THE LAST BRAIN THINKING

Teachers' notes

Site Overview

What is The Last Brain Thinking?

The Last Brain Thinking is a mental agility gameshow that aims to make maths and English fun for KS3 and KS4 students. Through a series of single player games, teenagers can test and improve their mental agility. The various games are all based on genuine neuroscientific research and encourage learning in different sections of the brain. Teenagers can then test their wits against each other in the multiplayer studios.

Aim of the resource:

- To encourage KS3 & 4 to engage in difficult maths and English language games.
- To introduce them to a range of tasks pitched at their ability level and above.
- To give pupils the tools to develop their mental ability.
- To enable pupils to play against each other in a classroom environment or at home.

Curriculum Relevance

Helps students to:

- Develop an understanding of how they learn and encourages them to think differently.
- Embed the use of specific skills related to the use of imaginative vocabulary.
- Improve learning and thinking skills.
- Increase their knowledge of regular patterns of spelling.
- Apply their knowledge of word formation.
- Look for and examine patterns and make connections.
- Evaluate their performance, respond to feedback and set targets to improve.

Key objectives:

At the end of the activity pupils will be able to:

- Understand that different parts of the brain affect different skills.
- Improve their ability in the various sections of the game and see for themselves how their mental agility has improved.
- Play the multiplayer game against pupils of all age groups.

Using the resource:

1. Click on the link and a pop up of the game will open in a new window.
2. Watch the Introduction to the game or choose skip if you have seen it before.
3. When you enter the waiting room, you are able to play the single player game:
    - Arcade Game: Tests your central executive
    - Vending Machine: Tests your formal maths
    - Plasma TV: Tests your episodic memory
    - Treadmill: Tests your phonological loop
    - Card Table: Tests your visual short term memory
    - Word Ladder: Tests your semantic creativity
    - Spot the Spots: Tests your informal maths
4. Check your progress on the scorecard. That will also give you an indication as to which studio you should be entering.
5. Once you have sufficiently tested your brain, you can got to makeup to accessorise your brain before heading to one of the studios to test your brain.
6. Choose a studio to play against other
    - The Easy Studio: Aimed at pupils in years 7-8
    - The Medium Studio: Aimed at pupils in years 9-10
    - The Difficult Studio: Aimed at pupils in years 11 and beyond
7. In the studio you should answer the questions correctly and as quickly as possible. If you are not quick enough, you'll lose a life. Lose all your lives and you're out of the game. If that happen it's time to play the single player games again to train up your brain some more.
8. There is also the option to create private studios where you can invite people to play against you. This would be useful in a teaching environment. Just set up a private studio and let the pupils know the name of it so they can play against each other. Eight pupils can play against each other at any one time.

Useful information:

- For more information on understanding what part of the brain the games test then click on the Ask Spinus bubble in the corner of the games.
- If you want to mute the sound there is a button in the top left hand corner of the screen.

Useful links

1. Learning styles

- Excellent link from BBC Wales Schoolgate on learning styles
  http://www.bbc.co.uk/wales/schoolgate/helpfromhome/content/2howchildrenlearn.shtml

- Keyskills - questionnaire to find out your preferred learning style
  http://www.bbc.co.uk/keyskills/extra/module1/1.shtml

- BBC/Open University
  http://www.open2.net/survey/learningstyles/learningstyles.htm

- Very good detailed description of different learning styles from the British Council
  http://www.teachingenglish.org.uk/think/methodology/learning_style.shtml#one

2. The Brain

- Science museum
  http://www.sciencemuseum.org.uk/on-line/brain/

- BBC Science & Nature: Brain map
  http://www.bbc.co.uk/science/humanbody/body/interactives/organs/brainmap/index.shtml

- Overview of brain
  http://www.bbc.co.uk/science/humanbody/body/factfiles/brain/brain.shtml

- BBC Science: Test to assess your memory
  http://www.bbc.co.uk/science/humanbody/mind/surveys/memory/

- Tony Buzan - the memory expert's website
  http://www.buzanworld.com/

Arcade Game

Overview:

The Arcade Game tests your central executive – the part of the brain that steps in when things get complicated. The game uses a trick called the Stroop effect which requires you to say the colour of the word rather than the word itself. Pupils can choose whether they play with colours or numbers.

What does the game test?

When a word such as blue or red is printed in a colour differing from the colour expressed by the word's semantic meaning (e.g. the word "red" printed in blue ink), a delay occurs in the processing of the word's colour. This leads to slower reaction times and more mistakes.

Aims of the resource:

- To improve the pupils response time to the Stroop effect.
- This improves the pupils' visual orienting, working memory, word meaning and visual features.

Curriculum Relevance

Helps students to:

- Improve their own learning and performance.
- Develop problem solving skills through reflective learning.
- Appreciate decision making skills and evaluate their performance.
- Consider links between thinking and decision making across different subjects.
- Make fresh connections between ideas, experiences and words.
- Evaluate and respond constructively when experiencing problems.

Key objectives:

At the end of this activity pupils should be able to:

- Increase their response time.
- Not read unnecessarily – by just seeing the colour rather than the word pupils can speed up their response times.
- Understand a bit of the science behind the game.

Using the resource:

1. When you are in the waiting room, click on the Arcade Machine to enter the game.
2. Read the instructions – decide whether you want to play using colours or numbers.
3. If you are playing the colours game then click the colour the word is rather than the actual word. Or if you are playing the number game, click on how many numbers there are rather than what the number is. Be aware there is a time limit on this game as well.
4. Complete the game and get as many consecutive correct answers as possible to improve your score.
5. When you feel happy with your score, go and play the other single player games or trial out your skills in the multiplayer studios.
6. You can check your score and what level you are working at on your score card.

Useful Links:

- Definition of The Stroop Effect
  http://en.wikipedia.org/wiki/Stroop_task
  http://faculty.washington.edu/chudler/words.html

Card Table

Overview:

The Card Table tests your visual-short term memory. This is your ability to remember images and spatial arrangements for a short period of time.

What does the game test?

The game focuses on your ability to see objects and remember them for a short period of time – normally about 30 seconds – after seeing them.

Aims of the resource:

- To encourage pupils to absorb information and remember it for short periods of time.
- To improve the pupils ability to memorise information by linking objects together to improve their recall ability.
- To encourage pupils to see patterns between objects so they can remember more.

Curriculum Relevance:

Encourages students to

- Develop an understanding of how they learn.
- Embed the use of specific skills to improve learning.
- Recognise, identify and classify 2-D shapes and their spatial arrangements.
- Look for and examine patterns and make connections.
- Make new connections between ideas and concepts.
- Simplify the problem in order to represent it.
- Evaluate their commitment and perseverance in carrying out activities

Key objectives:

At the end of this activity pupils should be able to:

- Be able to see a series of shapes and remember which ones are missing .
- Be familiar with the difference between visual short term memory and episodic memory (which is tested in the Plasma Screen game).
- Improve their concentration.

Using the resource:

1. When you are in the waiting room, click on the Card Table to enter the game.
2. Read the instructions.
3. Once the cards are dealt examine them carefully.
4. When you are ready the cards will be shuffled again and you'll have to work out which shape is missing.
5. Complete the game by getting as many correct answers in a level as you can.
6. When you feel happy with your score, go and play the other single player games or trial out your skills in the multiplayer studios.
7. You can check your score and what level you are working at on your score card.

Useful links:

- Definition of visual short term memory:
  http://en.wikipedia.org/wiki/Visual_short_term_memory

- Short term memory in practise:
  http://www.sciencemuseum.org.uk/on%2Dline/brain/265.asp
  http://www.bbc.co.uk/radio4/memory/understand/what_is_memory.shtml

- The Science Museum – Your Brain/Memory:
  http://www.sciencemuseum.org.uk/on%2Dline/brain/260.asp
  http://www.sciencemuseum.org.uk/on%2Dline/brain/264.asp

- Study notes:
  http://www.sparknotes.com/psychology/cognitive/memory/section1.html

Plasma TV

Overview:

The Plasma TV tests your episodic memory. This is the part of your brain that deals with your recollection of events. It takes in to account your sense of time, place and associated feelings, which is what makes it different from your ability to just remember shapes and patterns.

What does the game test?

The game focuses on your visual powers that enable you to see and remember series of events. Episodic memory acts as a map so for example when you see an image of a dog, you can imagine what it smells and sounds like and how it moves.

Aims of the resource:

- To encourage pupils to absorb information and remember it.
- To improve the pupils ability to remember sequences of events.
- To encourage pupils to link events and remember key facts.

Curriculum Relevance:

Allows students to:

- Develop an understanding of how they learn.
- Acquire specific skills to sustain and improve observation and recall.
- Evaluate their performance, respond to feedback and set targets to improve.
- Acquire skills to underpin the ways they learn across a range of activities.
- Understand how learning opportunities can be developed from a variety of tasks.
- Make informed decisions how to use the skills to support their learning.

Key objectives:

At the end of this activity pupils should be able to:

- Be able to see a series of events and be able to recount what happened in that event and recall key information from it.
- Be familiar with the difference between episodic memory and visual short term memory (which is tested in the Card Table game).
- Improve their concentration.

Using the resource:

1. When you are in the waiting room, click on the Plasma Screen to enter the game.
2. Read the instructions.
3. Watch each video clip carefully and answer the questions on it. The game requires you to watch three clips before answering any questions on it.
4. Complete the game by getting as many correct answers in a level as you can.
5. When you feel happy with your score, go and play the other single player games or trial out your skills in the multiplayer studios.
6. You can check your score and what level you are working at on your score card.

Useful Information:

- Please note the episodic memory is not tested in the multiplayer studios.

Useful links:

- Definition of Episodic memory:
  http://en.wikipedia.org/wiki/Episodic_memory
  http://en.wikipedia.org/wiki/Declarative_memory

- The Science behind Episodic memory:
  http://ai.eecs.umich.edu/people/laird/papers/nuxoll-2004-ICCM-epmem.pdf

Spot the Spots

Overview:
Spot the Spots tests your informal maths. It exercises how well you can approximate an answer to a mathematical question.

What does the game test?
The game focuses on your ability to make accurate guesses about a number from a glance.

Aims of the resource:
- To encourage pupils to rely on instinct rather than more traditional mathematical formulae to quickly gain an answer.
- To help develop an understanding of the relationships between numbers and things - a principle which can be applied to real life situations.
- To encourage pupils to have fun with words and familiarise themselves with key phrases and words.

Curriculum Relevance
Encourages students to:
- Solve problems involving number presented in a variety of forms.
- Recognise and select appropriate problem solving strategies.
- Use alternative approaches to overcome difficulties.
- Make mental estimates.
- Evaluate the effectiveness of their learning strategies.
- Evaluate their feedback and make future progress.

Key objectives:
At the end of this activity pupils should be able to:
- Give an accurate estimate of how many spots are on the page.
- Trust their instincts and believe they can guess how many spots there are rather than count each one.
- Feel confident with their ability to make accurate guesses.
- Understand that not all maths requires a calculator and definitive method of working out the answers.

Using the resource:
1. When you are in the waiting room, click on the Spot the Spots game
2. Read the instructions.
3. Look at the number of spots and guess how many there are.
4. It's best not to count how many spots there are because as the game progresses there will be more and more spots and you won't have time to count them all. The trick is to give an estimate.
5. Complete the game by getting as many correct answers and as high up the ladder as you can before the time runs out.
6. When you feel happy with your score, go and play the other single player games or trial out your skills in the multiplayer studios.
7. You can check your score and what level you are working at on your score card.

Useful links:
- Definition of informal maths:
  http://en.wikipedia.org/wiki/Informal_mathematics

Treadmill

Overview:

The Treadmill tests your phonological loop. This is the part of your brain used to remember sequences like phone numbers.

What does the game test?

The game focuses on encouraging your brain to seek patterns to enable you to remember long sequences of numbers.

Aims of the resource:

- To enable pupils to understand how this skill is transferable in everyday life e.g. your ability to remember phone numbers.
- To improve the pupil's ability to remember strings of things. This will also help when drawing up acronym for revision purposes.

Curriculum Relevance:

Enables students to

- Develop an understanding of how they learn.
- Embed the use of specific skills to sustain and improve learning.
- Develop personal, learning and thinking skills.
- Evaluate their performance, respond to feedback and set targets to improve.
- Make informed decisions how to use the skills to support their learning.
- Acquire skills to underpin the ways learners learn across the whole curriculum.
- Look for and examine patterns and make connections.

Key objectives:

At the end of this activity pupils should be able to:

- Remember long lists of letters or numbers with ease.
- Apply this to their revision skills by developing acronyms for various topics for different subjects.
- See patterns between lists of numbers or letters and apply this when solving number sequences.

Using the resource:

1. When you are in the waiting room, click on the Treadmill to enter the game.
2. Read the instructions – decide whether you want to play with numbers or letters.
3. Click ready to begin and then try and remember the sequence of numbers and letters. The more you get right, the longer the list will be.
4. Keep practising until you can remember longer and longer lists. To compare how you are doing, check the 'last attempt' and 'your record' log on the top of the treadmill.
5. When you feel happy with your score, go and play the other single player games or trial out your skills in the multiplayer studios.
6. You can check your score and what level you are working at on your score card.

Useful Information:

- You cannot type in the sequence of numbers and letters whilst the 'Get Ready' sign is on the screen.

Useful links:

- Definition of the phonological loop:
  http://en.wikipedia.org/wiki/Baddeley's_model_of_working_memory

- Study notes:
  http://www.sparknotes.com/psychology/cognitive/memory/section1.html

Vending Machine

Overview:

The Vending Machine tests formal maths. This is ability to quickly do sums in your head. It also activates the part of your brain involved with language.

What does the game test?

The game focuses on a range of mathematic techniques, including subtraction, addition, multiplication and division. It encourages children to carry out these sums in their head rather than rely on a calculator.

Aims of the resource:

- To improve how quickly and accurately pupils can carry out mathematical equations in their head.
- To improve the pupils skills in simple subtraction and addition as well as more complex long multiplication and division sums.
- To encourage pupils to enjoy improving their mathematical skills through this fun game.

Curriculum Relevance

Encourages students to:

- Break down complex calculations into simpler steps.
- Select efficient techniques for numerical calculation.
- Develop and use mental methods to add, subtract, multiply and divide.
- Develop a range of strategies for making mental calculations.
- Choose appropriate operations, methods and strategies to solve number problems.
- Use a variety of checking procedures.
- Evaluate the effectiveness of their learning strategies.

Key objectives:

At the end of this activity pupils should be able to:

- Answer simple addition and subtraction sums in their head.
- Answer more complex long multiplication and division questions in their head.
- Do simple mathematical equations mentally rather than relying on the use of a calculator.
- Feel confident with their mental arithmetic.
- Understand the difference between formal maths and informal maths (as tested in the Spot the Spots game).

Using the resource:

1. When you are in the waiting room, click on the Vending Machine to enter the game.
2. Read the instructions – decide which item from the vending machine you want to have – different items require different mathematical skills:
   - Apple: Simple addition
   - Banana: Simple subtraction
   - Tuna: Simple multiplication
   - Milk/ Juice/ Nuts/ Health bar: Random selection of sums getting progressively more difficult the higher the level.
3. You do not have to start at level 1, you can choose any level you want.
4. Complete the game but getting as many correct answers in a level as you can.
5. When you feel happy with your score, go and play the other single player games or trial out your skills in the multiplayer studios.
6. You can check your score and what level you are working at on your score card.

Useful links

- What is Formal maths?
  http://www.rbjones.com/rbjpub/cs/ai009.htm

Word Ladder

Overview:

The Word Ladder tests your semantic creativity. It deals with your ability to understand meanings from language and code. It's a bit like playing word association but there's a right answer as the words have to belong together in common words and phrases.

What does the game test?

The game focuses on your ability to see a word and automatically find a linking word, to give sense or another meaning to that word. It uses the language centres on the left side of the brain and as it uses the right side of the brain as you try to figure out how these words are connected.

Aims of the resource:

- To encourage pupils to see linking patterns between words and phrases.
- To improve the pupils vocabulary and understanding of how words have different meanings and can.
- be used in various contexts.
- To encourage pupils to have fun with words and familiarise themselves with key phrases and words.

Curriculum Relevance

Helps students to:

- Develop an understanding of how they learn and encourages them to think differently.
- Embed the use of specific skills related to the use of imaginative vocabulary.
- Improve learning and thinking skills.
- Increase their knowledge of regular patterns of spelling.
- Apply their knowledge of word formation.
- Look for and examine patterns and make connections.
- Evaluate their performance, respond to feedback and set targets to improve.

Key objectives:

At the end of this activity pupils should be able to:

- Work out how words can link together.
- Improve their vocabulary.
- Improve their ability to see a word and link it to other things and meanings.

Using the resource:

1. When you are in the waiting room, click on the Word Ladder Game.
2. Read the instructions.
3. Look at the two words you've been given and try and think of a word that could link the two words together.
4. If you can't think of a word, you can press the pass button to be given a new selection.
5. Complete the game by getting as many correct answers and as high up the ladder as you can before the rime runs out.
6. When you feel happy with your score, go and play the other single player games or trial out your skills in the multiplayer studios.
7. You can check your score and what level you are working at on your score card.

Useful links:

- What is semantic creativity?
  http://www.rbjones.com/rbjpub/philos/glossary/s.htm

- The semantic network:
  http://en.wikipedia.org/wiki/Semantic_network

The Multiplayer Studios

Overview:

The multiplayer studios combine questions from all the single player games. Pupils can play against other people who are also online in three studios – easy, medium and hard. They can also set up their own private studios and invite friends to play with them online.

Aim of the resource:

- To provide a fun environment for pupils to test their wits against other people online.
- To allow pupils to be tested on the various single player games in quick succession in one environment.
- To allow teacher's to set up private rooms for their students to play against each other in the classroom.
- To allow students of varying ability to play against people of that level in the different studios.

Curriculum Relevance

Facilitates students to:

- Develop an understanding of how they learn.
- Embed the use of specific skills to sustain and improve learning.
- Develop personal, learning and thinking skills.
- Evaluate their performance, respond to feedback and set targets to improve.
- Experience inclusive learning by having sufficient opportunities to succeed and develop.
- Make informed decisions how to use the skills to support their learning.
- Acquire skills to underpin the ways learners learn across the whole curriculum.
- Look for and examine patterns and make connections.
- Break down complex calculations into simpler steps.
- Select efficient techniques for numerical calculation.
- Develop and use mental methods to add, subtract, multiply and divide.
- Develop a range of strategies for making mental calculations.
- Choose appropriate operations, methods and strategies to solve number problems.
- Use a variety of checking procedures.
- Evaluate the effectiveness of their learning strategies.
- Recognise, identify and classify 2-D shapes and their spatial arrangements.
- Make new connections between ideas and concepts.
- Simplify the problem in order to represent it.
- Evaluate their commitment and perseverance in carrying out activities
- Evaluate their feedback and make future progress.

Key objectives:

At the end of the activity pupils will be able to:

- Progress through the three levels of difficulty in the studios.
- Compare their progress to other users online.
- Assess which areas they are weak at and train up those areas in the single player games.

Using the resource:

1. When you enter the waiting room, click on one of the studio doors:
   - Studio 1: Easy
   - Studio 2: Medium difficulty
   - Studio 3: Hard
2. Before you go into a studio, make sure you have gone to make up to accessorise your brain. The more single player games you have played, the more accessories you can choose from.
3. Once you enter the studio, watch the instructions on how to take part.
4. Answer the question as quickly as possible.
5. If you answer the question the fastest you will be chosen to pick the next round. To do so just hit your spacebar.
6. If you lose too many rounds your game will end – go and play the single player games again to improve your score.