Maths Games Pack

Key Stage 2 children and their parents

This book will provide ideas of games you can be playing at home to support your child's understanding and just as importantly, **enjoyment** of mathematics.

Maths Games Pack

The knowledge of basic mental maths is the basis of all maths, including those the children will use in everyday life. In this book you will find a range of maths games that you can play with your children to support them with these skills.

To play many of the games you will need the following –

- A dice
- A pack of playing cards
- A coin
- Some counters (could be buttons)
- A pencil
- A Paperclip

www.nrich.maths.org, which some of these games are from, is a great website for finding other games and investigations play at home together. www.mathsphere.co.uk is also a good website for free board games.
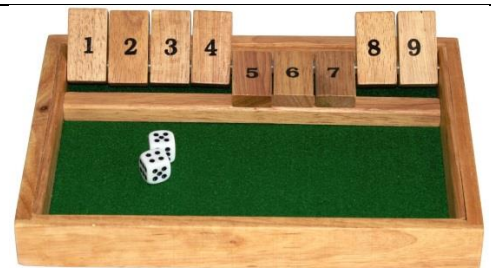
Alongside the games in the book there are a selection of excellent maths board games that you can purchase which are really good fun to play as a family and will support your children with their mathematical development.
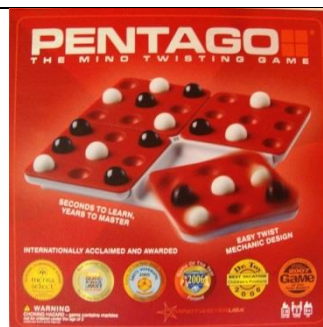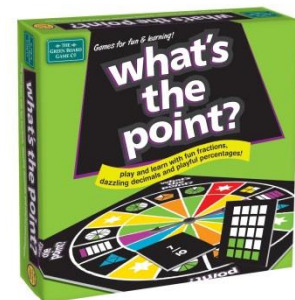
BrainBox Maths	**Monopoly**	**Shut the Box**
Q-Bitz	**Pentago**	What's the Point?

Tricky Track

Place counters on the squares numbered 2 to 12. Roll two dice and add to decide which player moves forward one square. The game should be played several times and discussion about the fairness of the game encouraged.

Fast Figuring

Using the number cards from an ordinary pack, deal out five cards to each player. Turn up one more card to reveal the 'target number'. Players race to use their five cards and any of the four operations (+, -, x, /) to form a statement that results in the target number. The first player to do so wins a point. If, after 3 minutes, no one can find a solution, the players show their hands for checking, then cards are shuffled and play continues.

Magic 15

This is a game for two players. Begin with the numbers 1 to 9. Players take turns to select a number, with each number used only once. The winner is the first player to have exactly three numbers that total 15. (There's a link to magic squares).

Roll Six

Players roll six dice and use five of the numbers together with any of the four operations to make the sixth number. Points are scored for successful equations.
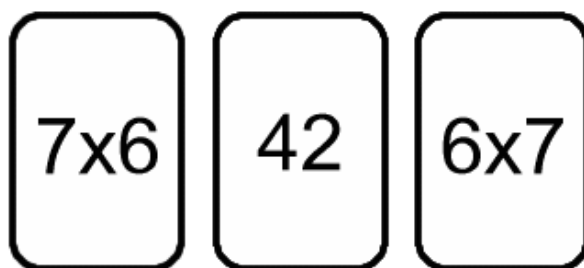
1.Use the rules of an existing game, but use different materials or add extra materials.
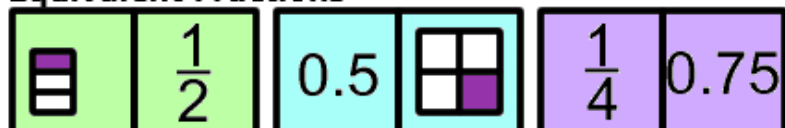
Example 1: Tables Fish - use the rules of the old favourite "Go Fish", but make a pack of cards for whichever multiplication facts need practising.

7x6   42   6x7

Bonus points can be given for collecting sets that the children might usually avoid, like 9 times 8. It might be helpful to allow children to use a tables card to start with, then have them play without assistance as they become more confident.

Example 2: Maths Dominoes - Make a set of paper or card dominoes where the dots have been replaced by equivalent values or matching concepts. Such as . . .
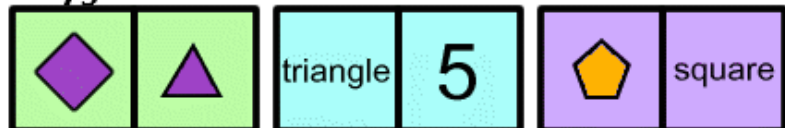
Equivalent Fractions

$\frac{1}{2}$ 0.5 $\frac{1}{4}$ 0.75

Basic Number Dominoes

five   3   four   6

Polygon Dominoes

triangle   5   square
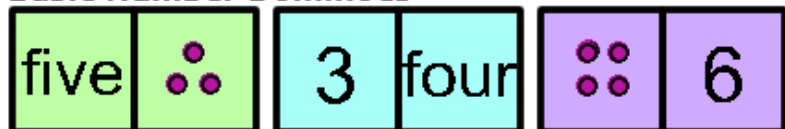
Example: Operation Snakes and Ladders - use the board with two dice. On each turn the player has the option of multiplying, dividing, adding or subtracting the two numbers, with a maximum answer of twenty.

NIM

Make a pile of seven counters. Two players each take turns to remove either one or two counters from the pile. The player left with last counter is the loser .

Odds and Threes

Stage: 2 ★

This is a game for two, three or four players.
You will need a pack of cards with the Jacks, Queens and Kings removed. (Ace is a one)

Deal out two cards to each player.
You can add, subtract, multiply or divide the two numbers to make a whole number, or just put them together to make a 2-digit number.

You score one point for making an odd number, OR a number that can be divided by three.

The player who has the most points after five rounds wins the game.

In China this game is known as Pong hau k'i and in Korea it is called Ou-moul-ko-no.
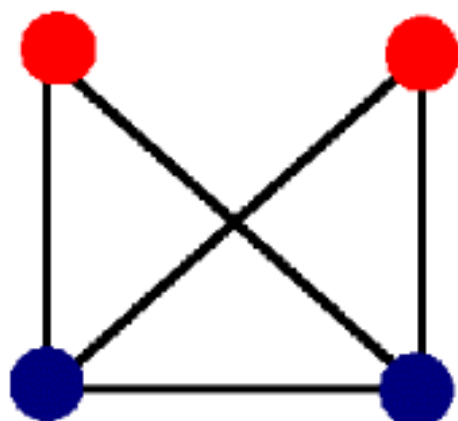

A game for two players.

Resources:
A game board like the one above.
Each player needs two distinctive pieces such as two pebbles.

To play:

Place the two pebbles at the top and two at the bottom as shown below .

Take turns to slide one pebble along a line to an empty spot.
The first move will be to the middle.
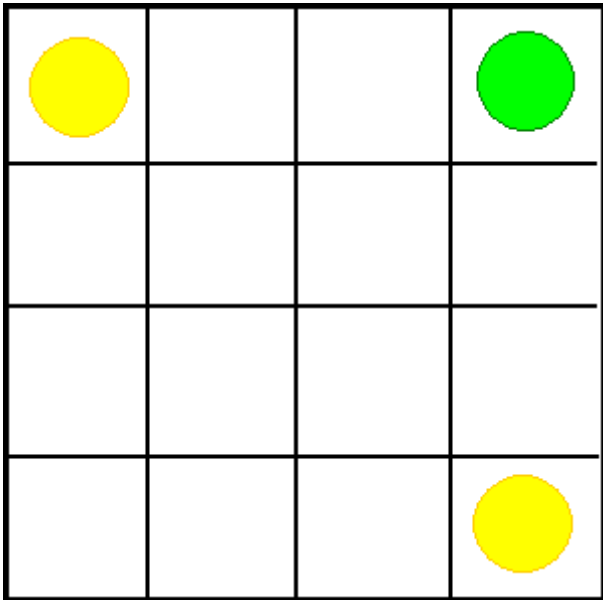
To win: block your opponent so that they cannot move.

Gotcha

Stage: 2 ⭐

A game for two players.
You need three counters - two the same colour, and a 4 x 4 grid.
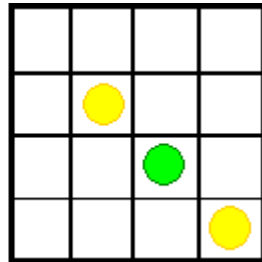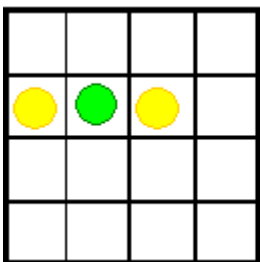(This is a good one to play outside with people instead of counters).

Start with the counters in the corners as shown.
Green moves first.
Counters can move one space up, down or sideways.
Yellow is trying to trap Green by getting on either side of it.

Green trapped!

What strategy does Yellow need to win?
What strategy does Green need to avoid being caught?
Try playing with 2 counters each. Both Yellow and Green can be caught!

Up and Down Donkey

Stage: 1 and 2 ⭐

A game for 2- 6 players.

This game used to be sold commercially so some families may have a box hiding in a cupboard!

Here we offer five versions of the game.
You can also invent your own games by creatively varying the rules.

Version 1: the basic game

You need six sets of these 1- 10 number cards

The aim of the game:

To build up six stacks in the middle of the table, face up, in order from 1 at the bottom to 10 on the top. The first player to get rid of all his cards is the winner. If the game has to stop at a pre-arranged time the player with the fewest cards left wins.

How to play:

1. Shuffle all the cards. Deal them face down to the players.
2. Without looking at them, each player makes a stack, face down in front of them.
3. The player on the left of the dealer turns over her top card. If it is a 1 she can start a stack in the centre and she can go on playing as long as she can put her cards onto the centre stacks (for example if her second card is a 1 or a 2). With the first card she is unable to build onto one of the centre stacks, she starts her own face-up stack in front of herself. This ends her turn.
4. From now on play is a little different, each player can use both stacks in turn:
   a. Face-up stack: place as many from this stack as possible, in turn, on the centre stack(s) using the rules above or start a new central stack if the card is a 1. When this is impossible move onto the face-down stack.
   b. Face-down stack: When this is impossible she turns over the next card of her face-down stack and places it on a centre stack. If she can't do that, it goes on top of her own face-up stack.
5. Whenever a player puts a card on a centre stack she has another turn. The turn ends when the player has to place a card on her own face-up stack.
6. If a player makes a mistake the other players call out WRONG and each hands her one of her own cards which the wrongdoer puts on her face-down stack.
7. When a player has used up her face-down stack she turns over her face-up stack and carries on.

Version 2: using different representations of the numbers 1- 10

You can play Version 1 but using different sets of cards.
Not all six sets need be the same: in fact two of each, numerals, words and dots would be good.

Numbers 1-10 in words: 1-10WordNumberCards.pdf
Numbers 1-10 arranged in dot patterns - 1-10DotNumberCards.pdf or 1-10DotNumberCards2.pdf

Version 3: using 1-20
You could play Version 1 using the numbers 1 to 20 instead of just 1 to 10: In this game, the six stacks in the middle of the table would each go in order from 1 at the bottom to 20 on the top.

Version 4: odds and evens

Using any of the sets of cards above, you can play a similar game but this time you build up twelve stacks in the centre. Six of the centre stacks must be the odd numbers in numerical order from 1 at the bottom to 9 at the top. The other six stacks must be the even numbers from 2 at the bottom to 10 at the top.

Version 5: watch out, my discard stack is in play!

In this version, as well as being able to place a card on one of the centre stacks, a player can also place a card on top of any other player's face-up stack. This can be done with the next higher or lower number e.g. a 7 or a 9 can be placed on an 8.

Over to you ...

What rules can you devise that would make a more thought-provoking game?
For example, using the 1-20 sets, you could build the centre stacks in the same way but allow players to put cards on their opponents' stacks which were multiples or factors of the top card. In this version the numbers 11, 13, 17 and 19 are the safest to have face up on top but 6 is much more risky. Why?

Calculator Bingo

Stage: 2 ★ ★

This game is for you to play against the computer. However, you could easily use your own calculators and adapt it to play away from a computer.

The object of the game is to be the first to get exactly to zero.

How to play:

1. Enter a 7-digit number into your calculator. You may use the same digit more than once. The computer will also put a number into its calculator.
2. A random number will appear at the top of the screen. If this digit appears in the number you have on your calculator, you can change that digit to zero by subtracting the appropriate number using the calculator keys.
3. If you subtract the correct amount, this digit will automatically change to zero. If you are incorrect, you will be allowed another chance.
4. For every random number given, you can only remove one digit from your calculator. So if you have, for example, four 3's you must wait for 3 to come up four times.
5. The computer will do the same thing as you for each number.
6. The first to reach exactly zero is the winner.

Make 24

Stage: 2 and 3 ★

This is a speed game that can be played with 2 or 4 players (or by yourself to practise).
All you need is a deck of cards!

Instructions:

1. Remove the Jacks, Queens and Kings and the Jokers from your deck of cards.
2. Shuffle the cards and deal them, face down, in piles in front of your players.
3. **With two players** - both players count down "3, 2, 1, turn!" and turn over their two top cards into the middle. **With 4 players** - everyone counts down "3, 2, 1, turn!" and turn over their top card into the middle.
4. Each player silently attempts to use the *all* of the numbers (Aces count as 1), and as many operations $+$, $-$, $\times$, $\div$ and brackets as necessary to try to make 24. (Only the numbers as they're presented are allowed - you're not allowed to take 2 and 4 and claim it's "24"!)
5. The first player to make 24 puts their hand down on the cards (like in "Snap!"), and tells the other(s) how they did it. If the method was valid, they take all the cards and put them, face down, in the bottom of their pile.
6. If their method was wrong, the round carries on until either someone else successfully snaps the cards, or everyone agrees they can't do it. In the second case, everyone takes back the number of cards they put in and places them in the bottom of their piles.

The game ends when one player runs out of cards - then the player with the most cards wins!

Numberline Difference

Start by drawing a number line from 0 to 20 like this:

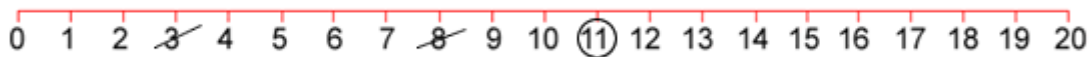0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

The first player chooses a number on the line and crosses it out.
The same player then chooses a second number and crosses that out too.
Finally, he or she circles the sum or difference of the two numbers and writes down the calculation.

For example, the first player's go could look like this:

0 1 2 3̶ 4 5 6 7 8̶ 9 10 (11) 12 13 14 15 16 17 18 19 20

3 + 8 = 11

The second player must start by crossing off the number that player 1 has just circled.
He or she then chooses another number to cross out and then circles a third number which is the sum or difference of the two crossed-off numbers.
Player 2 also writes down their calculation.

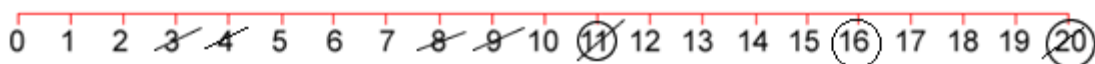For example, once the second player has had a turn, the game could look like this:

0 1 2 3̶ 4 5 6 7 8̶ 9̶ 10 (11̶) 12 13 14 15 16 17 18 19 (20)
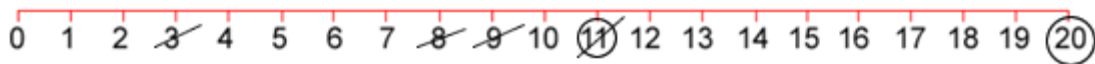
3 + 8 = 11
11 + 9 = 20

Play continues in this way with each player starting with the number that has just been circled.

For example, player one could then have a turn which left the game looking like this:

0 1 2 3̶ 4̶ 5 6 7 8̶ 9̶ 10 (11̶) 12 13 14 15 (16) 17 18 19 (20̶)
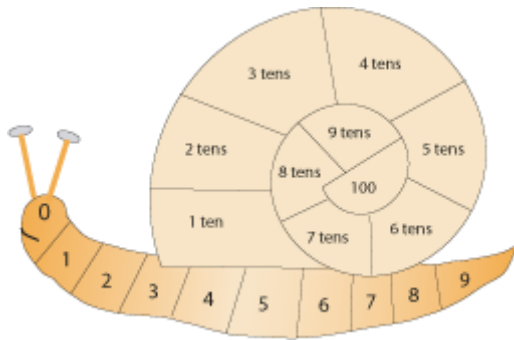
3 + 8 = 11
11 + 9 = 20
20 - 4 = 16

The winner of the game is the player who stops their opponent from being able to go.

Snail One Hundred

Stage: 1 and 2 ⭐

This game is about counting up to 100.

How to play the game:
To start put both your counters on "0" - which is the snail's eye!

The first player throws the dice and moves one of their counters that number along the snail's body. Take turns at throwing the dice.
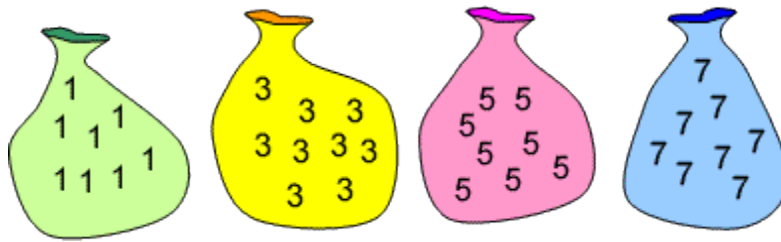
After you get to "9" the first counter goes back to "0" and the second counter goes onto "1 ten".

Go on moving the first counter along the snail's body and moving the second counter to the next "ten" every time you get to the end and go from 9 to 0.

The winner is the first to reach "100".

Play to 37

Stage: 2 ⭐

This is a game for two players.

Each bag above has unlimited 1s, 3s, 5s or 7s in it.

Aim of the game:

To be the player to add the final number to the 'running' total to make 37.

How to play:

1. Decide who is going first.
2, Player 1 chooses one of the numbers from the bags above (1, 3, 5 or 7).
3. Player 2 then chooses a number from one of the bags and adds this onto player 1's number to make a 'running' total.
4. Player 1 then has another turn and adds that number onto the 'running' total.
5. Play continues like this with each player choosing a number and adding it onto the 'running' total.

Things to think about:

How many numbers did you use altogether in the game?

Have another go. How many numbers did you use this time?

What is the largest amount of numbers you could use to reach 37?

What is the smallest amount of numbers you could use to reach 37?

Can you use all the different amounts of numbers in between the largest and the smallest to reach 37?
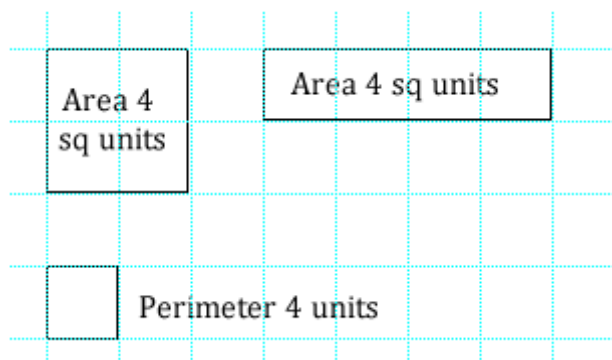
What do you notice? Can you explain this?

Dicey Perimeter, Dicey Area

Stage: 2 ⭐

This is a game for two players.

You will need two dice, some sheets of centimetre squared paper and two pencils or pens.

The aim of the game is to be the first to reach the agreed score.

How to play:

1. Decide on your target score. 10 might be a good number.
2. Decide who will go first.
3. Player 1 throws the two dice and finds their product.
4. Player 1 must then draw as many rectilinear* shapes as possible which have either an area or a perimeter equal to the product of the dice. Player 1 scores 1 point for each correct shape.
5. Player 2 throws the dice, finds their product and draws as many shapes as possible in the same way.
6. The winner of the game is the first to reach the agreed target score.

What are good numbers to throw? Why?
What are not very good numbers to throw? Why?
Is it better to go first or second or doesn't it matter?

A rectilinear shape is one whose edges meet at right angles. In other words, if you are drawing your shapes on centimetre squared paper, the sides of the shape will always be on the grid lines, not drawn diagonally.

Number cards, pencil, and paper

What to do

1. **How many numbers can we make?** Give each player a piece of paper and a pencil. Using the cards from 1 to 9, deal four cards out with the numbers showing. Using all four cards and a choice of any combination of addition, subtraction, multiplication, and division, have each player see how many different numbers a person can get in 5 minutes. Players get one point for each answer. For example, suppose the cards drawn are 4, 8, 9, and 2. What numbers can be made?
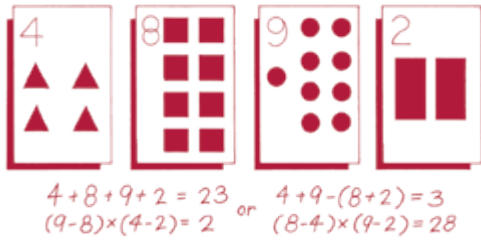
2. **Make the most of it.** This game is played with cards from 1 to 9. Each player alternates drawing one card at a time, trying to create the largest 5-digit number possible. As the cards are drawn, each player puts the cards down in their "place" (ten thousands, thousands, hundreds, tens, ones) with the numbers showing. Once placed, a card cannot be moved. The first player with the largest 5-digit number wins. For example, if a 2 was drawn first, the player might place it in the ones' place, but if the number had been an 8, it might have been put in the ten thousands' place.

$$4 + 8 + 9 + 2 = 23$$
$$(9-8) \times (4-2) = 2$$
or
$$4 + 9 - (8 + 2) = 3$$
$$(8-4) \times (9-2) = 28$$

Anyone for tennis?
A game for 2 players

Take turns to:
- choose a number from the tennis rackets and put the button on the racket
- spin the spinner
- perform the calculation, saying the number sentence
- cover the answer on the tennis balls.

Golden rule
- If the answer is not on a tennis ball or is already covered, miss that turn.

The winner is:
- the first player to complete a line of 4 counters. A line can go across ↔, up and down ↕, or diagonally ↘.

$\div 1000$ $\times 100$

$\times 10$ $\div 10$

$\div 100$ $\times 1000$

Rackets: 245, 645, 4, 45, 200, 6, 16, 400, 20, 60

Tennis balls:

0·645, 0·6, 4500, 4, 20 000, 2·45, 0·04

1600, 40 000, 6000, 0·02, 0·004, 6, 20

24·5, 600, 2, 0·45, 4000, 645 000, 1·6

6450, 0·4, 2450, 0·06, 200, 4·5, 160

450, 245 000, 0·2, 64·5, 0·16, 64 500, 0·245

0·006, 24 500, 6·45, 2000, 0·045, 400 000, 60 000

60, 45 000, 400, 16 000, 200 000, 0·016, 40

Roman additions
A game for 2 players

Take turns to:
- roll both dice
- cover the matching dice numbers (one above the Roman head and one above the column) with buttons
- add the two numbers (one on the Roman head and one on the column) together and say the answer.

When both players have had a turn, one player tosses the coin.

Golden rule

heads   tails

larger answer wins   smaller answer wins

The winner of that round takes a counter.

The winner is:
- the player with more counters after 12 rounds.

A night at the opera
A game for 2 players

Take turns to:
- choose a number from one of the singers and put the button on the singer
- spin the spinner
- perform the calculation, saying the number sentence
- look for the answer on the chairs.

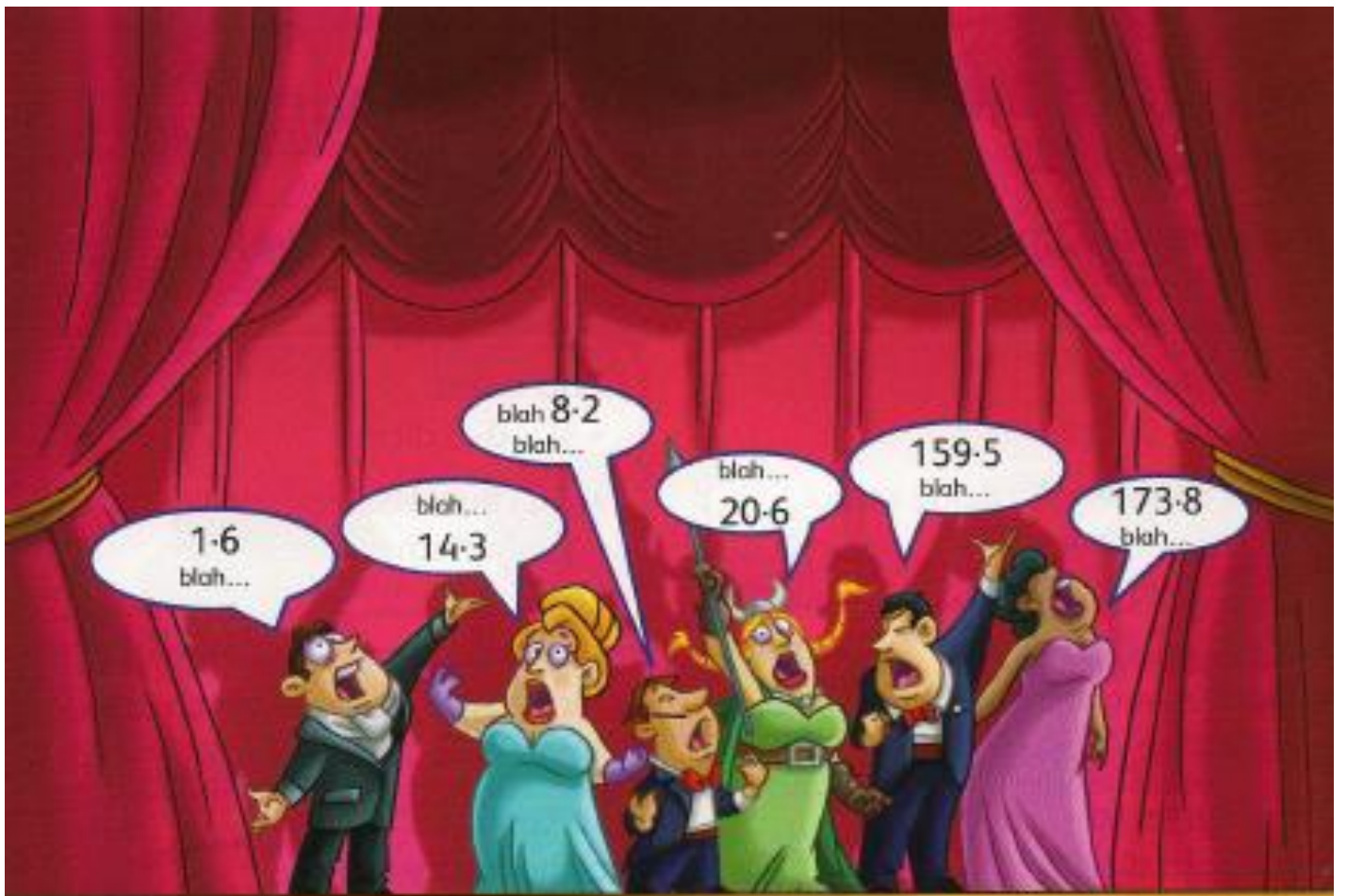- If the answer is on a chair with a star on it, take a counter.

The winner is:
- the first player to collect 5 counters.
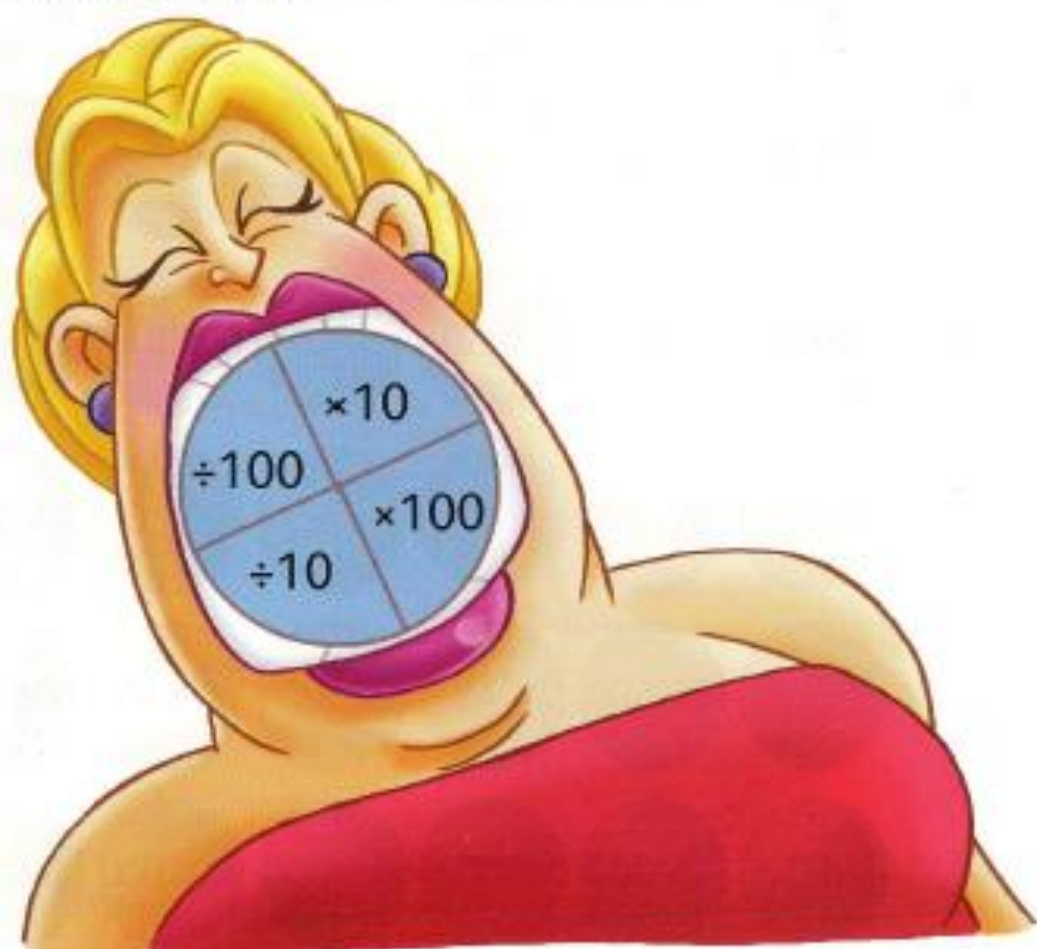
Scientific comparisons
A game for 2 players

Before you start:
- Decide who will have which colour counters.
- Decide who is Player 1 and who is Player 2.
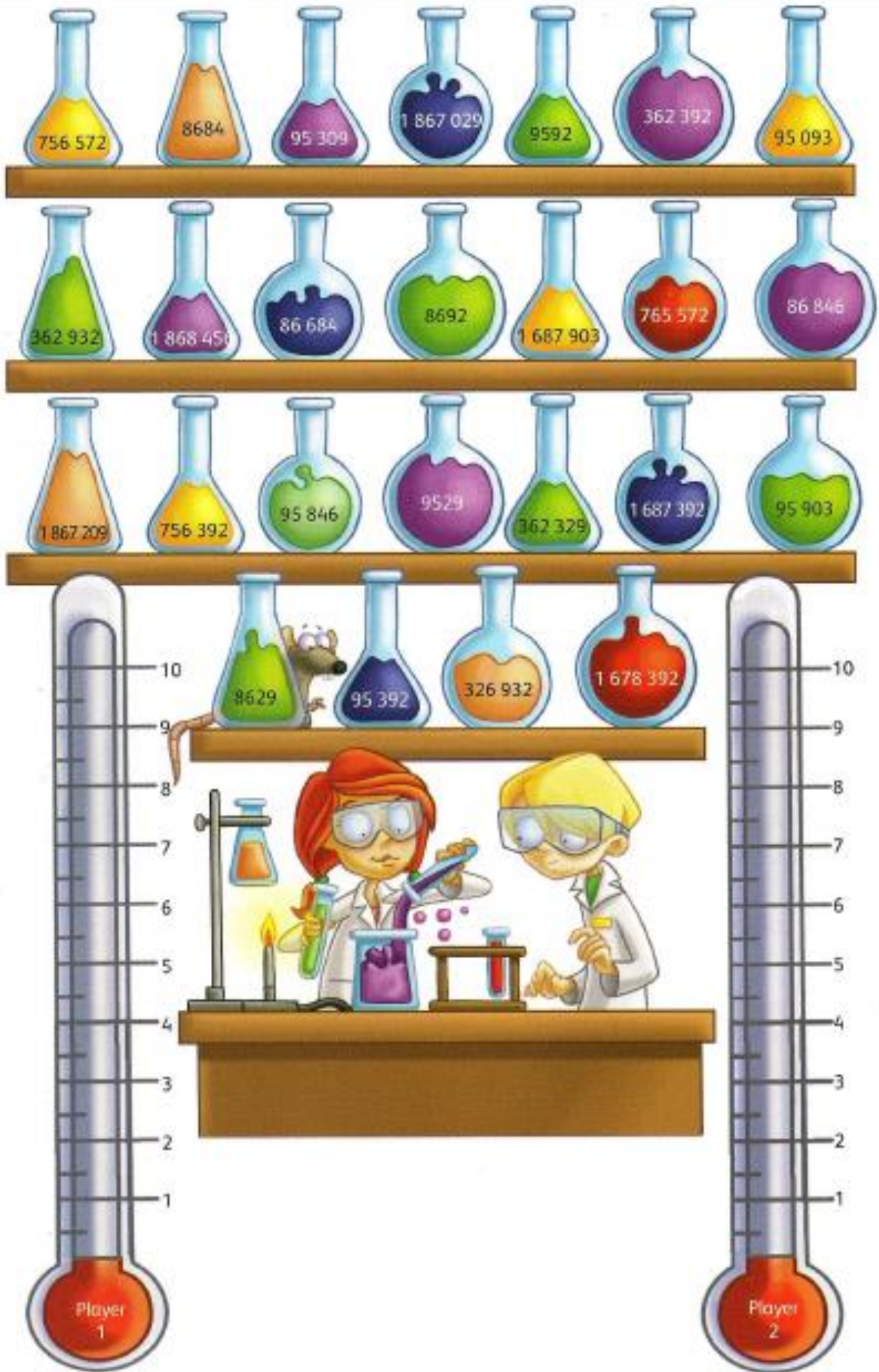- Put the buttons at the bottom of each thermometer.

What to do :
- Each player puts one of their counters on any bottle.
- Each player then puts their other counter on another bottle.
- One player spins the spinner.
- Follow the spinner's instructions.
- The winner (or winners) move their button up the thermometer.
- Remove the counters from the bottles.
- Repeat the above.

The winner is:
- the first player to score 10 points on their thermometer.

You need:
- 4 counters: 2 of one colour, 2 of another colour
- 2 buttons: 1 for each player
- pencil and paperclip (for the spinner)

Be sure not to cover the numbers.

largest number wins 1 point

smallest number wins 1 point

two numbers in between win 1 point each

Stone age value
A game for 2 players

Before you start:
- Decide who will have which colour counters.
- Take turns to put one of your counters on a stone tablet until all 24 tablets have a counter on them.

> Be sure not to cover the numbers.

Take turns to:
- spin the spinner
- look at all the tablets with one of your counters on them, and if one of these numbers has a digit with the same place value as the number spun, remove your counter from the tablet.

Golden rule
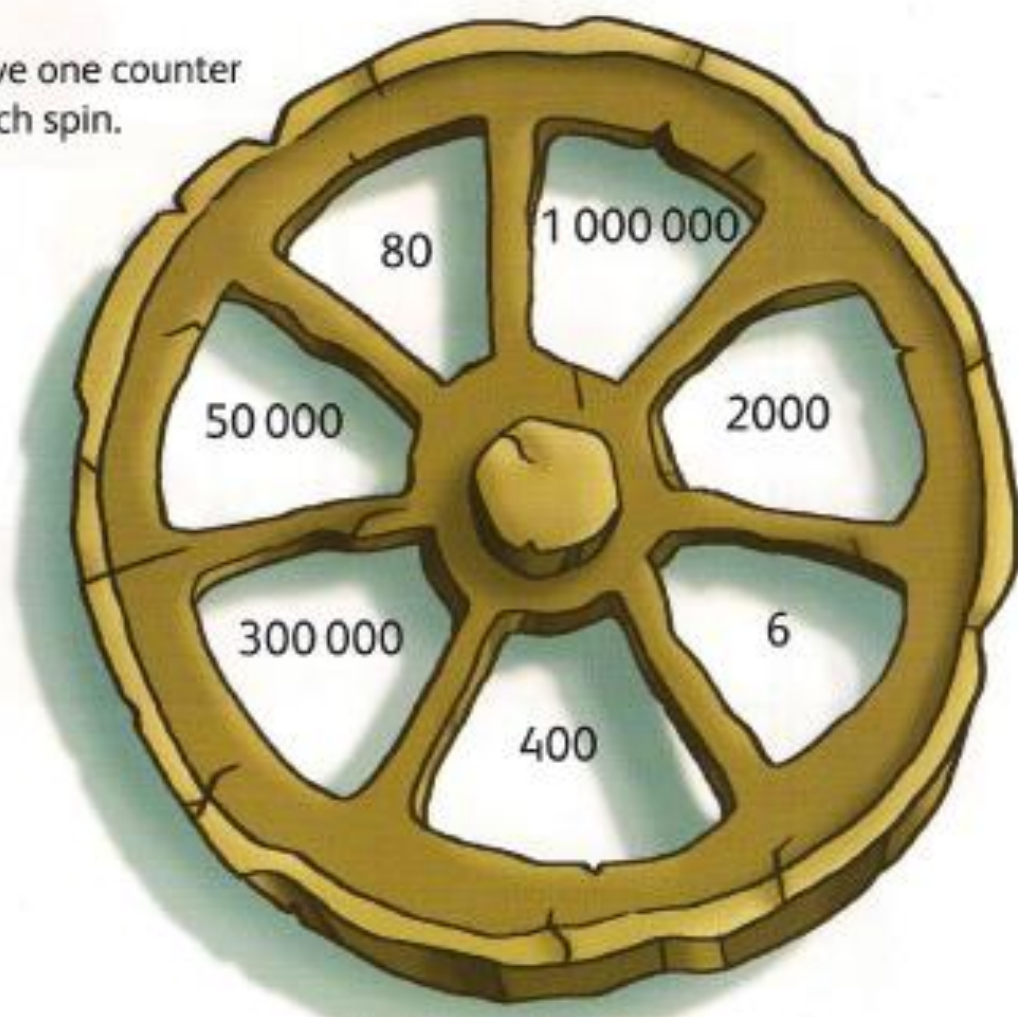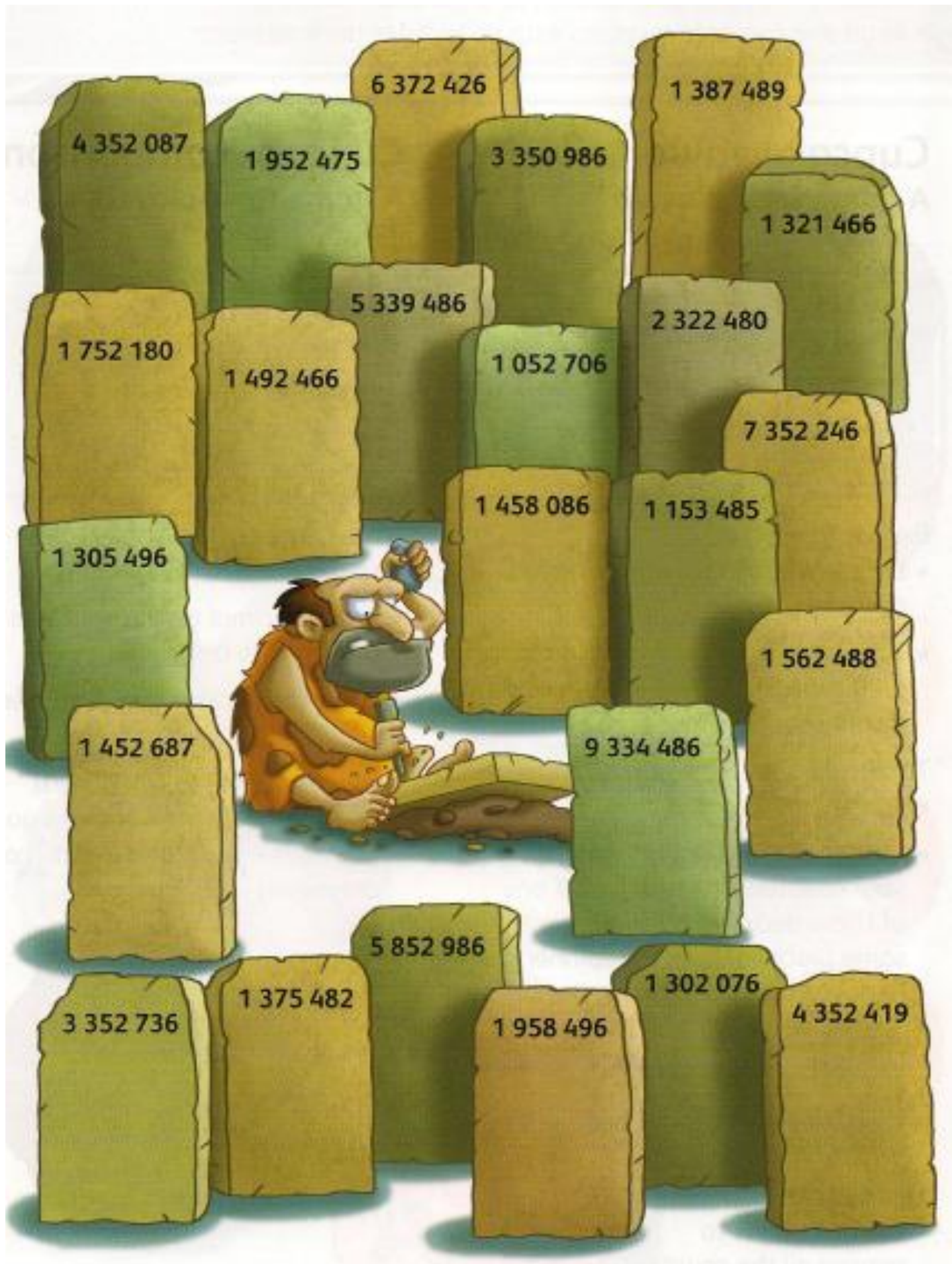- You can only remove one counter from one tablet each spin.

The winner is:
- the first player to remove all the counters from their 12 tablets.

More or less bubbles
A game for 2 players

Before you start:
- Decide whether you are going to use the purple bubbles (for 3-digit numbers) or the green bubbles (for 4-digit numbers).
- Cover each of the 12 bubble numbers with a counter.

What to do:
- One player removes a counter from one of the bubbles.
- Each player takes a turn to spin the spinner and add the spinner number to, or subtract the spinner number from, the bubble number.
- Each player says their answer.
- The player with the larger answer keeps the counter.
- Repeat the above with the other player removing a counter from one of the bubbles.
- Continue until all 12 counters have been removed from the bubbles.

The winner is:
- the player with more counters.

+10 −10

−100 +100

879 494
582
153
625 307 452
314 648
261 736
560

2397
7416
1183
5809 6238 1942
8175
1646
7053
4276
8640 3025

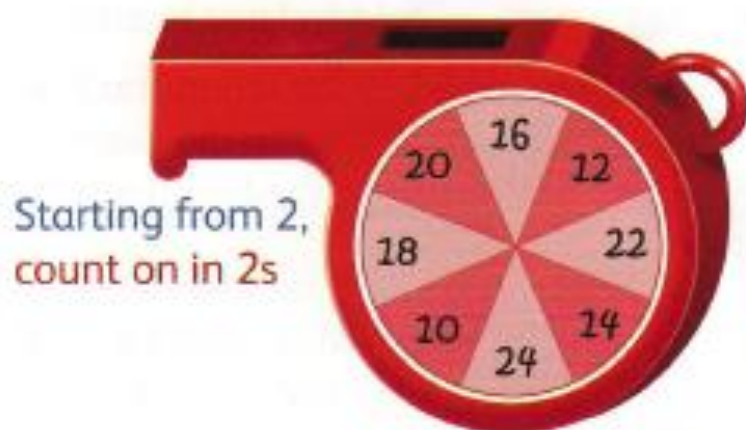# And the winner is...
A game for 2 players

You need:
- pencil and paperclip (for the spinners)
- 10 counters

What to do:
- Take turns to choose a spinner. Spin the spinner. The number you spin is the winning number. Put a counter on this number to remind you.

- The player who chose and spun the spinner starts the count from the 'Starting from...' number.

- Take turns to 'count on in...' or 'count back in...' the steps shown. (For example, Player A says: '2', Player B says '4', Player A says '6' etc. until the winning number is reached.)

- The winner is the player who says the number with the counter on it. They take the counter.

- Play 10 rounds.

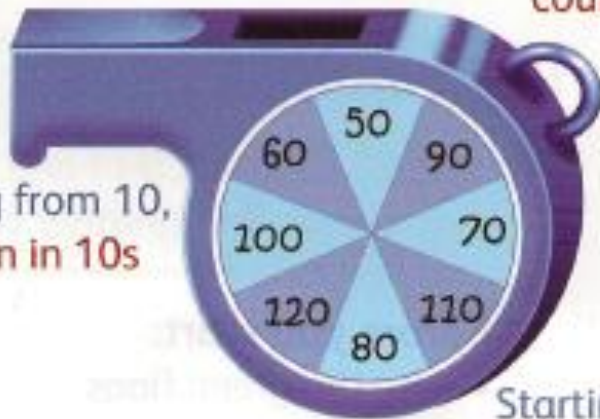### The winner is:
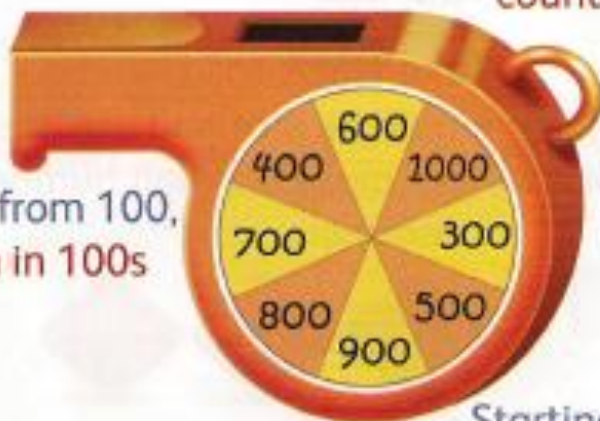- the player with more counters.

Starting from 2, count on in 2s

16
20   12
18   22
10   14
24

Starting from 3, count on in 3s

21
30   27
15   36
33   24
18

Starting from 4, count on in 4s

40
24 44
32 36
48 20
28

Starting from 5, count on in 5s

60
35 85
80 100
75 55
90

Starting from 10, count on in 10s

50
60 90
100 70
120 110
80

Starting from 50, count on in 50s

450
600 700
500 350
400 550
650

Starting from 100, count on in 100s

600
400 1000
700 300
800 500
900

Starting from 100, count back in 10s

60
10 30
70 0
40 50
20

Starting from 500, count back in 50s

250
350 0
50 150
200 300
100
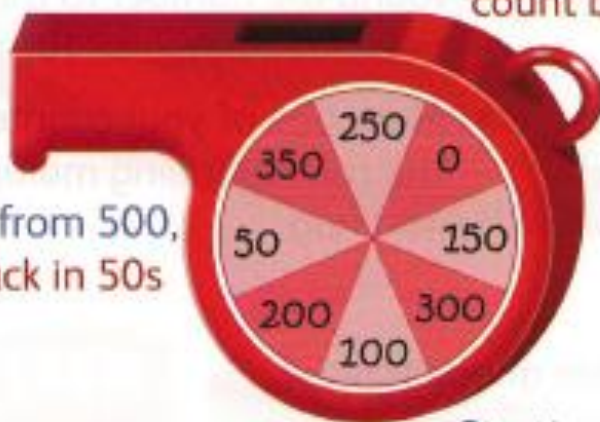
Starting from 1000, count back in 100s

500
600 0
100 700
200 300
400
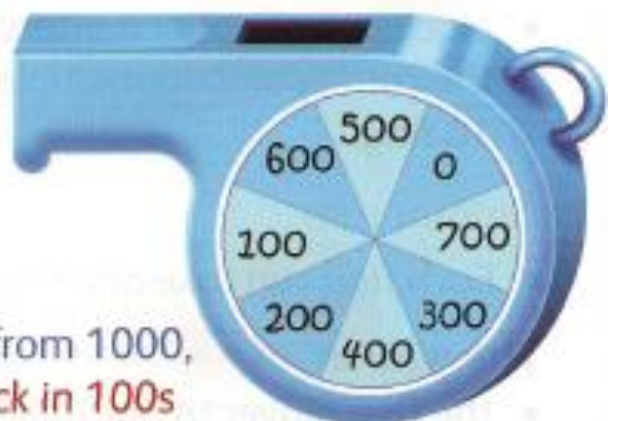
The coin decides: addition
A game for 2 players

The coin decides: subtraction
A game for 2 players

You need:
- 24 counters
- coin

Before you start:
- Cover each of the numbers on the notice board with a counter.

What to do:
- Each player removes two counters from the notice board and adds their two numbers together.

What to do:
- Each player removes two counters from the notice board and works out the difference between their two numbers.

- When players have shared their answers, one player tosses the coin.

Golden rules

Heads

Tails

Larger answer wins

Smaller answer wins

- The winner keeps all 4 counters removed from the notice board.
- Keep going until all 24 counters have been removed from the notice board.

The winner is:
- the player with more counters.

River times
A game for 2 players

Before you start:
- Place a counter on each child.

Take turns to:
- roll the dice

- move **1** of the 9 counters forward
  1 step if the next number on the stepping
  stone is a multiple of the number rolled,
  for example:

60 is a multiple of 12
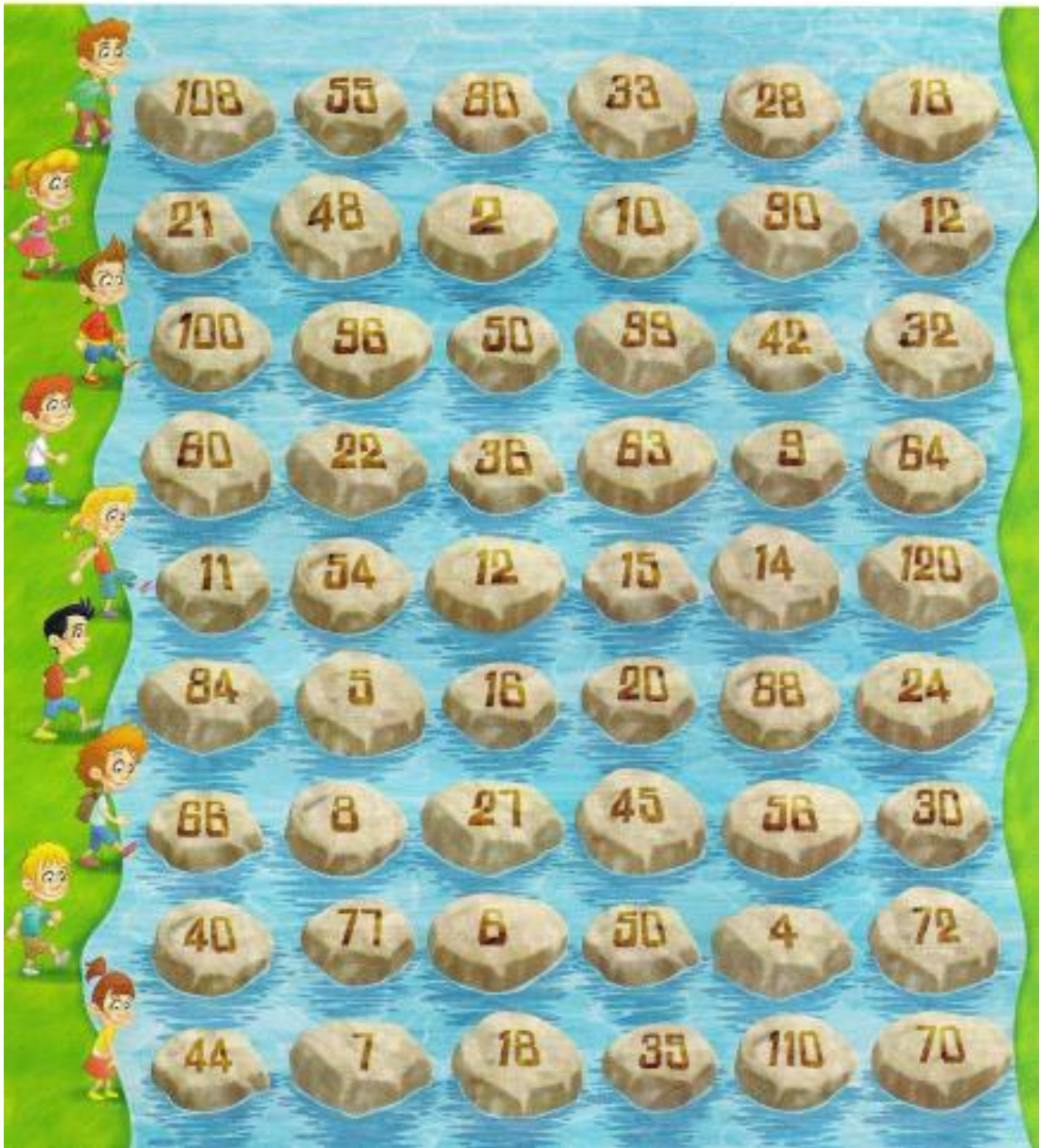
60   22   36   63   9   64

Golden rules
- You can only move 1 counter each turn.
- If you can't move a counter, miss that turn.

How to win:
- When a counter reaches the stone on the other side of the river, the player who moved the counter takes the counter.
- The first player to collect 3 counters is the overall winner.

Honeycomb: multiplication

A game for 2 players

You need:
- two 1–12 dice
- about 30 counters

Take turns to:
- roll both dice
- multiply the two numbers together and say the multiplication fact
- cover the answer on the honeycomb.

Golden rule
- If the answer has already been covered, miss that turn.

The winner is:
- the first player complete a line of 4 numbers up and down ↕, diagonally ↘ or in a block:

Honeycomb: division

A game for 2 players

You need:
- 1–12 dice
- about 30 counters

Take turns to:
- roll the dice
- find a multiple of the number rolled on the honeycomb and say the division fact
- cover the number.

Golden rule
- If you can't find a multiple of the number spun, miss that turn.

The winner is:
- the first player complete a line of 7 numbers up and down ↕, diagonally ↘ or in a block: