
Psychology 20: Social Psychology

Unit Two

Who Am I?



The unexamined life is not worth living.
Plato



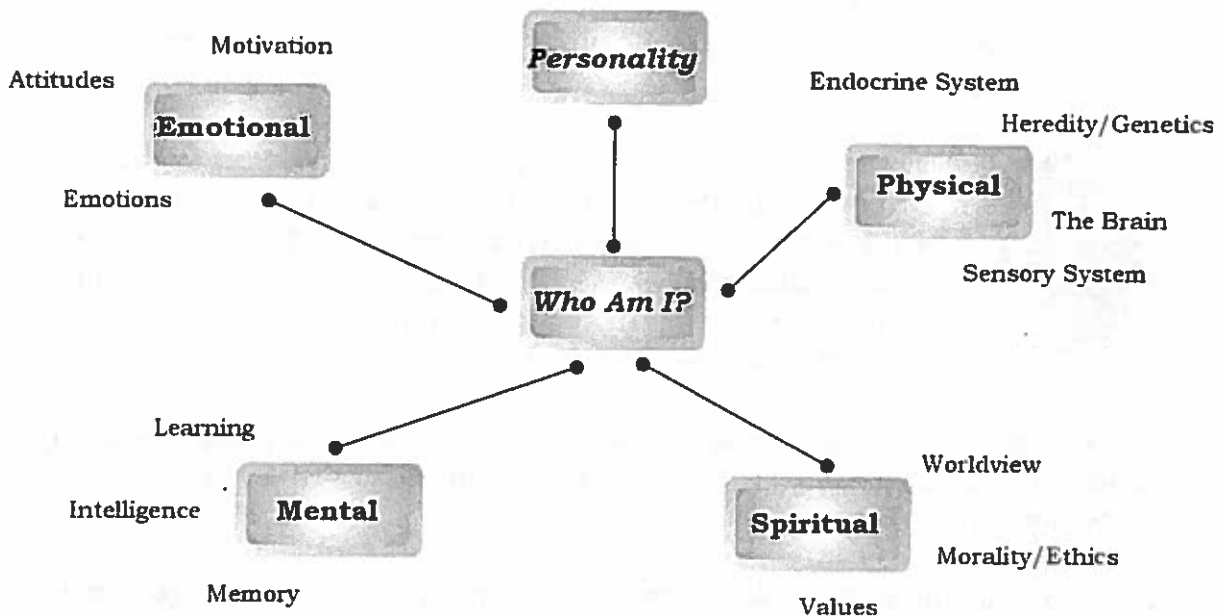
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Unit Two - Concept Web

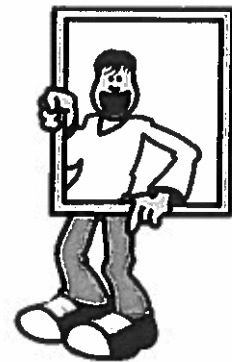
The following concept web outlines the basic topics that will be presented in this unit.



Unit Overview

The most profound discovery that you can make is the discovery of self. Your identity rests in the kind of person you are. To understand who you are and how to develop fully as a human being, you might explore the nature of your humanness and the purpose of your life.

- What are the common human qualities and ideals I hold?
- What roles do other people (e.g. friends, family) play in my life?
- What brings me joy, inspiration, and fulfillment?
- What doubts and fears do I have?



By examining your life and searching for answers to these and other questions, you find meaning and fulfillment.

The Aboriginal concept of the **Medicine Wheel** focuses on the physical, mental, emotional, and spiritual influences on how we think and feel about the world. We examine how our thoughts, feelings, behaviours, and personality influence us and other people. Who you are is explored through several self-reflection exercises related to the material in this lesson. You get to look at yourself.

As with other units in the Psychology 20 course this unit includes research and extension Activities.



The research activity for this unit relates to eyewitness testimony in the court system. You have the opportunity to explore the issue of whether eyewitness testimony is a valid and reliable means of assessing criminal guilt or innocence. A simple experiment tests the hypothesis that peoples memories are limited and selective.

The extension activity provides you with options to explore the issue of human cloning, or your personality and its development, or your understanding of the nervous system.

The topic of this unit is, Who Am I? Draw upon your knowledge of self, the knowledge and skills you have acquired in previous courses, and your life experiences as you approach this important and exciting topic. Learning is not a process of isolation; it is a process of integration.

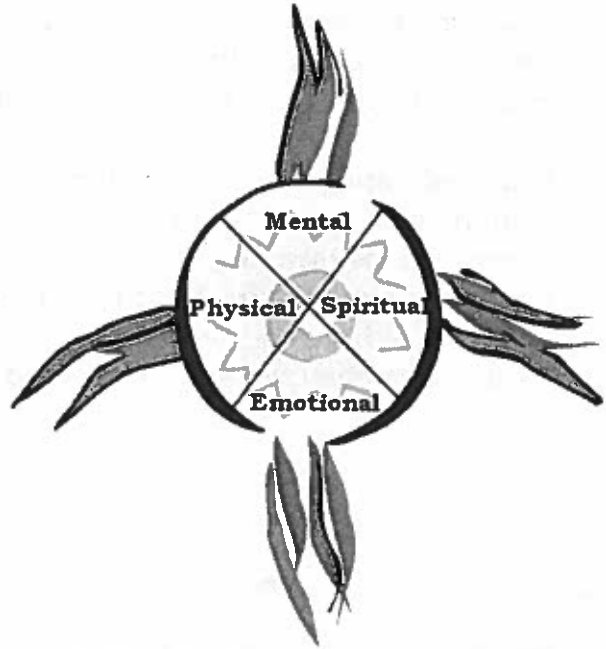
Understanding Human Nature

The Medicine Wheel

The medicine wheel is an ancient symbol used by many of the Native peoples of North and South America. The medicine wheel helps people see all parts of our humanness.

Focusing on this aspect of the medicine wheel teaches us that we have four parts to our human nature: the physical, the mental, the emotional and the spiritual. These aspects are equally developed in a healthy, well-balanced individual. Potentially the seed (the child) has a mighty tree within it.

Returning to the teaching of the medicine wheel helps to refocus when one area dominates and creates an imbalance. The circle of the Medicine Wheel shows us how to see the connection between all parts of our human nature within ourselves and as connected to our world.



Psychology also looks at who we are as human beings.

Physical aspects include the growth and change in a person's body, and genetic, nutritional, and health factors that affect that growth and change. Motor skills – everything from grasping a rattle to driving a car – are part of the physical domain, including biological make-up, and both social and cultural environment. Social and cultural factors that affect these areas, such as duration of breast feeding, education of children and attitudes about body shape are part of physical development.



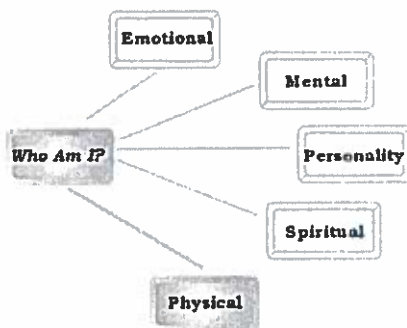
Mental (Cognitive) aspects include the mental processes used to obtain knowledge or to become aware of the environment. Cognition encompasses perception, imagination, judgement, memory, and language – the processes people use to think, decide, and learn. Education within schools, informal guidance of family and friends, and individual curiosity and creativity are also part of this domain.



Emotional aspects include development of emotions, temperament, and social skills. The influences of family, friends, the community, the culture, and the larger society are particularly central to the emotional domain. Cultural definitions of family structure, gender roles, and child rearing practices contribute to emotional development.



Spiritual aspects include the experiences that appeal to the human spirit and our connection to God or some spiritual power outside ourselves. Spirituality supplies meaning to our lives. It is our spiritual nature which motivates self expression through the arts, such as painting, music, drama, poetry, architecture, sculpture, and other art forms.



The Physical Dimension

Some of your biological and physical traits have been influenced primarily by genetic factors while other traits can be attributed to environmental factors. The nature/nurture or **heredity** (biologically determined traits or the process of transmitting biologically determined traits from parents to offspring) vs environment debate affects how we look at the dimensions of what it means to be human.

Psychologists and biologists have long debated whether interaction with the environment – a person's family and culture, for instance – is more important than genes in shaping character and behaviour. It is becoming more obvious that environment and genes have different degrees of influence, depending on the trait.

Some traits, such as eye colour, depend on genetics with little or no environmental input. However, others such as muscular strength or musical achievement seem to come from both genes and the environment. If a person is born with the genetic potential for great athletic or musical achievement, for example, those talents may not develop without practice or opportunity. By the same token, a child may be born with potentially high academic intelligence, but lack of stimulation and limited exposure to new experiences in early childhood may keep the child from fully realizing that potential.



Lack of nutrition, an environmental factor, during childhood can turn a person with the potential to be six feet tall into someone who barely clears five feet. Current research also indicates that the expression of genetic traits in certain individuals may depend on the unique internal make up of the person, such as nervous system, hormone balance, or other aspects of biochemistry.

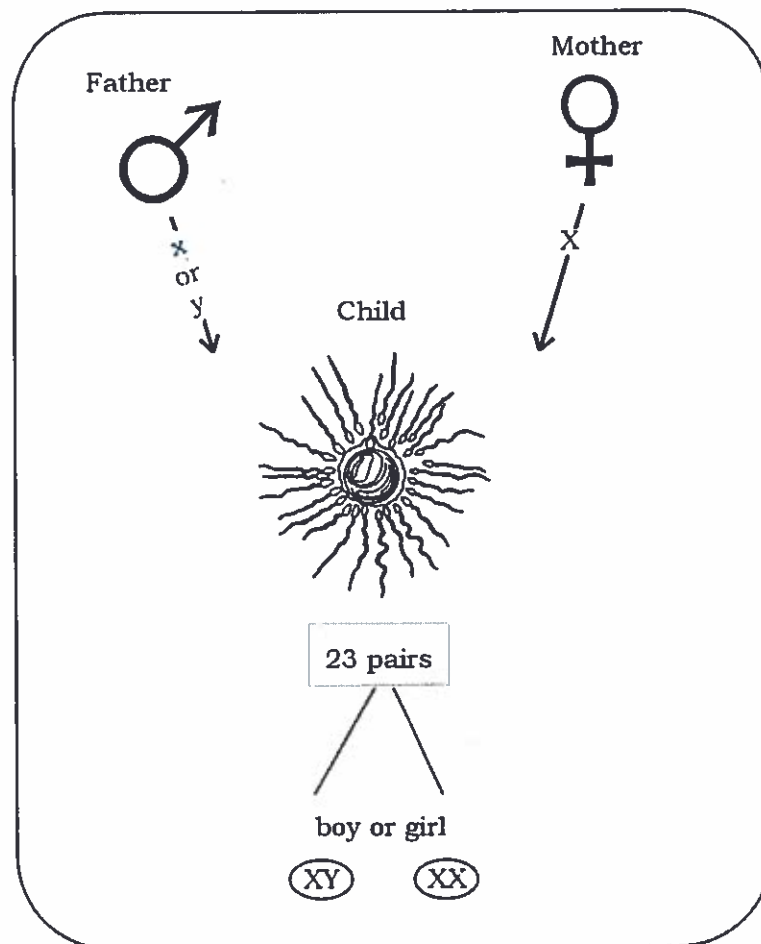
How are traits and characteristics passed from generation to generation?

A brief lesson in **genetics**, the study of how heredity works, helps to understand how characteristics are passed biologically from one generation to another. Each human has twenty-three pairs of chromosomes. In each pair, one chromosome comes from the mother and the other from the father.

Twenty-two of the pairs are the same in both men and women, and these are called autosomes. The twenty-third pair consists of the sex chromosomes, so called because they are the primary factor in determining the gender of a child.



The sex chromosomes are known as the X and Y chromosomes. Females have two X chromosomes, and males have one X and one Y chromosome. The Y chromosome is about one-third the size of the X chromosome. A sperm, the reproductive cell produced by the male, can carry either one X or one Y chromosome. An egg, the reproductive cell produced by the female, can carry only the X chromosome. When a sperm with an X chromosome unites with an egg, the result is a child with two X chromosomes – a female. When a sperm with a Y chromosome unites with an egg, however, the result is a child with one X and one Y chromosome – a male. So a person's gender is actually determined by the X or Y chromosome given by the father.



Chromosomes determine gender. Chromosomes are made of DNA (deoxyribonucleic acid) and they carry **genes** (segments of DNA) that serve as the basic units of heredity. Genes, working in combination with each other, and with environment, ultimately determine biological make-up.

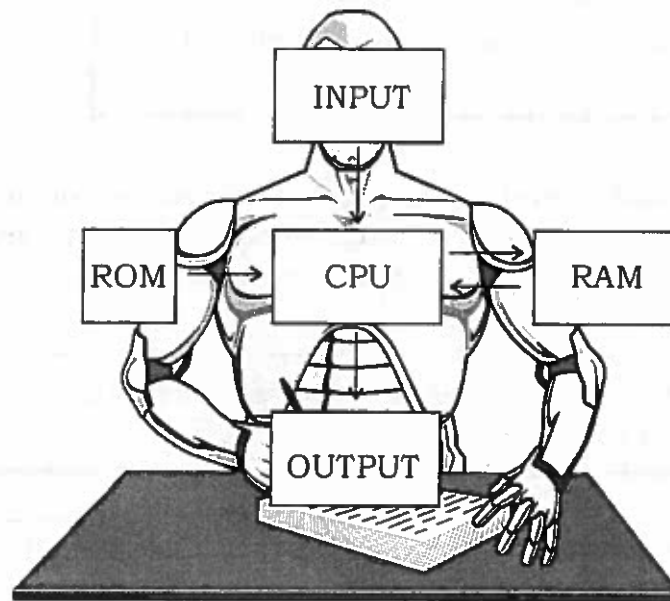
Genes contribute directly to physical appearance and make-up. Genes also have an indirect influence on behaviour. They exert this indirect influence through chemical reactions in the brain and other organs.



Biological Processes that Influence Human Thought, Feelings, and Behaviour

When the brain ceases to function, the abilities to think, feel, and act are gone. All thoughts, feelings, and behaviours originate from basic biological processes in the brain. In simplistic terms, everything we do from blinking reflexively, to completing schoolwork, to falling in love has a biological basis.

Both heredity and environment interact within the body and the brain to produce human behaviour. Think of the body as a computer.



The body and the brain receive, process, and act upon information from the world. How we perceive the world around us is directly related to how we choose to behave in it. Information about the world is translated in the body by the brain, the nervous system, and the endocrine system.

The Nervous System

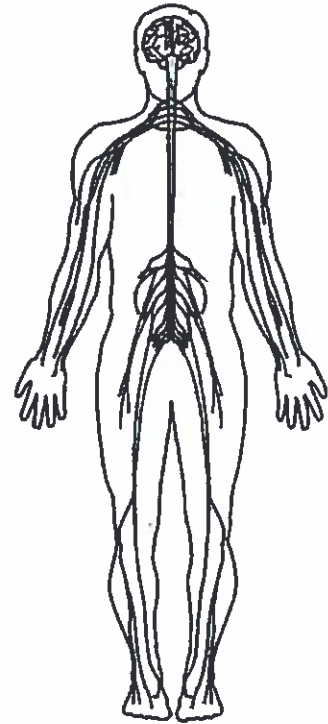
Information is transmitted to the parts of the body through the electrical impulses conveyed through the nervous system. The nervous system is like a communication system.

The nervous system is responsible for each of the following processes.

- the reception of stimuli
- the transmission of nerve impulses
- the activation of muscle mechanisms

In addition to receiving information, nerve cells or neurons also process and transmit information.

Neurons are the conducting elements of the nervous system.



Neurons differ significantly in shape but all neurons or nerve cells are made up of a central portion, or **cell body**, containing the nucleus and one or more structures referred to as axons and dendrites.

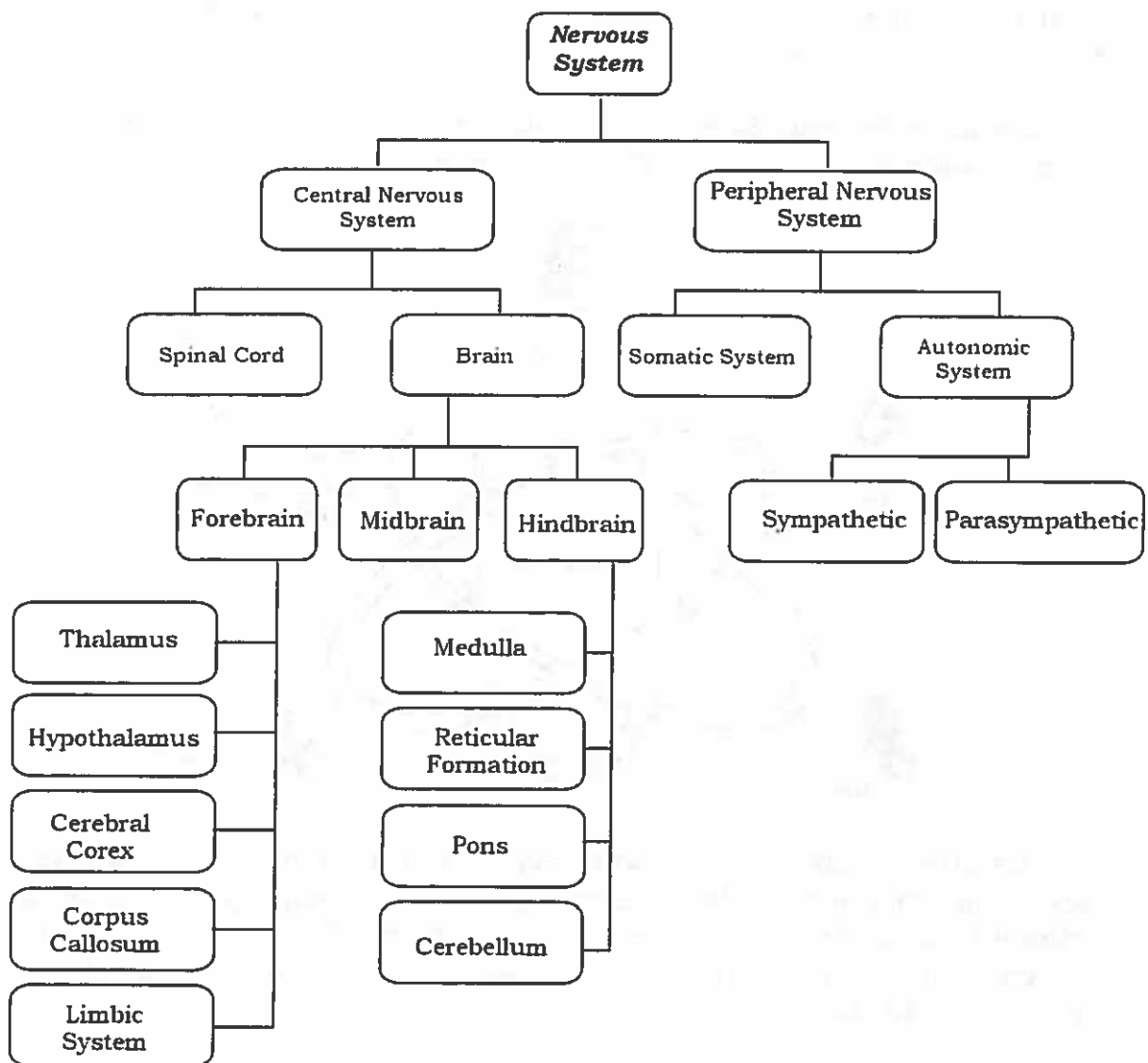
A **dendrite** is a relatively short extension of the cell body involved in the reception of stimuli.

An **axon** is a single elongated extension of the cell body important in the transmission of nerve impulses from the cell body to other cells.

Components of The Nervous System

It could be said that the nervous system connects you to yourself, to others and to the world around you through electrical impulses. The following chart illustrates the major components of the nervous system.

Knowing how the human body is “wired” may be beneficial in developing and maintaining a healthy mind and body.



The Peripheral Nervous System

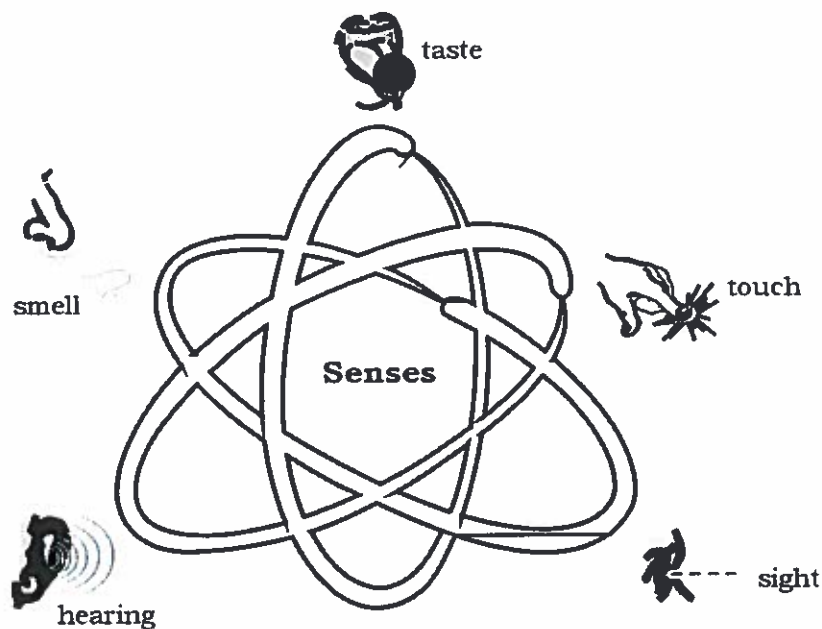
The **peripheral nervous system** is the part of the nervous system that carries information to and from the spinal cord and the brain through spinal nerves attached to the spinal cord and by a system of twelve cranial nerves, which carry signals directly to and from the brain.



The peripheral nervous system has two major parts:

- the Somatic System and
- the Autonomic System.

The **Somatic Nervous System** is involved in the perceptual processes of information gathered from the following five senses.



Through these senses information from the world around us is received. Special sensory nerve cells in the eyes, ears, nose, tongue and skin receive stimuli from the environment outside of the body. The somatic nervous system connects the central nervous system to voluntary muscles which are under an individual's control.

The Autonomic Nervous System

The **autonomic nervous system** connects the central nervous system to involuntary muscles and glands. As the name suggests it functions, for the most part, without voluntary control. The autonomic nervous system controls the vital processes of the body, such as heart rate, digestion, blood pressure, and the functioning of the internal organs.

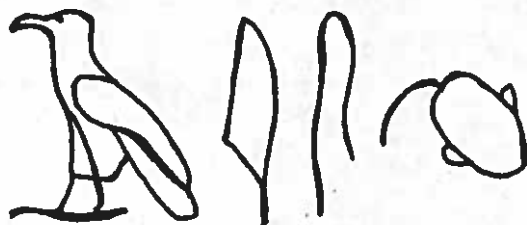
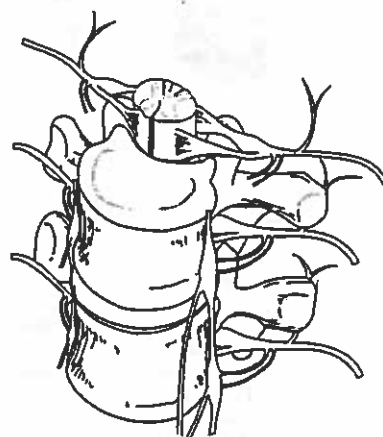
The autonomic system is further divided into:

- ★ the sympathetic system which readies the body for activity that uses energy and
- ★ the parasympathetic system which prepares the body for restoration of energy.

The Central Nervous System

The spinal cord connects the brain to the parts of the body. Neurons in the body receive sensory information and relay it to nerve fibres (made up of neurons) in the spinal column. The **spinal column** channels information to and from the brain.

Ancient Egyptians, as far back as 3000 BC, provided the first written accounts of the anatomy of the brain.



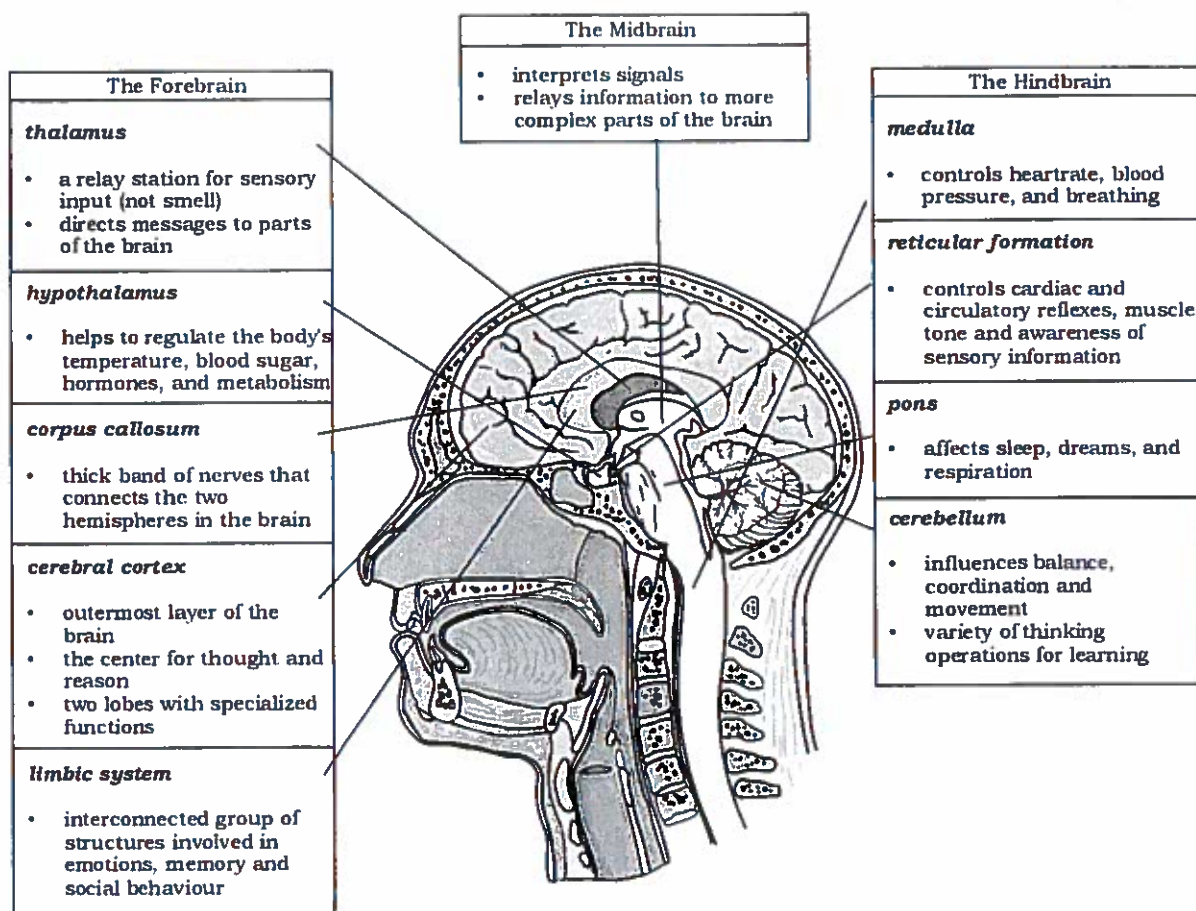
Hieroglyphic for "brain."

The **brain** can be thought of as the control centre of the human body. The primary functions of the brain are varied.

- It controls a vast number of complex internal processes and external activities.
- It stores information and rewrites its own programs in response to new information and experience.
- It remembers information.
- It holds the capacity for emotional responses, creativity, and insight.
- It allows human beings to develop their physical dimension.
- It cultivates and expresses the mental, emotional and spiritual dimensions of humans.

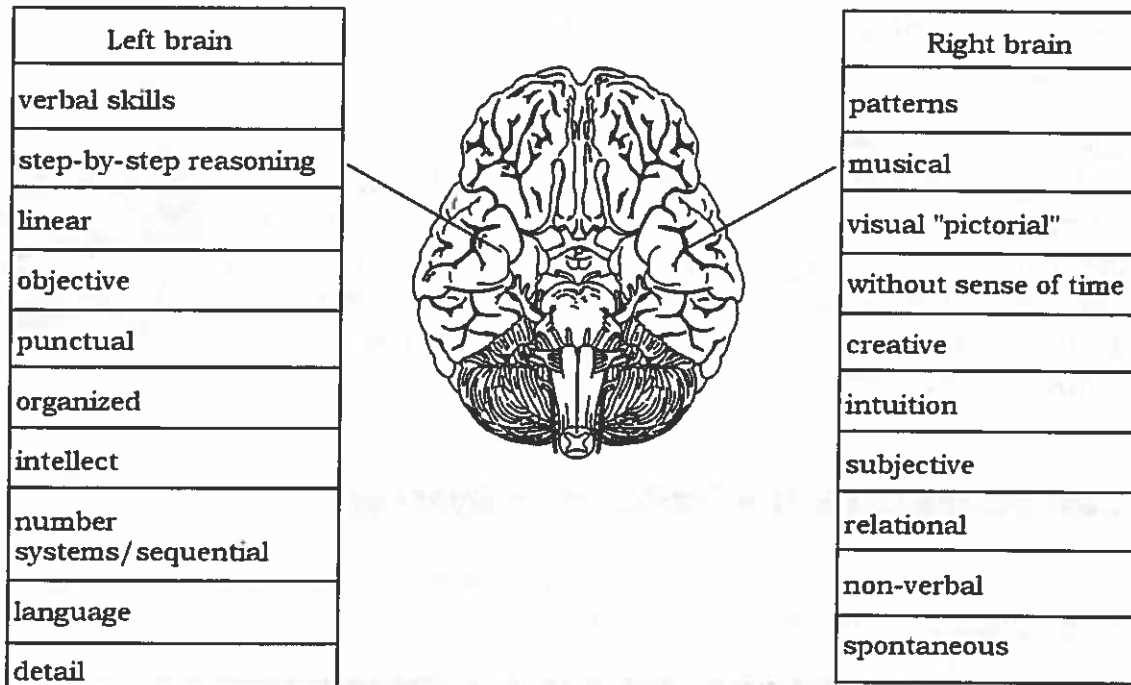


This biological organ has three sections from which to perform its multifaceted function. As you examine the illustration below, listen to track 2 of your CD to hear the names of each part of the brain and their duties.



Top View of the Brain

The cerebral cortex is divided into two hemispheres which perform different tasks.



The nervous system is one communication system within the body and, without it, we would not be able to connect with our environment. Becoming familiar with the components of the nervous system helps us to understand what it is to be human beings. Knowing just how each part of the nervous system supports our behaviour is an important focus of research in psychology.

Psychologists use a variety of methods to study the nervous system. Some psychologists have observed the effects of brain damage on human behaviour and thought; others have examined the electrical and chemical stimulation of the brain. Modern imaging techniques, such as PET scans, can be used to show how brain activity changes as people perform different mental activities. This can help psychologists to identify what parts of the brain are involved in different thought processes. PET scans are also used to compare the brain activity of "normal" people and people with mental or behavioural disorders, such as mental retardation and eating, sleep, or attention deficit disorders.

The Endocrine System

Very simply put, the nervous system sends messages throughout the body by electrical impulses. The endocrine system, on the other hand, emits chemical or hormones into the bloodstream carrying the flow of messages throughout the body.

The endocrine system is a group of specialized tissues and organs that produce, store, and secrete hormones.

Hormones are chemical messengers excreted directly into the bloodstream. They carry information and instructions from one set of cells to other parts of the body. These hormones have a great deal of influence over how you think, feel and behave.



Components of the Endocrine System

The following chart provides the names, locations, and functions of the major glands in the endocrine system.

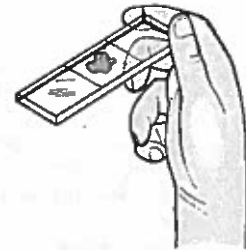
Gland	Location	Function
Adrenal	top of kidneys	produces hormone epinephrine (adrenaline) - important in reactions to stress promotes salt/water balance, metabolism, and proper reproductive functioning
Hypothalamus	part of brain	influences autonomic nervous system, sexual behaviour, emotions, hormone production of other glands
Pancreas	posterior wall of abdomen	produces hormones such as insulin which regulate metabolism
Parathyroid	neck region	controls the concentration of calcium and phosphorus in the blood
Pituitary	base of brain	master gland - regulates timing and amount of body growth, stimulates milk production in females and regulates excretion of water
Reproductive (ovaries or testes)	lower abdomen genital area	responsible for secondary sex characteristics and reproductive functioning
Thyroid	neck region	produces thyroxin which regulates metabolism and controls growth

All glands in the endocrine system produce hormones. Typically, only small amounts of a hormone are needed to achieve the desired response in the body. Too much or too little hormone can be harmful to the body. The body has its own feedback mechanisms to guard against abnormal hormone levels. An imbalance of hormones in the body, such as during stress, can cause a variety of physical and emotional problems. Infertility or depression, for example, may be caused by an imbalance of hormones.

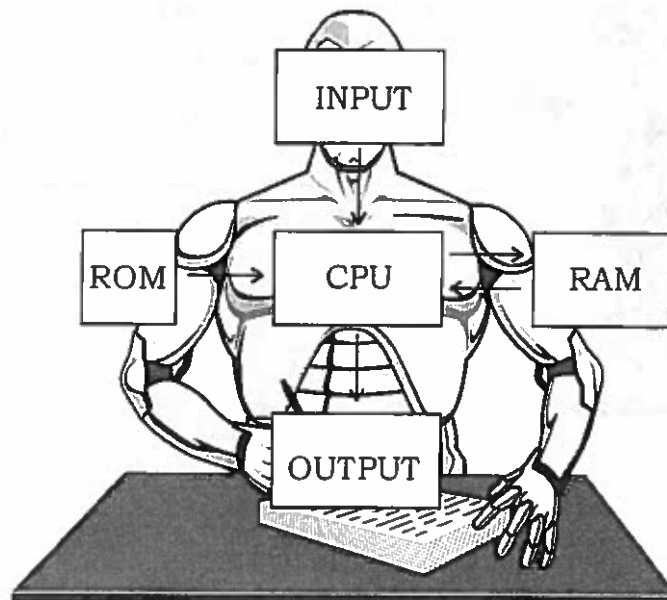


Summary of Body Systems

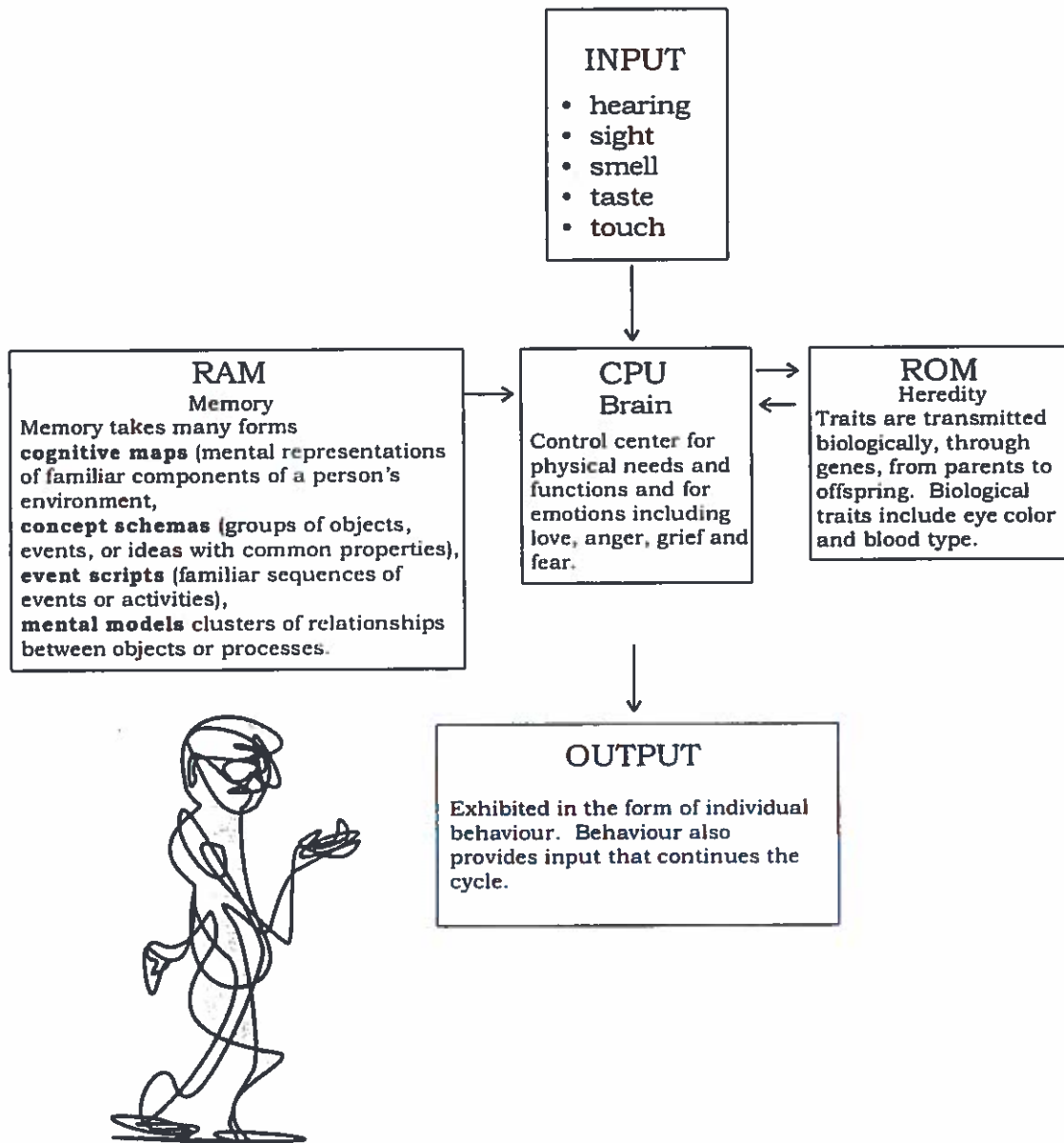
Psychologists study the nervous system and the endocrine system in an effort to understand human behaviour. Looking at these body systems is like looking at the body “machine,” or body mechanisms. These body systems receive, store and process information. Recall the analogy of the body system as a computer network system.

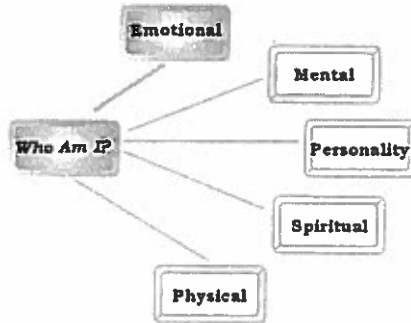


The various components of the communication system of a computer correspond with components and processes in the human body.



The various components in the human body are a complex set of processes that make us physical beings.





The Emotional Dimension

Who you are, or your identity, is linked to your physical body, your thoughts, feelings, and the expression of your spirit. The Greek philosopher, Aristotle, thought the heart, not the brain, was the location of intelligence and thought. Feelings communicate to yourself and others how you relate to the world around you.

The way you feel about the world is affected by distinct yet integrated factors: motivation, emotion, and attitude.

These factors influence how you feel, think, and behave.

Motivation

Motivation refers to factors that influence us to

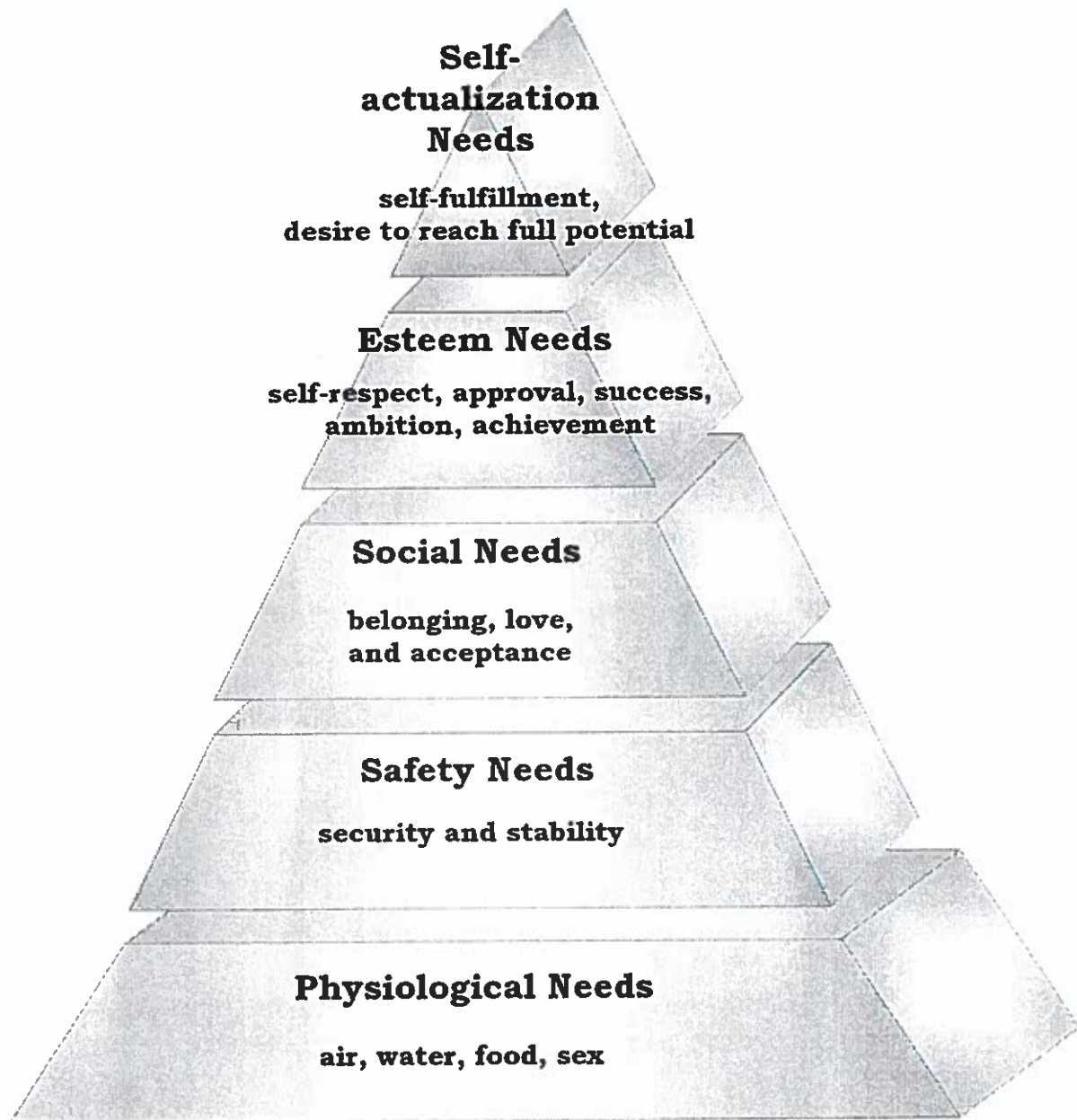
- act on our ideas,
- find direction, and
- intensify and maintain persistence of behaviour.

Motivation is the drive that is necessary to begin and/or to maintain goal-directed behaviour. Motivation is about how we navigate within our environment.

Human beings are complex organisms; consequently, our thoughts, feelings, and behaviours are motivated by a variety of external and internal factors.

Abraham Maslow, a leading figure of humanistic psychology, judged behaviourism and psychoanalysis to be too theoretical and too focused on illness. In 1954 he proposed the theory that human beings are motivated by a series of needs that progress from basic needs, such as food to the higher needs, including the fulfillment of potential and the expression of self-identity. His theory is represented by a pyramid.

Abraham Maslow's Hierarchy of Needs



His theory proposes that basic bottom level needs must be satisfied before the higher levels can be achieved. The bottom levels contain biological drives as well as learned needs that direct and guide behaviour.

What do you think? Is identity or personality based equally on the behavioural, emotional, spiritual, and mental traits of a person? Review the theories of contemporary perspectives in psychology explained in the first unit. How might a behaviourist or a psychoanalyst explain personality development? What is your theory of how we come to be who we are?

As a Psychology 20 class assignment, students at Martensville High School were asked to critique various theories of personality development including Maslow's theory. Then, they were asked to formulate their own theories of personality development.



On track 3 of your CD, "My Personality Theory", listen to a recording of Brae MacInnis' ideas on the subject of personality theory and consider which perspectives you might support.

Brae MacInnis discusses Abraham Maslow's theory as well as the theories of Carl Jung, a Swiss psychoanalyst who expanded Freud's work. Jung believed that awareness of mental and emotional problems leads to personal and spiritual fulfillment. In development of his theories, he studied dreams.



Abraham Maslow



Carl Jung

Biological (Physiological) Motivators, such as hunger and thirst, can be powerful motivators especially under extreme conditions of deprivation. These motivating factors are inherent in the body and present from birth.

Hunger and thirst are physiological motivators. Hunger and thirst motivate people to specific goals: food for hunger and water for thirst.

However, what seems simple on the surface is actually very complex. People, for example, quickly develop "tastes" for certain foods and dislikes for others. They may be motivated to walk to the corner store for ice cream but not for broccoli. Have you ever come home from school starving yet refused to eat meatloaf, fish, liver, or some other food just because you did not like the taste of it? What motives are physiological and what motives are psychological?



Psychological motivators include fear, love, achievement, and social approval. Based on interactions with people or with the environment these motivators are learned and developed rather than inherited.

However, very few motivators can be classified as purely physiological or purely psychological. Between purely biological motivators and purely psychological motivators is a continuum of motivators that are acquired through a combination of inherited and learned factors.

Biological Motivators

- primary and basic needs
- water, food, air, clothing, shelter
- needed for physical survival



Psychological Motivators

- secondary needs
- love, self-esteem, belonging, self-identity
- needed for fulfillment and self-actualization

In addition to psychological motivators, psychologists also talk about intrinsic and extrinsic motivation.

Intrinsic motivation comes from the pure satisfaction of participating or engaging in an activity. Intrinsic motivation comes from within.

Extrinsic motivation comes from some form of reward from the external environment.



Review the examples and note the difference.

- some children read because they love to read (intrinsic motivation)
- some children read by the lure of stickers, praise, or accomplishment (extrinsic motivation)
- some people participate in sports because they enjoy the game or activity (intrinsic motivation)
- some people play sports to lose weight or gain status (extrinsic motivation)

The examples are clear; however, most people are motivated by a combination of intrinsic and extrinsic factors. For example, a professional basketball player may love the game of basketball and may also be motivated by the fame and recognition that she/he gets as a result of playing the game.

Emotions

Emotions are temporary responses to an experience. Emotions may have negative or positive qualities, and they are felt with some intensity. Emotions are generated, in part, by an objective assessment of an experience as well as by subjective feelings and may elicit both learned and innate physical responses. For example, expressions of grief vary from culture to culture but the physical response of tears may be innate.



Emotions are different from feelings and sentiments.

- ★ Emotions are more temporary and less prolonged than feelings; for example, your intense emotions of anger may subside once you are removed from a specific situation with a chance to cool down.
- ★ Emotions are more intensified than feelings; for instance, you may feel sorry for a mother who has lost a child but the mother's grief would be an intense emotion.
- ★ Emotions are a specific reaction to a certain situation, where you may cry at a wedding ceremony because you are overwhelmed with happiness.
- ★ Emotions reflect survival strategies, in that anger and fear, for example, motivate you to fight back when you are being attacked.

Once the emotions are activated, the body responds through behaviour, reactions in the autonomic system, and hormonal changes. Examine the chart and the explanation of each of these components.

Components of Emotion	Physical Action
behavioural	muscular movements needed in the situation i.e. run away from danger
autonomic	changes in the autonomic nervous system provide energy i.e. heart rate increases and oxygen supplied to muscles to run away
hormonal	glands secrete chemicals needed i.e. adrenaline increases heart rate and supplies oxygen to the muscle

The brain itself can also generate emotional experiences even when no physical cause or circumstance is apparent. A memory of an experience can elicit an emotional response similar to the response caused directly by the initial event. A person may laugh at the memory of a funny incident or cry at the memory of a loved one.

Attitudes

The third factor that influences your outlook on life and how you view the world is attitude.

Attitudes are your judgements about what is desirable and how you perceive life ought to be. They are lasting patterns of beliefs and feelings about other people, ideas, or objects, and are based on values (general and abstract principles about what is important). Attitudes are more focused or specific than values. A person who values the principle of freedom, for example, may harbour attitudes of resentment toward government ownership of music, movies, or the media.



Attitudes are based primarily on past experience and they shape future behaviour. They are expressed through thoughts, emotions, and behaviour. The formation of attitudes begins early in life through a variety of formal and informal learning processes. Attitudes can be changed through positive influences, such as education or through negative means, such as scare tactics.

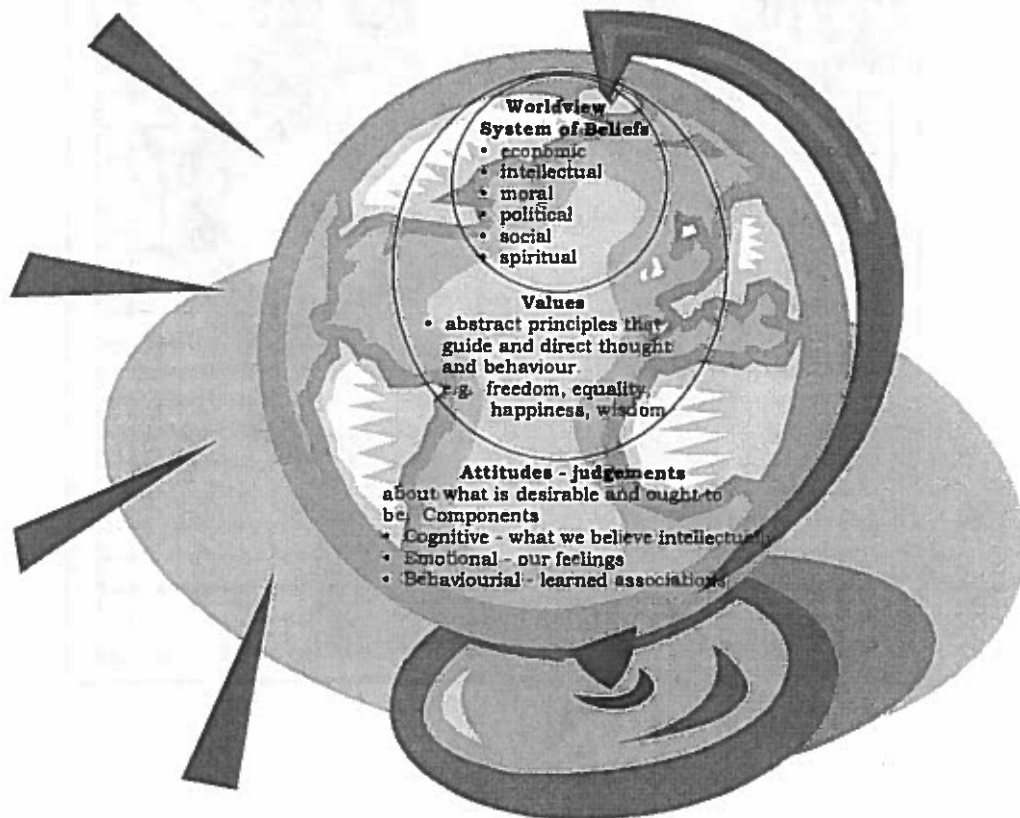


Your attitudes about yourself, other people, nature and the environment, gender issues, war and peace influence how you behave and how you influence those around you. You can never really see a person's attitudes but you can predict his/her attitude based on what he/she says and does.

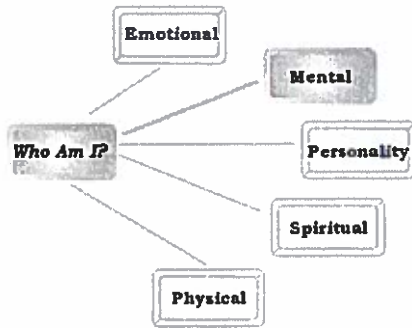
What are some ways that a person might show the following attitudes?

- a respectful attitude toward authority
- a disrespectful attitude toward authority

Your worldview or belief system is guided by values and these values, in turn, are reflected in your attitudes. The seed of who you are and who you will become, is represented in your worldview, your values, and your attitudes.

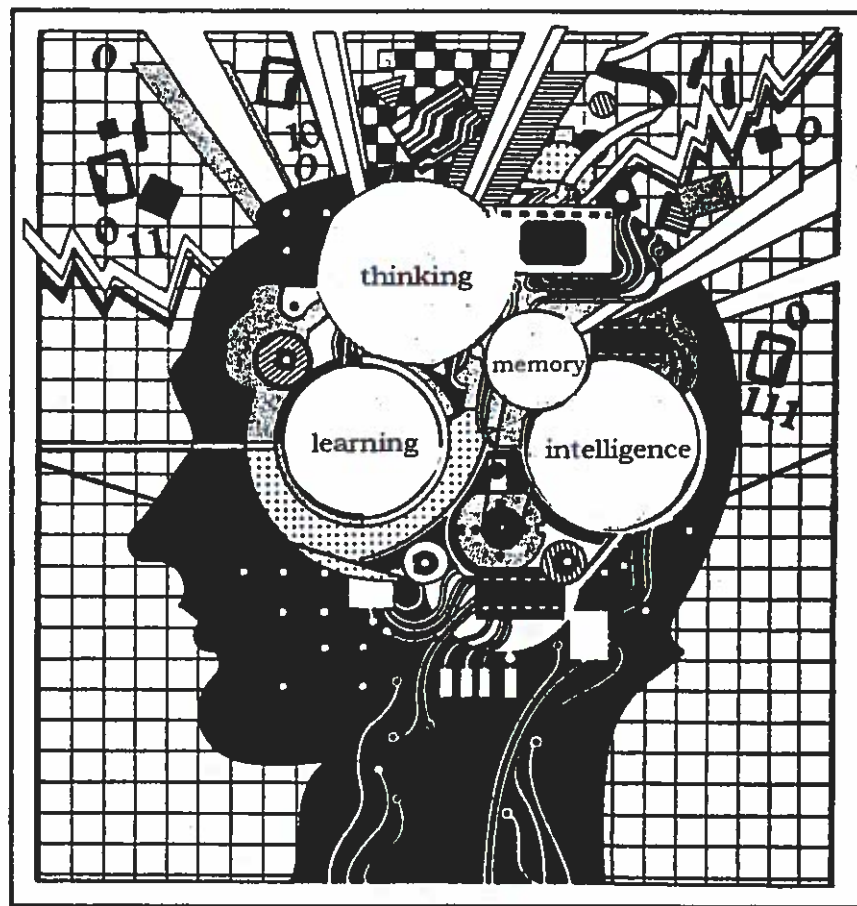


Motivations, emotions, and attitudes influence how we think, act, and interact in the world.



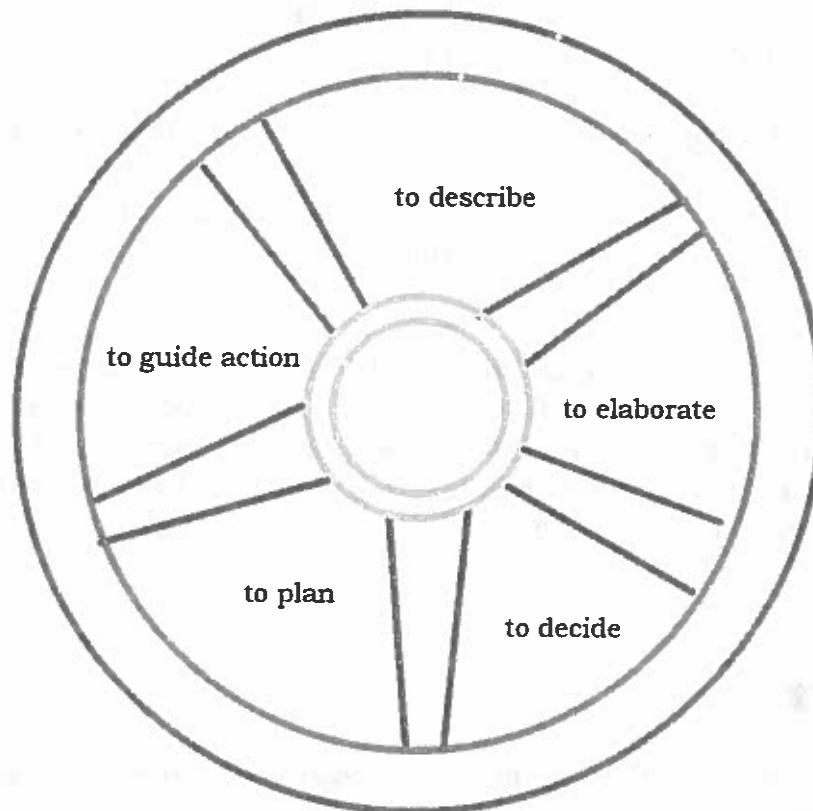
The Mental Dimension

The cognitive or mental aspects of your being include thinking, learning, memory, and intelligence.

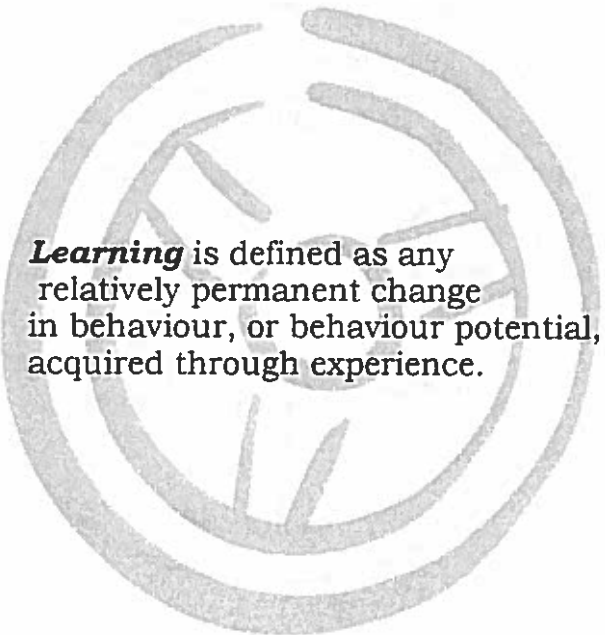


What Does it mean to think?

Thinking is described as the manipulation of information by a process which receives, represents, transforms, and acts on incoming stimuli. Thinking has five core functions.



Learning



Learning is defined as any relatively permanent change in behaviour, or behaviour potential, acquired through experience.

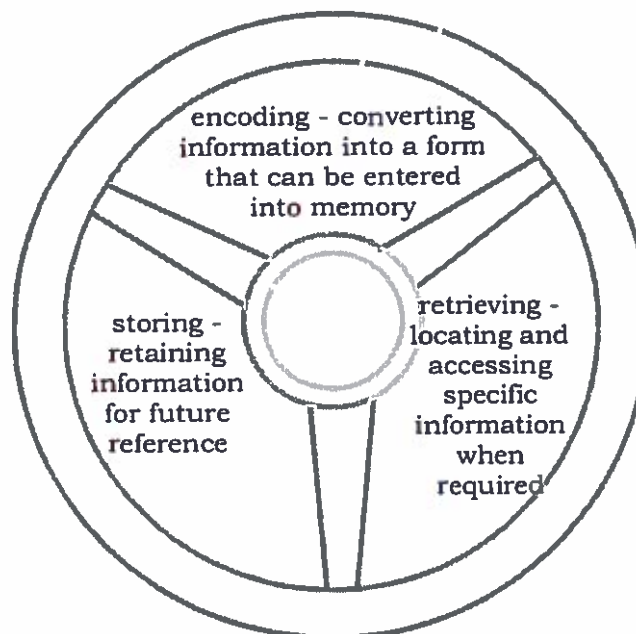
Learning takes place in the nervous system. Specific parts of the brain have been linked to specific learning functions, such as language and reasoning. Experience alters the structure and chemistry of the brain and, in turn, these changes affect future thought and behaviour. Learning plays an important role in everything you do from mastering complex skills to controlling your emotions, to committing the perfect crime. Evidence of learning is observed in the form of behaviour changes.

Behavioural changes produced by learning are not always positive. Many theories exist as to how people learn and under what conditions people learn best. Educational psychology is a growing and important area of study; however, specific learning theories will not be discussed in this course.

Technology provides psychologists with new means of studying how the brain functions, how learning occurs, and how information is being used. A vast amount of learning occurs before children reach school age, and learning continues beyond the classroom. People have the capacity to learn for as long as they live. There are many ways to learn and many learning styles.

Memory

Memory is the cognitive system for **encoding**, **storing** and **retrieving** information.

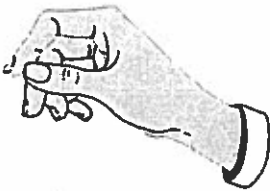


Most psychologists accept a model of human memory that includes three distinct memory systems.



Sensory Memory: temporary storage of sensory information taken in by the senses

Short Term Memory: information from the sensory system becomes part of short term memory only after it is selected or becomes the focus of attention. Selective attention means that people pay attention to parts of the environment while ignoring others.



Long Term Memory: relatively permanent storage of information. Information in short term memory enters long term memory only when we think about something's meaning and relate it to other information already in long term memory.

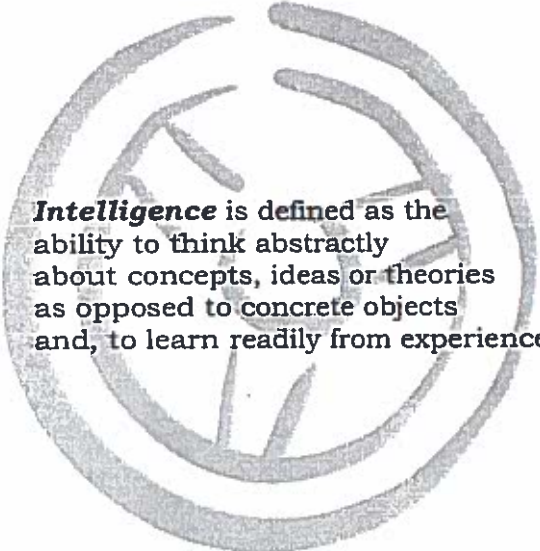
Learning, thought, and reasoning could not occur without memory. Memory is life. Your memories make you different from any other person. They describe who you are and tell of your journey to becoming who you are. They give meaning and continuity to your existence. Exercising your memory skills is very important.

Following are some helpful ways to improve memory.

1. *Really think about what you want to remember.* Doing so will help make the new information part of your existing knowledge frameworks and will increase the chances of its entry into long-term memory.
2. *Pay attention to what you want to remember.* Quick: Does the Queen's head face to the right or to the left on a loonie? On a quarter? All Canadians have seen these images many, many times, yet the odds favour your misremembering. If you want to remember something, you must first make it the centre of your attention.
3. *Use visual imagery.* "A picture is worth a thousand words." Where memory is concerned, this is often true.
4. *Give yourself extra retrieval cues.* A key problem with long-term memory involves retrieving stored information. One type of cue is the *context* in which the information was first acquired. Pause for a moment and try to remember the situations or surroundings in which you first entered the information into memory.

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5. *Develop your own shorthand codes.* The first-letter technique, in which the first letter of each word in a simple phrase stands for an item you wish to remember is one type of shorthand.
 6. *Develop your own cognitive frameworks.* Organized information is much easier to remember than unorganized information. Organization provides a framework to which new information can be attached.

Intelligence



Intelligence is defined as the ability to think abstractly about concepts, ideas or theories as opposed to concrete objects and, to learn readily from experience.

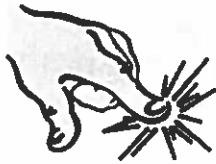
Most psychologists agree that people possess multiple intelligences, each of which involves a somewhat different set of skills. This may explain why one person may be a gifted athlete or musician or writer and be poor at math, for example. In 1983, Dr. Hugh Gardner, a noted psychologist, proposed that we possess six specific intelligences.

- ★ linguistic intelligence (vocabulary and reading comprehension) _____
- ★ logical - mathematical intelligence _____
- ★ spacial intelligence (relationship between objects) _____
- ★ musical intelligence _____
- ★ body-kinesthetic intelligence (dancing, athletics) _____
- ★ personal intelligence (self-awareness and social cognition) _____

From your experience, can you identify people who display each of these forms of intelligence?

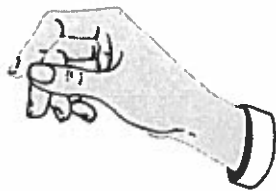
If you had to rank each of these forms of intelligence in yourself which would be first? last?

Most psychologists accept a model of human memory that includes three distinct memory systems.



Sensory Memory: temporary storage of sensory information taken in by the senses

Short Term Memory: information from the sensory system becomes part of short term memory only after it is selected or becomes the focus of attention. Selective attention means that people pay attention to parts of the environment while ignoring others.



Long Term Memory: relatively permanent storage of information. Information in short term memory enters long term memory only when we think about something's meaning and relate it to other information already in long term memory.

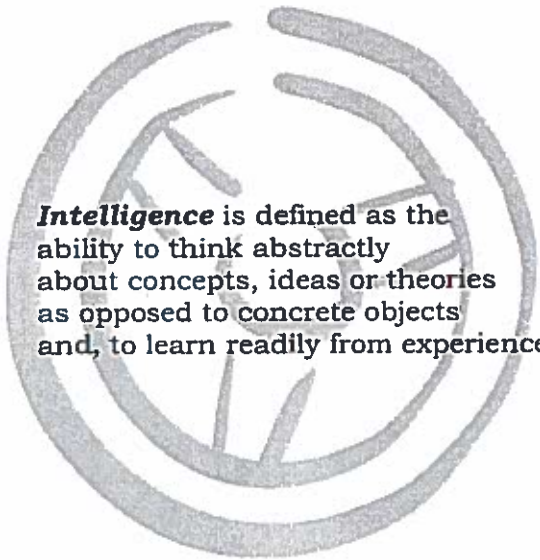
Learning, thought, and reasoning could not occur without memory. Memory is life. Your memories make you different from any other person. They describe who you are and tell of your journey to becoming who you are. They give meaning and continuity to your existence. Exercising your memory skills is very important.

Following are some helpful ways to improve memory.

1. *Really think about what you want to remember.* Doing so will help make the new information part of your existing knowledge frameworks and will increase the chances of its entry into long-term memory.
2. *Pay attention to what you want to remember.* Quick: Does the Queen's head face to the right or to the left on a loonie? On a quarter? All Canadians have seen these images many, many times, yet the odds favour your misremembering. If you want to remember something, you must first make it the centre of your attention.
3. *Use visual imagery.* "A picture is worth a thousand words." Where memory is concerned, this is often true.
4. *Give yourself extra retrieval cues.* A key problem with long-term memory involves retrieving stored information. One type of cue is the *context* in which the information was first acquired. Pause for a moment and try to remember the situations or surroundings in which you first entered the information into memory.

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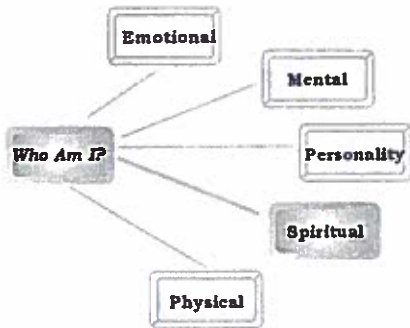
If you had to rank each of these forms of intelligence in yourself which would be first? last?

People differ in intelligence and exactly what causes intellectual differences between people is not clear. Almost all psychologists accept the idea that intelligence is a product of an extremely complex interplay between genetics and environmental factors. A great deal of controversy exists among psychologists over the extent to which genetic and environmental factors shape intellectual potential.

I.Q. (intelligence quotient) tests, such as the Stanford-Binet test and the Weschler scales attempt to measure some aspects of intelligence. These tests, often, are used to identify children in need of advanced or remedial educational programs. In some instances, scores on IQ tests may determine whether or not an individual qualifies for special educational programs.



Critics of IQ testing point out that tests may be culturally biased and that they are mainly verbal in content. Socioeconomic factors, such as poverty, may also have adverse effects on IQ scores. Perhaps, tests based on Gardner's list of multiple intelligences may provide a more comprehensive look at intelligence.



The Spiritual Dimension

I am not a human being having a spiritual experience; I am a spiritual being having a human experience.



Spirituality is the experience of the human spirit that connects us to God or some spiritual power outside ourselves. Spirituality tries to supply meaning and purpose to our lives. Painting, music, drama, poetry, and other forms of art are expressions of our spiritual dimension.



The soul is sometimes referred to as the spiritual part of a human being. Since a soul is not physical, it is often believed to survive death. The soul is considered to be the seat of human emotions, feelings, and sentiments. Spiritual beliefs guide decisions and behaviours related to moral and ethical issues.



In daily life we must make choices that involve questions of honesty, the treatment of other people, acting responsibly, and so on. These moral choices are based on beliefs about what is right and what is wrong. Moral choices frequently involve choices between personal gratification and the common good. When, for example, should a personal point of view be taken and when should a person decide in favour of the choice that satisfies others?

Lawrence Kohlberg, a noted psychologist, established a theory in the 1960's that explains three steps of moral development.

➤ **Preconventional Stage:**

- individual focus on own welfare
- emphasis on getting rewards and avoiding punishment
- obedience to authority
- avoids punishment and advances self-interest

➤ **Conventional Stage:**

- social standards and laws are primary criteria used to make moral decisions
- proper behaviour defined by social standards
- obedience to laws motivate behaviour

➤ **Postconventional:**

- emphasis on moral principles and ideals
- morality defined by personal standards rather than externally by others
- an individual code of ethics supercedes external laws and social standards of behaviour.
- obeys rules of society because they protect the common good not because laws require conformity

Morality and ethical decision making are influenced by a variety of factors. Psychologists have identified the following influential factors.

- your view of human nature
- the value you put on human life
- your view of the purpose of life
- the significance you give to death and dying
- whether you think we will face rewards and punishments for your actions in this life or in some future life



Do these factors sound familiar? Recall the factors that contribute to a person's worldview, and the system of values and attitudes that were discussed in the first unit.

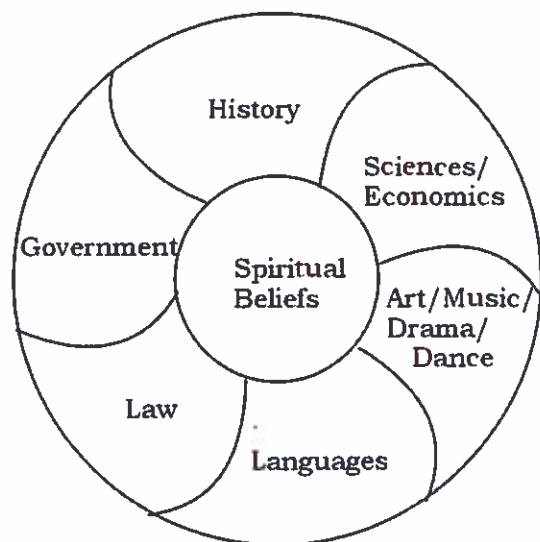
Review Bill Asikinack's description of the Aboriginal worldview.



A worldview is the fundamental set of values that direct our behaviour; it is how we view our relationship to all Creation. From our perspective, Humankind is the least of all of Creation because humans depend on the animals and plants. They do not need us to survive, we need them. In our worldview, everything has purpose. Our worldview is opposed to control, dominance, and ownership of Creation; we are one with Creation, and we must seek to live in harmony with all Creation.

First Nation's peoples describe their societies as belonging to a circle or an integrated whole; within the circle, everything has a place. When new things come into the circle, it expands. In Traditional Indian spirituality, the circle of human activities is seen holistically; family life, history, science, politics, culture, art, and economics are defined by core spiritual understandings. They believe that to speak of these things outside of a spiritual framework is neglectful or arrogant. The circle structure recognizes that each aspect of human life is connected. To look at one part in isolation of the others is compartmentalizing humanity.

The circle graphic represents the perspective of Plains First Nations peoples' regarding spirituality and its persuasive presence in all aspects of life.

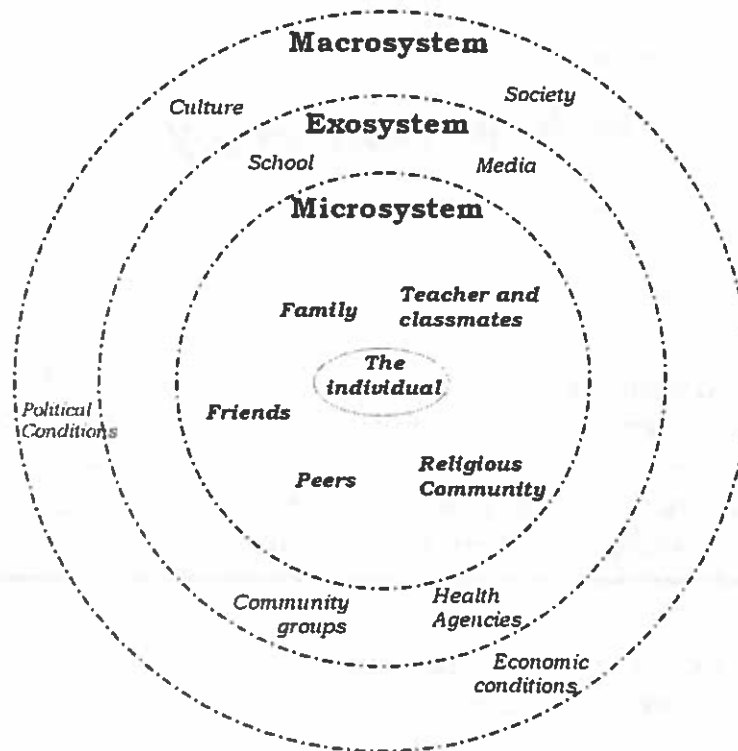


One of the most important First Nations' sacred teachings, as explained in the document *The Sacred Tree*, encourages us to be mindful of our day-to-day participation in the world.



Each morning before rising, and each evening before sleeping, give thanks for the life within you and for all life, for the good things the Creator has given you and others and for the opportunity to grow a little more each day. Consider your thoughts and actions of the past day and seek the courage and strength to be a better person. Seek the things that will benefit everyone.

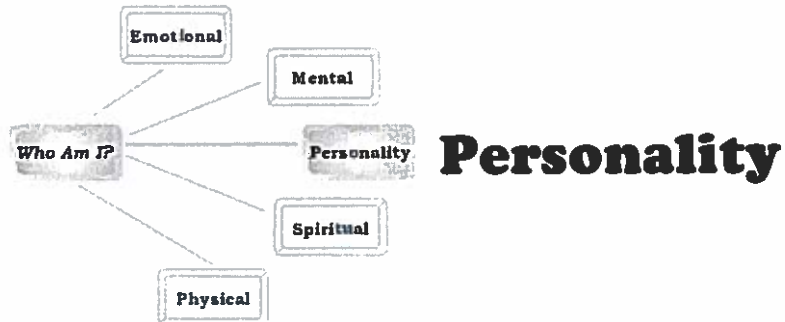
Now, recall Bronfenbrenner's ideas explained in Unit One about the systems that influence human behaviour.



The circles of both the First Nations and Bronfenbrenner show that the beliefs, thoughts, and behaviours of human beings are influenced by a variety of factors including social, economic, political, and cultural factors. Both models, when explained, highlight the importance of beliefs and values.

Spirituality, when outwardly expressed, becomes part of all aspects of life, integrating and providing a “wholeness” to human existence. Wholeness is integral to First Nations’ philosophy.

Human beings are influenced by both external and internal factors and, in turn, influence others and the natural world. Our lives are made up of many circles.



How would you respond to the question, Who Are You? Generally, people describe themselves in terms of their position roles and their personalities.

Position roles define your place within your family, the world, at work, or, within the community.

You may, for example, be a father/mother, carpenter, and basketball coach.

Personality refers to particular patterns of behaviour, thoughts, and feelings that are relatively stable and help to define who you are.



The word personality is derived from the Latin root *persona*, meaning “mask.” The face you present to others may determine how others feel about you. Your personality is defined by biological, mental, emotional, and spiritual factors.

There is general acceptance amongst psychologists that every individual is born with a distinct, genetically based set of psychological tendencies. The combination of these tendencies is called **temperament** and temperament affects and shapes a person’s personality. Temperament and, therefore, personality, begins genetically, but is also influenced by a multitude of environmental factors, people, learnings, and experiences.

In 1992, Wiggins and Pincus, psychologists at the University of British Columbia, did a major review of research in the area of personality theory. They found that a consensus is beginning to emerge among psychologists that there may be only five key or central dimensions of personality. “The Big Five,” as they are sometimes called, are described below.

- **Agreeableness:** ranging from good-natured, gentle, cooperative, trusting, and helpful at one end to irritable, ruthless, suspicious, uncooperative, and headstrong at the other.
- **Conscientiousness:** ranging from well-organized, careful, self-disciplined, responsible, and precise at one end to disorganized, careless, weak-willed, and neglectful at the other.
- **Emotional stability:** ranging from poised, calm, composed and not hypochondriacal at one end, to nervous, anxious, excitable, and hypochondriacal at the other.
- **Extroversion:** ranging from sociable, talkative, fun-loving, affectionate, and adventurous at one end to retiring, sober, reserved, silent, and cautious at the other.
- **Openness to experience:** ranging from imaginative, sensitive, intellectual, and curious at one end, to down-to-earth, insensitive, tradition-bound, and simple at the other.

Following is a simple objective test of personality. The test is presented here as one example of the types of objective personality tests that psychologists may use to study personality.

Complete each of the statements by indicating the degree to which you agree or disagree by circling the appropriate number.

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree

- I generally get along well with others. 1 2 3 4 5
- I am very careful and methodical. 1 2 3 4 5
- I cry easily. 1 2 3 4 5
- I feel comfortable in a group setting. 1 2 3 4 5
- I have a lot of trust in other people. 1 2 3 4 5

This test is related to the “big five” dimensions of personality. The first item is related to agreeableness, the second to conscientiousness, the third to emotional stability, the fourth to extroversion, and the fifth to experience. What ranges did you indicate for these five dimensions? What did you learn about your personality according to these five dimensions?



By comparing your answers to thousands of others who may take the test, an individual can obtain their relative standing on the traits being measured.

Now, onto the self-reflection exercises, research and extension activities.



Self-reflection Exercises

The following self-reflection exercises invite you to discover your gifts, understand your learning style, determine your thinking patterns, and understand your personality.



The **four** exercises are designed to help you learn more about yourself.

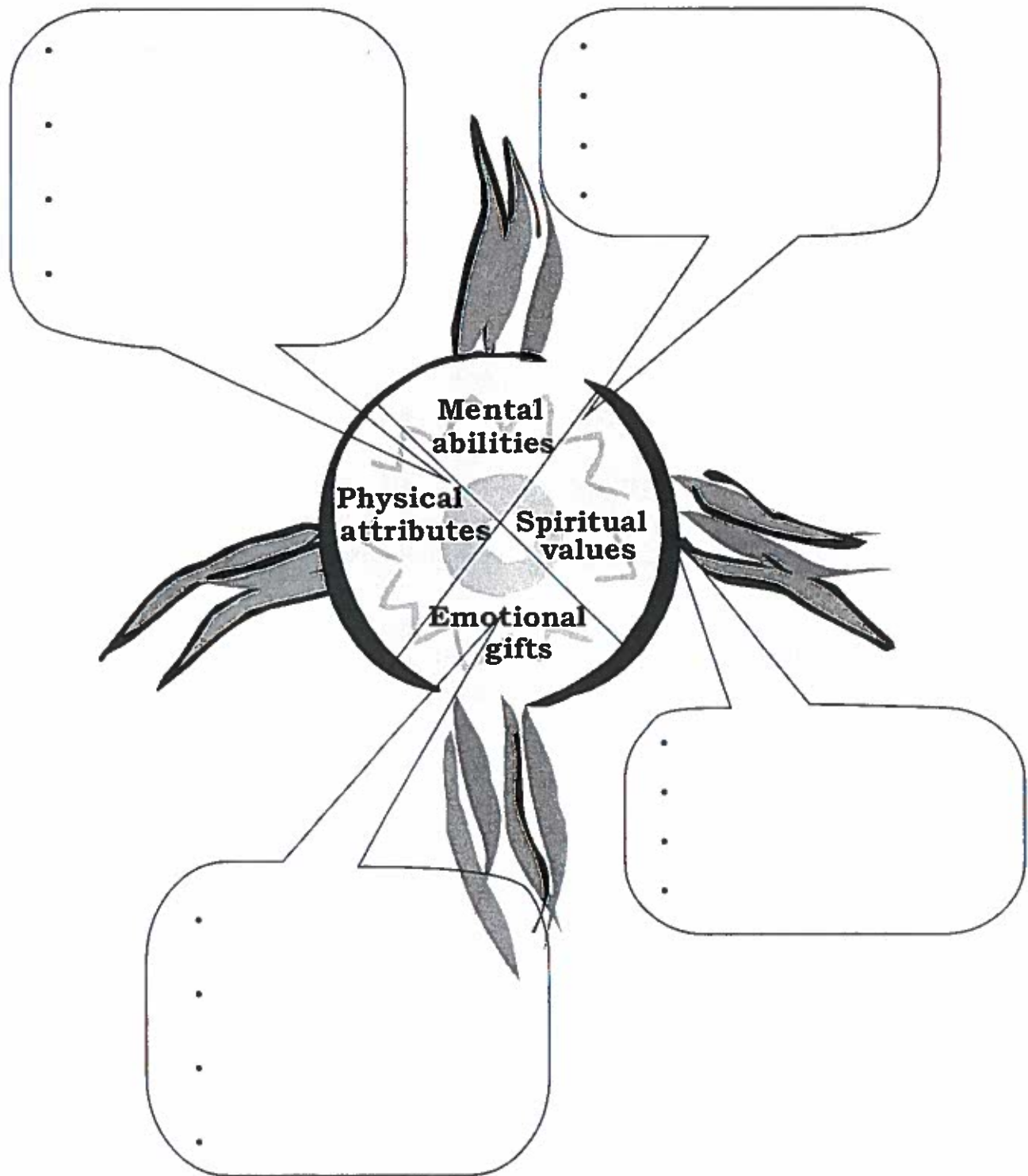
(5) Self-reflection Exercise 1: My Medicine Wheel

What have you observed to be your strengths in each of the four areas of the medicine wheel, in other words, what is your "medicine"?

Remember that your Medicine Wheel is a work in progress; some traits will remain constant while other traits will change with age, education, life experiences, and changing social conditions.

Provide two, three, or four ideas or examples that describe your strengths or talents in each of the dimensions of the Medicine Wheel. Write your traits in the spaces provided for each section of the medicine wheel on the following page.

My Medicine Wheel



(5) Self-reflection Exercise 2: What Motivates Me?

Think of some of the things that motivate your behaviour. Jot down five of your ideas in the spaces provided. Put a ✓ to indicate whether you think each motivator is learned or innate and another checkmark to indicate whether the motivator is intrinsic or extrinsic.

Remember that motivators are what influence us to:

- act on our ideas,
- find direction, and
- intensify and maintain persistence of behaviour.

Remember, as well, that a person may be motivated by a variety of internal and external factors. Refer to the section on "Motivation" in your lesson if you are having trouble completing this activity.

Behaviour	Motivators	(✓) Learned	(✓) Innate	(✓) Intrinsic	(✓) Extrinsic
<i>Winning a soccer game</i>	<i>Achievement</i>		✓	✓	
<i>Making friends</i>	<i>Belonging</i>	✓			✓



(5) Self-reflection Exercise 3: Learning Style

Have you ever wondered how you learn best? Some people have to hear something before they learn it and others have to interact with the material in some concrete way before they understand something. Children's play is like acting out or expressing learning. Different stages of growth sometimes require different methods of learning. Older adolescents are more prepared for independent learning; however, we all need to share in a learning community. Learning is a lifelong process.

Which sense do you use most in learning? Do you use a combination of senses or do you prefer one sense over another? Fill out the survey below by checking in the "That's Me!" column beside each statement that best describes you.

Visual Learners	That's me!
1. I remember faces but often forget names.	
2. I am distracted by sights rather than sounds.	
3. I doodle when I am thinking and solve problems by making lists.	
4. I show my emotions on my face so that people can see how I feel.	
5. I prefer visual art to music.	
6. I don't like to listen for long periods of time.	
7. I tend to think in pictures and have a strong imagination.	
8. I learn best by seeing and reading.	
9. I like descriptions when I read so that I can imagine the scene.	
10. I recognize words by sight rather than by sounding them out.	

Auditory Learners	That's me!
1. I remember names but forget faces.	
2. I am easily distracted by sounds.	
3. I think things through out loud and hum and talk to myself when I am alone.	
4. I express emotions verbally, such as shouting when I'm angry.	
5. I prefer music to visual art.	
6. I like listening, but I just can't wait to talk.	
7. I tend to think in sounds, not visual images.	
8. I need to hear instructions rather than read them.	

9. I prefer plays and dialogue to novels and long descriptions.	
10. I spell by sounding out words in my head.	

Kinesthetic Learners	That's me!
1. I remember actions but often forget what I have seen or heard..	
2. I may seem distracted during a long speech or presentation.	
3. I fidget and find reasons to move, needing to try things out.	
4. I make a physical show of emotions, such as stomping off when I'm angry.	
5. I respond to music by moving.	
6. I use my hands when I speak. I'm not a good listener because I want to move.	
7. Mental images are not important to me. I like action.	
8. I learn best by attacking problems physically. I like activities that allow me to move around.	
9. I like stories and novels in which the action begins early.	
10. I like to try things out. I touch, feel, and manipulate.	

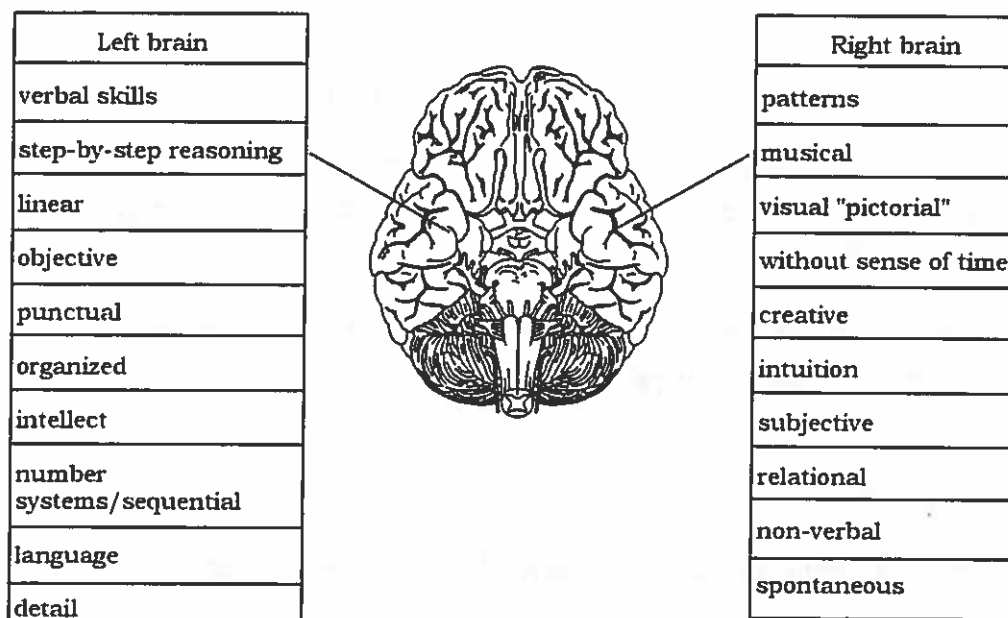
Now that you have completed the survey discuss three ways that knowing your learning style will help you in your studies.

1.

2.

3.

(5) **Self-reflection Exercise 4: Left Brain or Right Brain dominance**



Left Brain/Right Brain Inventory

Check the answers that most closely describe your preferences by circling either a. or b.

1. When you walk into a classroom, or auditorium which side do you prefer?
 - a. right
 - b. left
2. When taking a test, which style of questions do you prefer?
 - a. subjective (discussion)
 - b. objective (true/false, multiple choice, matching)
3. Do you often have hunches?
 - a. yes
 - b. no
4. When you have hunches, do you follow them?
 - a. yes
 - b. no

-
5. Do you like to keep everything neat and in its place?
- a. no
 - b. yes
6. When you are learning a dance step, is it easier for you to
- a. learn by imitating the teacher and getting the feel of the music?
 - b. learn the sequence of movements and talk your way through the steps?
7. Do you like to rearrange your bedroom frequently or do you prefer to keep the same arrangement?
- a. move
 - b. keep
8. Are you good at keeping track of time without a watch?
- a. no
 - b. yes
9. Is it easier for you to understand
- a. geometry?
 - b. algebra?
10. Which is easier to remember, names or faces?
- a. faces
 - b. names
11. If given the topic "friends" would you prefer to express your feelings through drawings or writing?
- a. drawing
 - b. writing
12. When someone is talking to you, do you respond to the word meaning, or to the feelings they convey?
- a. word pitch and feeling (how it is said)
 - b. word meaning (what is said)

-
13. Do you use few gestures, or do you use many gestures when speaking?
- a. many gestures (often use hands when you talk)
 - b. few gestures (very seldom use hands when you talk)
14. Your locker or work space is
- a. cluttered with stuff that you might need
 - b. neat and organized
15. Is it easier for you to read for main ideas or to read for specific details?
- a. main ideas
 - b. specific details
16. Do you do your best thinking sitting erect or lying down?
- a. lying down
 - b. sitting erect
17. Are you more comfortable when saying/doing humorous things or saying/doing well-reasoned things?
- a. humorous things
 - b. well-reasoned things
18. In math
- a. you can get the answer but cannot explain how
 - b. you can explain how you got the answer

Score: number of a responses _____
 number of b responses _____

If you answered more a responses then you are right brain dominant; if you answered more b responses then you are left brain dominant.

Complete the following statement:

According to this inventory I am _____ brain dominant.



Unit Two Research Activity

Issue: The reliability of eye witness testimony

Research Method: Survey

- (20) Read the following article related to the **Issue** of eyewitness testimony.

It's Him – Or Is It?

Mistaken Identity Can Land Innocent People In Jail

By Amy Sinatra
ABCNEWS.com

The headlines are familiar: Another inmate is freed after being cleared by DNA testing. Ever wonder why so many innocent people were behind bars in the first place?

Experts say it's often mistaken eyewitness testimony that puts innocent people in prison – and lets the real criminal roam free.

Of the first 40 cases overturned by DNA evidence, 36 of them were defendants convicted on eyewitness testimony, explains Boston defense attorney James Doyle, who has written several articles and co-authored a book on eyewitness testimony.

Experts say the problem is that, unlike in the movies, witnesses who point at a defendant and say "that's him" are often mistaken.

"Eyewitness testimony is the worst evidence you could possibly have, but at trial it's the strongest evidence you could possibly present," says David Odom, who represents a man who spent 15 years behind bars because of mistaken eyewitness testimony. "It's extremely powerful testimony."

And it's a problem that has defense attorneys and prosecutors concerned.

"Everyone in both law enforcement and, of course on the defense side, is becoming much more interested in first of all, how can you avoid using eyewitness testimony in the first place, and secondly, how you can avoid using mistaken identity," Doyle says.

Procedural Problems

The issues surrounding eyewitness testimony generally fall into two areas: police procedures and the way memory works.

A major problem, say critics, is when police don't tell witnesses that it's possible the actual perpetrator is not even in the lineup.

"People have a natural tendency to approach a lineup situation in such a way that they make what I've called relative judgment," says Gary Wells, an expert in eyewitness testimony and a psychology professor at Iowa State University. "What they'll do is they'll hone in fairly quickly on the person who looks most like the perpetrator relative to the others."

But if the perpetrator isn't there, the person in the group who looks most like him or her is likely to be deemed the culprit. And if the others selected to be in the lineup don't look anything like the witness description of the perpetrator, researchers say the lineup is biased. Wells also argues that by human nature, police may unknowingly influence the witness' selection by trying to assist the witness or by showing the relief or excitement that comes when the witness chooses their suspect.

Complicating police procedures are other effects on memory.

"The passage of time, I think, is one of the most important factors in determining the accuracy of an eyewitness," says Kathy Pezdek, a psychology professor at the Claremont Graduate School in California, referring to the amount of time that elapses between when the event occurs and when the witness makes an identification.

Other factors include the extreme level of stress in the situation, the presence of a weapon, the length of time that the person sees the perpetrator, whether it was dark out, the way witnesses might talk to one another after the event, possible influence by media reports and the race of the witness and perpetrator. Pezdek says more than a dozen studies have now found that there's an average of about 15 percent difference between the accuracy rates of identifying people of your own race vs. identifying people of a different race.

But even with all the potential margins for error, eyewitness testimony can still make or break a case. Confidence in the police station can translate on the stand, and a witness who honestly believes he or she has identified the right person and says something like "I know that's him – I'll never forget that face" can lead to conviction because juries tend to believe confidence equals accuracy.

"A confident witness—particularly one who's got details and expresses that detail in a confident manner – can be very persuasive," says Elizabeth Loftus, a psychology professor at the University of Washington who has spent 20 years studying eyewitness testimony and memory.

Double-Blind

To avoid the potential problem of police influence, Wells and other researchers recommend using "double-blind" lineups – where the person administering the lineup does not know who the police believe the suspect is.

Many police officers, however, don't think having a neutral party administer the lineup is necessary, and dispute that the officer's actions would be a problem.

"As a general rule, most police officers would absolutely nix that," says Detective Edward Rusticus of Grand Rapids, Mich. "They'd feel uncomfortable with that because it's their case ... I think that police

officers probably feel that their integrity is being undermined with that."

Rusticus also defended the role of police in a lineup.

"Most police officers as a rule, at least investigators who have been police officers for a while, would be unbiased. Everybody's human, and you're going to have some level of bias no matter where you go."

Coming to a Compromise

What 35 police officials, researchers, prosecutors and defense lawyers brought together by the Justice Department have agreed to is a set of guidelines for how to administer photo arrays and physical lineups.

Wells expects defense attorneys to be invoking the guidelines in court, comparing the procedures used by police with the recommended procedures. Police and prosecutors say they're willing to comply because they want to ensure they have the right person.

"The whole point of doing an investigation is to determine what the truth is and to find out what the facts are," says Richard Vulgamore, special investigator for the Brooke County prosecuting attorney's office in West Virginia. "Anything that can help us do that better is, of course, important to the justice system."

Wrongfully Imprisoned

At the age of 39, James Newsome walked out of a maximum-security prison in Illinois after 15 years of wrongful incarceration.

Newsome was convicted and sentenced to life in prison after three witnesses identified him as the man who shot and killed a 72-year-old grocery store owner on the South Side of Chicago, even though his fingerprints didn't match those at the scene.

But in 1994, fingerprint technology proved the real perpetrator was a man on death row.

Newsome was given a settlement of \$140,000 by the state, but he didn't think that was enough of an apology.

Now he's suing the police officers and the Chicago Police Department for millions for gross misconduct.

The amount of information a person remembers about a picture or event may be related to the amount of time they have to gather information about the picture or event.

What do you think? Are people's memories selective? Test the hypothesis on the next page by conducting a simple experiment.

Hypothesis:

- Peoples' memory is selective as measured by the fact that not all people remember the same details about an identical photo.

Procedure:

1. Show ten people the picture on the next page. Allow each person to view the picture for a standard time limit of ten seconds.
2. Immediately after the ten seconds are up, ask the person the ten questions that accompany the photo. Mark each response as either correct or incorrect.
3. Record your results on the experiment reporting form that follows the photo and questions.
4. Then, answer the "analysis of research findings" questions to summarize your findings.



Questions related to the picture.

1. Was the teacher male or female?
2. How many children were in the picture?
3. How many boys?
4. How many girls?
5. What was the boy in the back row wearing on his feet?
6. What number was imprinted on the back of one child's T-shirt?
7. What was the letter displayed on the open page of the book?
8. How many children were wearing striped T-shirts?
9. What was the hairstyle of the girl in the plaid dress?
10. What was the teacher wearing around her neck?

(10) Research Activity: Eye Witness Testimony Experiment Reporting Form

Questions

Circle each question that was answered correctly by each participant.

Example. 1 2 **3** 4 5 6 **7** 8 9 10

(Questions 3 and 7 were answered correctly)

Participants	Questions									
1	1	2	3	4	5	6	7	8	9	10
2	1	2	3	4	5	6	7	8	9	10
3	1	2	3	4	5	6	7	8	9	10
4	1	2	3	4	5	6	7	8	9	10
5	1	2	3	4	5	6	7	8	9	10
6	1	2	3	4	5	6	7	8	9	10
7	1	2	3	4	5	6	7	8	9	10
8	1	2	3	4	5	6	7	8	9	10
9	1	2	3	4	5	6	7	8	9	10
10	1	2	3	4	5	6	7	8	9	10

(10) Analysis of Research Findings

1. Did participants vary in the number of questions they answered correctly?

☐ yes ☐ no

2. What was the range of scores for correct answers?

Lowest number of correct responses: _____

Highest number of correct responses: _____

3. What was the average number of correct responses?

$$\frac{\text{sum of correct responses by all participants}}{\text{number of participants}} = \frac{\quad}{10} =$$

4. a. Were there any questions that were answered correctly by all participants?
- b. Were there any questions that were not correctly answered by any participants or by only one or two people?
- c. Speculate on two reasons why some details in a picture are more difficult to remember than other details.

5. Did research results support your initial research hypothesis?

Hypothesis	Yes	No
• Peoples' memory of details in a picture is selective. (Different people remember different things)	<input type="checkbox"/>	<input type="checkbox"/>

Remember that participants in the experiment were asked to look closely at the photo and to be prepared to answer questions based on it. At an accident or crime scene, the scene is not static. People frequently don't have any advanced warning of the event and those involved may be under sudden stress. All of these factors may make it more difficult to remember details of the event.



Extension Activity

Select and complete one of the following three extension options.

Option 1 - You explore the moral dilemma of scientific research into the human genome, and, determine your views by responding to questions following the reading of an article.

- (20) Read the following article entitled "A Double-Edged Sword." The article deals with the issue of scientific developments in genetic research and the moral dilemmas they create.

A Double-Edged Sword

by

Rupert J. and Linda E. Taylor

Scientific developments often present society with new moral dilemmas, perhaps never more so than with the decoding of the human genome.

"Science in the service of society." That's a slogan with a nice ring to it. Images of spring come to mind of barren landscapes made suddenly fertile, or people ravaged by disease quickly cured. Science performs those miracles and many more.

But, science and the way it's used isn't always for the best. This issue has been brought into sharp focus by the decoding of the human genome.

For a decade, more than a thousand scientists worked to unlock the biological secrets held within the roughly 100,000 genes that, together, form the basis of human life. With great fanfare, the completion of the project was announced in June, 2000.

Before the genome project began in 1990 most of the genetic construction of humans was a mystery. It was as though someone

had taken the only copy of the instruction manual for making people, stripped each page of its letters, jumbled them up, thrown them into a cellar, and switched the lights off. Scientists then had to grope about in the dark and reassemble the manual without even knowing what the original copy looked like.

The fact that the job was completed in ten years owes more to computer technology than biology. At the start of 1999, scientists in a branch of technology called bioinformatics developed the capacity to sequence 1,000 letters of DNA per second, 24 hours a day, seven days a week. That breakthrough got the project into the fast lane.

The decoding process was a joint effort, involving scientists from the United Kingdom, the United States, China, France, Germany and Japan. Its completion was

treated as a great moment in history, so Britain's Prime Minister Tony Blair and American President Bill Clinton jointly made the announcement through a transatlantic telephone hookup. However, understanding the location and function of each gene is only the start. A great deal of work remains to be done.

A large number of diseases are caused by genetic flaws, or by the absence of one or more genes. Having the complete instruction manual will help scientists solve many medical mysteries. Within a couple of decades, doctors could be able to cure many cancers that today are usually fatal. Such illnesses as Alzheimer's, Parkinson's, multiple sclerosis, schizophrenia, diabetes, and many others may also be conquered. Dr. Francis Collins is Director of the Human Genome Project (HUGO). He says that by 2040, gene therapy and gene-based drugs will be available for most diseases, and the average human life span will reach 90.

In July 2000, *The Economist* wrote about a brighter future for medicine. "These days the talk is of a perfect diagnosis, drugs that will work first time and have no side-effects, even of predictive medicine so accurate that it could tell you, should you want to know, when you are going to die and of what."

That's the good news. But, the information coming out of HUGO raises a lot of ethical questions. One of the major ones turns on money.

Jean Paul Getty (1892-1976) put together a vast fortune in the oil business. Recently, one of his grandsons made the observation that "Intellectual property is the oil of the 21st century." Companies protect the value of their intellectual property (their discoveries or innovations) through patents. A patent prevents anyone else from using the breakthrough without payment to its owner. This protection encourages biotechnology companies to undertake very expensive research because they are assured of a financial payoff if the research

proves successful. A patent gives its holder a monopoly in the same way as a right to drill for oil on a particular parcel of land. Without patent protection there would be little reason for commercial interests to be involved in research.

Genome 101

Deoxyribonucleic acid is such a mouthful that most people just call it DNA. James Watson and Francis Crick discovered DNA in 1953 inside tiny X-shaped structures called chromosomes.

Each person has 23 pairs of chromosomes in the nucleus of cells that make up their body. The DNA molecule is two chains of chemical compounds called polynucleotides. The chains are twisted into the form of a coil, called a double helix. Between the twisted strands of DNA are structures that look like the rungs of a ladder. These are called bases and they come in pairs. The bases are coded with the letters A, C, G, and T, which relate to their chemical composition. A section of DNA with a four-letter combination of bases forms a gene; a single gene can have thousands of base pairs.

The chemical instruction carried by a coded gene determines whether a cell will become part of a toenail or part of an ear lobe, for instance. There ought to be about 1,000,000 genes in each person (nobody knows for sure how many) and this is called the human genome.

The issue is full of high drama; it involves life, death and big money. To see why, let's look at the story of a bacterium called *Staphylococcus aureus*. This bacteria causes Toxic Shock Syndrome, an infection that usually proves fatal if untreated. But, *Staph aureus* is a clever little devil that develops resistance to the ever-more powerful antibiotics that are used against it.

In the early 1990s, doctors at Harvard University began the search for a way of attacking the bacterium. They realized the key to an effective treatment was unlocking the *Staph aureus* genome, but they lacked the funding for such a project.

Then, in 1996, a private company announced that it had decoded the *Staph aureus* genome. But, the Harvard scientists were denied access to it. Human Genome Sciences Inc., kept the genome secret to ensure that it got all the money out of its discovery that it could before sharing it with anyone else. Three other biotech companies did the same thing.

Harvard pleaded for public funding to help unlock the *Staph aureus* secret. The project eventually got its money and, early in 1999, the bacterium's genome was sequenced and a vaccine produced. But, how many people died during the two-to-three-year period it took for the public discovery of the genome?

Philosopher Alex Wellington and political scientist Ted Schrecker summed up the dilemma in a March 2000 article in the *Globe and Mail*.

"Questions remain," they wrote, "about the appropriate balance between private returns...and the public interest. Fairness dictates that the inventors and investors should benefit from their commitments of money and scientific knowledge. But their returns should not be determined only by what the market will bear."

Many people - scientists, religious leaders, philosophers, ethicists, and others - question whether or not a life form can, or even should be, patented. Dr. Gert-jan van Ommen of Leiden University in the Netherlands says, "A mere DNA molecule...cannot constitute an invention." However, by April 2000, an estimated 40,000 genetic patents were pending at the U.S. Patent and Trade Office.

Canadian law is beginning to catch up to this challenge. The Canadian Patent Act says that intellectual property rights may be asserted over "any new and useful art, process, manufacture or composition of matter." There's no mention of life forms. But, in simple terms, a patent application only has to pass three tests; is the invention new, useful and non-obvious?

In the case of the Harvard mouse the Canadian Court of Appeal answered "yes" to all three. In August 2000, the Court ordered that a patent be issued on the mouse which has been genetically tweaked to make it more prone to cancer, making it valuable to medical researchers. It took 15 years for the case to get this far, and the court ruled only on whether the mouse met the tests for patentability.

The Court of Appeal judges said that there might well be good reasons that living things should not be patented. But, that's an issue for elected officials to decide, not the courts. To which politicians will say under their breath, "Thanks a lot." It'll be a monster for legislators to tackle, because no matter what decision is made somebody will be ticked. Environmentalists and a large portion of the general public are very suspicious of genetics and biotechnology. But, multi-national companies are very gung-ho to push the science forward. Some experts get nervous about genetic screening. This can be done today for some conditions and it will become more commonplace in the near future. Careful study of a sample of DNA can reveal how likely a person is to succumb to certain illnesses.

One of these ailments for which a screening test is already available is Huntington's disease. It is a genetic brain disorder that affects one in 10,000 people. If one parent of a child has Huntington's disease and the other does not, the child has a 50% chance of inheriting the disease. Once transmitted, it is almost certain to develop and it is always fatal.

If Huntington's occurred in your family would you have the genetic test done? In Canada, only one in five at-risk people wants to know if the Huntington gene has been transmitted to them. There's nothing sinister about the personal choice of whether to know or not know. Where the moral dilemma creeps in is whether anybody else should know; and this applies to all genetic screening.

People applying for jobs today usually fill out an application form in which they reveal some personal information - age, marital status, previous employment, etc. Companies choose whom to hire based, to some extent, on this information. What if employers could add genetic screening to the hiring process? This would inevitably lead to genetic discrimination. Given two equally qualified applicants would a company hire the one whose genetic screening revealed a likelihood of developing schizophrenia? Probably not.

Genetic screening information could also be used to deny someone insurance. But, why would that be a problem? Insurance companies already delve into a person's medical history when writing life or health coverage. A person who has suffered a heart attack is going to have trouble getting life insurance. Concealing an existing heart ailment would probably make the insurance invalid. Genetic screening would simply give insurance companies more accurate information than they have now.

Another concern is the possibility of creating "designer babies." Today, when a sperm and an egg unite, chance plays a major role in how the life thus created will turn out. The embryo will get half its genes from its mother and half from its father. Whether it inherits its father's tallness or its mother's blue eyes pretty much depends on a roll of the dice. But, genetic engineering holds within it the promise of overcoming the random nature of heredity.

We might be able to fix the problem with chromosome 21. Most people have an identical second copy of chromosome 21, but occasionally a third copy appears. This extra chromosome 21 is the cause of Down's syndrome, a form of mental retardation. It's possible that the third copy of chromosome 21 could be removed and the baby born without Down's syndrome. Most people would agree that eliminating Down's syndrome is a positive development. The same with thalassemia and Tay-Sachs disease. Both illness usually kill victims before adulthood and both are inherited. A blood test can determine the odds of a couple having affected children. A screening project for thalassemia and Tay-Sachs disease has been underway in Montreal since the 1970s. Researchers say the program has reduced the incidence of the diseases by 95%.

But, suppose you are a carrier of thalassemia and you fall in love with another carrier. Do you call off the wedding because any children you might have together are more likely to die young? The tests can also be done on an unborn fetus. If it's positive do you have an abortion? These are troubling questions for many people.

The questions get even more troubling when we confront the possibility of creating "designer babies." Germ-line manipulation is the scientific term for this and it's done soon after an egg has been fertilized. It involves taking the very early-embryonic cells apart to see what the genetic lottery has delivered to them. (This process destroys the cells and puts new focus on the question of when life beings.) Any genetic material that is seen as defective - presumably, the parents decide what's good and what's bad - can then be snipped out and replaced. At present, this is a very difficult trick to pull off, but it will become easier and accurate.

We know that certain human characteristics will be preferred: tall over short, male over

female, good looking over average, smart over dumb. Will society go along with a concept that allows parents to order up a child with options in the same way as they can order up a hamburger or a car today?

On the other hand, who wouldn't want to get a pet unicorn for a birthday present?

- (6) 1. Perform an advantages/disadvantages analysis of genome research based on the information presented in the article.

Genome Research	
Advantage	Disadvantage
.	.
.	.
.	.

- (4) 2. Explain your personal views on the subject of genome research.

-
- (5) 3. Sheep have been cloned. Discuss whether you think human cloning should be permitted. Include reasons why or why not in your answer.

- (5) 4. In your opinion, what guidelines or laws are needed to protect society from the misuse of scientific research?



Extension Activity

Option 2: Internet Research Activity

(20) INTERNET RESEARCH ON THE BRAIN

Use this worksheet to research and discover more about the brain and nervous system on the "Neuroscience for Kids" web pages. Locate information, and record it in the spaces below. Be sure to browse this site for other information, games, and learning activities.

To begin, start up your computers and load your web browsers (either NETSCAPE or EXPLORER will work). Go to the NEUROSCIENCE FOR KIDS page at <http://faculty.washington.edu/chudler/neurok.html>.

On the "Neuroscience For Kids" homepage, scroll down to the Table Of Contents. Click on the colored words, "EXPLORE THE NERVOUS SYSTEM." This will bring you to a variety of topics. Scroll down to the section on "THE BRAIN." Click on the colored words "DIVISIONS OF THE NERVOUS SYSTEM."

Use the following questions to navigate through the pages. Record the information to the questions as you find it.

What are the two major subdivisions of the nervous system?

_____ nervous system

_____ nervous system

What is another name for a "nerve cell"? _____

What two structures make up the central nervous system?

About how much does the brain weigh? _____

About how many nerve cells are in the brain? _____

From this page click on the colored words, "BRAIN FACTS AND FIGURES." Using the data on this page, answer the following questions.

What animal has the largest brain? _____

What animal has the smallest brain? _____

Does brain size correlate to intelligence? _____

Go back to the page, "DIVISIONS OF THE CENTRAL NERVOUS SYSTEM." Scroll down to the "HEAR IT" section. Play the words, AMYGDALA, CEREBELLUM, AND DIENCEPHALON. Try to say these words yourself!!!

Continue scrolling down to the section called "BRAIN STRUCTURES."

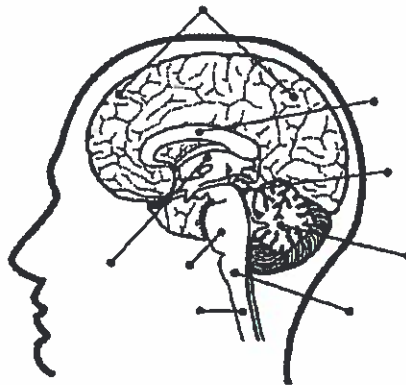
Where is the cerebral cortex located? _____

What is a groove in the cortex called? _____

What is a bump in the cortex called? _____

What is one area of the brain that is responsible for memory and learning?

Label the parts of the brain pictured below:



Go back to the page "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "OUR DIVIDED BRAIN."

What are the four major lobes of the brain?

What happened to Phineas Gage? _____

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "ONE BRAIN OR TWO?"

Name two functions that are dominant on the left brain side of the brain.

The right side of the brain?

What structure connects the right and left cerebral hemispheres?

What side of the brain controls language in most people? _____

List five famous left-handed folks.

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "HE BRAINS, SHE BRAINS."

Is the proportion of brain weight to body weight different for men and women?

What happens to the brains of adults as they age?

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "BRAIN DEVELOPMENT."

When does the nervous system begin to form?

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "THE VENTRICLES AND CSF."

What is cerebrospinal fluid (CSF)?

Name at least two functions of CSF.

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "THE BRAIN DURING SLEEP."

What instrument is used to measure brain activity?

About how much of your life do you spend asleep?

What does REM stand for?

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "BRAIN FITNESS-YOUR GUIDE TO GOOD HEALTH."

List three tips given on this page for good health.

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "THE BRAIN VS. THE COMPUTER."

Which sends signals faster, a brain or a computer? _____

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Click on the colored words, "WHAT BECAME OF EINSTEIN'S BRAIN?"

When did Einstein die? _____

Who removed his brain? _____

Where is the brain now? _____

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Scroll down to the bottom of the page where it says, "THE EFFECTS OF DRUGS ON THE NERVOUS SYSTEM." Click on the colored word "ALCOHOL."

What kind of drug is alcohol? _____

What term is given to drugs that kill brain cells? _____

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Scroll down to the bottom of the page where it says, "THE EFFECTS OF DRUGS ON THE NERVOUS SYSTEM." Click on the colored word "CAFFEINE."

Which soft drink has the most caffeine per serving? _____

What are two negative side effects of caffeine?

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Scroll down to the bottom of the page where it says, "THE EFFECTS OF DRUGS ON THE NERVOUS SYSTEM." Click on the colored word "COCAINE."

Is cocaine an addicting drug? _____

What organ does it affect other than the brain? _____

Go back to the page, "EXPLORE THE NERVOUS SYSTEM." Scroll down to the bottom of the page where it says, "THE EFFECTS OF DRUGS ON THE NERVOUS SYSTEM." Click on the colored word "MARIJUANA." Scroll down and click on the colored words, "MARIJUANA: FACTS FOR TEENS."

List two short-term effects of marijuana use.

List two possible long-term effects of marijuana use.

What effects may marijuana have on the babies of pregnant women who smoke marijuana?



Extension Activity

Option 3: A Personality Assessment

This activity is intended to help you to look introspectively at your personality and how your personality traits were acquired and developed.

1. Complete the questions in Part A about yourself.
2. Ask a parent to answer questions in Part B about you.
3. Analyse your findings by completing questions in Part C.

(5) Part A:

1. List three traits that best describe your personality as a young child (as far as you can remember).
2. Which of the traits you listed above apply to your personality at the present time?
3. List three new traits that you have developed since you were a young child (3-5 years old).

(6) Part B: Ask a parent these questions about you. Record answers in the spaces provided.

1. List three traits that best describe my personality as a young child.

2. Which of these traits best describe my current personality?

3. How has my personality changed since I was a young child?

4. What elements of my personality have remained consistent over time?

(9) Part C: Think about your responses in part A and your parents' responses in part B when you answer the following questions.

1. Is your assessment of your current and previous personality traits consistent with your parent's assessment of your past and present traits? How do you account for the similarities and differences you observe?

2. Do your findings confirm or reject the idea that personality traits remain fairly constant over time? Explain your answers.

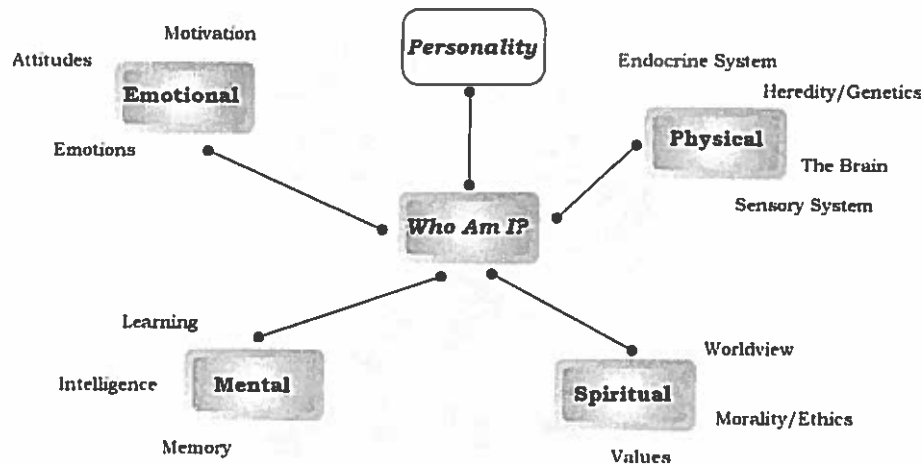
3. What evidence do you see that would lead you to believe that some personality traits have a genetic basis?

4. How has your family shaped your personality?

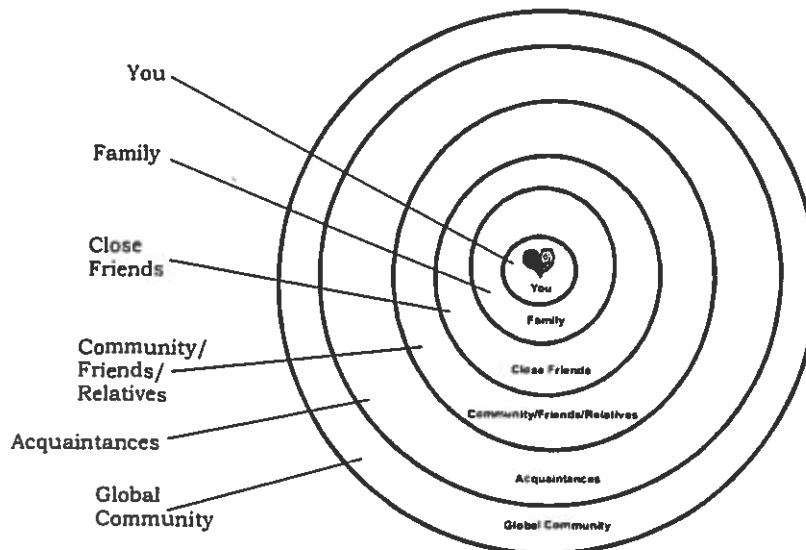
5. List four environmental factors (including people, institutions, social economic or political conditions, etc.) that have influenced your personality. Explain how each factor has influenced your personality.

Unit Summary

Before you begin your assignment take another look at the concept web introduced at the beginning of this unit. Review in your mind the things you have learned about each of the concepts that are listed on the web. If you need to refresh your memory, go back to sections in your unit that discuss each of these concepts.



The information and activities in this unit may have helped you to know yourself a little better. By looking introspectively at the biological, cognitive, emotional, and spiritual influences that shape who you are, you can gain a better understanding of why you think, feel, and behave the way you do. Your life is made up of many circles.



Now that you are prepared, proceed full speed to your assignment.



Psychology 20

Unit Two

Assignment 2



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**Saskatchewan
Learning**

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Correspondence School

**Staple here to the upper left hand
corner of your assignment**

**Before you submit your assignment,
please complete the following procedures:**

1. Write your name and address and the course name and assignment number in the upper right hand corner on the first page of each assignment.
2. Number all the pages and place them in order.
3. Complete the required information details on this address sheet.
4. Staple this address sheet to the appropriately numbered assignment. Use one address sheet for each assignment.
5. Staple the appropriately numbered, green, Assignment Submission Sheet to the upper left hand corner, on top of this address sheet.
6. Use sufficient postage.

Please print your name and address, including postal code in the space below. This address sheet will be used when mailing back your corrected assignment.

Name	
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City or Town	Province
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Student Number

6	3	4	0
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Course Number

0	2
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Assignment Number

Psychology 20

Course Title

Correspondence School Teacher's Name

Mark Assigned



Assignment 2

Values

- A. Lesson Activities: Submit the following activities:
- (20) 1. Self-reflection Exercises
- Exercise 1: Medicine Wheel
 - Exercise 2: What Motivates Me?
 - Exercise 3: Learning Style
 - Exercise 4: Left Brain or Right Brain Dominance
- (20) 2. Research Activity: Eye Witness Testimony
- (20) 3. Extension Activity (Option 1 or 2 or 3)
- B. Assignment Questions: Answer the following assignment questions.

(10)

1. **Matching:** Match the parts of the nervous system listed in Column B with the functions listed in Column A.

Column A		Column B
___ 1.	the part of the nerve cell involved in the reception of stimuli	a. autonomic nervous system
___ 2.	the name given to nerve cells	b. axons
___ 3.	the part of the nerve cell involved in the transmission of nerve impulses from the cell body to other cells	c. brain
___ 4.	controls the vital processes of the body, such as digestion, heart rate, and the functioning of internal organs	d. cerebral cortex
___ 5.	involved in the process of gathering information from the five senses	e. corpus callosum
___ 6.	channels information to and from the brain	f. dendrites
___ 7.	control center of the human body	g. hypothalamus
___ 8.	the exterior covering of the brain	h. neurons
___ 9.	a thick band of nerve fibres that provide connections between the two sides of hemispheres in the brain	i. somatic nervous system
___ 10.	regulates body temperature, blood sugar and hormonal levels, and metabolism	j. spinal column

(7) 2. Briefly define the following terms in your own words.
Write your definitions in the spaces provided.

- heredity

- personality

- motivation

- attitudes

- intelligence

- learning

- position roles

-
- (6) 3. Briefly explain the steps in the following progressions.
- sensory memory → short term memory → long term memory

- pre-conventional → conventional → post-conventional

4. **Short Answer:** Answer the following questions in the spaces provided.

- (5) a. Explain the purpose of the spiritual dimension of human beings as described in the lesson.

(6)

b. In the Self-reflection Exercises section of this unit you completed a number of exercises that invited you to take an introspective look at who you are.

i. Based on this introspection, list three things that you like most about yourself and explain why you made each of these selection.

- I like that I

Reason:

- I like that I

Reason:

- I like that I

Reason:

-
- ii. List three things about yourself that you would like to change or improve and list one method you could use to make each of these changes/improvements?

- I want to change

I could do this by

- I want to change

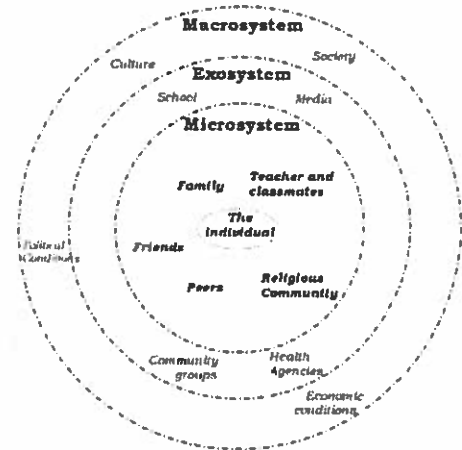
I could do this by

- I want to change

I could do this by

(6)

3. Using Bronfenbunner's model of the system that influences human behaviour, briefly explain how two of the factors included in the graphic have had an influence on who you are.



Factor:

Influence:

Factor:

Influence:

Unit Two Checklist ☒

Have you included all the following items, and stapled them together in the correct order?

☐ Coloured assignment submission sheet

☐ White address sheet

☐ Part A

1. Self-reflection Exercises

☐ Exercise 1: Medicine Wheel

☐ Exercise 2: What Motivates Me?

☐ Exercise 3: Learning Style

☐ Exercise 4: Left Brain or
Right Brain Dominance

2. ☐ Research Activity: Eye Witness
Testimony

3. ☐ Extension Activity (Option 1 or 2 or 3)

☐ Part B: Assignment Questions