BRAIN WAVES

THE BRILLIANT BOAR

THE BRAIN-TRAINING MEMORY GAME FOR THE WHOLE FAMILY

SCIENTIST RECOMMENDED

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KOSMOS

BRAIN🧠WAVES

Fun memory games for the whole family
Exercise your brain while playing games!

Brainwaves games can help you to train your brain — in just 15 minutes. The game series was developed by experienced game designers and scientifically tested by neuroscientists. Their conclusion was that these games work the parts of the brain that handle fluid intelligence, working memory, and episodic memory. Above all, fluid intelligence, which is the ability to think logically and solve problems, and working memory, which enables us to temporarily store and simultaneously process information, are trained in this particular game.

For 1–4 players, ages 8 and up

Game Components

54 Animal cards with 9 unique designs
  1 Scoring notepad
  1 Rulebook with information regarding the memory study

Notepad to record the points scored

Animal card   Card back

Game Overview

When drawing a new card into his or her hand, a player first reviews the image on the front, memorizing which animal design is on the card in order to match as many pairs as possible later on. Each player holds his or her cards **with the fronts facing the other players.** By laying down cards to make matching pairs and drawing new cards, the animal cards in your hand are constantly changing throughout the game. This is exactly what is intended to stimulate those brain cells in the frontal and parietal lobes that are important for mental abilities (see the info at the end of the rulebook).

Game Preparation

- Depending on the desired level of difficulty, different quantities of **cards** come into play.

Difficulty Level 1 *Rookie*	Difficulty Level 2 *Experienced*	Difficulty Level 3 *Advanced*	Difficulty Level 4 *Expert*
Level 1 is played with 6 designs (for a total of 36 cards). 3 sets consisting of 6 cards each are removed, e.g. 6 foxes, 6 hares, and 6 mice.	Level 2 is played with 7 designs (for a total of 42 cards). 2 sets consisting of 6 cards each are removed, e.g. 6 foxes and 6 hares.	Level 3 is played with 8 designs (for a total of 48 cards). 1 set consisting of 6 cards is removed, e.g. 6 foxes.	Level 4 is played with 9 designs (for a total of 54 cards). All of the cards are used in the game.

Tip: Begin with the lowest level of difficulty and increase the difficulty level step by step.

The cards, which are selected according to the desired difficulty level above, are shuffled and placed as a deck with the animal side face up in the middle of the table.

- The **notepad** will only be required at the end of the game to record the points scored.

Gameplay

The youngest player starts. Then, gameplay continues clockwise.

During your turn, you must decide between one of the following actions:

> **A) Take a card from the draw deck OR**
>
> **B) Play a card from your hand**
> - ➡ If you do not have any cards in your hand, then only action A is possible (that is, e.g. the case with the first turn for all players).
> - ➡ If near the end of the game, the draw deck is empty, then you must select Action B as long as you have cards in your hand.

A) Drawing a card from the draw deck

The player draws the top card from the draw deck. He or she then memorizes which animal design is on the card and takes it into his or her hand **with the card back facing toward the player.** His or her turn is now over.

Now the other players can see which animal design the player has in his or her hand. However the individual player may no longer look at the animal side of his or her cards and only sees the blue card back.

If the player already has cards in his or her hand, then the player places **the new card in the last position of his or her hand.**

1. Each player sees the card backs of the cards he or she is holding during the course of the game.

2. The cards should be fanned out and held so that they are not overlapping too much, allowing the other players to see the animal designs. This makes the game much more fun.

B) Playing a card from your hand

The player takes one card from his or her hand and lays it on the table with the animal side facing up to form an animal pair with a face up card already on the table. Hopefully the player has correctly remembered the cards in his or her hand and played the correct animal:

✓ **Match:** If the animal laid down is a match with the animal card on top of the draw deck or — as explained below — with another face up card, then the player takes both animal cards and places them face down as points in front of himself or herself. The player then takes another turn (Action A or B) and, if he or she succeeds again, another turn, and so on.

✓ **Match**
The player takes both animal cards and now takes another turn.

✗ **No Match:** If it is not a match, then the animal card that was laid down remains face up on the table and may be used by any player to form pairs in future turns. In this way, it can happen that several different animal designs remain face up in the middle of the table. The player's turn now ends.

✗ **No Match**
The card that was played remains face up on the table. The player's turn is now over.

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End of Game

The game ends as soon as the draw deck is empty **and** only one player has cards left in his or her hand. Each of these cards will reduce that player's final score by one point. All other players will have no cards in their hands and therefore no minus points.

The player with the most cards collected (subtracting any points for cards in the hand of the player who still has cards) wins the game.

Example: At the end of the game, Chris has nine pairs of cards and two cards in his hand, Andrea has seven pairs of cards and no more cards in her hand, and Iris has nine pairs of cards and no more cards in her hand. There are still two more cards in the center. The draw deck is empty and the game ends. Now, from the 18 cards which Chris has won, the two cards in his hand are deducted. That brings him down to 16 points. Andrea has 14 points and Iris 18 points. The points are written down on the notepad so that they can be compared with future results. Iris won the game.

Chris	Andrea	Iris
16	14	18

Notes on Special Situations

- If a card is played in Action B (e.g., the wolf) which does not result in a match, then it remains on the table. It could now happen that, when the top animal card is taken from the draw deck by Action A or B, below it on the draw deck is an animal that matches the one that is already lying on the table (e.g., another wolf). A subsequent player who takes his or her turn and plays a matching animal, the wolf, can decide whether to use the wolf from the draw deck or the one in the middle of the table to form a pair.

- Players continue to play even when the draw deck is empty if more than one player still has cards in his or her hand. Since players can no longer draw new cards into their hands, only the action to "play a card from your hand" is possible. If a player still has cards in his or her hand, he or she **must** play a card, even when there is nothing in the middle of the table or no suitable card to match. Players who have no more cards to play do not take any further action and wait for the end of the game.

- The moment the game ends, the player with cards still in his or her hand is often tempted to play them. They may not do so, even if they could still match with a face up card in the middle of the table.

Variant: Name the Card

- Players can agree amongst themselves before the game that they must announce the animal when playing a card. This eliminates random, unintentional matches.

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Solo Version

Select the difficulty level you wish to play with and shuffle the corresponding deck of cards. The game functions as described in the preceding pages.

Whenever the player plays the wrong animal card, that card and the top animal card in the draw deck are placed in an error pile. When the draw deck is empty, the game ends. The player counts up his or her correct cards as well as the cards in the error pile. They will deduct these error cards and any remaining cards in his or her hand from the correct cards and write down the result on the notepad.

After more solo games, the player can compare the results and see if he or she has made any improvements.

These designs are included in the game:

The Author

Dirk Baumann, born in 1971 in Braunschweig, lives with his wife and two daughters in Troisdorf, Germany. A computer IT expert he likes to develop games in his spare time, preferring mechanisms that involve as few rules as possible. With *The Brilliant Boar,* he has succeeded in creating a clever memory game that is as simple as it is playfully appealing.

Dirk Baumann and Kosmos thank all play testers and rule readers.

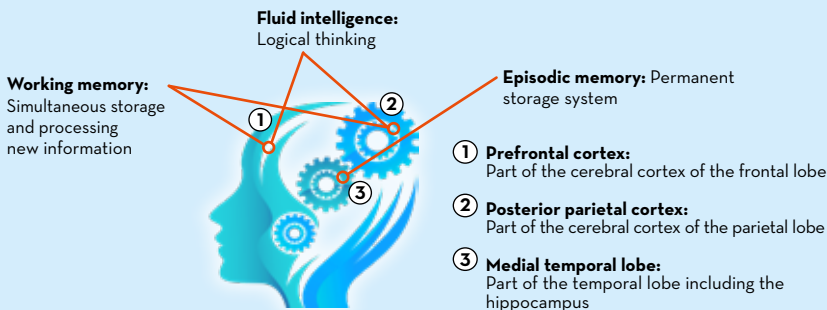## Interested in More Brain Training?

The Brainwaves series contains additional games offering a variety of brain training exercises.
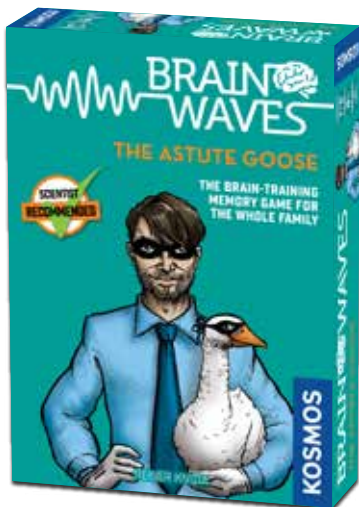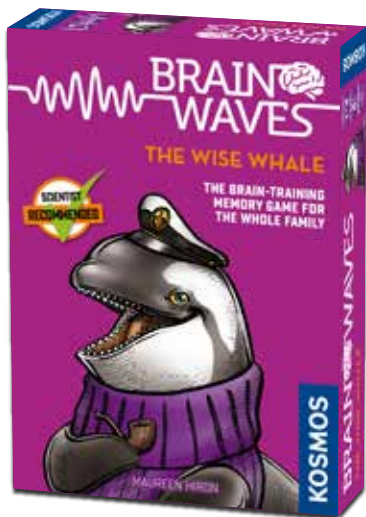
Scientific Study

The following is some additional information about how the Brainwaves games have been specifically designed and tested to work the memory.

Neuroscientists from the Clinical and Biological Psychology Research Group at the University of Ulm, Germany investigated the Brainwaves series as part of a scientific study. The question at the heart of the study was which brain functions are used or required by these games. The demands placed on the working memory (simultaneous storage and processing of new information), long-term or episodic memory (the brain's permanent storage system), and fluid intelligence (logical thinking) were examined.

Fluid intelligence: Logical thinking

Working memory: Simultaneous storage and processing new information

Episodic memory: Permanent storage system

① **Prefrontal cortex:** Part of the cerebral cortex of the frontal lobe

② **Posterior parietal cortex:** Part of the cerebral cortex of the parietal lobe

③ **Medial temporal lobe:** Part of the temporal lobe including the hippocampus

The games studied:

THE BRILLIANT BOAR

THE ASTUTE GOOSE

THE WISE WHALE

Results of the scientific study: The Brainwaves series places demands on all three of the brain functions that were examined (fluid intelligence, working memory, and long-term memory) and is therefore suitable for mental training exercises from the scientists' point of view.

Other well-known memory games are usually "static" — there are often no changes in the positions of the elements being memorized. The Brainwaves series is totally different: the players' memories must be constantly updated because the elements in their hands or in the display change with each turn. This means that the players must remove already-imprinted elements associated with a certain position from their memories and remember new elements over and over again.

The game series thereby places demands on several important brain functions. This results in an effective, simple, and quickly played series of brain exercises. And the games are fun, because many people of all ages find these mental challenges and competitions enjoyable — whether played alone or in a social group setting.

Conclusion: Playing these games will help you train your memory.

Memory Terms Defined

Fluid intelligence, or fluid reasoning, is the ability to think logically and solve newly confronted problems. It is the ability to analyze a problem, see patterns underlying it, and come up with solutions using logic.

Working memory enables us to temporarily store and simultaneously manipulate and process information. We require working memory, for example, to remember the beginning of a sentence when the sentence comes to an end so that we can understand its content.

Episodic memory, or long-term memory, refers to memories that are held indefinitely — longer than short-term memories. Episodic memory is required, for example, to remember a conversation that already took place several days ago.

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