

TOWERS of ILLUSION

HOW TO PLAY AND WHAT YOU SEE

YOUR GAME INCLUDES:

- 3 Towers
- 6 Jester playing pieces with stands
- 1 Die
- 18 Treasure Coins
- 198 Optical Illusion Cards
- 66 Key Cards (to go through doors)
- 132 Path Cards (these lead you along the steps)
- 18 "Lose 1 Turn" Cards
- 18 "Extra Turn" Cards
- 8 Clips to hold towers together (4 long and 4 short)

Game developed for The Museum of Fine Arts, Boston by Marka Levene and Yvonne Oates of MY Design.

Ca 1988

HOW TO SET UP YOUR TOWERS OF ILLUSION GAME



Just fold the jesters in half as shown, and push them into their stands.

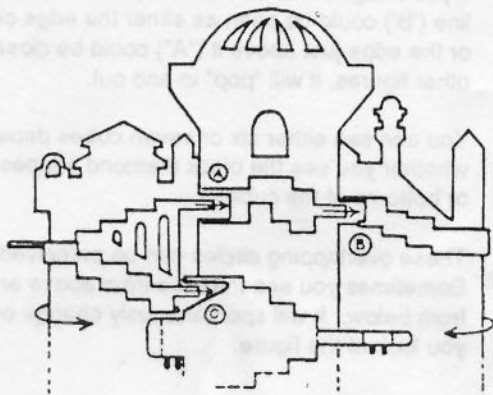


Figure 1: Pop up Tower and slide internal tabs into place.

Figure 2: Insert tabs in numerical order.

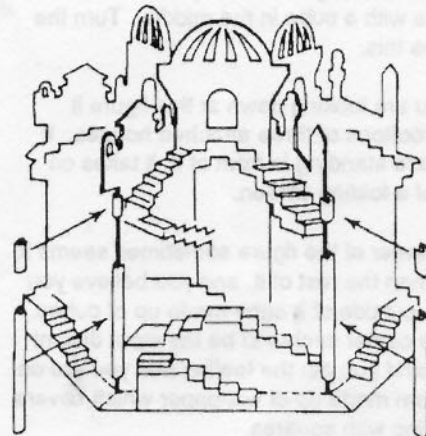
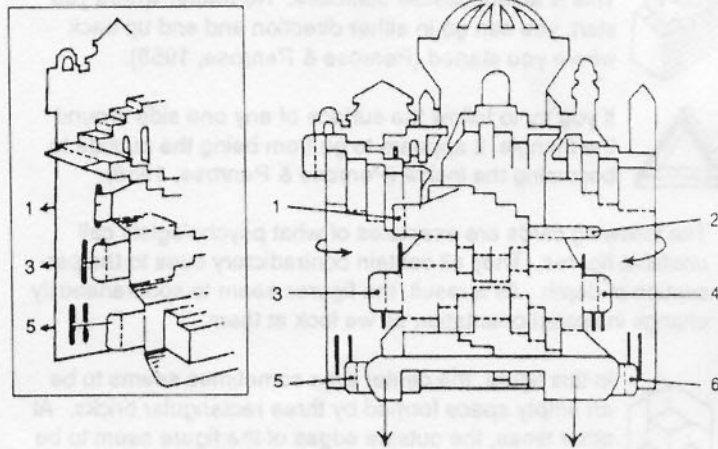


Figure 3: Attach the 3 Towers as shown at left with the yellow plastic clips enclosed. It's easiest if you lay the towers down and slide the long clips up from the bottom.

ABOUT THE ILLUSION CARDS

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In addition to the hours of fun you will have playing *Towers of Illusion*, you can enjoy the cards used in the game by themselves. Altogether, there are 66 different visual illusions or visual oddities on the cards.

Visual illusions involve the eye and brain working together to interpret an image which enters the eye. An illusion involves misinterpreting a real object. Most people enjoy being fooled by illusions. All of the card illustrations in *Towers of Illusion* have one thing in common – each of them can be seen as two different things. But, even though you can see two different images on each card, you cannot see them both at the same time! As you look at the figure, each possibility will pop in and out of your attention without your ability to control which one you see.

Sometimes people wonder if it means anything if you see one of the two figures before the other, or if a person has difficulty seeing both possibilities at first. Generally speaking, there is no significance to either seeing one figure first or having difficulty seeing both until they are explained to you. However, it is possible to make it more likely that a person will see one figure first before the other by developing an expectation in the person or focusing their attention on a specific part of the image. Psychologists call this *perceptual set*. For example, one of the cards can be seen as both a young woman and an old woman. If someone was shown this card after seeing a film about aging, they would

be more likely to see the old woman first. However, if the film was about fashion models they would be more likely to see the young woman first.

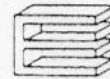
In the next several pages we will describe each of the two figures which can be seen on each card, and will discuss the type of illusions involved.

The Key Cards

The following cards are examples of *impossible figures*. The figures look like real three dimensional objects, but cannot be manufactured. This idea was first presented in 1934 by the Swedish artist Oscar Reutersvard. It was brought to the attention of the scientific community 24 years later by two British psychologists, L.S. Penrose and R. Penrose. The Dutch artist M.C. Escher used many impossible figures in his drawings and paintings.



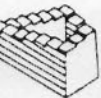
The left side of this figure seems to have a base which can support only two pegs, but there are ends of two pegs on the right (Schuster, 1964).



In this case, the left side seems to support three arms, but four arms can be seen on the right (Huffman, 1971).



The left edge of the window frame appears to be standing upright, but the right edge appears to be flat (Draper, 1978).

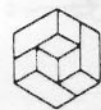


This is an impossible staircase. No matter where you start, you can go in either direction and end up back where you started (Penrose & Penrose, 1958).



If you try to follow the surface of any one side around the triangle, it appears to go from being the outside to becoming the inside (Penrose & Penrose, 1958).

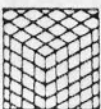
The following cards are examples of what psychologists call *unstable figures*. They all contain contradictory cues to the perception of depth. As a result, the figures seem to spontaneously change in spatial orientation as we look at them.



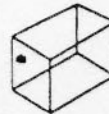
In this figure, the center area sometimes seems to be an empty space formed by three rectangular bricks. At other times, the outside edges of the figure seem to be pairs of flat boards with a cube in the middle. Turn the card around to see this.



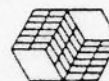
If you imagine you are looking down at this figure it seems to be the rooftops of three attached houses. If you imagine you are standing in front of it, it takes on the appearance of a folding screen.



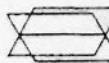
In this card, the center of the figure sometimes seems to be closer to you than the rest of it, and you believe you are looking at the outside of a cube made up of cubes. At other times the center seems to be the most distant part of the figure and you get the feeling that you are on the inside of a room made up of wallpaper which covers the walls and ceiling with squares.



It is not clear which corner of the tank is closest to you. Sometimes it seems to be the lowest part of the figure, but then it reverses itself so that the tank seems to be seen from below. Thus, the insect can be seen as either inside or outside the tank.



As you concentrate on this figure, the "bricks" in the middle spontaneously change from facing right to facing left.



Because of contradictory cues for depth perception, you cannot be sure whether the short fins are closer or further away than the longer ones. If this were the tail of an arrow, it could be flying either left or right.



If you imagine this as a folded piece of paper, the bottom line ('B') could be seen as either the edge close to you or the edge just above it ('A') could be closer. Like the other figures, it will "pop" in and out.



You can see either six or seven cubes depending upon whether you see the black diamond shapes as the tops or bottoms of the cubes.



These overlapping circles can be perceived as a tube. Sometimes you see the tube from above and sometimes from below. It will spontaneously change orientation as you look at the figure.



Depending on whether you assume that light is coming from the upper left or right, these figures can either appear to be cubes with the lower part in darkness, or they can be gravestones casting a shadow behind them to the left (Ramachandran, 1988). Adapted from G. Kevin © 1988.

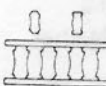
The cards below are examples of *figure-ground* illusions. When a figure is printed, it is seen as a figure which stands out from the background (the paper). Usually, figures are darker than their backgrounds. They also tend to be smaller and more regularly shaped than the background against which they are placed. Sometimes these principles do not hold, so the brain becomes confused in interpreting what is seen. It is difficult to tell which is the background and which is the figure.



This figure can be perceived as either black arrows pointing outward or white arrows pointing inward. Since the arrows share edges, either can be seen as figure or background.



If you focus on the dark area as the figure, it can be seen as waves against the sky. However, if you focus on the white part as the figure, it can be seen as a theater curtain hanging over a dark set (Block & Yaker, 1989).



Since figures "A" and "B" are both possible shapes for posts of the railing, and are approximately the same size, each can be seen as figure and background as you concentrate on the illustration.



This illustrates the *Gestalt* principle called *common fate*. People tend to group things together which seem to be going in the same direction. The triangles can be seen as a fleet of rocket ships either landing or taking off. Since they all have the same spatial orientation, they share a common fate, and you cannot see some of them taking off and others landing.

The Path Cards

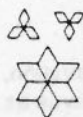


Most of the *Path Cards* are examples of *ambiguous figures*. These illusions tend to be much more complex than the illusions of the *Key Cards*. They are clever artistic creations in which the artist has managed to create figures in which two different images can be seen.

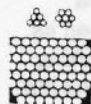


This is one of the earliest and best known *ambiguous figures*. Called *My Wife and My Mother-in-law*, it first appeared in the British humor magazine *Puck* in 1915. The old woman is seen in full profile looking down, while the young woman is turned away from you in about one-quarter profile. You can see the tip of the old woman's nose as the young woman's chin, and vice versa (Hill, 1915).

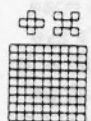
These last four key cards are examples of *figural organization*. In the early 1920s a popular theory of perception called *Gestalt Psychology* was developed. Among other areas of research, *Gestalt* psychologists attempted to develop principles which explain how visual patterns are organized.



This figure is made up of six diamonds forming a single six-pointed "star". Once you notice that it is possible to see the two different patterns of diamonds called "A" and "Y" you find that one or the other figure tends to be organized in your awareness. In addition, whichever you focus on at the moment seems to be nearer to you than the other (Block & Yaker, 1989).



The urge to organize is seen in this figure. All of the circles are the same size and distance apart. If you concentrate on the figure, from time to time you will see the "triangle" pattern emerge as well as the "circle" pattern. These are not the only two geometric patterns that can be seen. You can see larger triangles, diamond shapes and still others.



The squares in this figure similarly tend to be seen in clusters as you focus on the illustration. In *Towers of Illusion* we ask you to choose between the "+" pattern and "x" pattern each made up of five squares. There are many other patterns you can see if you concentrate on organizing the illustration.



Forty-six years after *My Wife and My Mother-in-law* appeared, this illustration called *Husband and Father-in-law* was published. The old man is seen in profile, facing right, with the dark areas representing a coat pulled up close to his jaw. His nose is the tip of the young man's chin as he looks away from you. The nearly straight horizontal line near the middle of the picture serves as the old man's mouth, or a neck band for the young man (Botwinick, 1981).



In this drawing by Paul Agule, a New York artist, the round circles in the middle can be seen as either laces of a shoe or eye glasses (Courtesy, P. Agule).



The top part of this drawing can be seen as either a thumb nail or the eyes and mouth of a person wrapped in a blanket which partially covers the top of the head (Fisher, 1968).



The top part of this drawing can be seen as either a baby's face or a bun of hair on top of a woman's head. The baby's left arm also can be seen as the cheek line on the woman's face. The woman is looking toward the right. The baby's crossed legs can be seen as a large collar around the woman's neck (Fisher, 1968).



The dark area can be seen as either long hair flowing down the back of a seated woman, or as the hair on top of a man's head. The woman's right arm can be seen as the nose of the face. (Fisher, 1976).



Do you see the mermaid's tail at the bottom of the drawing? It can also be seen as a scarf for the face. The mermaid has long flowing hair which flows down her shoulder and hides her face. The hair also hangs half-way down the face of the second figure. The mermaid's arm is the nose on the face, and the horizontal edge of the beginning of her tail can be seen as a mouth (Fisher, 1968).



The woman's face is at the top middle of this illustration, with her long hair at the top left. Her hair also serves as the man's nose, and her face is the man's eye. Her arm is the man's chin line, and the baby's face at the top right is the man's ear (Fisher, 1967).



The dark area on the right of the illustration can be seen as an Indian's headdress. It can also be seen as a storm outside an igloo with an Eskimo inside looking out. The Indian's ear is the Eskimo's right arm, and the Eskimo's legs are the Indian's neck.



The boy's face is seen in profile facing right. The mouse's face is at the bottom of the figure and its nose is the boy's chin. The mouse's left ear is the boy's eye while its right ear is the boy's ear. The mouse's tail is at the top right of the drawing and can be seen as hair on the boy's head. The boy's nose is the mouse's front left foot (Adapted from Fisher, 1968).



This is one of many ambiguous figures which depends on whether you see the figure facing right or left. Facing right, the figure appears to be a rabbit sitting upright with long ears pointed upward. Facing left the drawing seems to be a pelican. The rabbit's ears are the pelican's beak and the rabbit's forelegs are the pelican's wings (Kay, 1988).



If you think the figure is facing right it appears to be the head of an antelope with its horns pointing toward the upper left. If you think it is facing left, it is a bird with its beak pointing toward the upper left.



The two small round areas near the top left are either the rat's ears or the man's glasses. The rat's head is the man's nose. The man's chin is the rat's tail (Bugelski & Alampay, 1961).



The seal's flippers, at the top, are the donkey's ears. The donkey's nostrils are the seal's eyes (Fisher, 1968).



This illustration can be seen as either a duck coming toward you, or a squirrel seen from the rear. The duck's tail feathers are the squirrel's head, while the duck's head is the squirrel's tail (Fisher, 1968).



This is either a rabbit or the head of an Indian. The rabbit's head and ears form the band and single feather at the back of the Indian's head (Fisher, 1968).



This is either a hawk flying to the right or a goose flying left.



This figure is either a rabbit head facing right or a duck head facing left. The rabbit's ears are the duck's bill.



The key distinction in this illustration is in the interpretation of the upper left hand corner of the figure. The small oval area can be seen as either an angel's face or as a parrot's head in profile. The angel is wearing a long flowing robe which becomes the parrot's tail feathers. The wings at the upper right can belong to either figure (Fisher, 1968).



The elephant's trunk is at the lower left. The small dot near the center of the drawing is its eye and the lower right is its ear. The darkened part below the elephant's eye can also be seen as the opening of a sea shell (Adapted from Fisher, 1968).



The oval section at the top of the drawing is a lion's mane and its face. The lower section is his left front leg. Alternatively, the oval can be seen as a flower with petals. The lower section is the stem and leaf of the flower (Adapted from Fisher, 1968).



The top portion of this illustration can be seen as an Eskimo's face in a fur hat. The extension to the left is the Eskimo's arm. A different way of looking at the drawing would be to see the extension as the head of a turkey with the top portion representing the turkey's tail (Fisher, 1968).



If you imagine the top part of this figure to be a snake, the lower portion becomes a basket used by snake charmers. On the other hand, it is possible to see the top vertical portion as being made out of metal. Seen this way the figure is a corkscrew and handle.



If you think this illustration is facing right, it is a smiling hippopotamus. If it is facing left, you'll see a mouse looking up in the air. The hippo's nose is the mouse's ear. Both figures use the small dot as an eye.



This figure can be seen as either a ballet shoe or a stylized letter "G" at an angle going from the lower left to the upper right. This is the logo of a British company, Gamba Ltd, which manufactures ballet and theatrical shoes (Courtesy of Gamba, Ltd.).



This illustration is the letter "W" if you ignore the circle at the top. However, if you include the circle at the top and focus on the center of the figure you can see a man walking. This is the logo of a British biscuit company (Courtesy of Walker's Crisps).



There are two different faces in this drawing, one facing left; the other right.



The famous American theatrical caricaturist, Al Hirschfeld created this drawing in 1963 for the Broadway show *The Boys from Syracuse*. It sometimes appears the boy at the right seems closer, and then the boy running left appears closer (Margo Feiden Galleries, New York).

The following cards are based on *figure-ground illusions*. Most of them are less complex than the previous cards, with the two possible interpretations determined by whether you see the white or dark area as the figure. Again, once you see both figures they will spontaneously alternate in your consciousness.



The black face is looking left and the white face looks toward the right (Fisher, 1968).



The black area seen as the figure seems to be a person with an out-stretched hand. When the white area is seen as the figure it appears to be a laughing person with a large nose (Kay, 1988).



The white area appears to be a candle with a flame. The black areas on both sides appear to be two faces almost touching each other (Kettlekamp, 1974).



This is two people with their foreheads touching when the black area is seen as the figure. The white area is a mosque-like structure one would associate with Middle Eastern houses of worship (Block & Yucker, 1989).



The white area is a candle in a candle holder, while the black areas on either side seem to be two faces close together with their mouths open wide.



The white area appears to be a flower in a pot with leaves on either side. The black areas on each side are two faces with large noses and open mouths in profile.



The black area looks like an old-fashioned telephone. However, it is possible to perceive part of the white area as the figure. The white area underneath the mouth-piece and receiver can be seen as two reindeer with their antlers up. The circles in the dial form the letter "C".



The center white figure appears to be a wine glass with a long stem. If this is seen as background, the black area forms the image of two wine bottles. The two thin lines on either side of the glass can be seen as the sides of two forks standing up in profile (Kay, 1988).



The black image looks like several palm trees. Under the trees, in white, there seem to be several sail boats (Kay, 1988).



The black figures appear to be kitchen utensils standing upright. The white areas appear to be a quite different set of utensils hanging down (Kay, 1988).



This Victorian print, called *All Is Vanity*, can be seen either as a skull or as a woman seated at a vanity table looking into a mirror. If you focus on the white area as the figure you can see a skull. Otherwise, the eye on the left (your left) is a woman's head while the right eye is her reflection in the mirror.

These next two cards illustrate size perception. We judge the size of an object by comparing it with other objects of known size. In each of these two cards, your estimate of size will depend on the comparison figure you use.

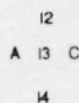


Different species of fish vary widely in size. Since you do not know the species of the fish in this drawing, your estimate of its length will depend on whether you compare it with the fisherman to its left (in which case the fish is about six feet long) or with the knife, fork, and plate to its right (in which case the fish is seen as six inches long).



If you focus on the center figure you can see an apple core with a leaf on top. If you look at the white background, the left and right edges of the apple core can be seen as two faces looking at each other.

A few more cards complete your deck!



The figure in the center is seen as the letter "B" if you see it belonging to the sequence of A, B, and C, or as the number 13 if you see it as belonging to the vertical sequence of the numbers 12 and 14 (Block & Yucker, 1989).



This drawing presents conflicting cues for depth perception. As you concentrate on it, it sometimes seems to be sloping away from you and is seen as sinking. At other times it appears to be "above" you and falling forward.



This is the King of Hearts from a deck of cards published in France early in the 19th century. The artist who did the illustration not only included a full face, and two profiles on either side, but when you turn the card upside down you can see additional faces, amounting to a total of ten in all!

MORE THAN 1 WAY TO PLAY!

TRIPLE TRIUMPH:

Reach the top of all 3 towers before anyone else does!

To Start:

1. Select a jester. Separate the key cards from the path cards into piles. Place the two piles with the Optical Illusions facing up.
2. Choose a tower to start from and place your jester at "start". No more than two players may start in any one tower.
3. Roll the die. Whoever rolls the highest number goes first. Then take turns clockwise from there.

To Play:

Roll the die, and move your jester along as many steps as the number you rolled. You may move in any direction as long as you move the full number of steps in that direction, equal to the number rolled on the die. Usually the best direction is to go forward and up towards the top. But there may be times when you will want to back-track (to get to a key card, for example.)




If you land on a step with a path card symbol on it, take the top path card and read the question on the front of the card out loud. Then answer the question out loud too, depending on what you see in the optical illusion at that moment. Turn the card over and follow the directions based on what you saw in the illusion. Place the card at the bottom of the pile.

LOSE 1 Turn Pick one of these cards up whenever a path or key card says you need to lose a turn. Put it back when your turn has already been skipped.

EXTRA Turn Pick one of these cards up whenever a path or key card says you have an extra turn. Put it back when you finish taking that extra turn.


To Win:

 When you get to the very top of a tower, you get a Treasure Coin that is the color of the tower you just climbed. Keep that coin; you'll need the other two to win!

Some Coin Notes:

- ◆ To get a treasure coin you have to land on the top step (by an exact roll of the die).
- ◆ If you get to the top of the same tower more than once, you do not get another treasure coin. You need to get one of each color.
- ◆ Once you reach the top step and get your coin, move your jester to "start" in a tower whose coin you don't have yet.

The first player to get three different-colored Treasure Coins wins!

 If you land on a step with a key on it, take the top key card. Look at the illusion, read the question, say what you see, and follow the directions on the back of the card.

Going "through a door" means you move your piece to the key step on the tower next to the key step you're on. Pretend you can go through the arches and doorways. It's an illusion!

Some Card Notes:

- ◆ Just because you saw something once, and that choice led you forward, that will not always be so. There's more than one of each illusion.
- ◆ Wherever you get sent, if you land on a path or key card symbol, pick a path or key card up.
- ◆ Hold on to the card you're moving with if you need it to remember what to do. Put it at the bottom of the pile later.
- ◆ You must roll onto a step to get a card. If another player happens to move you to a step with a key or path symbol, just stay there. You don't get to pick up a card.

QUICK VICTORY:

Be first to reach the top of any tower!

This *Towers of Illusion* game is played exactly as Triple Triumph is, except that you only need to reach the top of one tower.

You can also have players announce in advance which tower is their goal. Then see who gets there first!

MEET ME AT THE TOP:

Meet another player at the top of a tower.

Instead of being a competitive race, this game asks that you work together in order to get to the top together.

Choose a partner and pick one of the three tower tops to meet at. Each of the partners must start in different towers and not in the tower they have chosen to meet at.

Play the game as you would Triple Triumph or Quick Victory. When you reach the top of a tower, your partner must "meet" you there on his or her turn. If your partner doesn't get to meet you on that next turn and it is your turn again, you will have to roll the die, keep moving back and forth near the top of the tower, and try to meet again!

Another way to play Meet Me at the Top is a race against time! Cut both the key card and the path card deck in half before playing. Then try to meet at the Top of a tower before either deck is out of cards.