you can play as two teams so that everyone can play together. As chance is involved, younger learners are not always at a disadvantage. Participants can learn from each other if the teams are allowed to consult before deciding where to place the random digit that has just come up.

AS A GAME FOR INDIVIDUALS: the players play for themselves and compete against everyone else. All the games can be for 2 players or for any number of players.

HOME LEARNING AND INCLUSION GUIDE

Theme: Games for all ages involving placing random digits in written calculations aiming to get answers as close as possible to set TARGET numbers.

Suggestions for Home Learning

PLAY FOR FUN – THINK AND WIN – PLAY TO LEARN

Pick the most suitable game for your children over a period of play a few days. Encourage them not just to fill the boxes without thinking but to think about their best choices in order to win. Explore the learning gains after they have plenty of experience of playing the game.

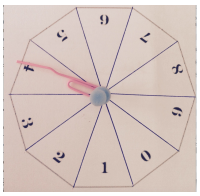
Young children

SPIN HIGH

https://aiminghigh.aimssec.ac.za/years-3-8-spin-high-or-low/

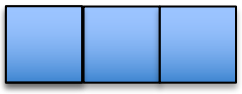
The **TARGET** is to get the highest possible number.

You will need a 0-9 spinner like the one in the picture, or a pack of cards numbered 0 to 9.

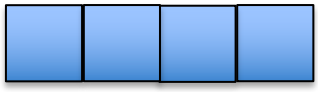


SPIN HIGH can have grids of 2, 3 or 4 squares.

2-digit numbers



3-digit numbers



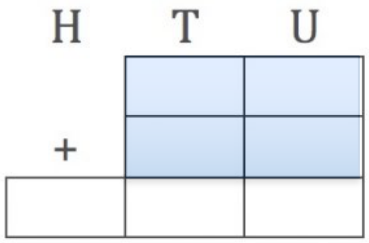
4-digit numbers

Spin 2, 3 or 4 times. The player with the highest number wins.

TARGET 50 (or 100)

https://aiminghigh.aimssec.ac.za/years-4-5-target-100/

This is the game as described on page 1 could be played by 7 or 8 year olds. Players start with **TARGET 50.** They will need to put low numbers in the tens column to stop the total getting much bigger than 50.



The strategy is different when they progress to **TARGET 100.**

HOW TO WIN

All the games offer number skill practice and an incentive to improve those skills in order to win.

Chance is a big factor. Players need to think for example ‘if I put this number in that box how likely am I to get a better number for that position on the remaining throws?’ So learners get experience of reasoning about probabilities before meeting a formal definition of probability.

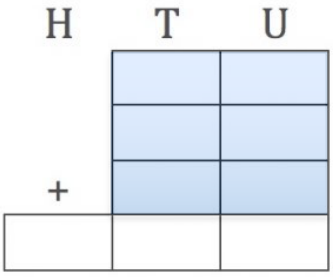
Upper Primary

Learners can play the **SPIN HIGH** and **TARGET 50** or **TARGET 100** games.

When adding three 2-digit numbers, they can play

TARGET 500 or TARGET 1000

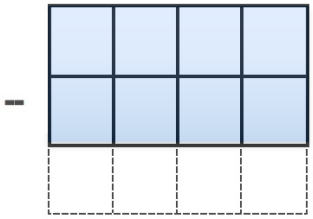
https://aiminghigh.aimssec.ac.za/years-4-7-target-1000/



TARGET SUBTRACTION

https://aiminghigh.aimssec.ac.za/years-4-7-target-subtraction/

Choose you own **TARGET NUMBER**



HOW TO WIN

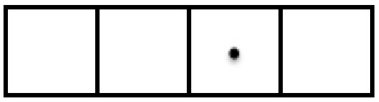
All the games offer practice in number skills and also an incentive to improve those skills in order to win.

Chance is a big factor. Players need to think for example 'if I put a this number in that box how likely am I to get a better number for that position on the remaining throws?' At this stage learners have met the definition of probability and they can practise thinking probabilistically.

Lower Secondary Years 7 – 9

SPIN LOW

In the **SPIN LOW version** of the 4-digit game the players with the lowest 4-digit number win a point. As a **variation of the game**, other targets can be set and players can take turns to choose the target.

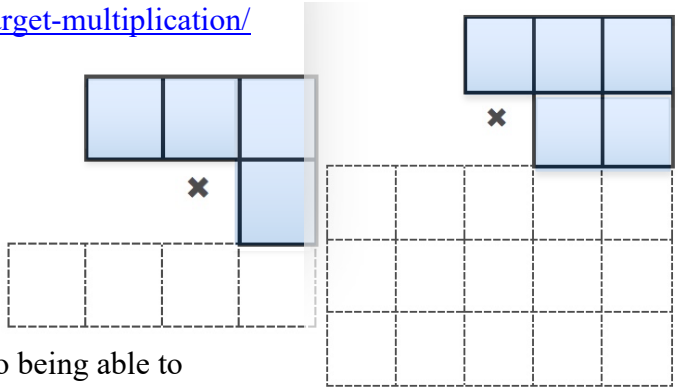


A grid for the **decimal version** is shown and the teacher, or players, choose the number of places in the grid, where to place the decimal marker and the **TARGET** number. If you use a decimal comma in your country then put a comma in your grid. With the grid shown, a target is set and three digits are chosen randomly by spinning the spinner as in the other games. The player or players closest to the target number win a point.

TARGET MULTIPLICATION

https://aiminghigh.aimssec.ac.za/years-4-7-target-multiplication/

Versions of this game range from multiplying a 2-digit number by one digit to multiplying a 3-digit number by a 2-digit number with the **TARGET 10 THOUSAND**



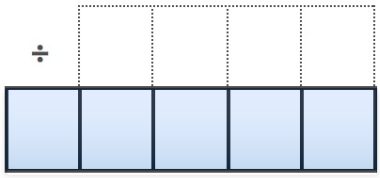
Winning depends on knowing products of single digit numbers (essentially the same as knowing the multiplication tables) and also being able to estimate the products roughly during the game.

https://aiminghigh.aimssec.ac.za/years-5-7-target-10-thousand/

TARGET DIVISION

https://aiminghigh.aimssec.ac.za/years-5-7-target-division/

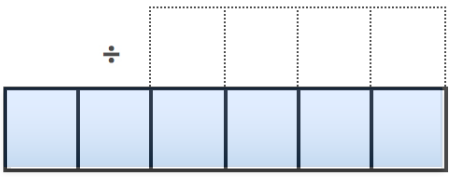
The players divide a 3-digit number or a 4-digit number by a 1-digit or 2-digit number and write the answer on the top line.



Winning TARGET numbers can be:
division of 3-digit number by a 1-digit number (TARGET 100);
division of a 4-digit number by a 1-digit number (TARGET 1000);
division of a 4-digit number by a 2-digit number (TARGET 100).

https://aiminghigh.aimssec.ac.za/years-6-9-target-4-by-2-division/

Again chance is a factor. Players need to think where to place each digit and whether a better number for each place is more likely to occur or less likely. They get experience of reasoning about probabilities.



Upper Secondary Years 10 - 12

The challenge for older students is to play some of the games and investigate the best strategies for winning. Another challenge is to invent a new game involving random digits, calculation and a target answer.

Why do this activity?

The games develop the learners' number sense and gives practice in estimating the results of calculations. Doing well in this game depends on an understanding of place value and how and why the calculation algorithms work. The games can be used at different times for short periods as lesson starters. When learning how to do calculations the game help to deepen the learners' understanding of the method as well as giving practice. Subsequently the game can be used from time to time to give learners practice in doing calculations. Players should check their own calculations and their opponent's calculations without using a calculator. The teacher might introduce additional penalty points for incorrect calculations to give extra incentive to work accurately.

The games also develop an appreciation of probability as it requires judgement about where to place the numbers in the grid and whether a 'better' number for that position is likely to come up.
The games are versatile and can be changed to provide easier of more challenging versions or to investigate how strategies change when the target numbers change.

Learning objectives

In doing this activity students will have an opportunity to:

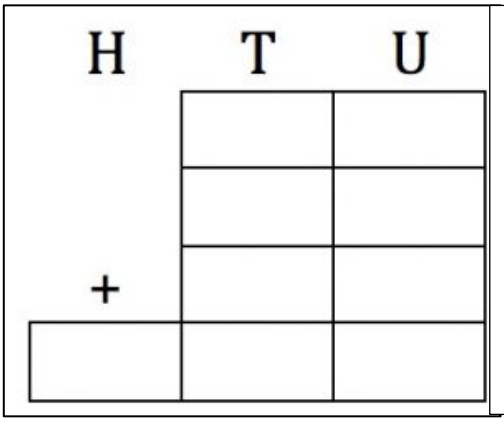
- develop numeracy and skills at performing calculations;
- develop understanding of place value and methods of calculation.

Generic competences

In doing this activity students will have an opportunity to **think flexibly** and be creative and innovative.

Diagnostic Assessment This should take about 5–10 minutes.

1. Show the question say to the group:
   "Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D".



Enter the 6 digits
0, 2, 3, 4, 5, 9
in the top 6 boxes to make three 2-digit numbers with a total as close to 100 as possible. The closest you can get to 100 is:

A. 122 C. 104
B. 103 D. 113

2. Notice how the learners respond. Ask them to explain why they gave their answers and DO NOT say whether it is right or wrong but simply thank the learner for giving the explanation.
3. It is important for learners to give reasons for their answers because putting ideas into words helps people to sort out their own thinking and to develop communication skills.
4. Encourage other learners to listen to these reasons and try to decide if their own answer was right or wrong.
5. **Ask the learners again to vote 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:
Make the tens 2, 3 and 4 and the units 0, 5 and 9 https://diagnosticquestions.com

Suggestions for Home Learning

You can make sets of number cards, or use old playing cards. The cards must be shuffled and one drawn at random each time. If you have enough spinners, or 0 – 9 dice, or sets of number cards you can organise for learners to play the game in pairs. In this case play the game a few times and the first player to get 3 points is the winner.

You could start with the formative assessment using the Diagnostic Quiz or a Quiz that you have devised. Ask the learners if any of them got the same answer in a different way and encourage the group to do the calculation in as many different ways as possible. For example, in the diagnostic quiz there are 8 ways to get a total of 104 and more if you don't allow for commutativity:
20 + 35 + 49 = 104; 20 + 39 + 45 = 104; 25 + 39 + 40 = 104;
25 + 30 + 49 = 104; 29 + 30 + 45 = 104; 29 + 35 + 40 = 104.

AS A TEAM GAME: If you have a group then they can play as two teams so that everyone can play together. As chance is involved, younger learners may not always be at a disadvantage. If the teams are allowed to consult before deciding where to place the random digit that has just come up, then the participants can learn from each other.

AS A GAME FOR INDIVIDUALS: In this version the players play for themselves and compete against everyone else. This can be a game for 2 players or for any number of players.

First ask the players to make a copy of the grid. Then spin the spinner and call out the numbers and the players fill in the numbers in their grids. Then ask players who have got an answer near the target number to show and explain their answer. If anyone has got closer to the target they should show what they have done. After deciding on the winner ask the group if anyone could have got closer to the target if they had known all the digits that came up ***before*** filling in any digits.
The learners could use ***a different way of scoring***. For example, they could get penalty points for the difference between their total and the target number and add up their penalty points. They should play a few games until one of the players gets 100 penalty points and loses the match.

Key Questions *These are questions you ask to help learners to **think for themselves**. **STOP yourself** telling children what to do next. Instead ask a **KEY QUESTION**.*

You want to get the target number. About how big do you want the digit in that box to be?
If you put a high digit there would it give you a good chance of getting close to the target?
If you put a low digit there would it give you a good chance of getting close to the target?
What do you think would be the best digit to put in that box?

Follow up

This is a different game with different rules and it involves positive and negative numbers: TARGET GAME https://aiminghigh.aimssec.ac.za/years-7-10-target-game/