

Name

at

Bristol

Brain benders

Go through the brain benders, follow the instructions and solve the puzzles.
For some of the puzzles, you will need to work in pairs.

What you see is what you get?

Have a look at the following pictures.

What do you see?

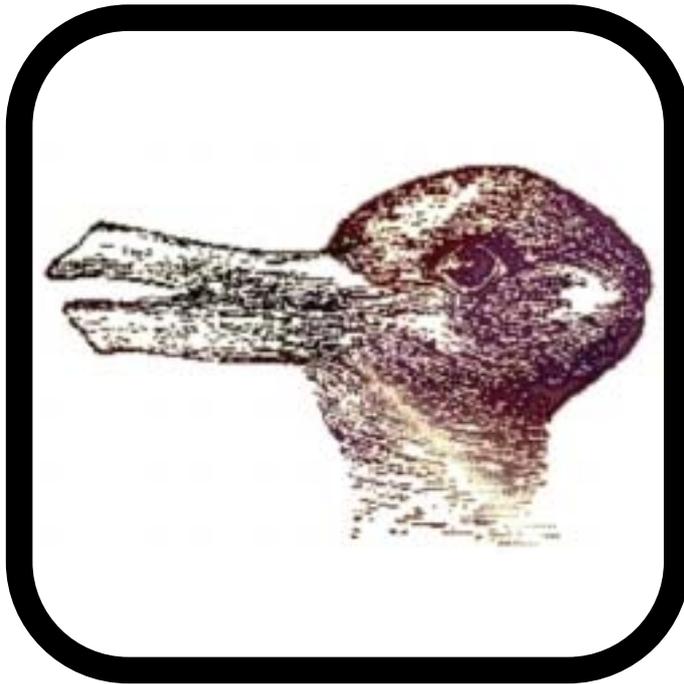
Does what you see change the longer you look at the picture?



Old woman, or young girl?

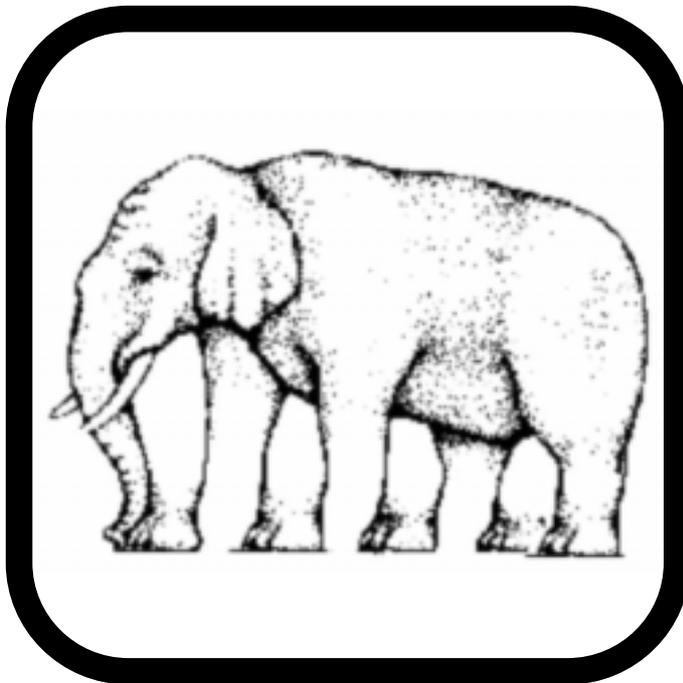
Hint: the old woman's nose is the young girl's chin.

What you see is what you get?



A rabbit or a duck?

Hint: the duck is looking left, the rabbit looking right.



How many legs does this elephant have?

What you see is what you get?

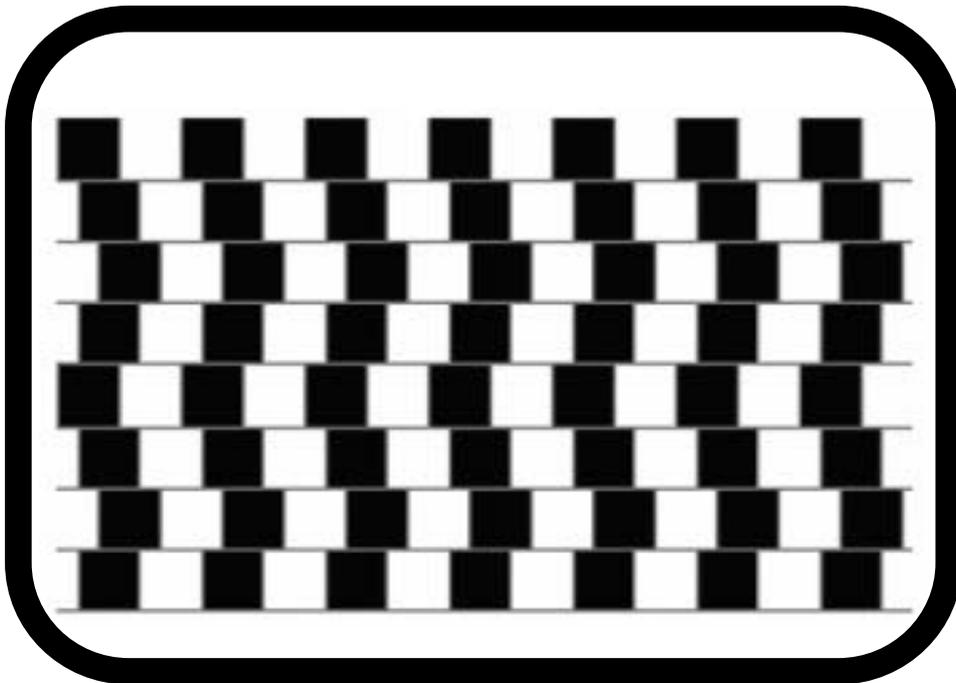


A face of a Native American, or an Eskimo?



I can't believe my eyes?

Have a look at this picture and think about whether you can always believe your eyes.



Are the horizontal lines parallel or do they slope?

Impossible stories

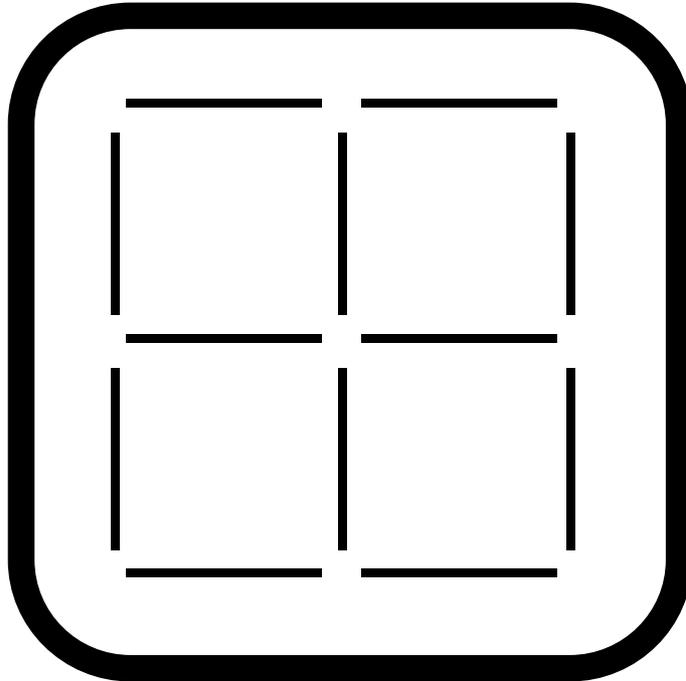
Each of these stories may seem impossible at first. Can you figure out the solution?

1. A man and his son were on a tour of an atomic power plant. In the control room, the boy asked if he could see the controls for the reactor core. The head physicist said yes, and explained how the controls worked. After the boy left, the head physicist turned to an assistant and said, "That was my son." How could that be?
2. Three kids from Bristol went for a walk. About a mile into the walk, they came to a deep, wide river. There was no bridge. They didn't have a boat or raft, or any materials to make one. None of them could swim. How did they get across?
3. Lisa walked out the back door of the farmhouse on a Thursday afternoon and found a man's pipe, a scarf and three lumps of coal lying on the wet grass near the barn. The nearest neighbours lived a mile away, and no-one had visited that day. Where did the objects come from?
4. A true story: a white horse jumped over a castle and landed on a bishop, who immediately disappeared from the landscape. Where did this take place?



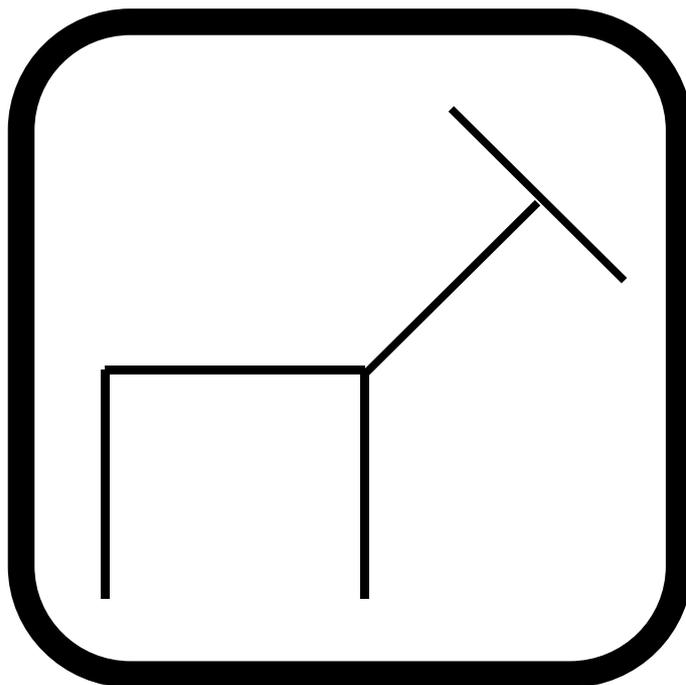
Tricky toothpicks

1. Make the following shape using 12 toothpicks



Now, move only 2 toothpicks, and make a figure with 7 squares.

2: Make this goat out of 5 toothpicks.

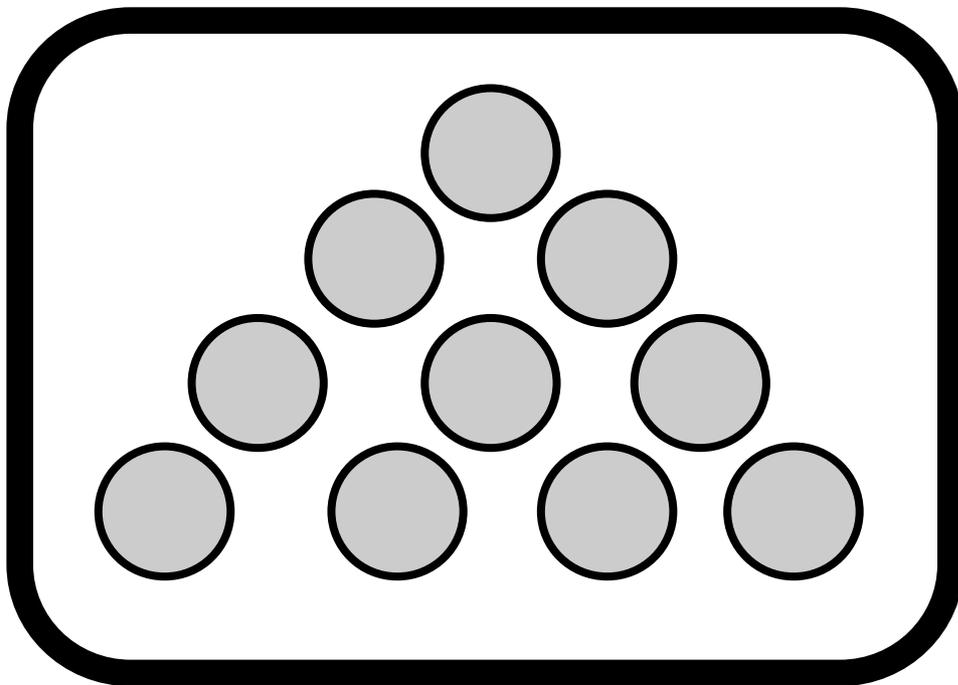


Now move just one toothpick to make a goat that faces in a different direction.



Penny triangle

Make this triangle out of ten pennies.



Now, moving only three pennies, can you make a triangle that points down instead of up?

The new triangle should look just like the one above only flipped upside down.

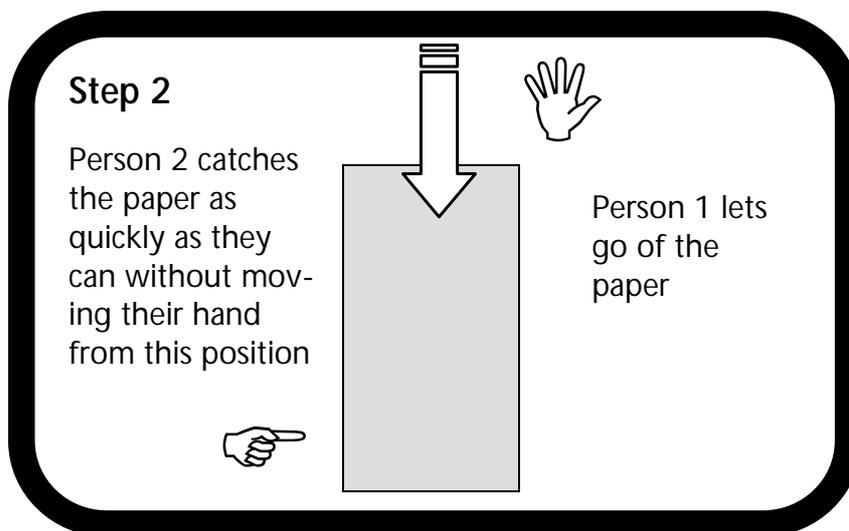
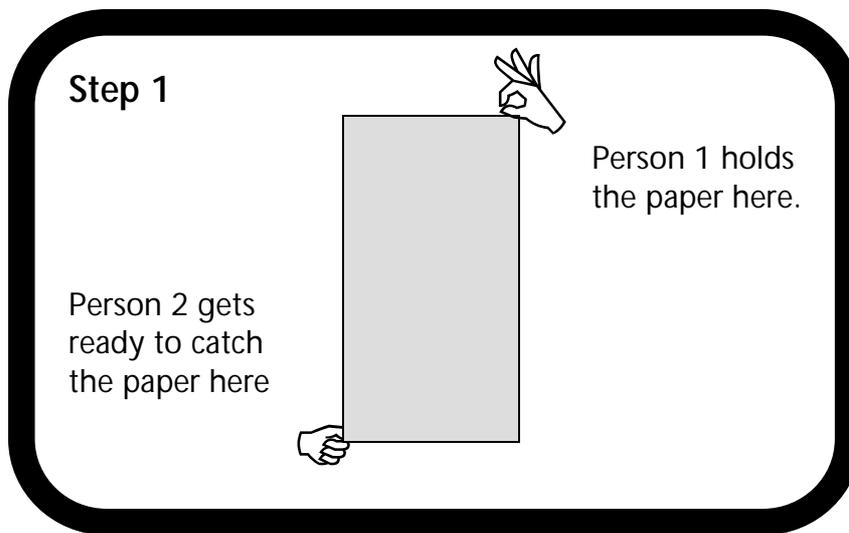


Test your reaction time

Work with a partner.

One of you holds the piece of paper at the top. The other gets ready to catch the paper by holding their hand at the level of the bottom of the paper.

The person holding the paper lets go and the catcher has to catch the paper.



Can you catch the paper before it falls through your fingers?

Make a mark on the paper where you catch it. The quicker your reaction time, the closer to the bottom of the paper the mark will be. Compare it with your partner's reaction time.

Is there anything you can do to increase your reaction time?

If you can't catch the paper, why do you think this is?



Dingbats

Look at the words below. They describe the way someone might order breakfast in a restaurant.

EGGS
EASY

The trick to solving the puzzle isn't just reading the words, it's noticing how they're arranged.

1: ARREST
YOU'RE

2: SOMEWHERE
RAINBOW

3: ONCE
TIME

4: R
K CLOCK O
C

5: T
I
P
TULIPS
T
O
E

6: GNIKOOL

7: SOME **I'M** THING

8: R D
A
O I
R L

9: ME ME ME
AL AL AL



Dingbats

Can you create your own dingbats?

How do you start?

You need a common phrase that most people will know or recognise. If you use a phrase that only you know, no one else will be able to solve the dingbat.

Where do you get a phrase from? It might from TV, an old saying or the title of a popular book.

Here are some phrases to start with; can you make these into dingbats?

The cat in the hat

Reading between the lines

Beating around the bush

The inside story

A hole in one

Alice in wonderland

Once in a blue moon

Now what?

Look at the words and see if you find shapes in the words, are there any prepositions (words such as "in," "between," "under."), could you use colour?

Can you come up with different dingbats for the same phrase?



Mirror writing

Write your name on a piece of paper.

Hold it up to the mirror. What does it look like?

What part of the brain are you using when you write your name normally?

Can you write your name so that when you hold it up to the mirror it reads correctly?

Is it easy, or do you have to think about what you are doing?

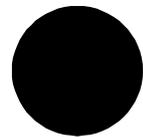
What part of the brain are you using now?

Try writing your name while you are looking in the mirror, so that it still reads correctly in the mirror.

Is it easier to write your name like this than without the mirror for help?



Find your blind spot!



Print this page out and cut along the dotted lines. Hold the page in front of your face with the circle on the right hand side. Close your right eye and stare at the circle. Slowly move the card from left to right and the cross should disappear! You have found your blind spot.



Answers



Bristol

Brain benders

What you see is what you get?

All these picture don't change, but your brain interprets them in two different ways.

When you look at something, your eye and brain must decide what it is in a split second. Your brain makes a 'best guess' and usually gets it right.

But this picture is ambiguous. Your brain can't decide which is the best 'best guess', so the picture appears to flip between the two options.

For example, whether you see the old or young woman partly depends on where you look. Looking at the eye / ear provides strong evidence for the old woman, whereas looking more to the left of the picture provides strong evidence for the young woman, so that is who you see.



Impossible stories

Hints on how to solve the stories:

Why does it seem impossible?

What are you assuming?

What else could be going on?

The more you can avoid making assumptions about what is going on, the easier it will be to avoid traps.

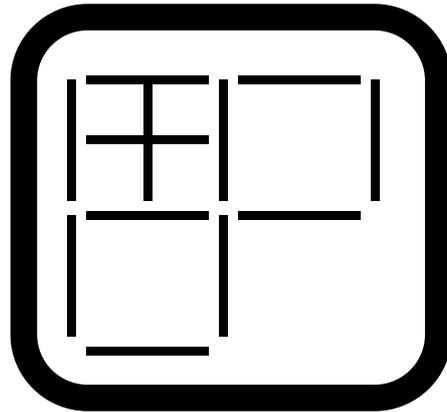
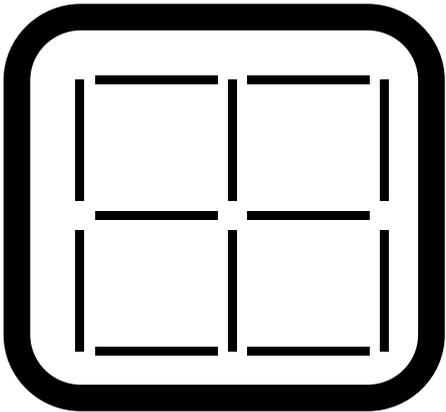
1. A man and his son were on a tour of an atomic power plant. In the control room, the boy asked if he could see the controls for the reactor core. The head physicist said yes, and explained how the controls worked. After the boy left, the head physicist turned to an assistant and said, "That was my son." How could that be?
The head physicist was the boy's mother.
2. Three kids from Bristol went for a walk. About a mile into the walk, they came to a deep, wide river. There was no bridge. They didn't have a boat or raft, or any materials to make one. None of them could swim. How did they get across?
It was winter. The river was frozen and they walked across.
3. Lisa walked out the back door of the farmhouse on a Thursday afternoon and found a man's pipe, a scarf and three lumps of coal lying on the wet grass near the barn. The nearest neighbours lived a mile away, and no-one had visited that day. Where did the objects come from?
The weather had got a lot warmer and Lisa's snowman had melted.
4. A true story: a white horse jumped over a castle and landed on a bishop, who immediately disappeared from the landscape. Where did this take place?
On a chessboard. The white knight (horse) was moved over the rock (tower) and landed on the square occupied by the black bishop, which was immediately removed from the board.



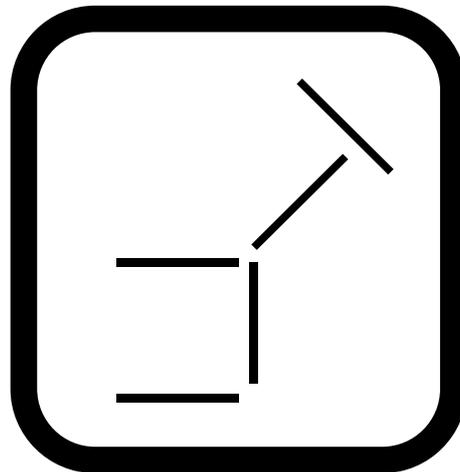
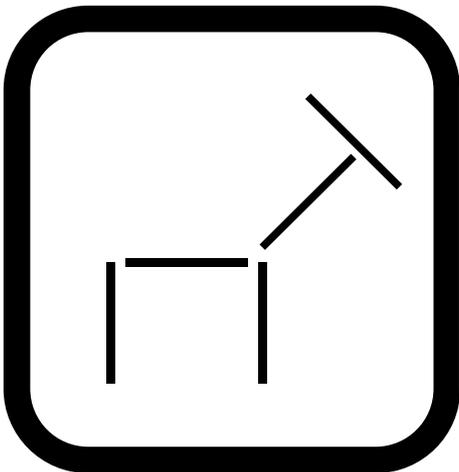
Tricky toothpicks

1. Now, move only 2 toothpicks, and make a figure with 7 squares.

In this puzzle the assumption is that all the squares have to be the same size, but it doesn't say that anywhere in the instructions. Don't jump to conclusions!



- 2: Make this goat out of 5 toothpicks. Now move just one toothpick to make a goat that faces in a different direction.



Hints: Try walking around the table and look at the puzzle from different angles. Which are the most complicated parts of the shape, can they be moved?

Assumptions: You might think that each toothpick could only be the same body part as it started out being. This may be the true with real goats, but there is no such rule here. A toothpick is a toothpick

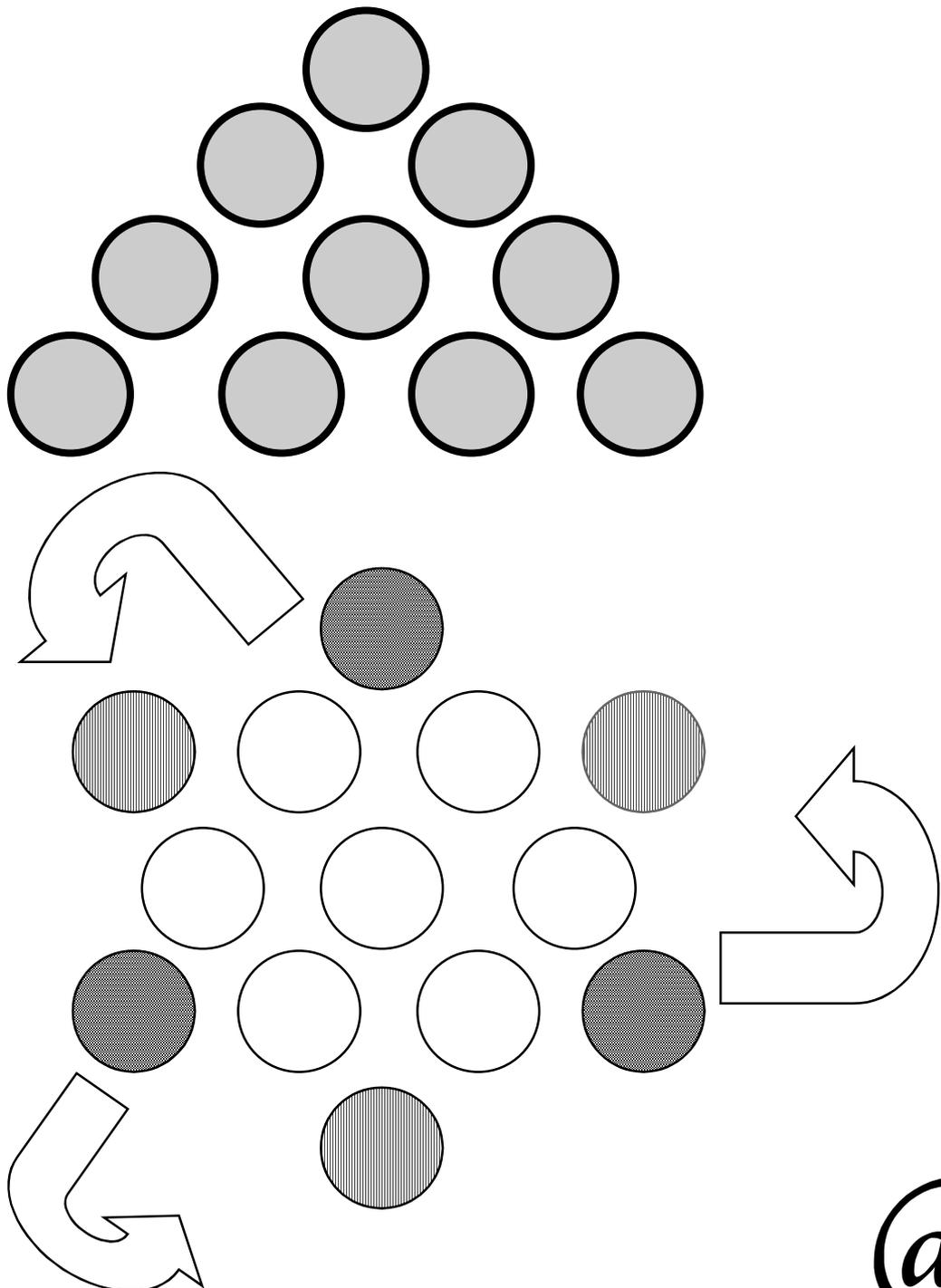
You may also have assumed the new goat would be standing "on the ground" - that is both legs pointing down. There is no "ground" in the picture, but you may have created an imaginary ground in your head.

Penny triangle

Make this triangle out of ten pennies.

Now, moving only three pennies, can you make a triangle that points down instead of up?

The new triangle should look just like the one below only flipped upside down.

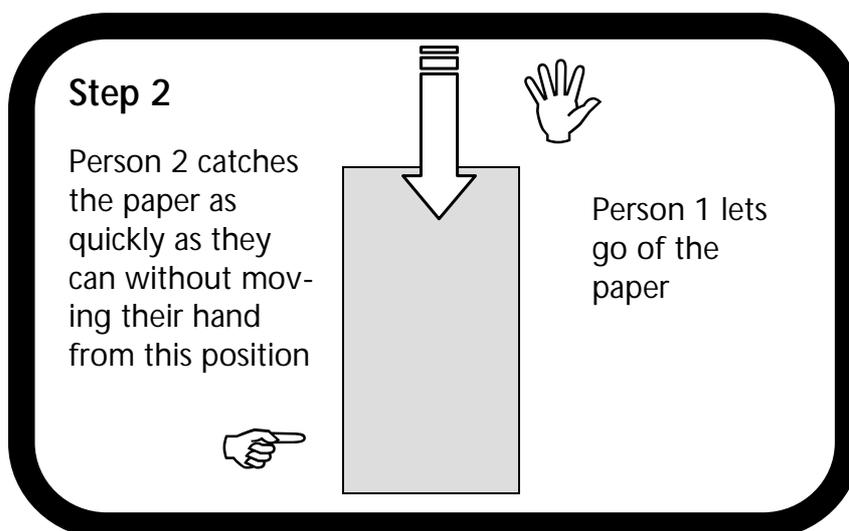
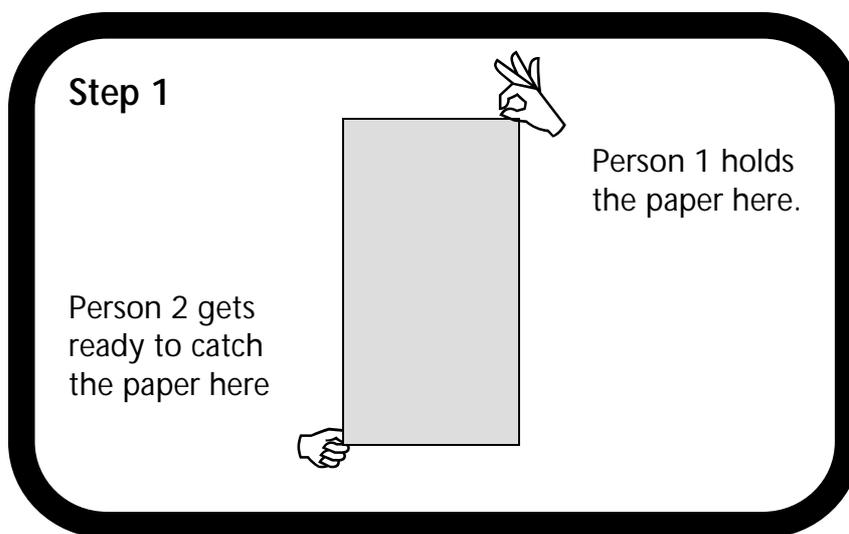


Test your reaction time

Work with a partner.

One of you holds the piece of paper at the top. The other gets ready to catch the paper by holding their hand at the level of the bottom of the paper.

The person holding the paper lets go and the catcher has to catch the paper.



It is unlikely that you will be able to catch the paper. This is because it takes time for the messages from your eyes (that the paper has started to fall) to reach your brain. It then takes time for your brain to tell your hand to move. This is your reaction time. The quicker your reaction time, the sooner you will catch the paper. Measure this by marking the paper where you caught it, the closer to the bottom of the paper, the quicker your reaction time.



Dingbats

Look at the words below. They describe the way someone might order breakfast in a restaurant.

EGGS

EASY

The trick to solving the puzzle isn't just reading the words, it's noticing how they're arranged.

Try out some more dingbats, don't forget to ask your mentor for clues:

1. You're under arrest
2. Somewhere over the rainbow
3. Once upon a time
4. Rock around the clock
5. Tiptoe through the tulips
6. Looking backward
7. I'm in the middle of something
8. Railroad crossing
9. Three square meals

Tips for solving dingbats:

Check your prepositions. A preposition is a word that tells you where something is done. A lot of dingbats depend on prepositions like "above," "below," "on," "under," "after," and so on. The first thing you should do when you see a dingbat is to look carefully at the positions of the words. If they're stacked on top of each other, the solution may have something to do with "over," or "under." But don't jump to conclusions.

Pull the dingbat apart. What if you have a dingbat that looks like it's all one word—but it's a word that makes no sense? Try looking for little words inside the big one—then notice the position of the words. For example: JOANB
It looks like a girl's name and the letter B. "An" is a word, and the remaining letters spell "job," so the answer is "an inside job."

What do you see? When you're trying to figure out a dingbat, it sometimes helps to talk out loud about what you're seeing. In a lot of dingbats, the word on the page is part of the solution, so hearing it out loud may give your brain a clue or a connection. In other dingbats, the shape of the word is important. What does it look like? Is it bent? Turned over? Backward? Really big? Describing exactly what you're seeing may give you the clue that will lead



Mirror writing

Write your name on a piece of paper.

Hold it up to the mirror. What does it look like?

What part of the brain are you using when you write your name normally?

Can you write your name so that when you hold it up to the mirror it reads correctly?

Is it easy, do you have to think about what you are doing?

What part of the brain are you using now?

Try writing your name while you are looking in the mirror, so that it still reads correctly in the mirror.

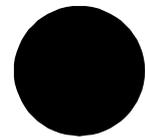
Is it easier to write your name like this than without the mirror for help?

In the first case the part of the brain that you are using is the cerebellum. This is the part of the brain used for actions that are automatic, like writing your name or riding a bike. It by-passes the area of your brain called your cortex which does your thinking, so you don't seem to be thinking about what you are doing.

When you hold your written name up to the mirror it looks as if it is written backwards. This means that to write it so that it looks normal in the mirror, your name must be written backwards on the paper. To do this you have to think about it and use different motor skills. The part of the brain that you are using this time is the cortex. You are having to think about each letter, then reverse it and then try and write it.



Find your blind spot!



There is an area near the back of your eye called the optic disk. It is here information leaves your eye for the brain along the optic nerve, and blood vessels enter your eye. This area lacks any photoreceptors, the cells needed to detect light. When the cross disappears it is imaged on the optic disk so it seems to disappear. This area is called your blind spot.

