Learning how to Learn

Roadmap

- Develop a growth mindset
- How do we think?
- How to deal with procrastination?
- How our brain processes work?
- How to learn?

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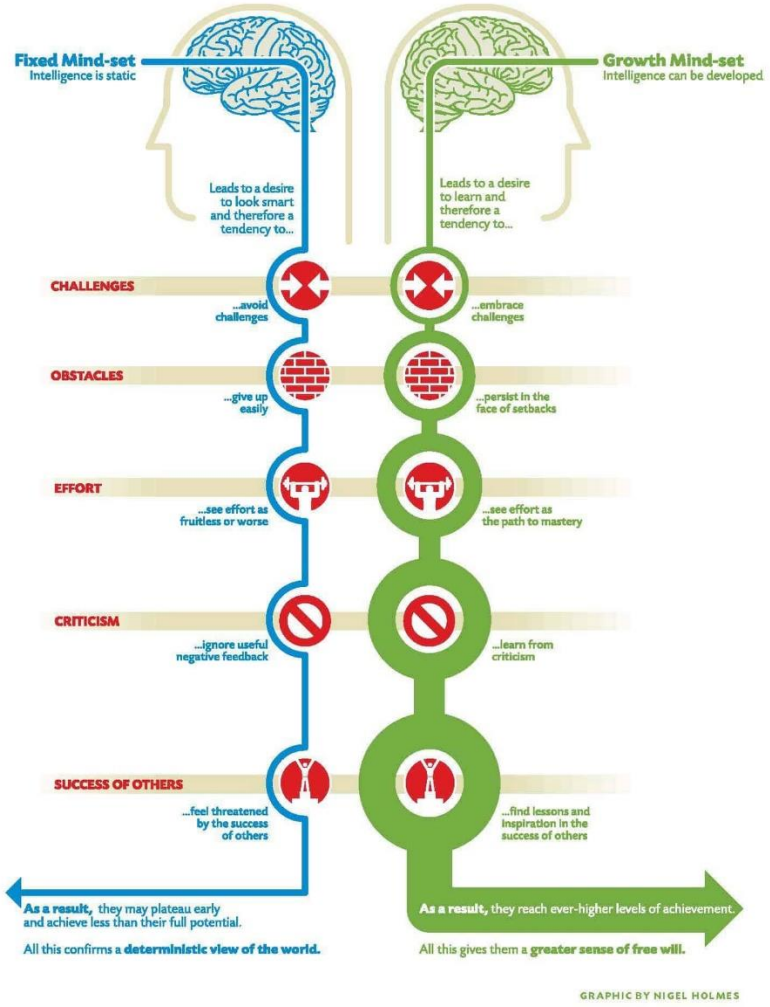
Fixed Mind-set
Intelligence is static
Growth Mind-set
Intelligence can be developed
Leads to a desire to look smart and therefore a tendency to...
Leads to a desire to learn and therefore a tendency to...
CHALLENGES
...avoid challenges
...embrace challenges
OBSTACLES
...give up easily
...persist in the face of setbacks
EFFORT
...see effort as fruitless or worse
...see effort as the path to mastery
CRITICISM
...ignore useful negative feedback
...learn from criticism
SUCCESS OF OTHERS
...feel threatened by the success of others
...find lessons and inspiration in the success of others
As a result, they may plateau early and achieve less than their full potential.
All this confirms a deterministic view of the world.
As a result, they reach ever-higher levels of achievement.
All this gives them a greater sense of free will.
GRAPHIC BY NIGEL HOLMES

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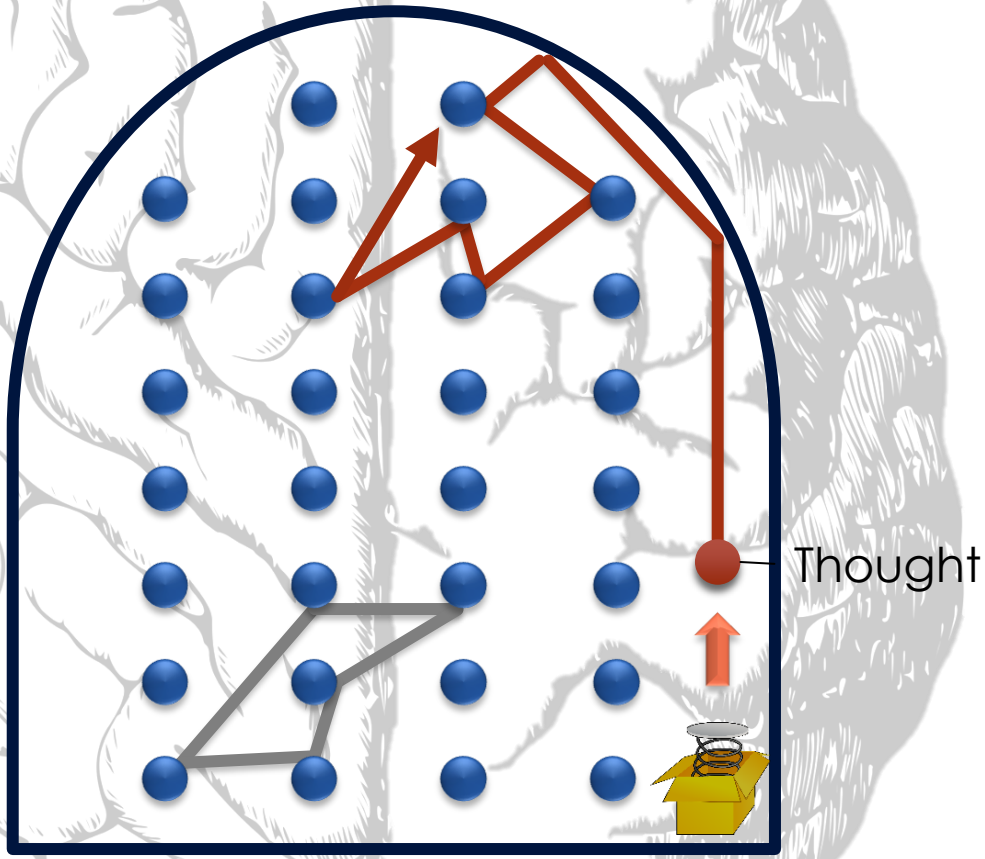
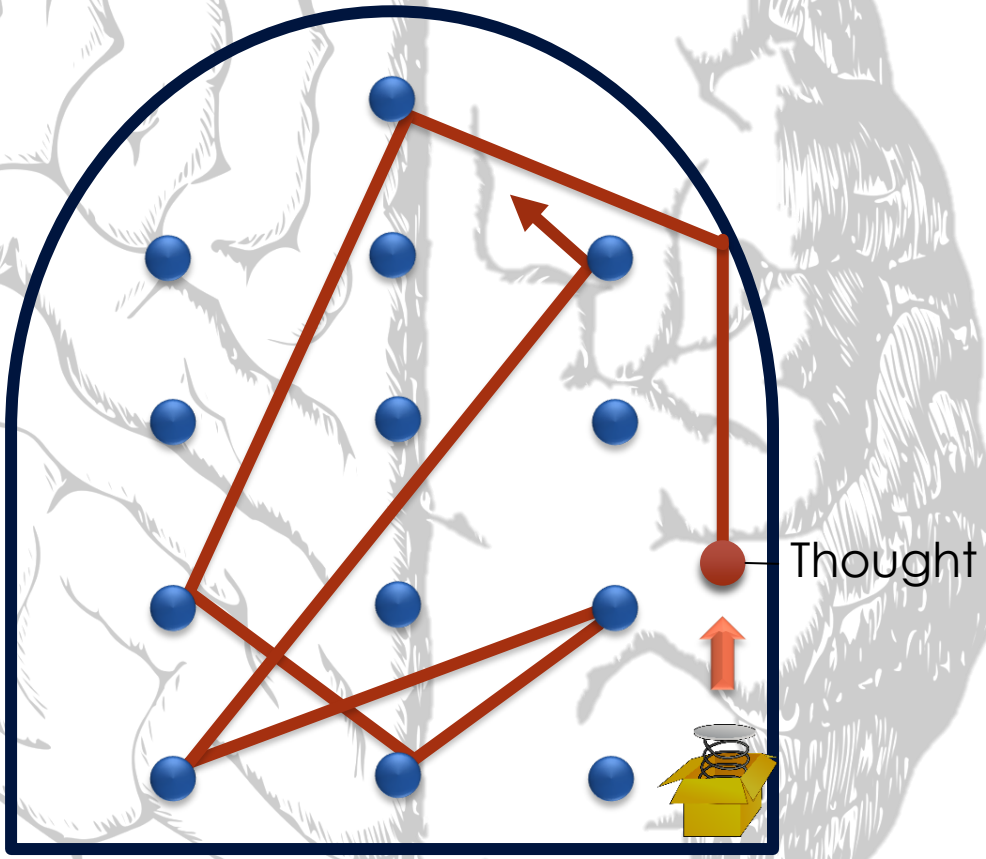
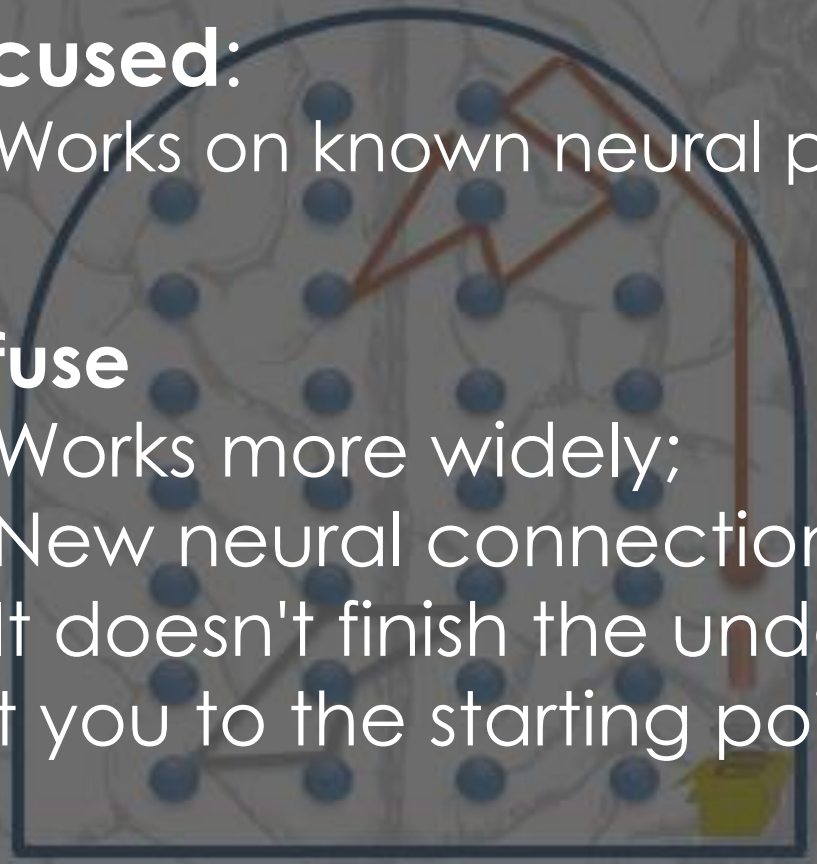
Focused



Diffuse



Focused



Diffuse

- **Focused**:
  - Works on known neural pathways.

- **Diffuse**
  - Works more widely;
  - New neural connections can be formed;
  - It doesn't finish the understanding or solution, but it can get you to the starting point

Thomas Edison

Salvador Dali

- When we are learning something new, your mind needs to work in focused and diffused modes.

Thomas Edison

Salvador Dali

Helps to get into Diffused mode.

Exercise also helps to get into Diffuse mode.

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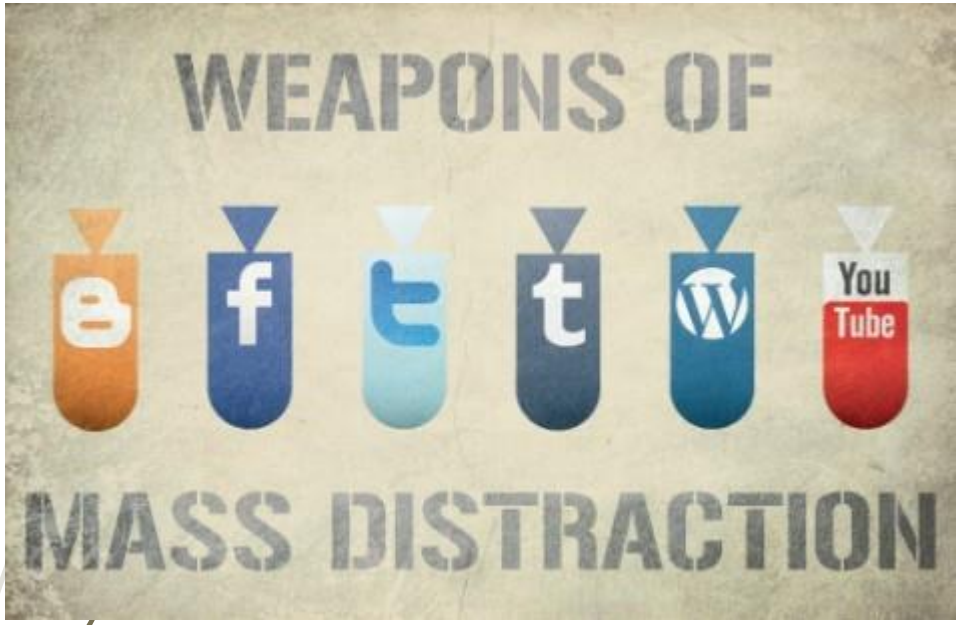
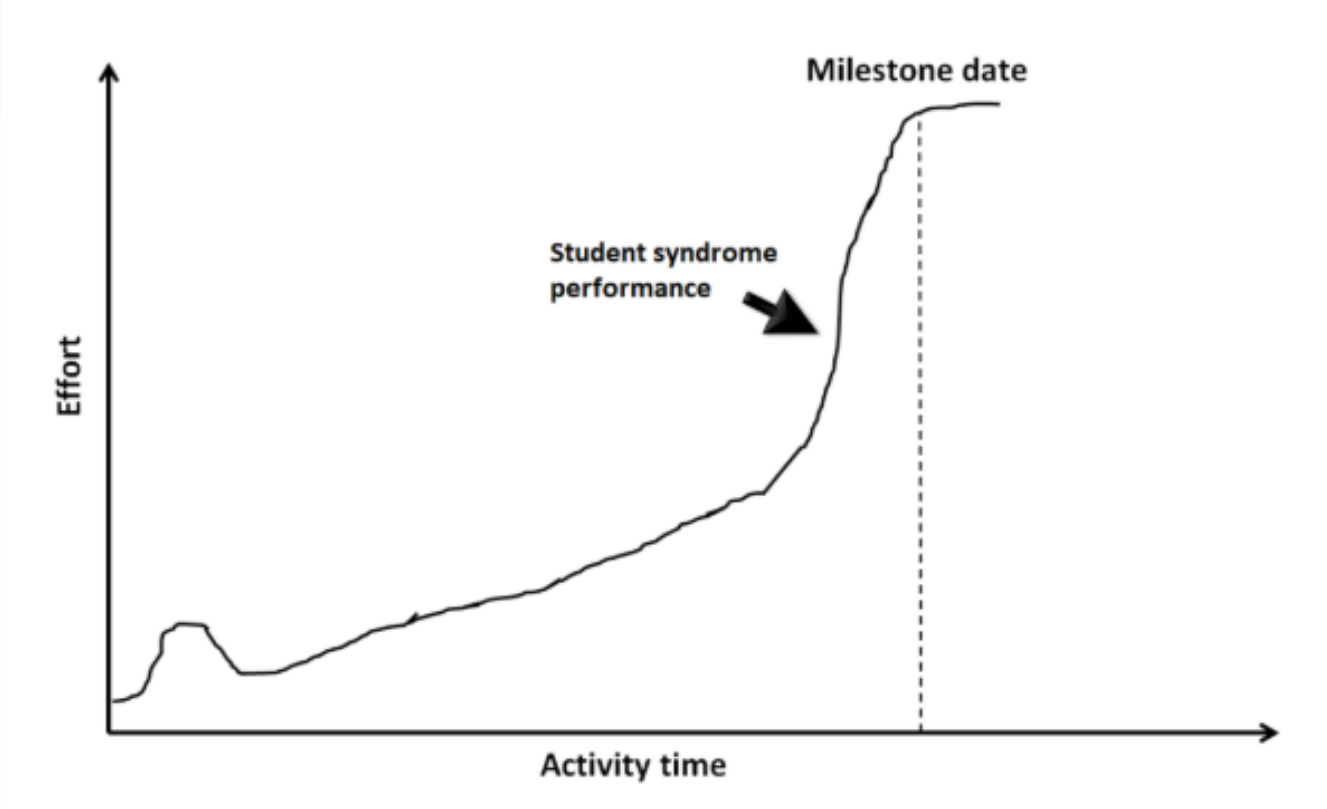


Procrastination

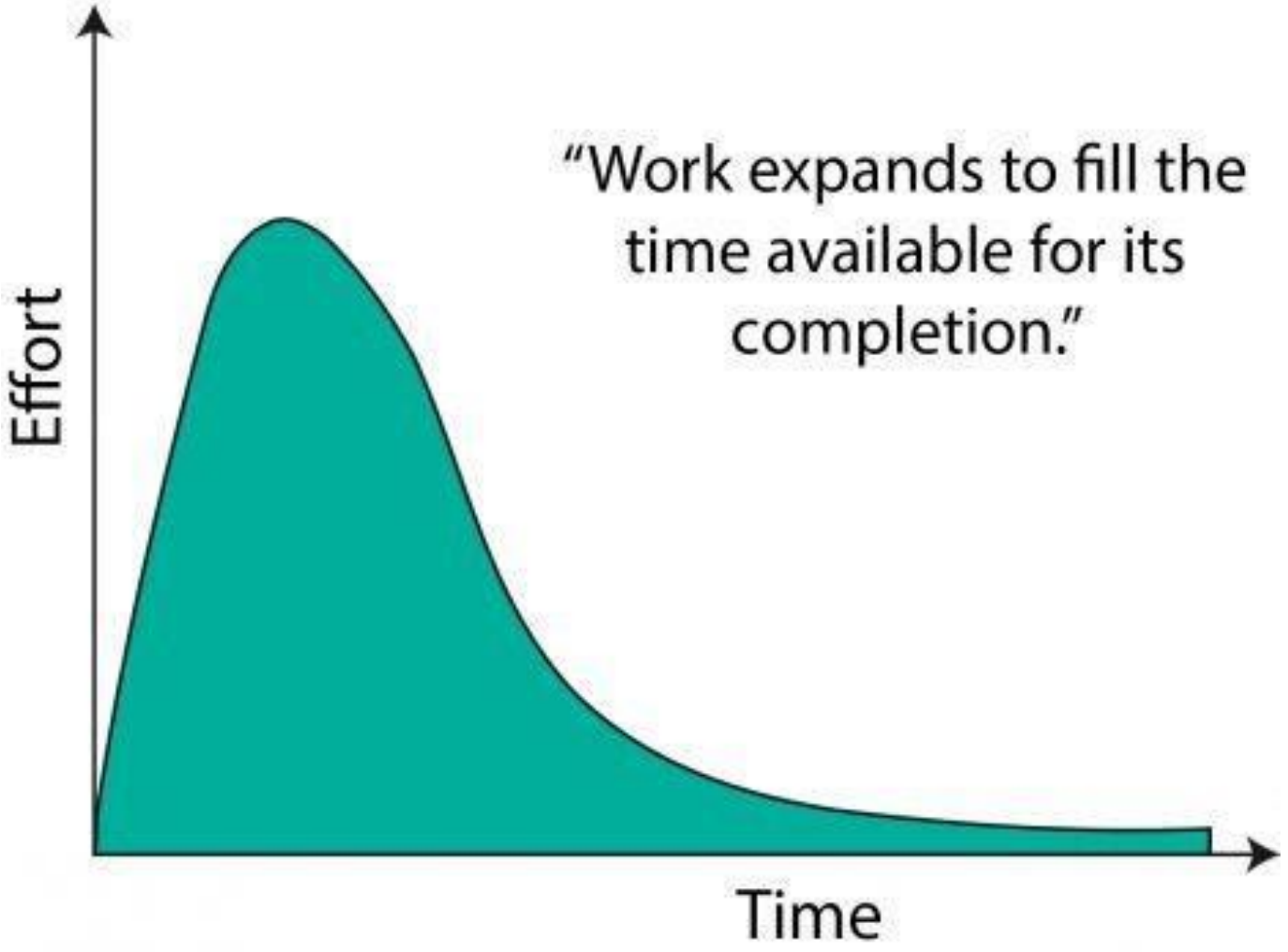
- When we start working on something we don't want, brain areas associated with pain are activated!
- But …
- Shortly after you start working on something you don't like, the neural discomfort disappears.



Student syndrome

ever-increasing practice of leaving a lot of work until the last moment

Parkinson's Law



"Work expands to fill the time available for its completion."

How to not procastinate?

THE POMODORO TECHNIQUE

1. Decide the task you'd like to get done
2. Set the timer to 25 minutes
3. Work on the task until the alarm sounds
4. Take a 5 minutes break
5. Take a 15 minutes break

Repeat four times

Focus on the **PROCESS**
and not on the product!

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How does memory work?

Two Types of Memory

LONG TERM

- Remember some formula, algorithm, events, words ...

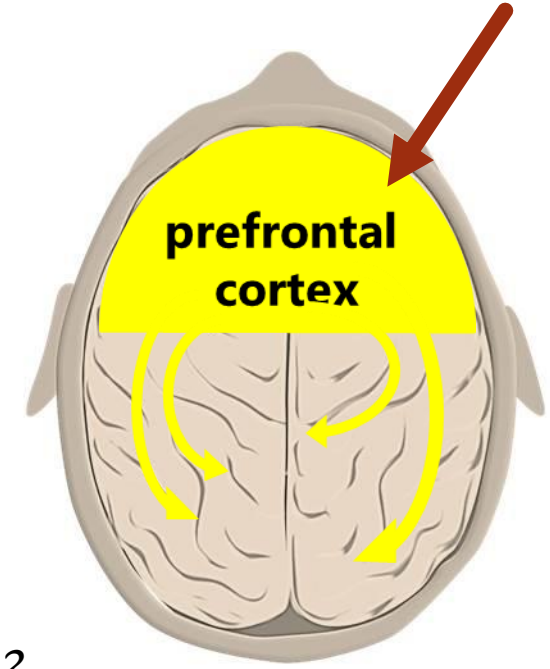
SHORT TERM

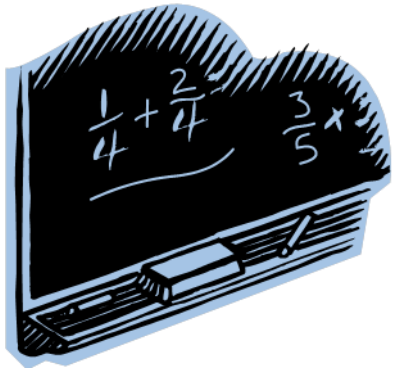
- Things you're currently dealing with

Short Term Memory

How much information can we keep?

Four slots





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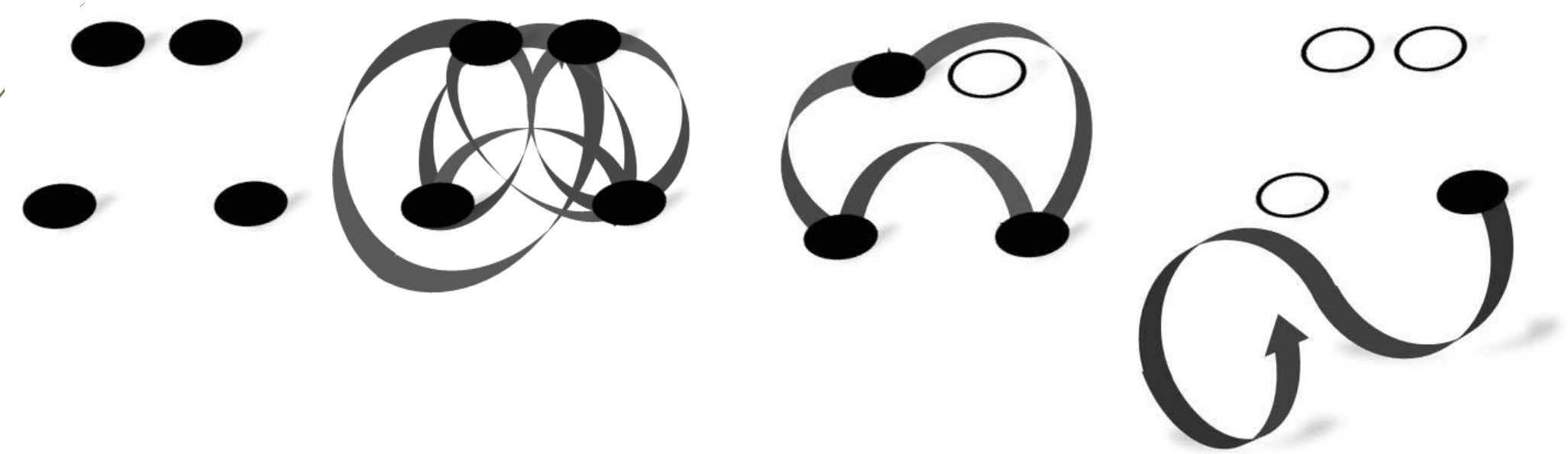
How to deal with complex problems with such a small working memory?

Storing pieces of information

In other words, learning, becoming more intelligent, means “fitting more information” into one short memory slot.



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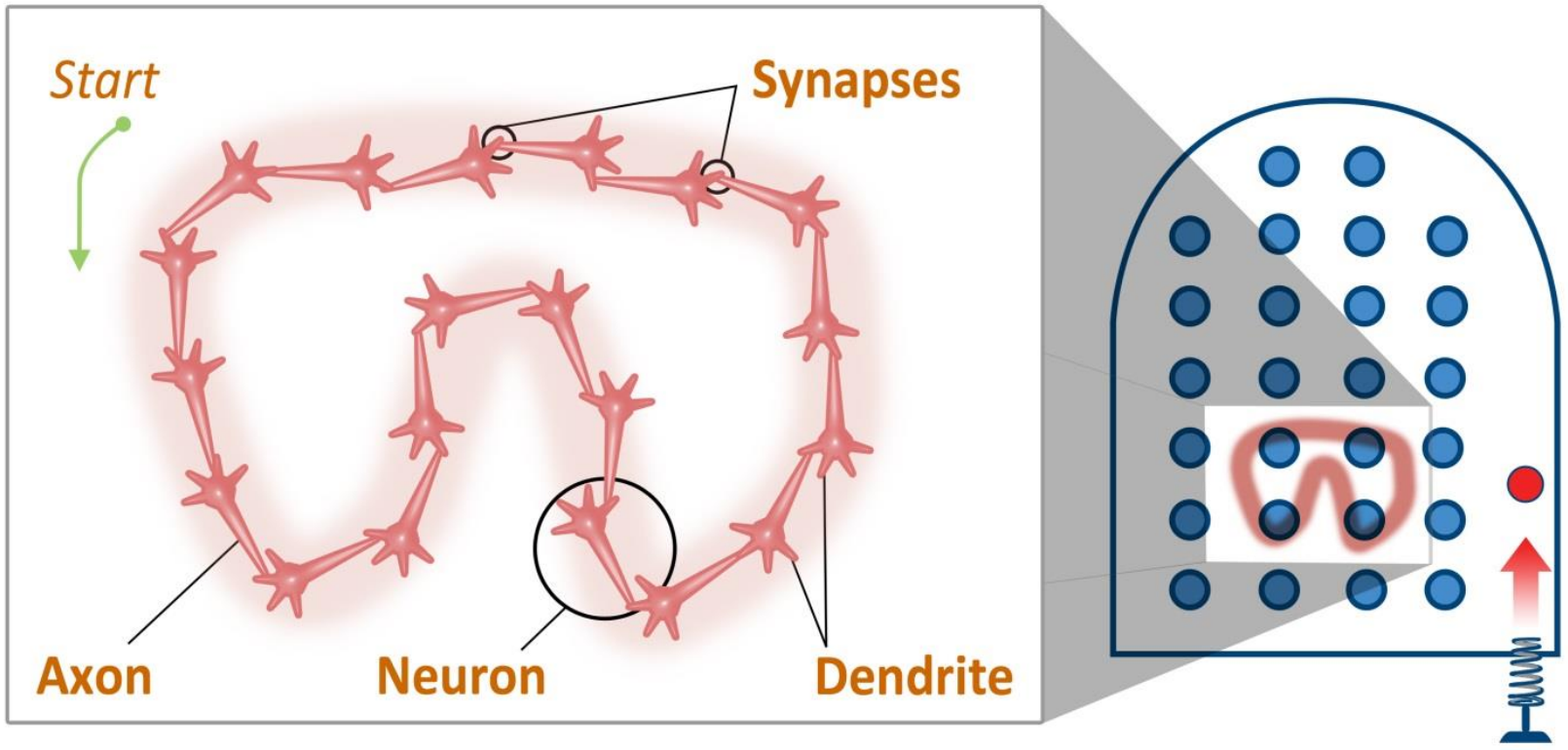
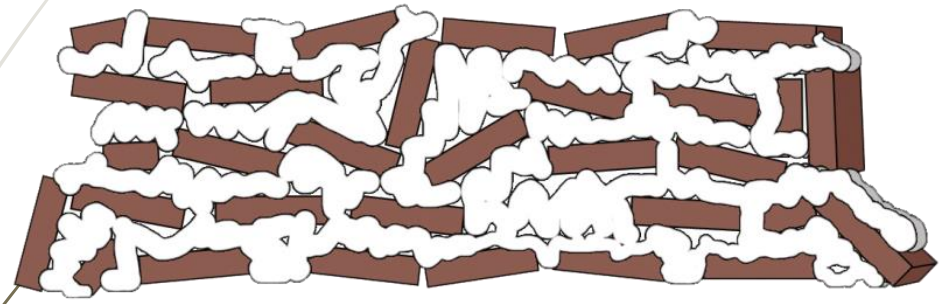
Learning means creating a neural pattern

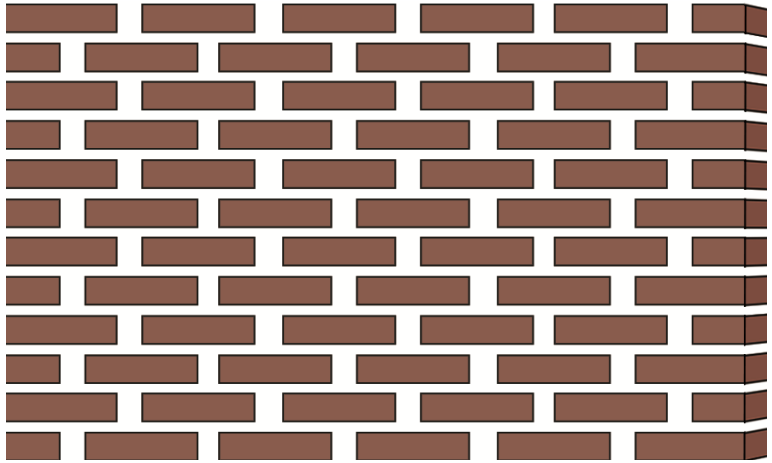


Practice makes perfect

Building strong neural structures



- All at once



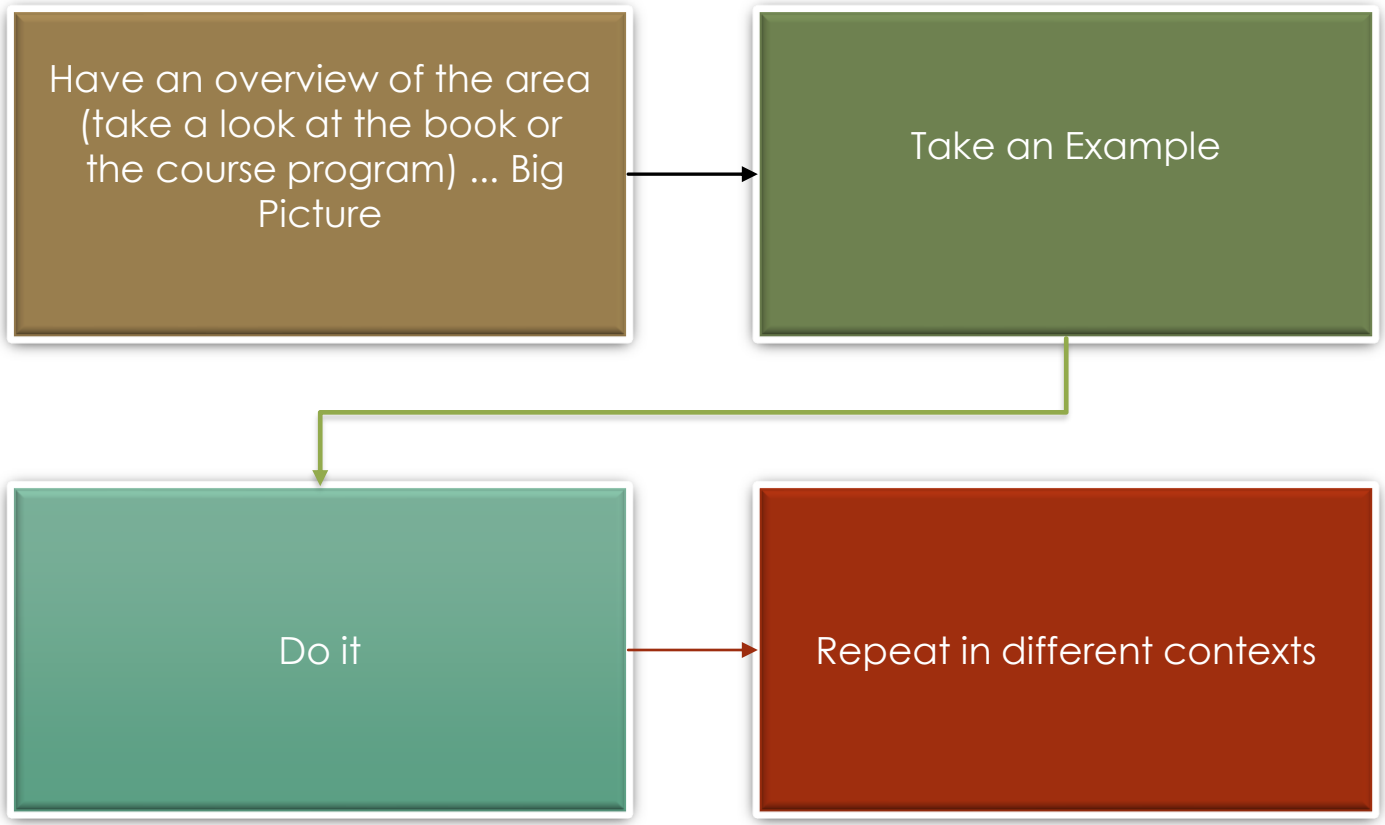
- a little bit every day

Spaced Repetition

- Rereading the book or slides is **inefficient** (an exception is if there is a lot of time between readings)
- The best solution is … **TRY TO REMEMBER … TEST YOURSELF!**
- Beware of **illusions of Competence**:
  - Watch a video and think you've learned the subject
  - See a solution and understand it and think you've learned

The biggest enemy of knowledge is not ignorance, it is the illusion of competence!

A simple way to learn anything



Passive learning	Active learning
Watch a lecture	Recall concepts
Read a book	Solve exercises
Follow a tutorial	Work on projects
Listen to a podcast	Teach others
Listen to a recorded lecture	Participate on debates
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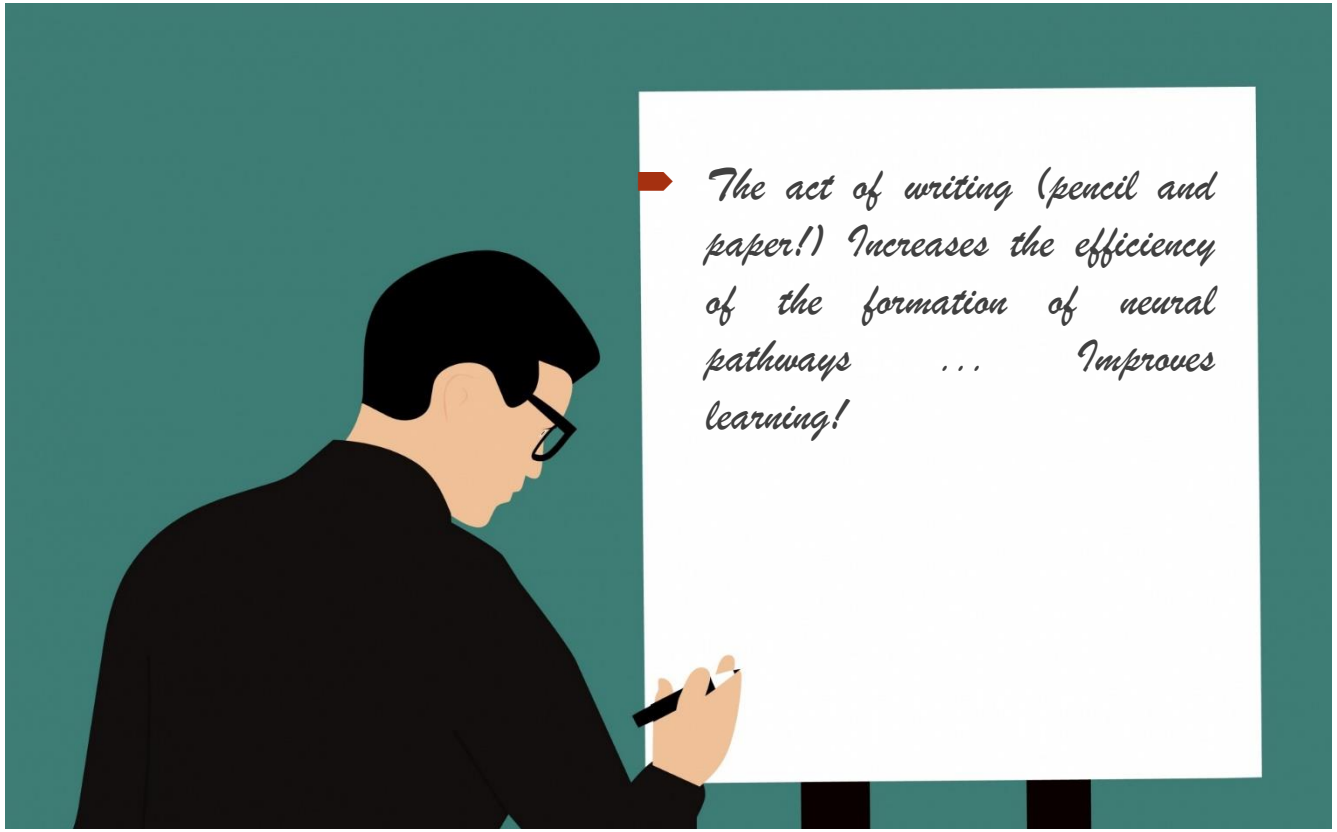
Should be around 60% to 70% of your study time



Writing (pencil and paper) boosts your potential to create neural patterns

Summary

- We need to work in focused and diffuse modes to learn;
- Trying to learn everything in one session is the worst possible solution;
- Not sleeping or not exercising is a bad idea;
- To learn something complex, you need time;
- Beware of illusions of competence