ACCELERATED LEARNING

A multi-sensory presentation

filtered by the limbic system activates

both the left hemisphere

logic / linear
analyses / word

and the right hemisphere

pattern / picture
space / music

involves all nine intelligences

This way you meet all

needs of the learners

As a result accelerated learning is evoked

imaginative resourceful state of mind

special skills

BRAIN – FRIENDLY LEARNING

The Triune Brain Theory

The Triune Brain

Archipallium brain (reptilian brain)
Palleomammalian brain (limbic system)
Neopallium brain (neocortex)

Dr Paul MacLean of the National Institute of Mental Health, Washington DC suggests that the brain is made up of three distinct areas;

The Reptilian Brain. (5%)
This lies at the base of the brain and is likely to be the oldest, evolutionary part of the brain. The main responsibility of this brain is to ensure survival and to maintain routine body functions (breathing, heart beat...etc)
In animals such as reptiles, the brain stem and cerebellum dominate. For this reason it is commonly referred to as the "reptilian brain". It has the same type of archaic behavioural programmes as snakes and lizards. It is rigid, obsessive, compulsive, ritualistic and paranoid, it is "filled with ancestral memories". It keeps repeating the same behaviours over and over again, never learning from past mistakes. This brain controls muscles, balance and autonomic functions, such as breathing and heartbeat. This part of the brain is active, even in deep sleep.

The Limbic System/Mid-Brain (15% of the brain)
This is located at the seat of the emotions and regulates the sense of self-identity, belief, values and long term memory. A high level of self-esteem and motivation keeps the mid-brain happy and open to successful learning. This is linked to the idea of Emotional Intelligence. It filters the data that flows through the senses- picking out the important pieces of information and bringing them into consciousness.

The Neo-Cortex (80% of the brain)
The higher cognitive functions which distinguish Man from the animals are in the cortex. MacLean refers to the cortex as "the mother of invention and father of abstract thought
This is the academic brain where the higher order thinking skills occur. It is divided into two hemispheres; the right and the left. The brain is stimulated to learn by novelty, multi-sensory learning techniques, high stimulation and regular feedback. It works best in short bursts. Each brain is unique and the individual must tailor learning approaches according to their own needs.

This hypothesis has become a very influential paradigm, which has forced a rethink of how the brain functions. It had previously been assumed that the highest level of the brain, the neocortex, dominates the other, lower levels. **MacLean has shown that this is not the case, and that the physically lower limbic system, which rules emotions, can hijack the higher mental functions when it needs to.**
Summary

The Brain Stem - our reptilian brain
This is the primitive brain which is only interested in the four Ss:

- sustenance

- shelter
- safety
- sex

This puts a whole new meaning to the term "snake oil salesperson"!

Features
- flight/fight centre
- acts rather than thinks
- we downshift to reptile when under threat, when downshifting occurs, learning cannot take place

The Limbic System - our emotional brain

- The limbic system is the seat of emotion. Often our most memorable learning experiences are linked with emotion.
- Has visual memory, but language is limited to screams and expletives.
- "Soft skills" like empathy, understanding, assertion, humour are increasingly recognised as being important for learning.

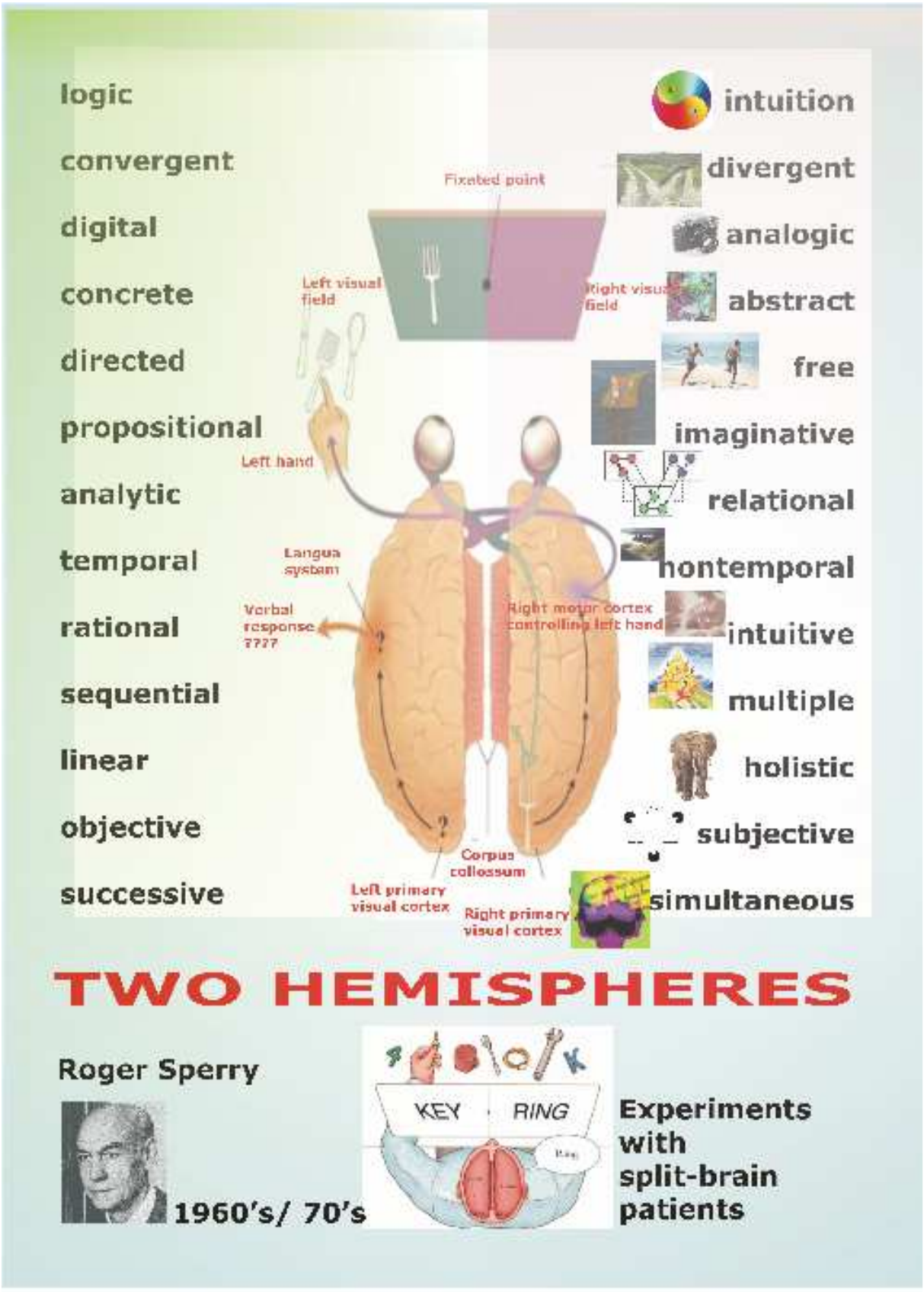
Emotional intelligence is gaining more press recently as a critical factor in learning.

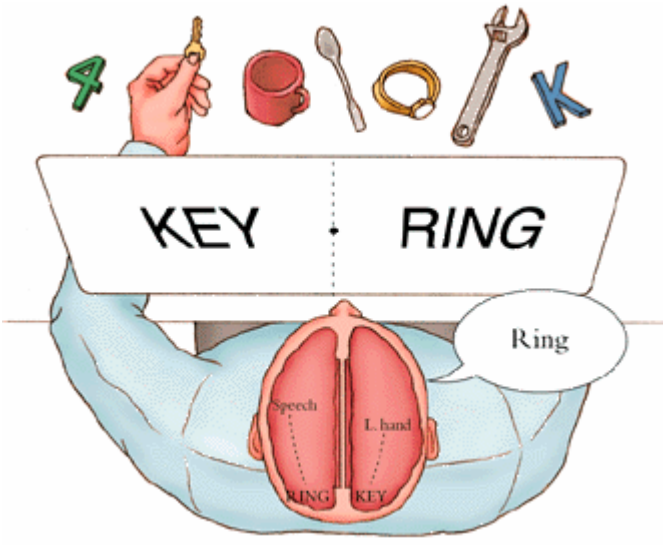
The neocortex - our rational brain

- The seat of academic learning.
- The neo-cortex is divided into the **right and left brain.**

To be receptive to learning, the learning environment must be absent of threats. Otherwise, we downshift to limbic, or if it's really bad, to reptile!

THE TWO HEMISPHERES by Roger Sperry





The participant fixates a centre dot and then sees a picture or a word on the right or left side of the dot. He may be asked to respond verbally, by reading the word or naming the picture. He may also be asked to respond without words, for example, by picking out a named object from among a group spread out on a table and hidden from view, so that it can only be identified by touch.

The "split brain" was first discovered in the laboratory by Roger Sperry and Ronald Meyers in the late 1950's . Initially they began experimenting with cats, and later proceeded to study monkeys. In 1961 the first human patient was subject to the split brain surgery.
The procedure worked well as a "cure" for patients who suffered from severe epilepsy and did not respond to anti-epileptic drugs. It was soon discovered that patients who had a commissurotomy had some interesting difficulties. Patients were not able to communicate information from one hemisphere to the other, almost as though they now had two separate brains.
Here is an example of a standard experiment done to examine split brain perception.
Sperry and other scientists proceeded with further experimentation in order to determine the relationship between the right and left hemispheres of the brain. How (and what) the hemispheres communicate would provide valuable insight into the "mind" of a split brain patient. How did a commissurotomy affect one's perceptions of the outside world?
In one experiment, a word (for example "fork") was flashed so only the right hemisphere of a patient could receive the information. The patient would not be able to say what the word was. However, if the subject is asked to write what he saw, his left hand would begin to write the word "fork". If asked what he had written, the patient would have no idea. He would know that he had written something, he could feel his hand going through the motion, yet he could not tell observers what the word was. Because there is no longer a connection between the two hemispheres, information presented to the right half of the brain cannot convey this information to the left. Interestingly enough, the centres for speech interpretation and production are located in the left hemisphere. Similarly, if the patient is blindfolded and a familiar object, such as a toothbrush, is placed in his left hand, he appears to know what it is; for example by making the gesture of brushing his teeth. But he cannot name the object to the experimenter. If asked what he is doing with the object, gesturing a brushing motion, he has no idea. But if the left hand gives the toothbrush to the right hand, the patient will immediately say "tooth brush".
Micheal Gazzaniga, who did his graduate work in Sperry's laboratory, did further experiments which showed the attempts of the left hemisphere to compensate for it's lack of information, as well as attempts by the right hemisphere to get it's knowledge conveyed.
These experiments, pioneered by Sperry and colleagues, provided insight into the functionings of the two hemispheres and how they are different.

Two Ways of Knowing

The key idea is that there are two parallel "ways of knowing".

Parallel ways of knowing (J. E. Bogen)	
LEFT	**RIGHT**
intellect	intuition
convergent	divergent
digital	analogic
secondary	primary
Abstract	concrete
directed	free
propositional	imaginative
analalytic	relational
lineal	nonlineal
rational	intuitive
sequential	multiple
analytic	holistic
objective	subjective
successive	simultaneous

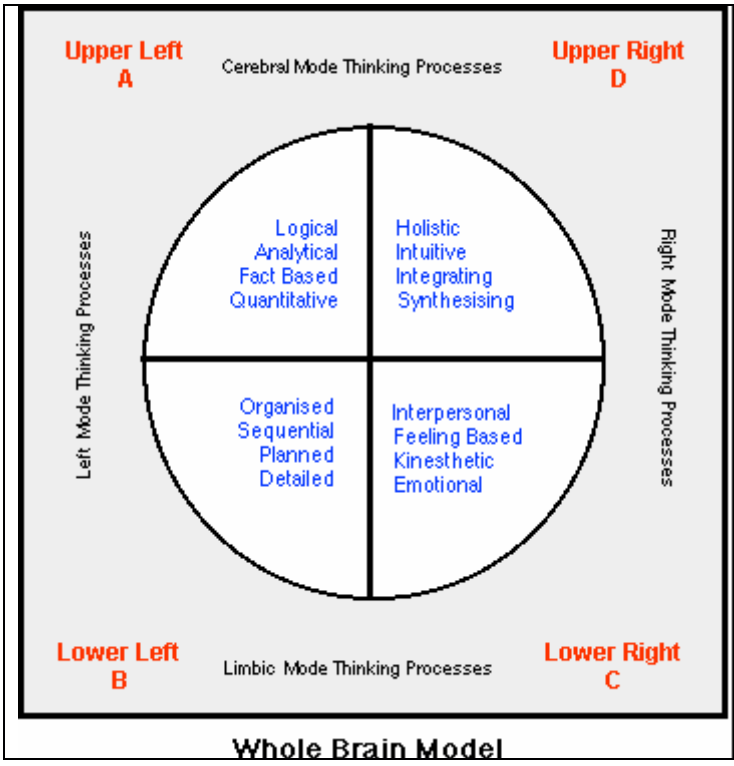
The Whole Brain/Four Quadrant Model

Ned Herrmann showed that by incorporating the research of Paul McLean of the Triune Brain and Roger Sperry's Left Brain/Right Brain function, we can build a model of the human brain with two paired structures, the two halves of the cerebral system and the two halves of the limbic system. This allows s to differentiate between not only the more popular notions of left/right brain, but also the more sophisticated notions of cognitive/intellectual which describes the cerebral preference, and visceral, structured and emotional which describes the limbic preference.

One further concept is important to understanding Ned Herrmann's Whole Brain Model, and that is dominance. The evidence of human dominance shows that wherever there are two of anything in the body, one is naturally dominant over the other. Therefore like we are right or left handed, we are also naturally `footed', `eyed'. `kidneyed', etc. We can also be thought of as `brained'. Since dominance can only occur between paired structures, the Herrmann Brain Dominance Model focuses on the Limbic and Cerebral layers of the Triune Brain.

The model is a metaphorical interpretation of how we think and what are our preferred ways of knowing.

The Whole Brain Model shows four distinct thinking styles.



Whole Brain Model

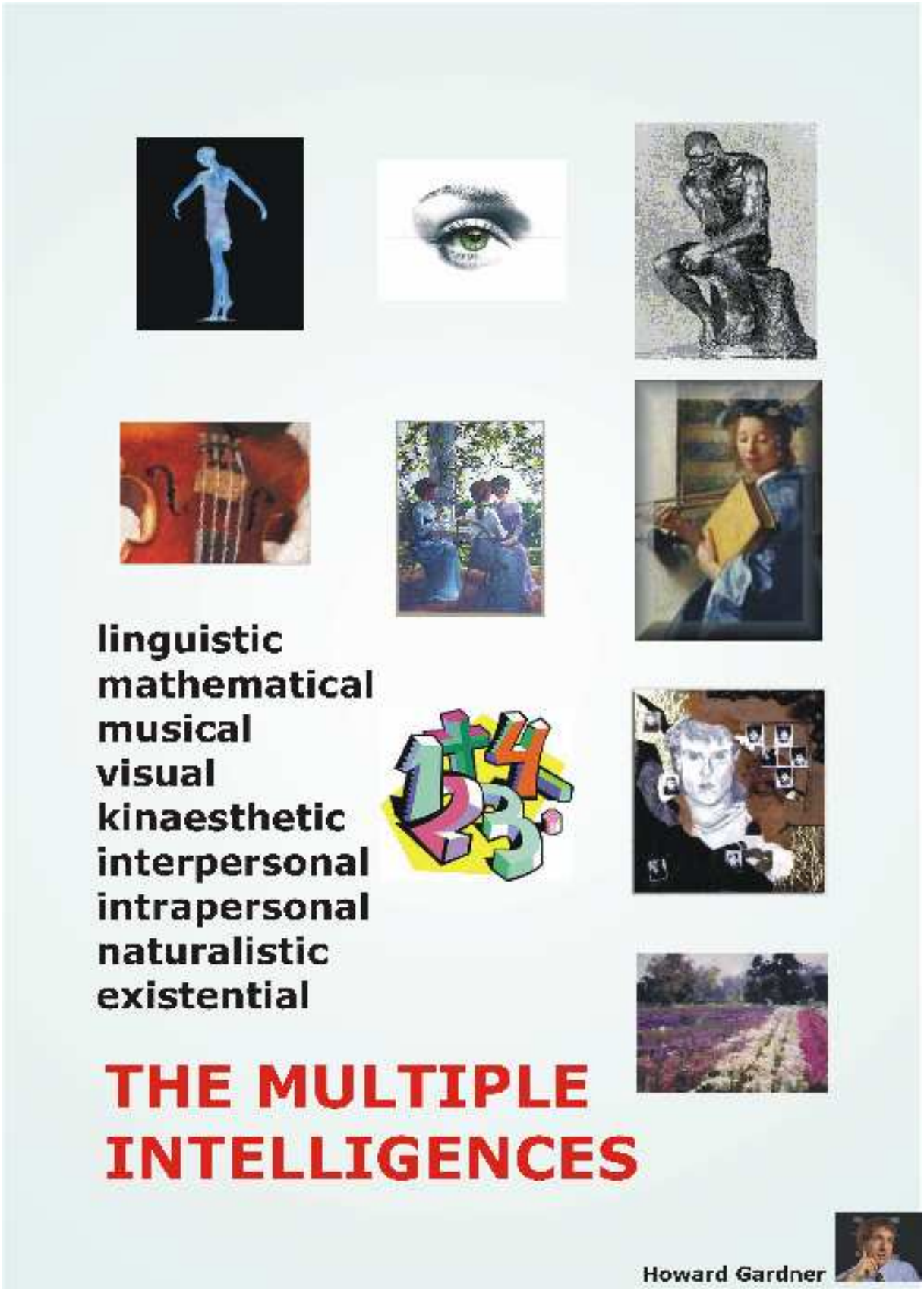
Modes of Thinking
The upper (cerebral) left A:analytical, mathematical, technical and problem solving.

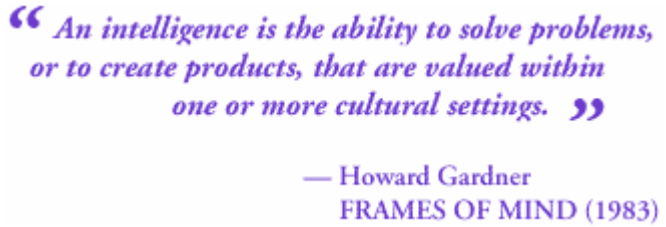
The lower (limbic) left B: controlled, conservative, planned, organised and administrative in nature.

The lower (limbic) rightC: interpersonal, emotional, musical, spiritual and the "talker" modes.

Upper (cerebral) right D: imaginative, synthesising, artistic, holistic and conceptual modes.

THE MULIPLE INTELLIGENCES





Dr. Howard Gardner, a psychologist and professor of neuroscience from Harvard University, developed the theory of Multiple Intelligences (MI) in 1983. The theory challenged traditional beliefs in the fields of education and cognitive science. Unlike the established understanding of intelligence -- people are born with a uniform cognitive capacity that can be easily measured by short-answer tests -- MI reconsiders our educational practice of the last century and provides an alternative. According to Howard Gardner, human beings have nine different kinds of intelligence that reflect different ways of interacting with the world. Each person has a unique combination, or profile. Although we each have all nine intelligences, no two individuals have them in the same exact configuration -- similar to our fingerprints.

- **Verbal-Linguistic Intelligence** -- well-developed verbal skills and sensitivity to the sounds, meanings and rhythms of words; the capacity to use language to express what's on your mind and to understand other people.
  Any kind of writer, orator, speaker, lawyer, or other person for whom language is an important stock in trade has great linguistic intelligence.

- **Mathematical-Logical Intelligence** -- ability to think conceptually and abstractly, and capacity to discern logical or numerical patterns
  the capacity to understand the underlying principles of some kind of causal system, the way a scientist or a logician does; or to manipulate numbers, quantities, and operations, the way a mathematician does.

- **Musical Intelligence** -- ability to produce and appreciate rhythm, pitch and timber
  the capacity to think in music; to be able to hear patterns, recognize them, and perhaps manipulate them. People who have strong musical intelligence don't just remember music easily, they can't get it out of their minds, it's so omnipresent.

- **Visual-Spatial Intelligence** -- capacity to think in images and pictures, to visualize accurately and abstractly
  the ability to represent the spatial world internally in your mind -- the way a sailor or airplane pilot navigates the large spatial world, or the way a chess player or sculptor represents a more circumscribed spatial world. Spatial intelligence can be used in the arts or in the sciences.

- **Bodily-Kinesthetic Intelligence** -- ability to control one's body movements and to handle objects skillfully
  the capacity to use your whole body or parts of your body (your hands, your fingers, your arms) to solve a problem, make something, or put on some kind of production. The most evident examples are people in athletics or the performing arts, particularly dancing or acting.

- **Interpersonal Intelligence** -- capacity to detect and respond appropriately to the moods, motivations and desires of others.
  the ability to understand other people. It's an ability we all need, but is especially important for teachers, clinicians, salespersons, or politicians -- anybody who deals with other people.

- **intrapersonal Intelligence** -- capacity to be self-aware and in tune with inner feelings, values, beliefs and thinking processes
  having an understanding of yourself; knowing who you are, what you can do, what you want to do, how you react to things, which things to avoid, and which things to gravitate toward. We are drawn to people who have a good understanding of themselves. They tend to know what they can and can't do, and to know where to go if they need help.

- **Naturalist Intelligence** -- ability to recognize and categorize plants, animals and other objects in nature
  the ability to discriminate among living things (plants, animals) and sensitivity to other features of the natural world (clouds, rock configurations). This ability was clearly of value in our evolutionary past as hunters, gatherers, and farmers; it continues to be central in such roles as botanist or chef.

- **Existential Intelligence** -- sensitivity and capacity to tackle deep questions about human existence, such as the meaning of life, why do we die, and how did we get here.
  the ability and proclivity to pose (and ponder) questions about life, death, and ultimate realities.

- According to Gardner
- All human beings possess all nine intelligences in varying amounts.
- Each person has a different intellectual composition.
- We can improve education by addressing the multiple intelligences of our students.
- These intelligences are located in different areas of the brain and can either work independently or together.
- These intelligences may define the human species.

THE MORE WAYS YOU TEACH
THE MORE STUDENTS YOU REACH

Definition of intelligence

Traditional Intelligence	**Multiple intelligences**
Intelligence can be measured by short-answer tests:	Assessment of an individual's multiple intelligences can foster learning and problem-solving styles. Short answer tests are not used because they do not measure disciplinary mastery or deep understanding. They only measure rote memorization skills and one's ability to do well on short answer tests. Some states have developed tests that value process over the final answer, such as PAM (Performance Assessment in Math) and PAL (Performance Assessment in Language)
People are born with a fixed amount of intelligence	Human beings have all of the intelligences, but each person has a unique combination, or profile.
Intelligence level does not change over a lifetime.	We can all improve each of the intelligences, though some people will improve more readily in one intelligence area than in others.
Intelligence consists of ability in logic and language.	There are many more types of intelligence which reflect different ways of interacting with the world
In traditional practice, teachers teach the same material to everyone.	M.I. pedagogy implies that teachers teach and assess differently based on individual intellectual strengths and weaknesses.
Teachers teach a topic or "subject."	Teachers structure learning activities around an issue or question and connect subjects. Teachers develop strategies that allow for students to demonstrate multiple ways of understanding and value their uniqueness.

Involving all the intelligences in the teaching process							
Skill ⇨ Intelligence↓	**Listening**	**Reading**	**Writing**	**Speaking**	**Grammar**	**Vocabulary**	**Literature**
Bodily – kinaesthetic 	Learners listen to three sections of a tape in three different places. Then form groups to collaborate on their answers to ask	Learners re-order a cut-up jumbled reading text	Learners write stories in groups by writing the first sentence of a story on a piece of paper and passing it to another learner for continuation	Learners play a game where they obtain information from various places in the classroom and report back.	Learners play a board game with counters and dice to practice tenses	Learners label objects in the classroom with names.	Learners create a similar scene to one they have read about and act it out. (e.g. a conflict, a time you were let down)
Interpersonal 	Learners check their answers to a listening task in pairs or groups before listening a second time	Learners discuss answers tom questions on a text in groups	Learners write a dialogue in pairs.	Learners read problem-page letters and discuss responses.	Learners do a "Find someone who…"activity related to a grammar point /e.g. present perfect: find someone who has been to Spain)	Learners test each other's vocabulary	In groups, learners discuss their preferences for characters in a book.
Intrapersonal 	Learners think individually about how they might have reacted, compared with someone on a video they have seen	Learners reflect on characters in a text and how similar or different they are to them.	Learners write learning diaries.	Learners record a speech or talk on a cassette.	Learners complete sentences about themselves, practising a grammar point (e.g. complete the sentence "I am as … as…" five times)	Learners make their own vocabulary booklet which contains words they think are important to learn.	Learners write a diary for a few days in the life of a character in a book.
Linguistic 	Learners write a letter after listening to a text.	Learners answer true/false questions about a text.	Learners write a short story.	In groups, learners discuss statements about a controversial topic.	The teacher provides a written worksheet on a grammar point.	Learners make mind maps of related words.	Learners rewrite part of a book as a film script, with instructions for the director and actors.

Logical – mathematical 	Learners listen to three pieces of text and decide what the correct sequence is.	Learners compare two characters or opinions in a text.	Learners write steps in a process (e.g. a recipe)	Learners in a group each have a picture. They discuss and re-order them, without showing them, to create a story.	Learners learn grammar inductively, i.e. they work out how a grammar rule works by using discovery activities.	Learners discuss how many words they can think of related to another word (e.g. paragraph, photographer)	Learners re-order a jumbled version of events in a chapter of a novel they have read.
Musical 	Learners complete gaps in the lyrics of a pop song.	Learners listen to music extracts and decide how they relate to a text they have read.	Learners write the lyrics to an existing melody about a text or topic they have been dealing with in class.	Learners listen to a musical video clip (with the TV covered up) and discuss which images might accompany the music)	Learners create a mnemonic or rhyme to help them remember a grammar point.	Learners decide which new words they would like to learn from a pop song.	Learners find a piece of appropriate music to accompany a passage from a book.
Naturalistic 	Learners listen to sounds inside and outside the classroom and discuss what they have heard.	Learners work with a text on environmental issues.	Learners write a text describing a nature scene.	Learners discuss an environmental issue.	Learners do an activity associated with nature (e.g. walk by the sea) and write a story in the past tense about it.	Learners make a mind map with a word related to nature (e.g. bird, tree)	Learners read descriptions of nature in a novel and then write their own.
Spatial 	Learners complete a chart or diagram while listening.	Learners predict the contents of a text using an accompanying picture or photo.	Learners make a collage with illustrations and text about a place in their country.	In pairs, learners discover the differences between two pictures without showing them to each other.	The teacher illustrates a grammar point with a series of pictures (e.g. daily activities to show present simple)	Learners cut out a picture from a magazine and label it.	Learners draw a cartoon version of a story.