**P1-20:**

**P20-36:**

Scientific Method:

* Systematic observation of events

>gather numerical data of phenomenon

>data needs be objective and repeatable

>usually quantitative data, sometimes qualitative in early stages

* Formulation of question
* Hypothesis about fact relationship

>an attempted answer to the question

>specify relationship between two or more variables

* Test hypothesis

>make operational definitions, or definitions of a concept such that the concept can be measured.

>observe things that directly affect study, and also indirectly affect study

* Use evidence to form theory

>identifies underlying reasons for the principles laid out by the experimental data

* Test theory

>Test predictions made by theory for accuracy

>good theories are falsifiable, so that the theory can be rejected if the predictions are wrong

>usually seek very specific predictions

Observations:

* Naturalistic Observation

>Observe events as they occur

* Case Studies

>Focus on a single individual

>DON’T GENERALISE BASED ON CASE STUDY

* Surveys

>series of questions about stuff

>good for personality or social interactions

>good for hard information but not mental processes

Correlation:

* Obtain measurements of two variables
* Examine the relationship between two variables

This allows comparison of variables that cannot be directly manipulated, but doesn’t allow any interpretation about causation.

Experimental Groups:

* Experimental group

>independent variable is changed and measured

* Control group

>independent variable is constant

* Random assignment is used to eliminate between members of different groups

Variables:

* Independent variables are the manipulated variables
* Dependent variables are the measured aspect
* Confounding variables are aspects of the situation that change with the independent variable that could account for the change in the dependent variable.

Analysis:

* Quasi-experimental design

>When random assignment is not possible because of the specificity needed in group formation

* Meta-analysis

>A statistical technique used to combine data from different studies to find the relationship between variables.

* Reliability

>consistency in findings

* Validity

>method measures what it is supposed to measure

* Bias

>beliefs, expectations, habits of subject affect the outcome

>response bias is when participants tend to respond a specific way regardless of their actual circumstances.

>sampling bias occurs when researchers do not pick a diverse enough sample

* Experimental Expectancy

>when the experimenter treats subjects in such a way that encourages a specific outcome.

* Double blind design

>the participant doesn’t know the prediction of the study

>the experimenter doesn’t know whether the person is control or experiment

* Pseudopsychology

>looks like psychology but is supported only by superstition or opinion

**P42-50:**

* Mental contents—knowledge. Beliefs, desires, feelings
* Mental processes—sets of operations performed by the brain.
* Neurons—the building blocks of the brain that send and receive signals from one another and from other parts of the body. The human brain is composed of 100 billion neurons. Classifications:

> Sensory neurons—respond to signals from sensory organs

> Motor neurons—control movement

> Interneurons—link sensory and motor neurons

* Brain circuits are sets of neurons that receive input, operate on the input and produce a specific output.

Structure of the Neuron:

Cell body and cell membrane are fairly similar. Has Axon for sending signals; axons frequently split into many terminals. Terminals end with Terminal Buttons, these little knob-like structures that release the neurochemicals into the Synapse. Neurons are surrounded by fluid and the chemical signals are passed through the fluid. Dendrites (Greek::Tree) dot the outside of the cell body and receive incoming messages from the axons of other neurons.

* Neurons communicate with chemicals. At rest, the Neuron waits at a slightly negative Resting Potential. When the chemical balance of ions is disrupted by a change in electrical charge, an Action potential fires down the neuron.
* Action potentials are all-or nothing: if there isn’t enough stimulus, there can’t be a partial action potential.
* Axons are covered in a Myelin Sheath, a fatty layer that allows for faster action potential transmission.
* Multiple Sclerosis is caused by a deterioration of the myelin surrounding the axons, which makes the action potentials slow and inconsistent.
* Synapse has three parts:

> Sending terminal button

> Receiving dendrite

> Space between

* Neurotransmitters are stored in small vesicles in the axon terminal.
* Endogenous Cannabinoids—neurotransmitters released by the receiving neuron. They impact the action of the sending neuron. Marijuana affects the release of these (i.e. cannabis) and can erase neural connections.
* Receptors on the receiving neuron are coded for specific neurotransmitters. Receptors send signals when neurotransmitters bind to them.
* Agonist drugs—affect the neurotransmitters by mimicking them, by increasing their abundance, or by slowing down the rate of their reuptake.
* Antagonist drugs—block receptors to prevent neurotransmitters from bonding with them.
* Glial Cells (Greek::glue)—help neurons create synapses and form appropriate connections when the brain is developing. They can regulate the effect of one neuron on the other, and receive signals from neurons. Communicate with hormones.

**P50-76:**

* Peripheral Nervous System—connects the brain to the body
* Autonomic Nervous system—controls the smooth muscles and some glands. Used in self-regulatory processes.

> the Sympathetic Branch causes the nervous response for dealing with an emergency. The Sympathetic Branch ups heart rate and breathing, dilates pupils and inhibits internal systems.

> the Parasympathetic Branch undoes the sympathetic branch’s effects.

> Sensory-Somatic Nervous System is comprised of the neurons that relay information from sensory organs to he brain and includes the Somatic Motor System, which triggers voluntary motions.

* Central Nervous System—brain and Spinal Cord

This is in charge of conscious responses and is comprised of interneurons in the brain and spinal cord. The front of the spinal cord relays information from the brain to the body, while the back of the spinal cord relays information from the body to the brain. The Spinal cord controls reflexes like jerking away from something that causes pain.

* Brain Parts
* Meninges—are the 3 protective membranes that cover the brain.
* Cerebral Hemisphere—the crease down the centre of the brain.
* Occipital Lobe—back of the brain

Interprets visual signals sent from the eyes.

* Temporal Love—bottom of the brain

Processes information sent from the ears, processes new information and forms memories, and helps comprehend language.

* Parietal Lobe—Top of the brain

Attention, arithmetic, touch, and spatial position. The Somatosensory Strip is right behind the central sulcus and registers all of the touch signals sent to the brain.

* Frontal Lobe—…

Size of this makes us uniquely human. Controls planning, recovering memories, motor control, speech control, reasoning, and emotions.

* Corpus Callosum—bundle of about 300 million axons that connect the two halves of the brain.
* Cerebral Cortex—the outer region of the brian where most mental processes occur.
* Sulci—brain creases
* Gyri—brain bulges
* Subcortical Structures—inner brain, made of grey matter and look very similar to the structure of a nonhuman brain.

The Forebrain

* Thalamus—redirects signals as they enter the brain to their appropriate locations
* Hypothalamus—Regulates eating, drinking, body temperature, blood pressure, heart rate, sexual behaviour, and hormones.
* Hippocampus—creates memories.
* Amygdala (Greek::almond)—controls strong emotions such as fear and anger. It is used to interpret the facial expressions of others.
* Basal Ganglia—plans and produces movement, and plays a role in habit formation. Relies heavily on dopamine.
* Nucleus Accumbens—part of the basal ganglia that controls the brain’s response to reward or the anticipation of reward.

The Brainstem

* Medulla—controls automatic functions like breathing, swallowing, and blood circulation.
* Pons—connects the medulla and the midbrain. Regulates sleep and control of facial muscles.
* Cerebellum—balance and physical coordination.
* Split-Brain Patient—undergoes the severing of the corpus callosum. This is used to severe epilepsy.
* Left brain is verbal and analytical, right brain is perceptual and intuitive (but this isn’t true for all things)
* Neuroendocrine System—works in coordination with the CNS, controls the release of hormones.
* Neuroimmune system—Hypothalamus, pituitary gland, and adrenal gland form an axis that release white blood cells to fight threats to the body.
* Stroke—when blood fails to reach a certain part of the brain.
* Electroencephalograph (EEG)—records electrical activity in the brain.
* Magnetoencephalograph(MEG)—records magnetic activity in the brain.
* Neuroimaging—a scan of the physical structure of the brain.

Note: Brain Scans only show correlational data, do not imply causal aspects of brain function.