Section 1: Concept Checklist

Check off each concept once you can explain it in your own words.

3.1 Human Genetics

- ☐ Theory of evolution by natural selection
- ☐ Genotype vs. phenotype
- ☐ Gene-environment interactions and range of reaction
- ☐ Genetic environmental correlation
- ☐ Epigenetics and identical vs. fraternal twins
- ☐ Dominant and recessive alleles
- ☐ Homozygous and heterozygous traits
- ☐ Polygenic traits
- ☐ Mutations and genetic variation

3.2 Cells of the Nervous System

- ☐ Structure and function of neurons
- ☐ Soma, dendrites, axon, and terminal buttons
- ☐ Myelin sheath and Nodes of Ranvier
- ☐ Synaptic cleft and neurotransmitters
- ☐ Semipermeable membrane and resting potential
- ☐ Action potential and all-or-none phenomenon
- ☐ Threshold of excitation
- ☐ Reuptake and clearing the synapse
- ☐ Electrical vs. chemical synapses
- ☐ Agonists and antagonists
- ☐ Psychotropic medications and neurotransmitter systems

3.3 Parts of the Nervous System

- ☐ Central nervous system (CNS) vs. peripheral nervous system (PNS)
- ☐ Somatic nervous system (sensory and motor neurons)
- ☐ Autonomic nervous system and voluntary control
- ☐ Sympathetic nervous system and fight or flight response
- ☐ Parasympathetic nervous system and homeostasis
- ☐ Efferent and afferent fibers

3.4 The Brain and Spinal Cord

- ☐ Spinal cord organization and reflexes

- [ ] Neuroplasticity and brain recovery
- [ ] Cerebral cortex: gyri and sulci
- [ ] Longitudinal fissure and hemispheres
- [ ] Lateralization of function
- [ ] Corpus callosum and split-brain patients
- [ ] Four lobes of the brain (frontal, parietal, temporal, occipital)
- [ ] Motor cortex, prefrontal cortex, and Broca's area
- [ ] Somatosensory cortex and body mapping
- [ ] Wernicke's area and speech comprehension
- [ ] Visual cortex in occipital lobe
- [ ] Thalamus as sensory relay
- [ ] Limbic system: hippocampus, amygdala, hypothalamus
- [ ] Reticular formation and sleep/wake cycle
- [ ] Substantia nigra and ventral tegmental area (VTA)
- [ ] Medulla, pons, and cerebellum
- [ ] Brain imaging techniques (CT, PET, MRI, fMRI, EEG)

3.5 The Endocrine System

- [ ] Hormones vs. neurotransmitters
- [ ] Endocrine glands and hormone secretion
- [ ] Pituitary gland as "master gland"
- [ ] Hypothalamus-pituitary interaction
- [ ] Thyroid gland and metabolism
- [ ] Hyperthyroidism and hypothyroidism
- [ ] Adrenal glands and stress response
- [ ] Pancreas and blood sugar regulation
- [ ] Gonads and sexual hormones
- [ ] Insulin and glucagon
- [ ] Epinephrine and norepinephrine

Section 2: Fill in the Blank

Each blank is a vocabulary word from the chapter's Key Terms list. A word bank is provided after Section 2.

3.1 Human Genetics

1. _____ refers to the genetic makeup of an individual based on inherited genetic material.

2. _____ refers to an individual's observable characteristics, which are a combination of genetic and environmental influences.

3. A _____ is a specific version of a gene.

4. _____ asserts that our genes set the boundaries within which we can operate, and our environment interacts with the genes to determine where in that range we will fall.

5. The _____ states that organisms better suited for their environment will survive and reproduce compared to those poorly suited.

6. _____ is a study of gene-environment interactions, such as how the same genotype can be expressed in different ways.

7. _____ are twins that develop from the same sperm and egg, so their genetic material is identical.

8. _____ are twins that develop from two different eggs fertilized by different sperm, so their genetic material varies.

9. A _____ is a sudden, permanent change in a gene.

10. _____ is the concept that our genes influence our environment, and our environment influences the expression of our genes.

11. _____ traits are controlled by more than one gene.

12. A _____ is a long strand of genetic information made up of DNA.

13. _____ is a helix-shaped molecule made up of nucleotide base pairs that carries genetic information.

3.2 Cells of the Nervous System

14. The _____ is the outer surface of a neuron that allows smaller molecules to pass through while stopping larger or highly charged molecules.

15. The _____ is the cell body of a neuron that contains the nucleus.

16. _____ are branch-like extensions of the soma that serve as input sites where signals are received from other neurons.

17. The _____ is a major extension from the soma that transmits signals away from the cell body.

18. The _____ is a fatty substance that coats the axon and acts as an insulator, increasing the speed of signal transmission.

19. _____ are small gaps in the myelin sheath along the axon where the signal jumps during transmission.

20. _____ are small structures at the end of the axon that contain synaptic vesicles.

21. _____ are storage sites for neurotransmitters at the end of the axon.

22. _____ are chemical messengers of the nervous system released into the synaptic cleft.

23. The _____ is the small gap between two neurons where communication occurs.

24. _____ are proteins on the cell surface where neurotransmitters attach.

25. The _____ is the difference in charge across the neuronal membrane that provides energy for the signal.

26. The _____ is the state of readiness of a neuron membrane's potential between signals.

27. The _____ is the level of charge in the membrane that causes the neuron to become active.

28. The _____ is the electrical signal that typically moves from the cell body down the axon to the axon terminals.

29. An _____ is a phenomenon in which an incoming signal is either sufficient or insufficient to reach the threshold of excitation.

30. _____ involves moving a neurotransmitter from the synapse back into the axon terminal from which it was released.

31. A _____ is a drug that mimics or strengthens the effects of a neurotransmitter.

32. An _____ is a drug that blocks or impedes the normal activity of a neurotransmitter.

33. _____ are drugs that treat psychiatric symptoms by restoring neurotransmitter balance.

3.3 Parts of the Nervous System

34. The _____ is comprised of the brain and spinal cord.

35. The _____ connects the CNS to the rest of the body.

36. The _____ is associated with activities traditionally thought of as conscious or voluntary.

37. _____ are neurons carrying instructions from the CNS to the muscles.

38. _____ are fibers that carry instructions away from the CNS.

39. _____ are fibers that carry sensory information toward the CNS.

40. _____ are neurons carrying sensory information to the CNS.

41. The _____ controls our internal organs and glands and is generally outside the realm of voluntary control.

42. The _____ is involved in preparing the body for stress-related activities.

43. The _____ is associated with returning the body to routine, day-to-day operations.

44. _____ is a state of equilibrium in which biological conditions are maintained at optimal levels.

45. The _____ allows the body access to energy reserves and heightened sensory capacity to fight off a threat or run away to safety.

3.4 The Brain and Spinal Cord

46. _____ refers to how the nervous system can change and adapt.

47. The _____ is the surface of the brain known for its pattern of folds and grooves.

48. A _____ is a bump or ridge on the cerebral cortex.

49. A _____ is a depression or groove in the cerebral cortex.

50. The _____ is the deep groove that separates the brain into two halves.

51. The _____ is the left or right half of the brain.

52. _____ is the concept that each hemisphere of the brain is associated with specialized functions.

53. The _____ is a thick band of neural fibers consisting of about 200 million axons connecting the brain's two hemispheres.

54. The _____ is the largest part of the brain, containing the cerebral cortex and other structures.

55. The _____ is located in the forward part of the brain and is involved in reasoning, motor control, emotion, and language.

56. The _____ is a strip of cortex involved in planning and coordinating movement.

57. The _____ is responsible for higher-level cognitive functioning.

58. _____ is a region essential for language production.

59. The _____ is located immediately behind the frontal lobe and is involved in processing sensory information.

60. The _____ is essential for processing sensory information from across the body, such as touch, temperature, and pain.

61. The _____ is located on the side of the head and is associated with hearing, memory, emotion, and some aspects of language.

62. The _____ is the main area responsible for processing auditory information within the temporal lobe.

63. _____ is important for speech comprehension.

64. The _____ is located at the very back of the brain and contains the primary visual cortex.

65. The _____ is a sensory relay for the brain where most senses are routed before being processed.

66. The _____ is a collection of structures involved in processing emotion and memory.

67. The _____ is an essential structure for learning and memory.

68. The _____ is involved in our experience of emotion and in tying emotional meaning to our memories.

69. The _____ regulates homeostatic processes and serves as an interface between the nervous system and the endocrine system.

70. The _____ is the largest part of the brain, located between the forebrain and the hindbrain.

71. The _____ is centered in the midbrain and is important in regulating the sleep/wake cycle and arousal.

72. The _____ is a midbrain structure where dopamine is produced and involved in control of movement.

73. The _____ is a midbrain structure where dopamine is produced and associated with mood, reward, and addiction.

74. The _____ is located at the back of the head and contains the medulla, pons, and cerebellum.

75. The _____ is a hindbrain structure that controls automated processes like breathing, blood pressure, and heart rate.

76. The _____ is a hindbrain structure that serves to connect the hindbrain to the rest of the brain.

77. The _____ receives messages from muscles and structures in the ear to control balance, coordination, and movement.

78. _____ is memory involved in learning and remembering how to perform tasks.

79. A _____ is an imaging technique in which a computer coordinates and integrates multiple x-rays.

80. A _____ is a scan that involves injecting individuals with a mildly radioactive substance to monitor blood flow to brain regions.

81. _____ uses magnetic fields to produce detailed pictures of tissue being imaged.

82. _____ operates on the same principles as MRI but shows changes in brain activity over time.

83. _____ provides a measure of the brain's electrical activity by recording brainwaves.

3.5 The Endocrine System

84. The _____ consists of a series of glands that produce chemical substances known as hormones.

85. A _____ is a chemical messenger released by endocrine glands.

86. The _____ descends from the hypothalamus at the base of the brain and is often called the "master gland."

87. The _____ is located in the neck and releases hormones that regulate growth, metabolism, and appetite.

88. The _____ sit atop our kidneys and secrete hormones involved in the stress response.

89. The _____ is an internal organ that secretes hormones that regulate blood sugar levels.

90. The _____ secrete sexual hormones that are important in reproduction and mediate sexual motivation and behavior.

91. _____ is a hormone that regulates blood glucose levels by lowering them.

92. _____ is a hormone that regulates blood glucose levels by raising them.

93. _____ is a neurotransmitter and hormone involved in the stress response and adrenaline surges.

94. _____ is a neurotransmitter and hormone involved in the stress response.

Word Bank (Alphabetized)

Possible answers for Section 2. Each term is used once.

- action potential
- adrenal glands
- afferent fibers
- agonist
- all-or-none phenomenon
- allele
- amygdala
- antagonist
- auditory cortex
- autonomic nervous system
- axon
- Broca's area
- central nervous system (CNS)
- cerebellum
- cerebral cortex
- chromosome
- computerized tomography (CT) scan
- corpus callosum
- dendrites
- deoxyribonucleic acid (DNA)
- efferent fibers
- electroencephalography (EEG)
- endocrine system
- epigenetics
- epinephrine
- fight or flight response
- forebrain
- fraternal twins
- frontal lobe
- functional magnetic resonance imaging (fMRI)
- genotype
- glucagon
- gonad
- gyrus (plural: gyri)
- hippocampus
- medulla
- membrane potential
- midbrain
- motor cortex
- mutation
- myelin sheath
- Nodes of Ranvier
- norepinephrine
- occipital lobe
- pancreas
- parasympathetic nervous system
- parietal lobe
- peripheral nervous system (PNS)
- phenotype
- pituitary gland
- polygenic
- pons
- positron emission tomography (PET) scan
- prefrontal cortex
- procedural memory
- psychotropic medication
- range of reaction
- receptor
- resting potential
- reticular formation
- reuptake
- semipermeable membrane
- soma
- somatic nervous system
- somatosensory cortex
- substantia nigra
- sulcus (plural: sulci)
- sympathetic nervous system
- synaptic cleft
- synaptic vesicles

Study Sheet

Chapter 3, Psychology 2e

- homeostasis
- hormone
- hypothalamus
- identical twins
- insulin
- lateralization
- limbic system
- longitudinal fissure
- magnetic resonance imaging (MRI)
- temporal lobe
- terminal buttons
- thalamus
- theory of evolution by natural selection
- threshold of excitation
- thyroid gland
- ventral tegmental area (VTA)
- Wernicke's area

Answer Key

3.1 Human Genetics

1. genotype
2. phenotype
3. allele
4. range of reaction
5. theory of evolution by natural selection
6. epigenetics
7. identical twins
8. fraternal twins
9. mutation
10. genetic environmental correlation
11. polygenic
12. chromosome
13. deoxyribonucleic acid (DNA)

3.2 Cells of the Nervous System

14. semipermeable membrane
15. soma
16. dendrites
17. axon
18. myelin sheath
19. Nodes of Ranvier
20. terminal buttons
21. synaptic vesicles
22. neurotransmitters
23. synaptic cleft
24. receptors
25. membrane potential
26. resting potential
27. threshold of excitation
28. action potential
29. all-or-none phenomenon
30. reuptake
31. agonist
32. antagonist
33. psychotropic medications

3.3 Parts of the Nervous System

34. central nervous system (CNS)
35. peripheral nervous system (PNS)
36. somatic nervous system
37. motor neurons
38. efferent fibers
39. afferent fibers
40. sensory neurons
41. autonomic nervous system
42. sympathetic nervous system
43. parasympathetic nervous system
44. homeostasis
45. fight or flight response

3.4 The Brain and Spinal Cord

46. neuroplasticity
47. cerebral cortex
48. gyrus
49. sulcus
50. longitudinal fissure
51. hemisphere
52. lateralization
53. corpus callosum
65. thalamus
66. limbic system
67. hippocampus
68. amygdala
69. hypothalamus
70. midbrain
71. reticular formation
72. substantia nigra

54. forebrain
55. frontal lobe
56. motor cortex
57. prefrontal cortex
58. Broca's area
59. parietal lobe
60. somatosensory cortex
61. temporal lobe
62. auditory cortex
63. Wernicke's area
64. occipital lobe
73. ventral tegmental area (VTA)
74. hindbrain
75. medulla
76. pons
77. cerebellum
78. procedural memory
79. computerized tomography (CT) scan
80. positron emission tomography (PET) scan
81. magnetic resonance imaging (MRI)
82. functional magnetic resonance imaging (fMRI)
83. electroencephalography (EEG)

3.5 The Endocrine System

84. endocrine system
85. hormone
86. pituitary gland
87. thyroid gland
88. adrenal glands
89. pancreas
90. gonads
91. insulin
92. glucagon
93. epinephrine
94. norepinephrine