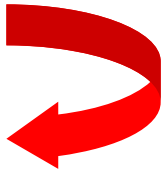
Through learning we acquire new…

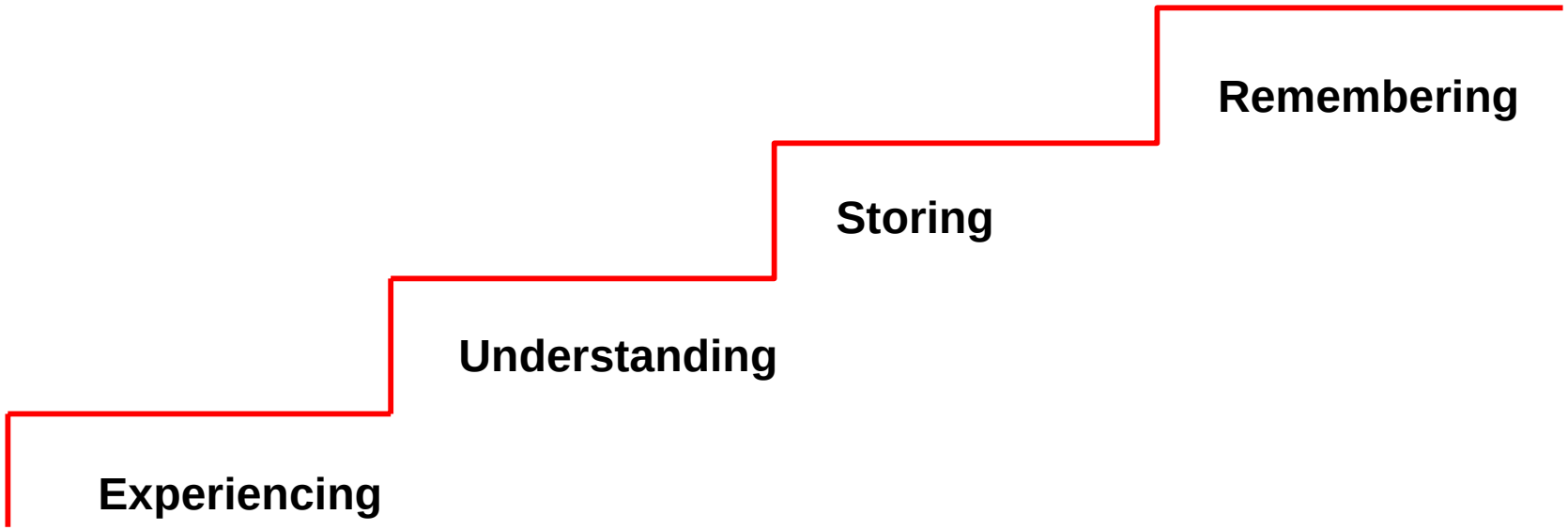
Learning = Change of behavior due to experiences

- Knowledge
- Skills
- Attitudes

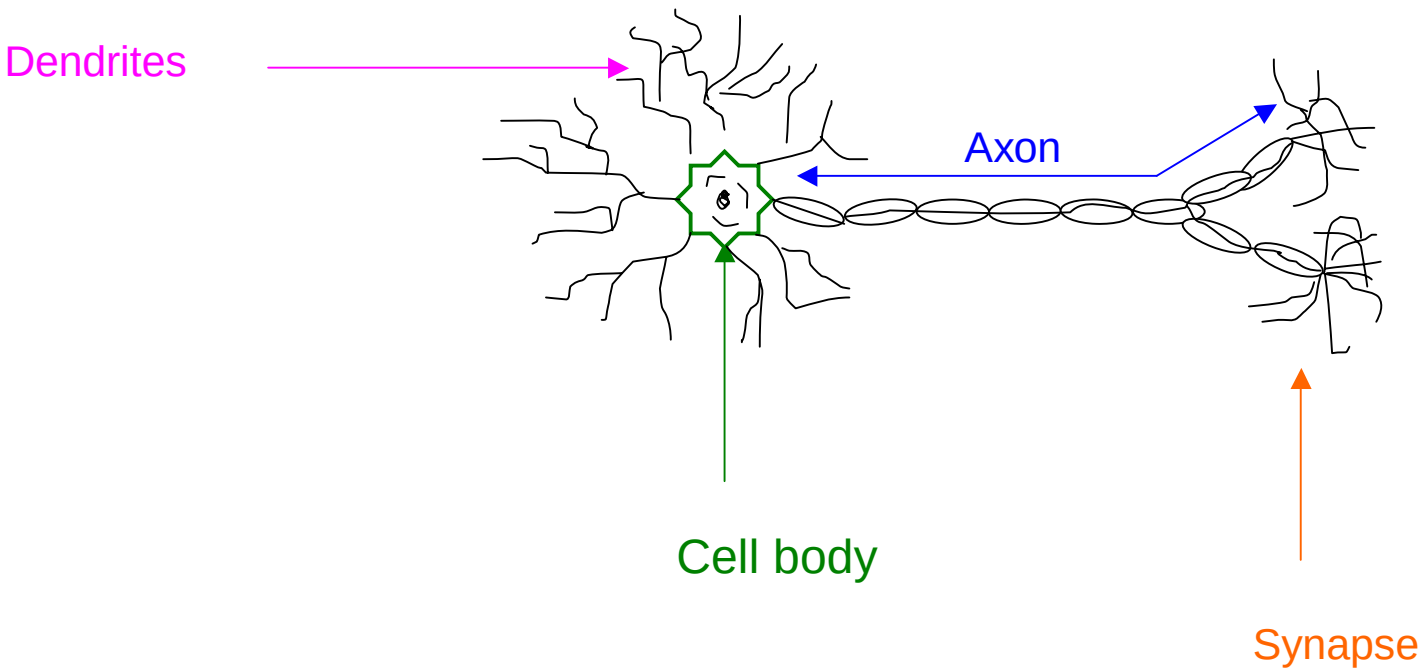


New patterns of behavior

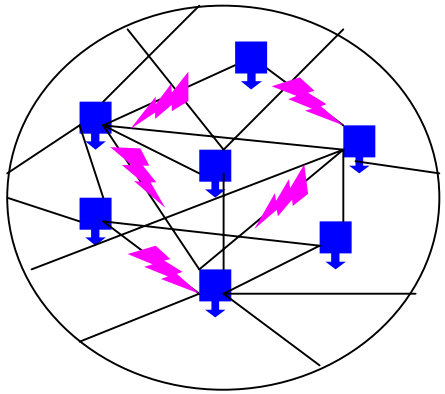
The 4 steps in learning



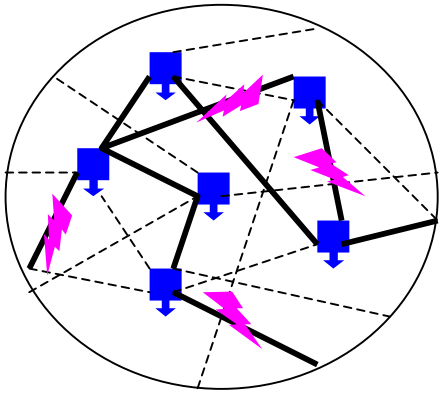
Neuron



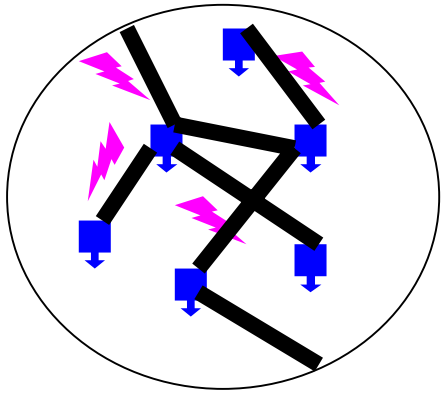
Brain development



Age 0 – 2



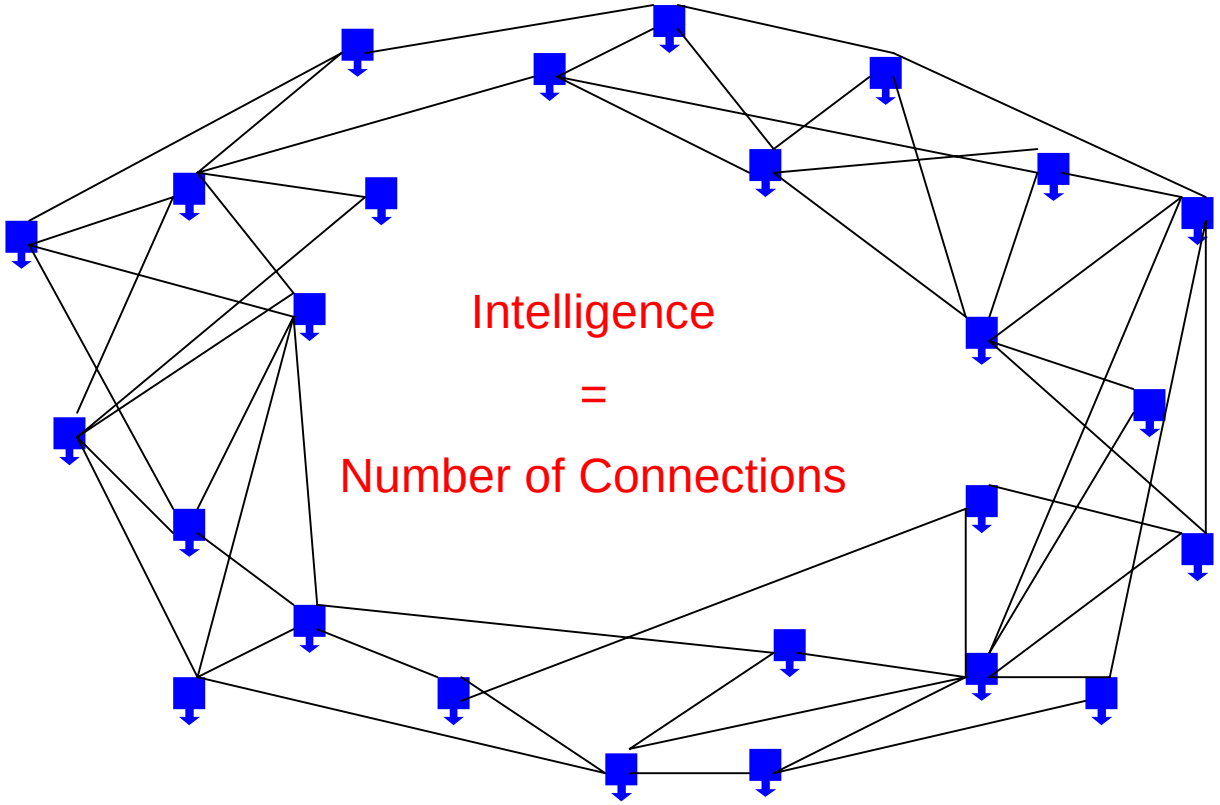
Age 2 – end of adolescence

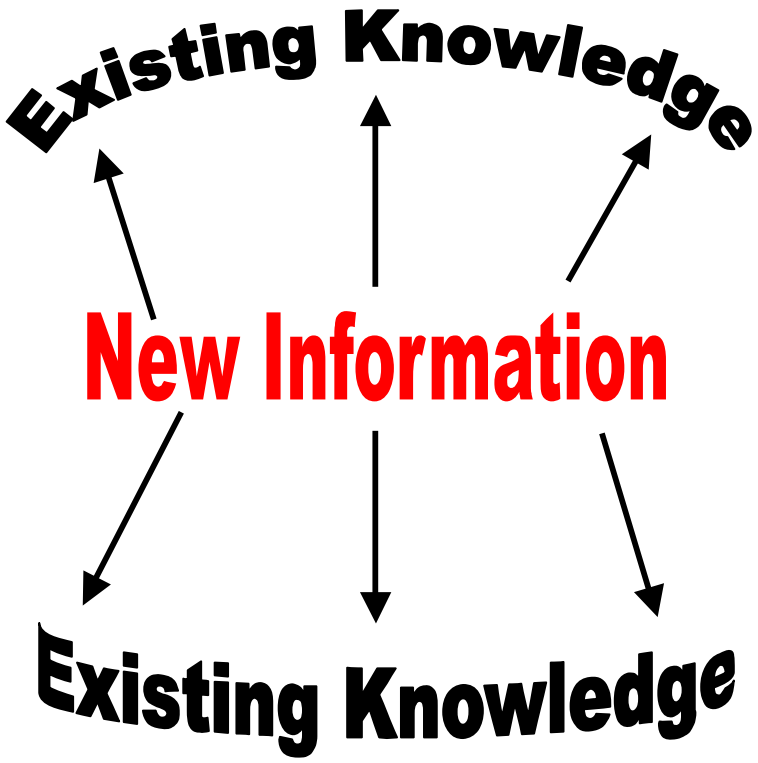


Adult

Neuron with synapse

Electrical impulse


Intelligence
=
Number of Connections


Existing Knowledge
New Information
Existing Knowledge

Recognizing individual differences

Connecting links & prior knowledge

Number of verbal & pictorial links to existing knowledge

Reference to life

Relationship to our own life

Style of learning

Preference for style of learning depending on exposure

Basic patterns of perception

Preference for input channel depending on first months of life

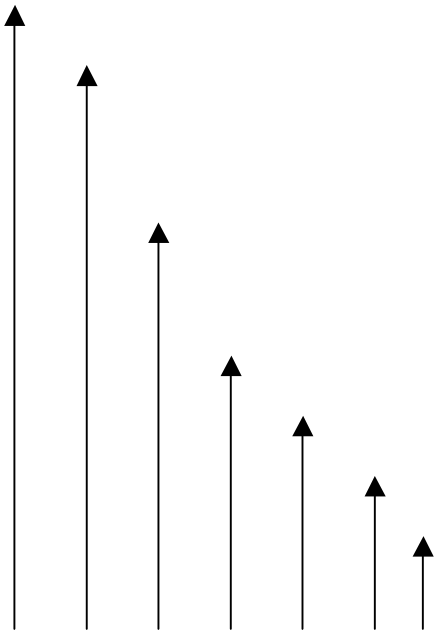
Recognizing individual differences

Auditory Learners	Listening & Hearing
	Fundamental principles explained
	Misunderstandings clarified in discussion
Visual Learners	Observing & Seeing
	Observing demonstration
	Reading & apprehending by insight & reasoning
Kinesthetic Learners	Touching & Feeling
	Experiencing meaning by handling & feeling
	Executing experiment

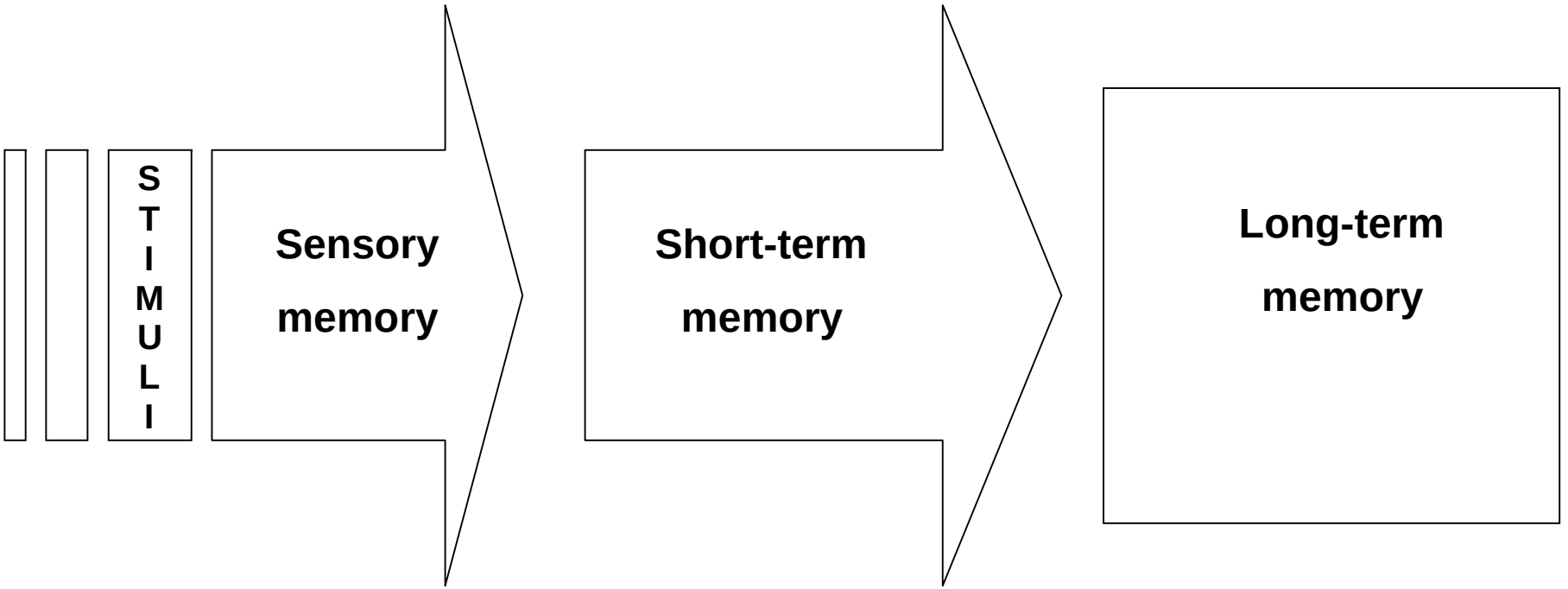
Acquiring information

Remembering information

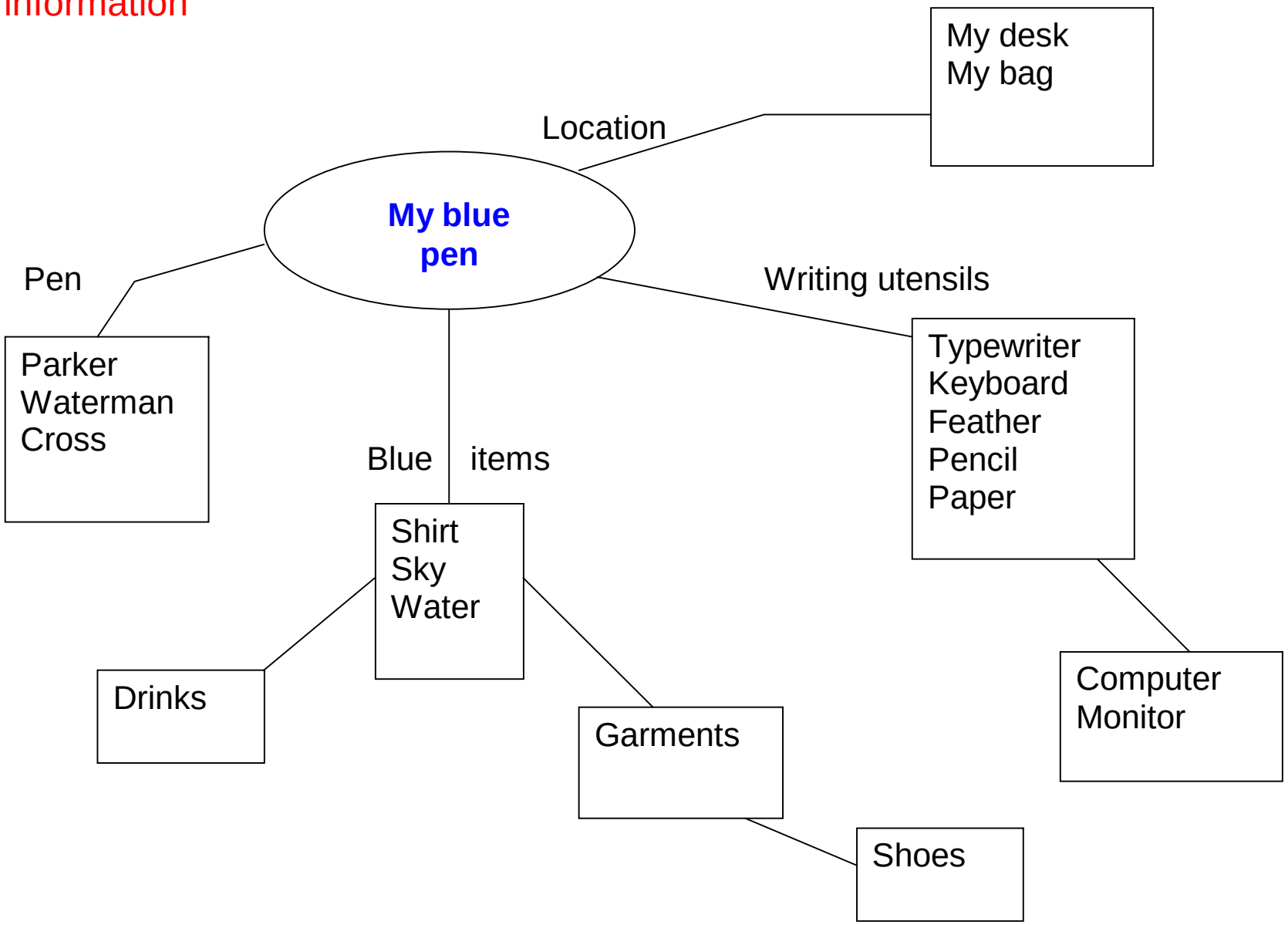
By exploring & overcoming difficulties on your own	90 %
By exploring & phrasing on your own	80 %
By talking about it	60 %
By seeing and hearing	40 %
By seeing	30 %
By hearing	20 %
By reading	10 %



The Human Memory



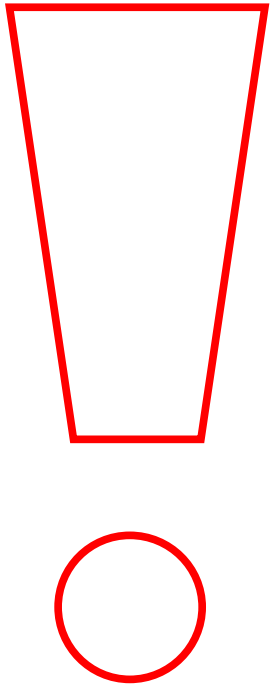
Storing information



The left & the right brain

Left **L**ogic brain	c**R**eativ brain **R**ight
Speech	Creativity (new combinations)
Calculations	Artistic activity
Intellectual Analysis	Musical ability/Rhythm
Reading	Emotions
Writing	Recognition
Naming	Comprehension
Ordering	Perception of abstract patterns
Sequencing	Spatial abilities
Complex motor sequences	Facial expressions
Critique	Holistic ability
Evaluation	Intuition
Logic	Images
	Color

Learning how to learn should be part of the curriculum



Visual

Visual learners find it easier to take in new information through pictures, diagrams, charts, films etc.

Auditory

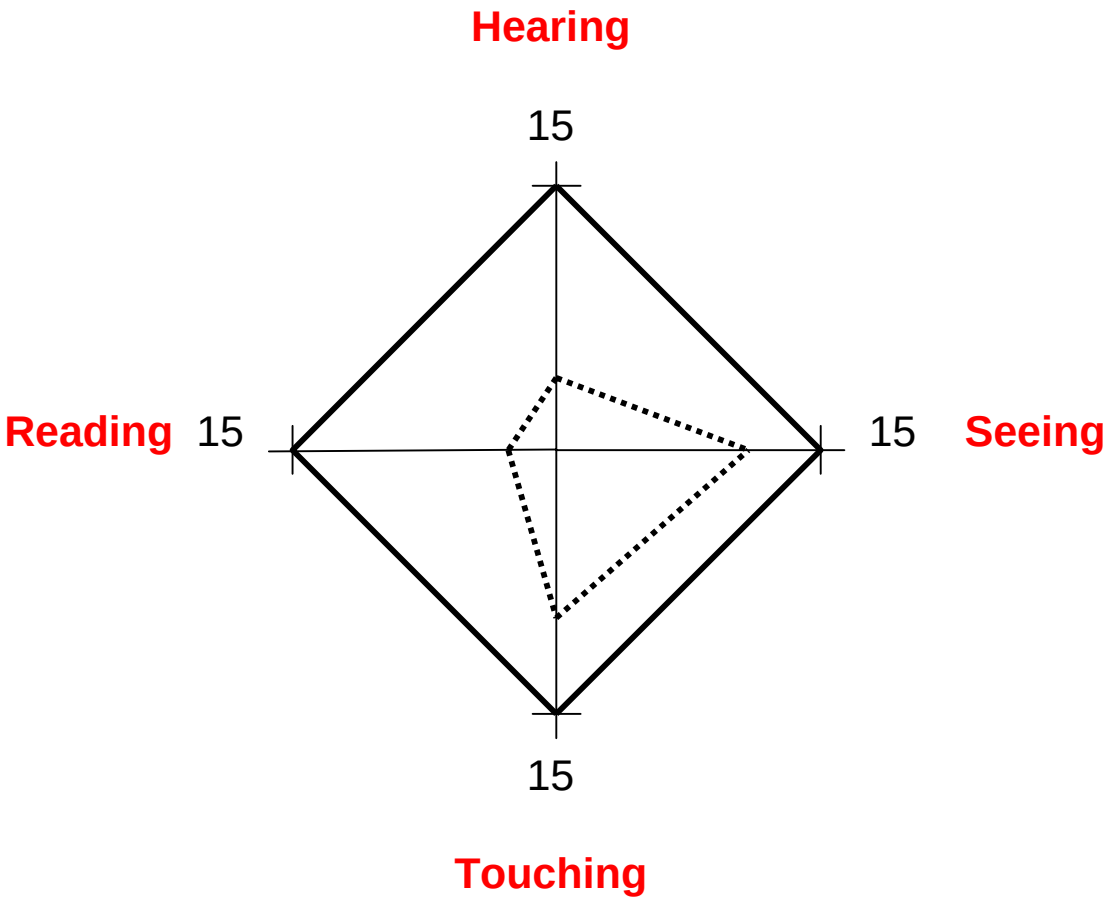
Verbal learners find it easier to take in new information through the spoken word.

Kinesthetic

Kinesthetic learners find it easier to take in new information through copying demonstrations and getting physically involved.

- [ ] When I touch an object and play with it, I can describe it much better as opposed to just thoroughly looking at it.
- [ ] Only when I have made a paper airplane myself do I know how it works. From observing alone I cannot remember it.
- [ ] Explaining me how to operate a machine or equipment, or being able to observe an experiment during instruction, I remember the process much better as opposed to only having a hands-on experience.
- [ ] I can find a way through town easier when I not only have been explained or shown it on the map, but also traced the route with my finger.
- [ ] I understand the design of a blossom or leaf better when looking at a drawing in a book than by examining it myself.
- [ ] I remember experiences better than conversations or what I read.

Assessment Chart



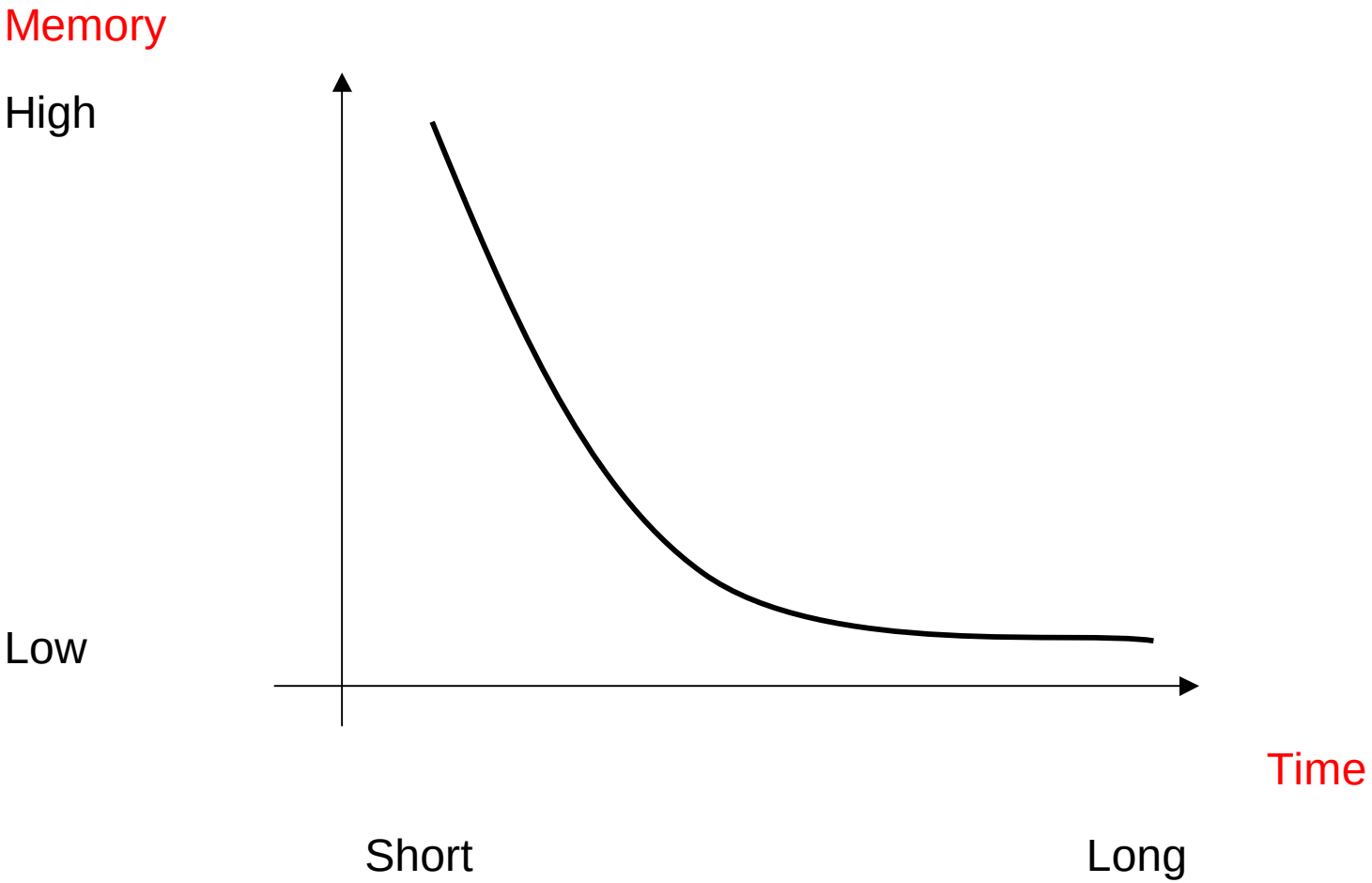


Chart 1: No repetition

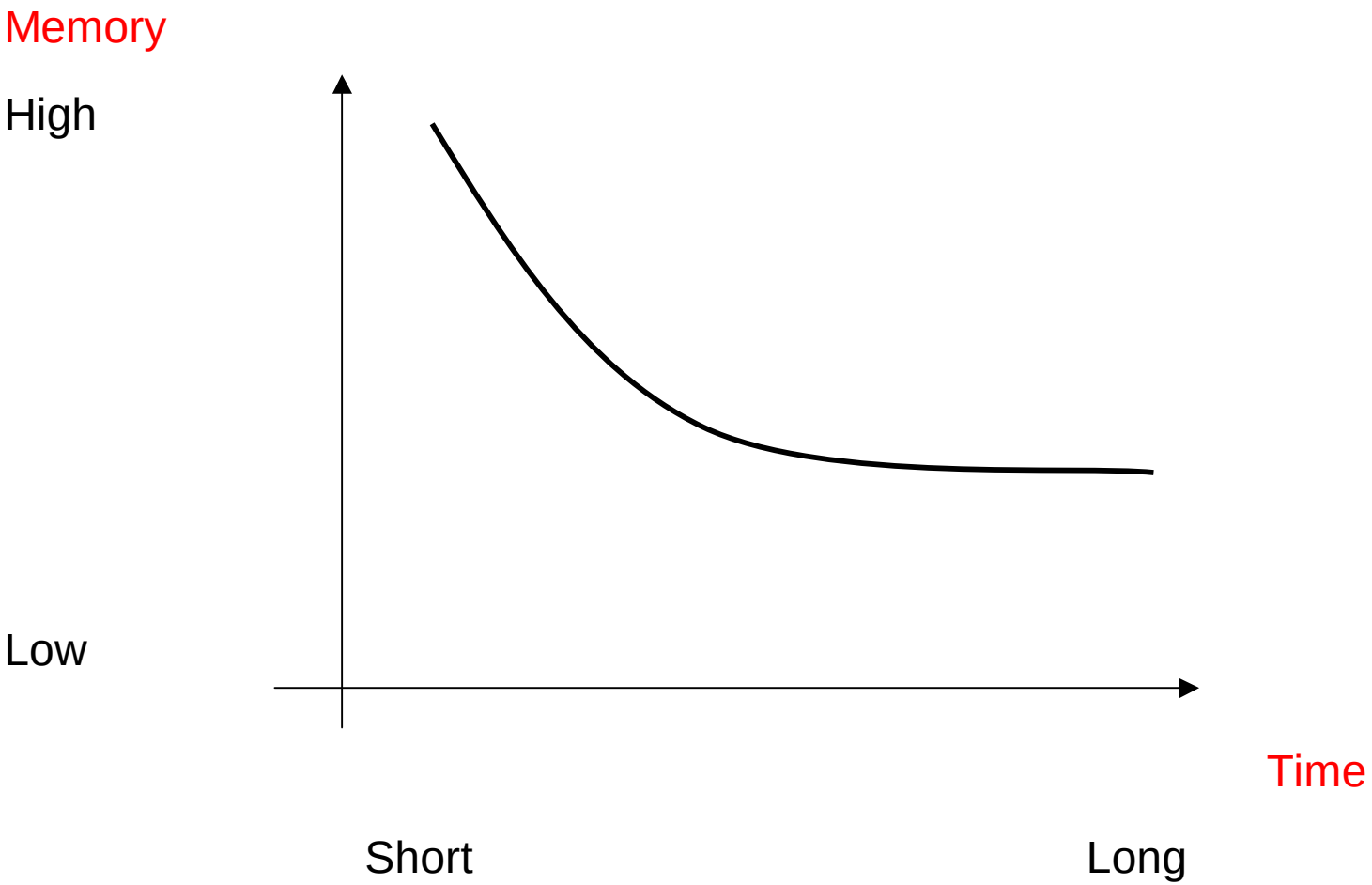


Chart 2: Repetition after 1 day

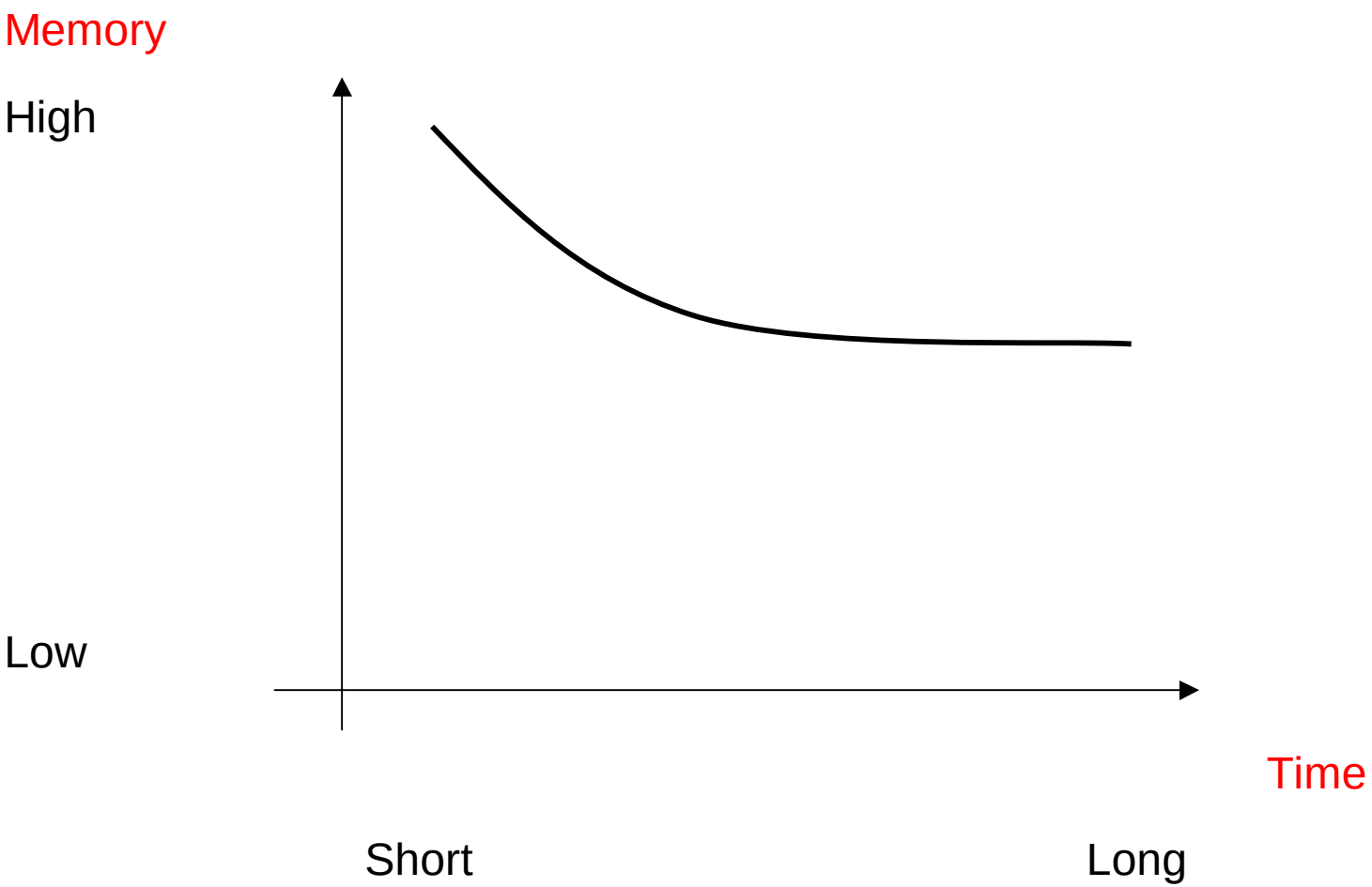


Chart 3: Repetition during same day

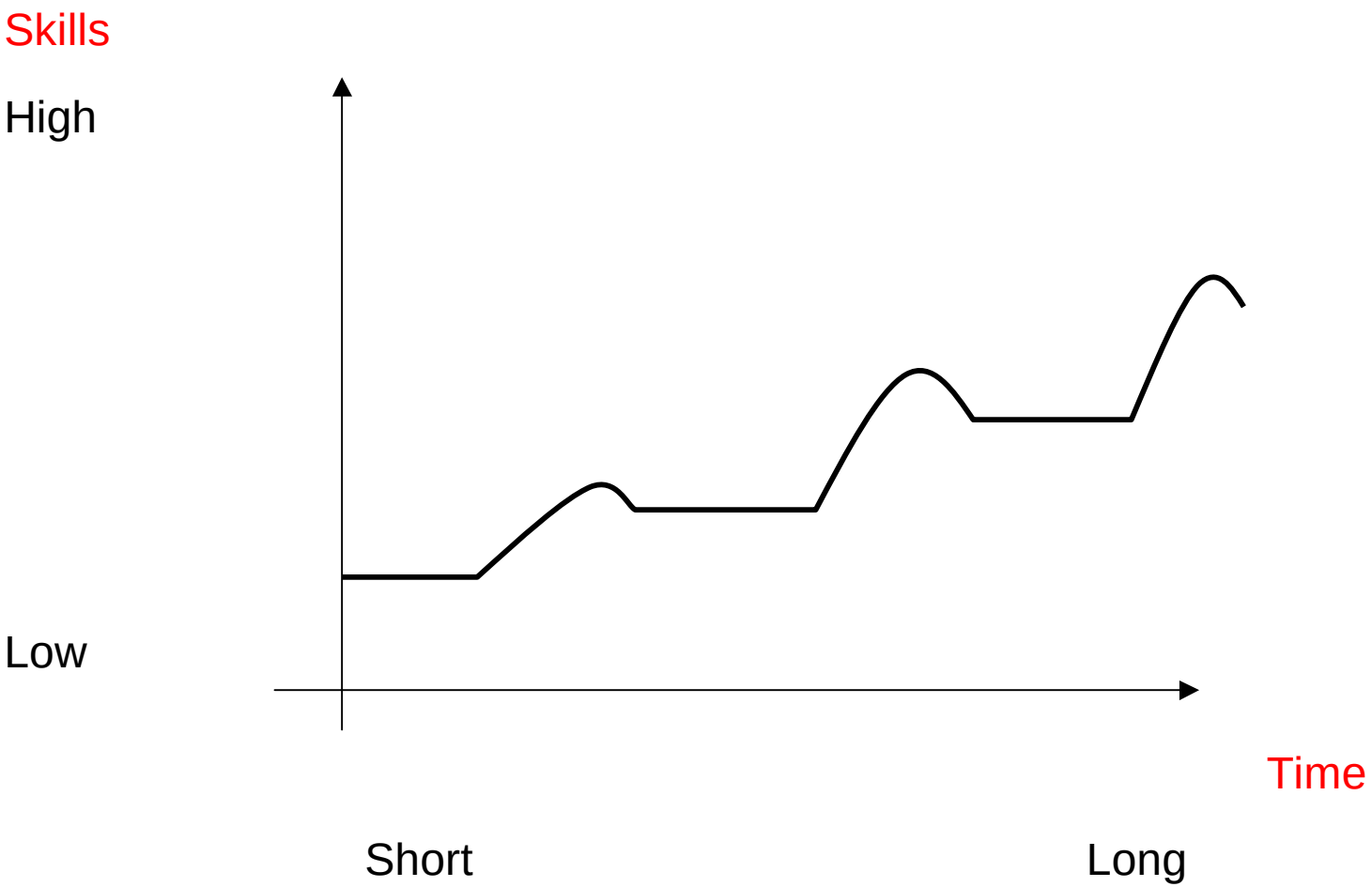


Chart 4: Ongoing repetition/exercise

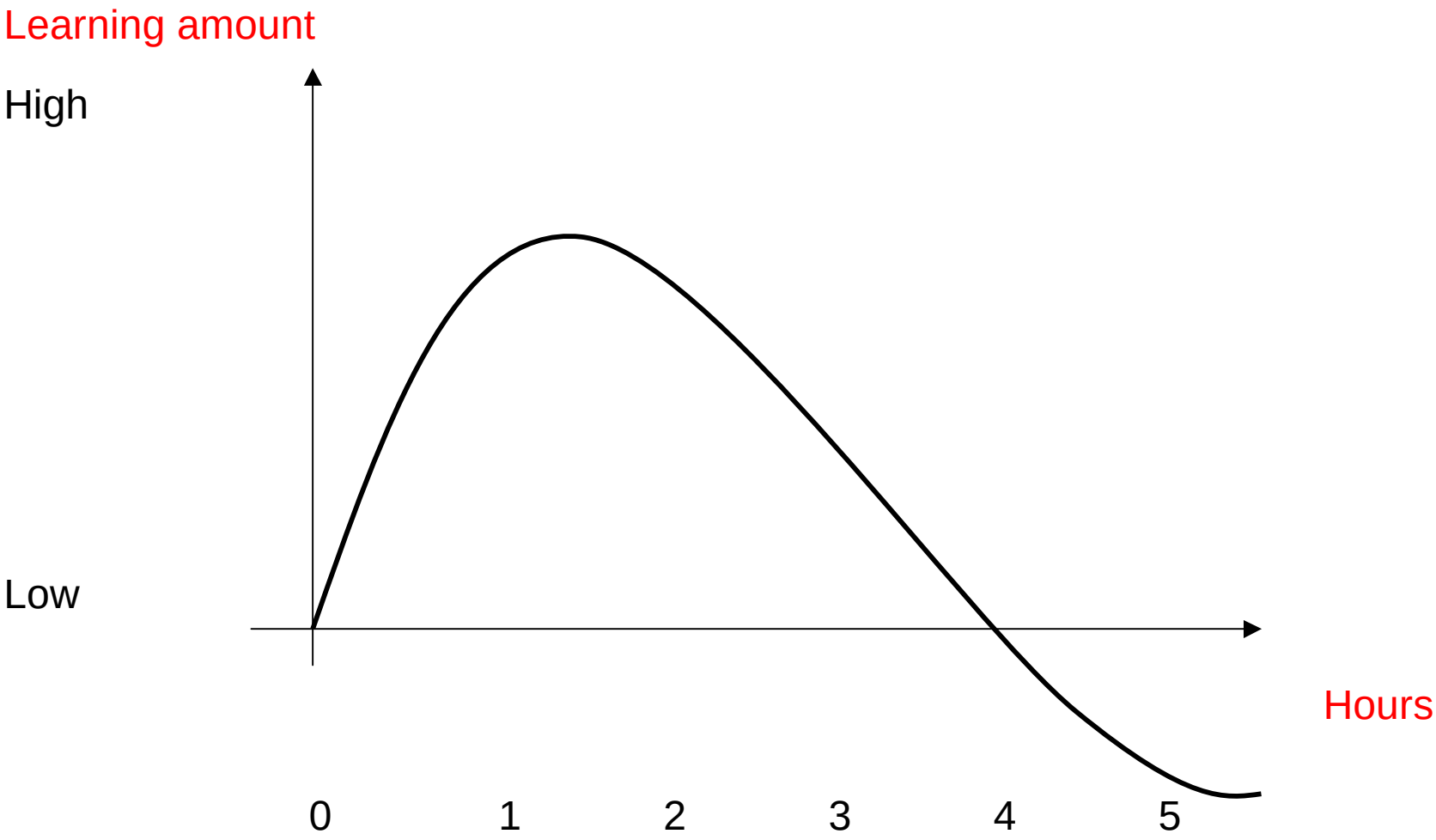


Chart 5: Continuous learning without breaks

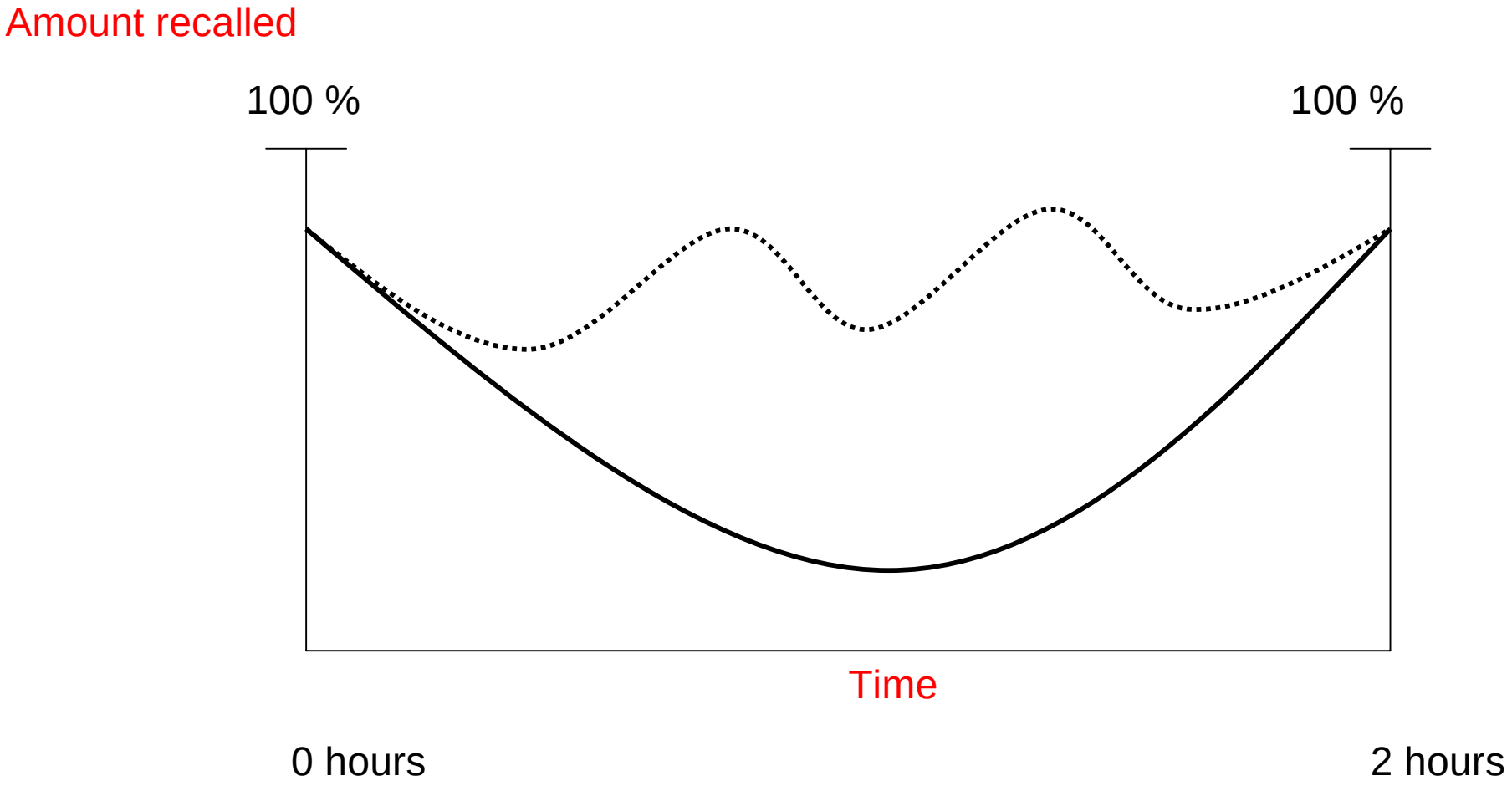
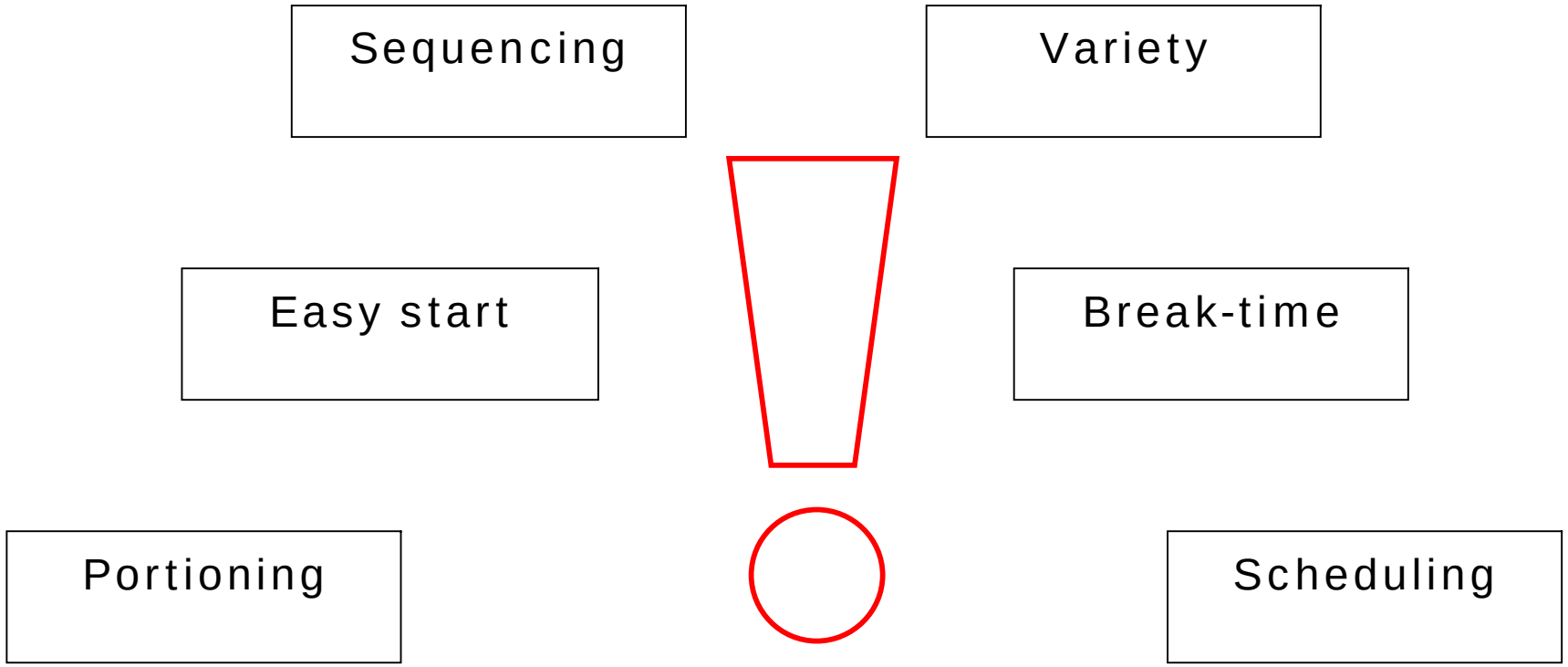
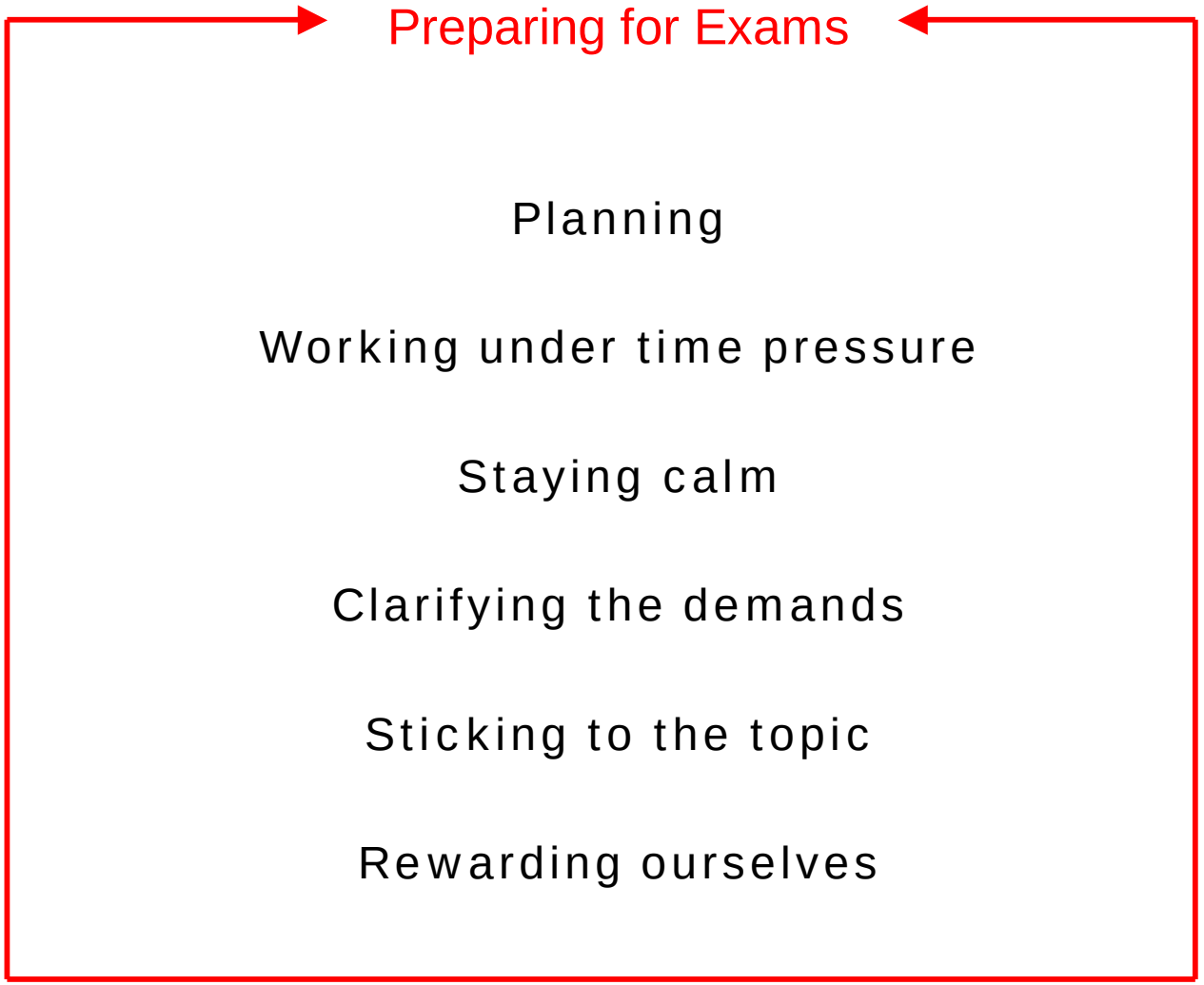


Chart 6: Learning with regular breaks

Planning Learning Activities




Preparing for Exams
Planning
Working under time pressure
Staying calm
Clarifying the demands
Sticking to the topic
Rewarding ourselves

The Learning Environment

My learning results are best

- When music is played during learning
- When I am not distracted by any kind of noise
- When I am alone in the room
- When someone I like stays with me in the same room
- When I am together with my classmates
- When I am surrounded with strangers (atmosphere of a café)
- When I have eaten before I start learning
- When I can eat or drink during learning
- When I am in a good mood
- When I am angry or frustrated
- When I am looking forward to something nice after I finish learning

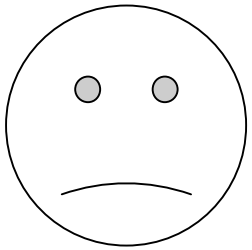
The Learning Atmosphere

Statements describing the learning atmosphere at school:

- I can follow some teachers very well, with others I have difficulties
- There are teachers I am afraid of
- With these teachers my marks are usually low
- With these teachers my marks are usually high
- I feel inhibited by my classmates or colleagues
- In a certain environment, I can concentrate myself very well, in others not
- I often experience thinking blockades and I do not understand despite repeated explanation

Learning Difficulties

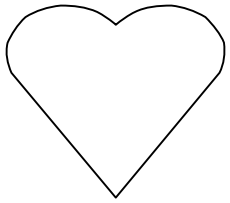
Mental sphere:



- Reduced ability to structure when acquiring information
- Reduced ability to abstract and conceptualize
- Limited ability to transfer known facts to new situations
- Restricted imagination
- Restricted perception
- Reduced memory performance
- Reduced ability to concentrate
- Language deficits

Learning Difficulties

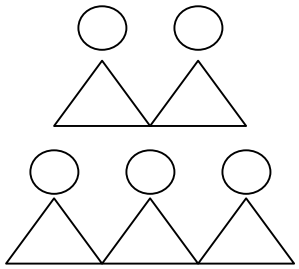
Emotional sphere:



- Lacking emotional stability
- Strong orientation on needs when acting
- Rather passive drift approach than active problem solving and shaping of life
- Tendency for depression or aggression
- Deficiency in acknowledging and expressing own feelings
- Strong fear of failure
- Negative self-image with low self-esteem
- Low staying power, little perseverance
- Aversion against school and school tiredness

Learning Difficulties

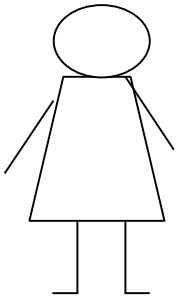
Social sphere:



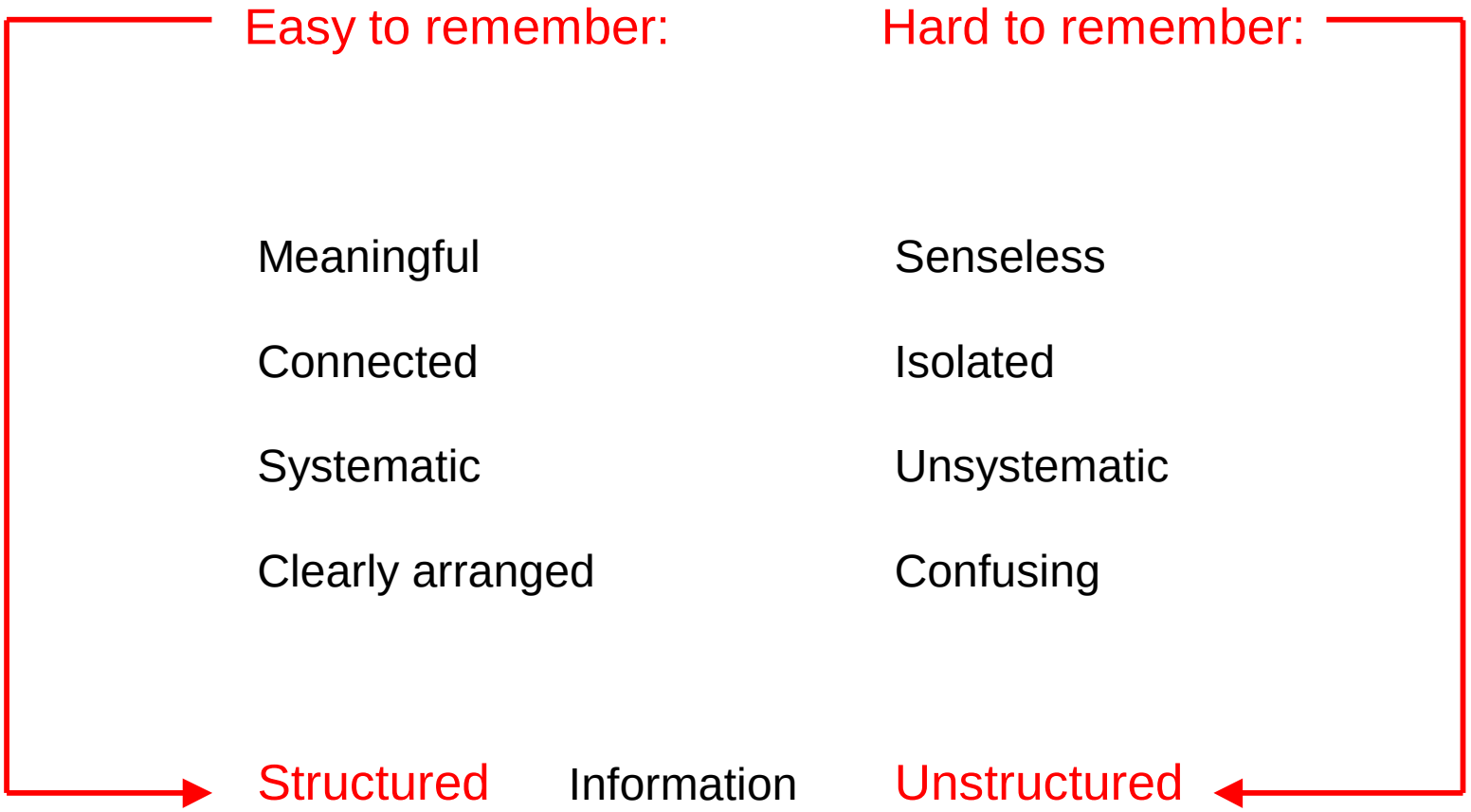
- Reduced ability and willingness for cooperation
- Difficulties with accepting and coping of social role
- Social behavior ranging between being the clown or being strongly inhibited
- Loner
- Emotional outbursts
- Problems to subject to social rules

Learning Difficulties

Physical sphere:



- Frequent delays in physical development such as muscle development, growth, sexual maturity etc.
- Reduced performance with regard to speed, coordination and strength during work proceedings
- Weakness with fine motor skills and therefore with precision
- Poor coordination between muscle activity and perception


Easy to remember:
Hard to remember:
Meaningful
Connected
Systematic
Clearly arranged
Senseless
Isolated
Unsystematic
Confusing
Structured
Information
Unstructured

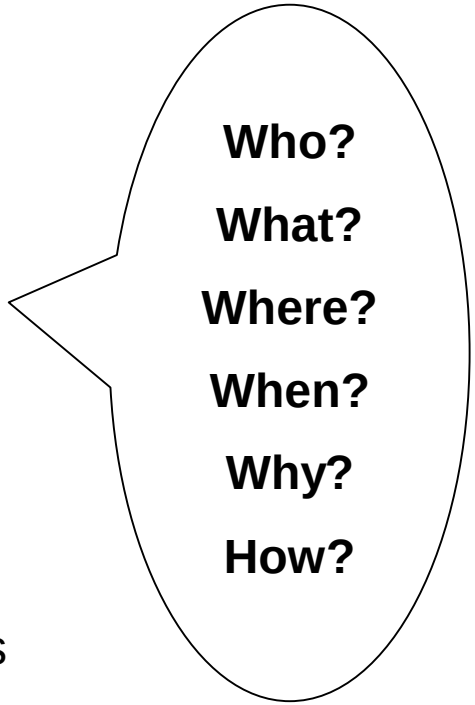
Why skimming through a text?

Survey reading is useful when…

1. topic of text is not totally unknown to us
2. we look for specific information to answer given or self-constructed questions
3. we deal with a longer text of which only a part is important for us
4. we want to get a first impression before reading it in detail
5. we are already knowledgeable about a topic and only like to verify whether a text contains any new information for us
6. we quickly want to know whether a text contains any interesting or important information for us

Questions

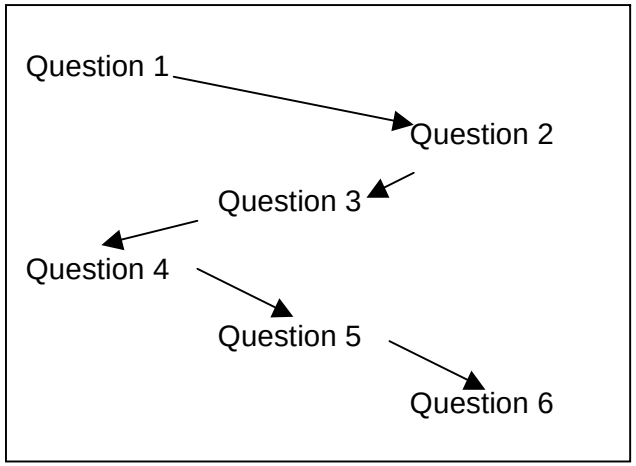
Knowledge	Comprehension			Values
	Causes	Results	Countermeasures	
Asking for: Terms Numbers Names Details to be memorized	Lead further into topic and require thinking, combining and arguing			Concern personal opinions and values



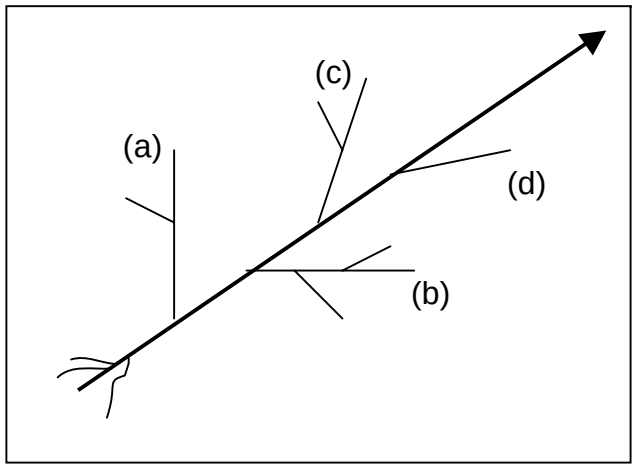
Frameworks for organized writing

1. .....
   1.1. .....
   1.2. .....
2. .....
   2.1. .....
   2.2. .....
   2.3. .....

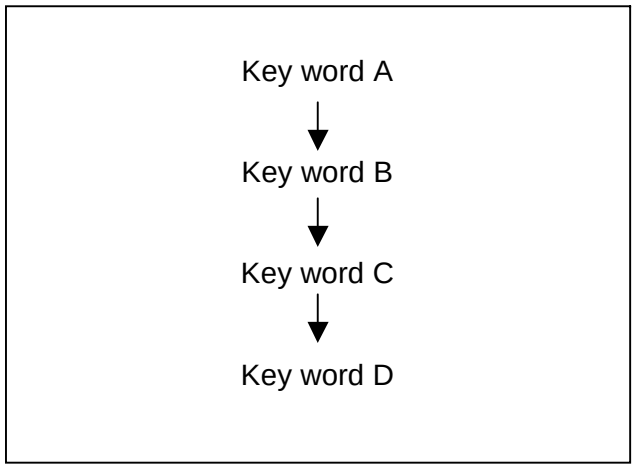
Plan for outline



Chain of questions



Tree frame



Chain of key words

Rules for Mind Mapping

1. We begin with a word, symbol or picture representing our topic.

   We put it at the center of a blank page.

   We use the paper in landscape format.

2. We write down key words.

   We connect them with lines (branches) radiating from our central image.

   We print key words for easier reading.

   We print one key word per line/branch.

   We create side branches for points related to the key words.

3. We use colors, pictures, dimensions and codes for emphasis/association.

   We highlight important points, e.g. using text marker.

   We illustrate relationships using colors, arrows etc.

Seminar Papers

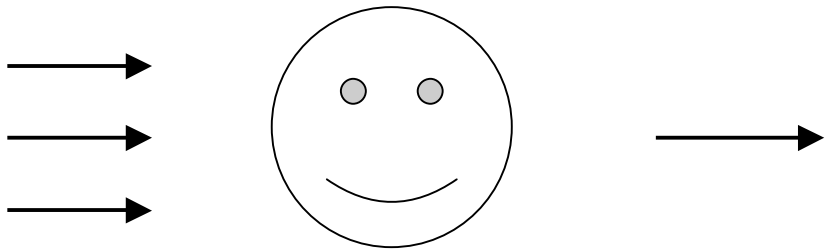
Introduction	Topic, reasons for topic, importance of topic
Main part	Development of central ideas/main bulk of information
End	Summary/Result/Conclusion

Title page	Title/topic, subtitle, author, purpose of presentation, month & year
Table of content	List of numbered chapters and respective page number
Bibliography	List of books used for writing the paper stating name of author, title, place and year of publishing, appearing in alphabetical order
Quotes	Identified by quotation marks, statement of source inclusive page number

Requirements at work

1. Organizing and carrying out assignments

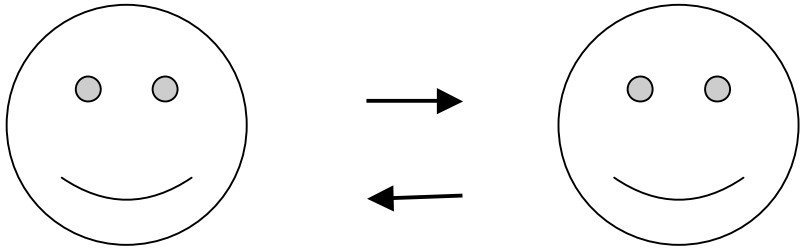
- Determination
- Accuracy
- Systematic course of action
- Organizational ability
- Coordinative ability



Requirements at work

2. Communication and cooperation

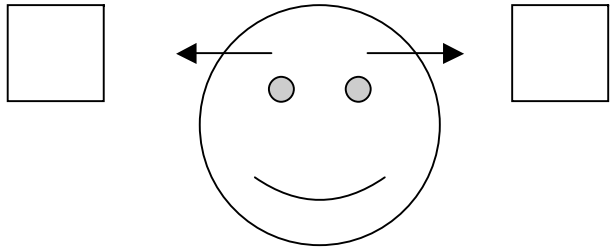
- Open-mindedness
- Ability to cooperate
- Ability to work in teams
- Appropriate behavior towards customers
- Appropriate behavior towards colleagues
- Intuition



Requirements at work

3. Application of learning techniques

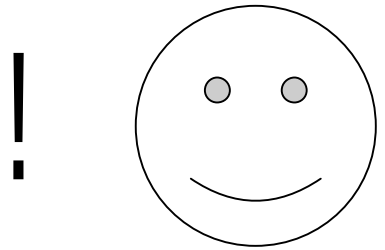
- Using learning techniques
- Deductive thinking
- Ability to transfer methods to other areas
- Thinking in systems



Requirements at work

4. Independence and responsibility

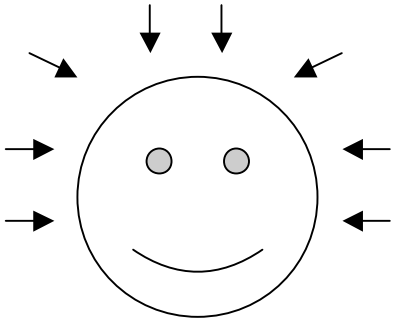
- Involvement
- Reliability
- Acting prudently
- Ability to criticize oneself
- Ability to express own opinion



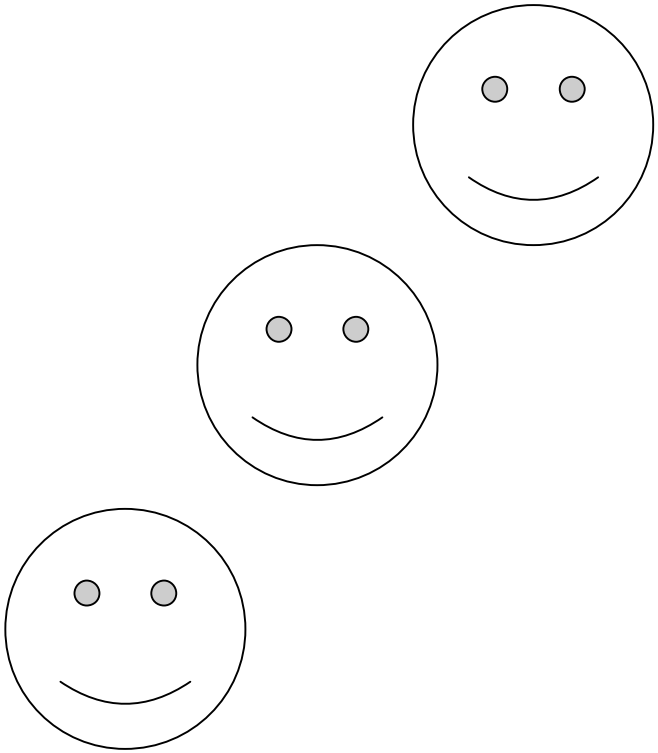
Requirements at work

5. Ability to work under stress

- Ability to concentrate
- Perseverance
- Adaptability



Importance of group work

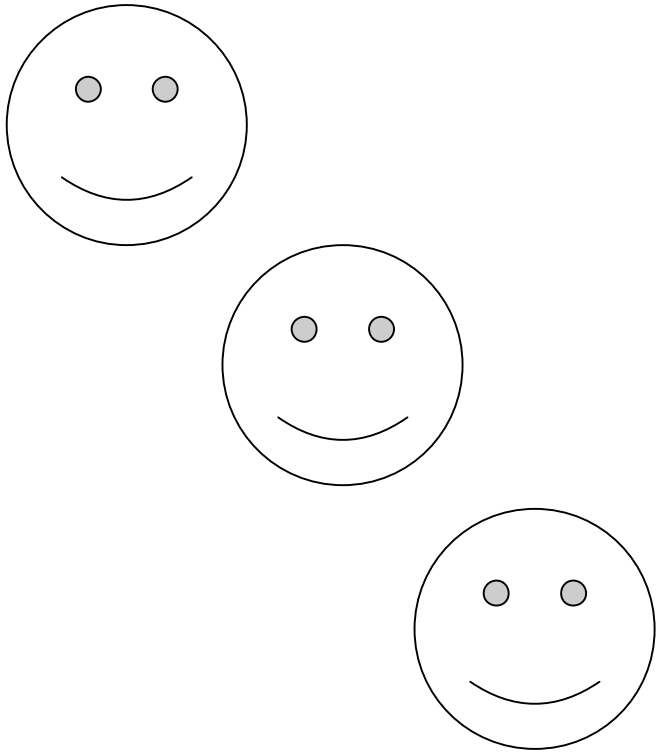


Associations

Explanations

Assistance

Activation



Check of performance

Group work & Social skills

Fair sharing of workload

Finding a compromise among different views

Using convincing technical arguments

Dealing with criticism

Accepting the superiority of other teams' results in a fair appreciation