

## How do we learn?

You will not be surprised to hear that we have been doing a lot of work in school over the last few years about how children learn. This is not to say that we did not think about this before! It is just that over the last few years, there has been large steps forward in the science of understanding of how we learn, what some people call cognition.

There are three parts of human cognitive processes: perception, attention and memory.

**Perception** determines how we see the world around us. We bring our prior knowledge to bear to make sense of the information we are receiving. The more knowledge we have, the better we are able to perceive things and make sense of the world around us. The example below shows how important perception is to our ability to understand things.

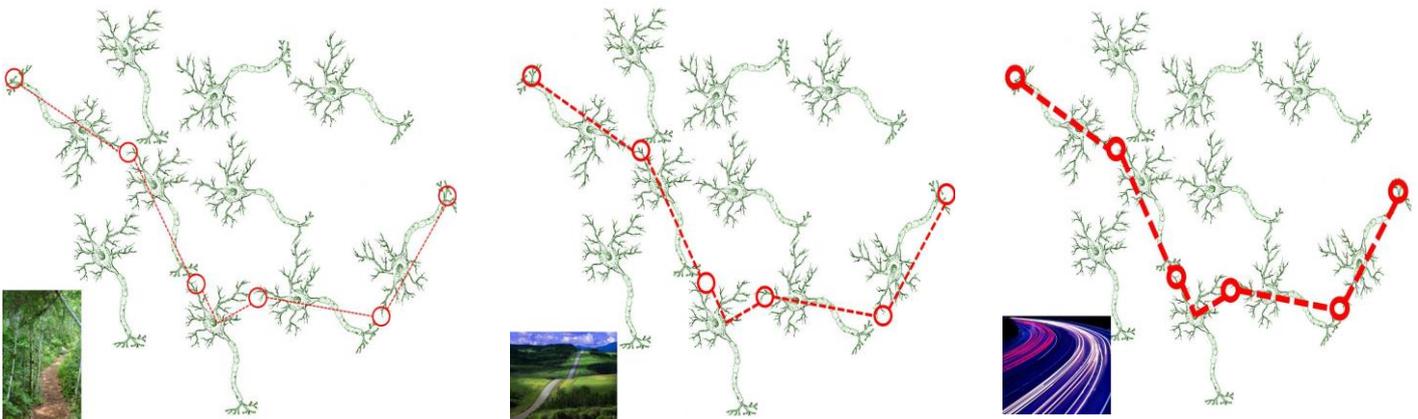
<https://www.brainhq.com/brain-resources/brain-teasers/adelsons-same-color-illusion/>

**Attention** is actually difficult to define for researchers of cognitive researchers. The most commonly agreed definition is that attention is the ability to focus on a specific stimulus. Attention is thought to be a 'limited capacity resource'. This means we cannot effectively focus on more than one thing at a time. In education, not paying attention can severely impede learning. Despite what people might think, multi-tasking is a myth. To prove this, time yourself doing each of the three tasks below. Tasks one and two will be done quickly, but it will take you more than twice the amount of time to do task three as your focus is on more than one stimulus.

- Task 1 is counting up from 1 to 26
- Task 2 is reciting the alphabet from A-Z
- Task 3 is interleaving numbers with letters, 1-A-2-B-3-C-4 etc

Everything you do requires **memory** in some form or another. Memory is not like a library where you lay down a memory and then just go find where you left it. Memory is reconstructive. That means every time you retrieve a memory, you are actually changing it. Every time you bring that memory out, it gets better and stronger. When people say they are rubbish with names, it's not actually true. They are good with names that they use regularly, but not so good with people they've only met a few times as they won't think about those people in between meetings.

If you were to imagine your memory is like a trip through a forest. The first time you do something, the connections you make in your brain will be faint. If you were to look back at the path you walked through the forest, it would be difficult to see where you had been, as the branches would spring back and cover your path. The more you went down that path (i.e. the more you retrieved that memory), the path would become clearer, and seem more like a road through the forest. The more you retrieve a memory, the stronger the connections in your memory are and it would be like travelling down a clear motorway.



## Tips for parents

This advice is taken from the book 'Understanding how we learn – A visual guide' by Yana Weinstein and Megan Sumeracki with Oliver Caviglioli. You can find some really clear visual resources to support each of the techniques below at this website:

<https://www.learningscientists.org/>

## Planning – this is known as spaced learning

Your child will learn more if they spread their studying out over a period of time. Repetition of work is important, but it is more effective if you revisit work at intervals over time. Cramming is ineffective and long periods of study are not so effective. Short, regular periods of practice going over material from the course of the year is the most effective way to learn.

- Help your child plan out a study schedule and stick to it
- Encourage your child to revisit old topics
- Take advantage of homework as a way to help your child practice what they have learnt in school

## Developing understanding – activities which will help your child learn more effectively

- a) **Elaboration** – This is the process by which we add something to memory by asking questions to help us think about things on a deeper level. In order to do this with your child, you can:
  - Ask your child to elaborate on how the things they learnt in school today apply to their everyday experiences
  - Ask your child to describe problem solving exercises step by step
  - Ask them 'how' and 'why' questions about their work
- b) **Concrete examples** – These help students understand abstract ideas. For instance, if we wanted to understand the concept of scarcity, we might use the example of the increased cost of plane tickets as you get closer to the departure date.
  - Point out any concrete examples that might relate to what your child is learning
- c) **Dual coding** – This is the process of recalling information by combining pictures with text.
  - Help your child understand something by doing sketches and short, written explanations
  - Find pictures relevant to what they are studying and discuss them with your child
  - You could have a game where you take it in turns to draw concepts they are studying
- d) **Retrieval practice** – Simply, this is helping them remember work they have done, usually through mini quizzes.
  - Simply ask them what they have learnt at school today
  - Also tried spaced retrieval practice; ask them about work they did a few weeks or months ago – you could do this with their exercise book or using an online revision site such as BBC Bitesize
  - Get them to write everything they know about a subject on a blank piece of paper and then ask them questions (elaboration) to help them make links between ideas
  - There lots of online quiz sites like Kahoot which have readymade quizzes which you could challenge your child to

And most importantly .... make sure your child gets enough **sleep**. Research has shown that a good night's sleep is essential in helping us remember things and means we can concentrate more easily during the day.

Further reading:

<https://sites.google.com/view/efratfurst/learning-in-the-brain>

<https://medium.com/swlh/neuromyths-the-10-top-misconceptions-about-your-brain-51675a4f4c4f>