Chapter 1: Thinking Like a Scientist

MULTIPLE CHOICE

1. A psychologist from the _____ research area might study brain organization or the chemical messengers used in the nervous system.
   a. cognition
   b. social psychology
   c. psychobiology
   d. human development

   ANS: C

2. A psychologist from the _____ research area might study how humans process, store, and retrieve information.
   a. cognition
   b. social psychology
   c. psychobiology
   d. human development

   ANS: A

3. A psychologist from the _____ research area might conduct research on prenatal development or gerontology.
   a. cognition
   b. social psychology
   c. psychobiology
   d. human development

   ANS: D

4. Psychologists interested in how being part of a group affects the individual are most likely from the _____ research area.
   a. cognition
   b. social psychology
   c. psychobiology
   d. human development

   ANS: B

5. A psychologist studying whether therapy is really effective in helping people is most likely from the _____ research area.
   a. cognition
   b. social psychology
   c. psychotherapy
   d. human development

   ANS: C

6. A belief that is based on subjective feelings is to knowing via _____ as gaining knowledge without being consciously aware of where the knowledge was gained is to knowing via _____.
   a. authority; superstition
   b. superstition; intuition
   c. tenacity; intuition
   d. intuition; superstition

   ANS: B

7. Gaining knowledge from those viewed as authority figures is to knowledge via _____ as stubbornly clinging to knowledge gained from repeated ideas is to knowledge via _____.
   a. tenacity; authority
   b. rationalism; tenacity
   c. authority; tenacity
   d. intuition; authority

   ANS: C KEY: www

8. Gaining knowledge through logical reasoning is to knowledge via _____ as gaining knowledge through observation of organisms and events in the real world is to knowledge via _____.
   a. rationalism; empiricism
   b. science; empiricism
   c. rationalism; science
   d. empiricism; rationalism

   ANS: A

9. Gaining knowledge via science involves using _____ and _____.
   a. empiricism; intuition
   b. tenacity; authority
   c. intuition; logical reasoning
   d. empiricism; rationalism

   ANS: D

10. Mike pitched a great game on Saturday and he believes that it is because he wore his lucky socks. He has now decided that he will wear these socks for every game of the season because he believes that they will make him lucky. This belief is based on _____.
    a. superstition
    b. rationalism
    c. authority
    d. science

    ANS: A

11. Hypothesis is to _____ as theory is to _____.
    a. an organized system of assumptions and principles that attempts to explain certain phenomena and how they are related; a prediction regarding the outcome of a study
    b. a prediction regarding the outcome of a study; an organized system of assumptions and principles that attempts to explain certain phenomena and how they are related
    c. not used in science; used in science
    d. used in science; not used in science

    ANS: B

12. An event or behavior that has at least two values is
    a. a hypothesis.
    b. a theory.
    c. a variable.
    d. science.

    ANS: C

13. Although Mulder believes in the paranormal, Scully questions the validity of such beliefs because she is a
    a. pagan.
    b. parapsychologist.
    c. skeptic.
    d. pseudoscientist.

    ANS: C

14. The scientific approach involves using
    a. intuition, skepticism, and tenacity.
    b. tenacity, public verification, and skepticism.
    c. systematic empiricism, public verification, and solvable problems.
    d. superstition, intuition, and skepticism.

    ANS: C

15. The idea that a scientific theory must be stated in such a way that it is possible to refute or disconfirm it is known as the principle of
    a. pseudoscience.
    b. falsifiability.
    c. public verification.
    d. systematic empiricism.

    ANS: B KEY: www

16. Making observations in a systematic manner to test hypotheses and refute or develop a theory is known as
    a. systematic empiricism.
    b. the principle of falsifiability.
    c. pseudoscience.
    d. public verification.

    ANS: A

17. Questions that are potentially answerable by means of currently available research techniques are known as
    a. systematic empiricism.
    b. the principle of falsifiability.
    c. solvable problems.
    d. public verification.

    ANS: C

18. Presenting research so that it can be observed, replicated, criticized, and tested is known as
    a. systematic empiricism.
    b. the principle of falsifiability.
    c. pseudoscience.
    d. public verification.

    ANS: D

19. _____ often violates _____.
    a. Science; public verification
    b. Pseudoscience; the principle of falsifiability
    c. Science; systematic empiricism
    d. Basic research; systematic empiricism

    ANS: B

20. The three goals of science are to
    a. describe, research, and explain.
    b. describe, predict, and research.
    c. predict, explain, and research.
    d. describe, predict, and explain.

    ANS: D

21. When we identify factors that indicate when an event or events will occur, we have used
    a. prediction.
    b. description.
    c. explanation.
    d. falsifiability.

    ANS: A

22. Identifying the causes that determine when and why a behavior occurs involves using
    a. prediction.
    b. description.
    c. explanation.
    d. falsifiability.

    ANS: C

23. Research on the treatment of AIDS is to _____ research as research on the differences between short-term memory and long-term memory is to _____ research.
    a. basic; applied
    b. applied; basic
    c. naturalistic; laboratory
    d. laboratory; naturalistic

    ANS: B

24. When Stella finishes graduate school, she wants to conduct research that can be used immediately in order to improve the lives of others. Stella is most interested in _____ research.
    a. basic
    b. applied
    c. naturalistic
    d. laboratory

    ANS: B

25. As a researcher, Ray is simply interested in finding answers to the questions he poses. Ray is most interested in _____ research.
    a. naturalistic
    b. laboratory
    c. applied
    d. basic

    ANS: D

26. Because Jim was interested in the nest building behavior of wrens, he went into the field to observe them. Jim was using the _____ method of research.
    a. case study
    b. laboratory observational
    c. naturalistic observational
    d. correlational

    ANS: C

27. Observing the behavior of humans or other animals in a contrived and controlled situation involves using the _____ method.
    a. laboratory observational
    b. naturalistic observational
    c. correlational
    d. survey

    ANS: A KEY: www

28. An in-depth study of one or more individuals is
    a. laboratory observation.
    b. naturalistic observation.
    c. a survey.
    d. a case study.

    ANS: D

29. Questioning individuals on a topic or topics and then describing their responses is to the _____ method as an in-depth study of one or more individuals is to the _____ method.
    a. case study; survey
    b. survey; case study
    c. case study; observational
    d. observational; case study

    ANS: B

30. A method that assesses the degree of relationship between two variables is the _____ method.
    a. survey
    b. observational
    c. case study
    d. correlational

    ANS: D

31. The group of people who participate in the study is to _____ as all of the people about whom a study is meant to generalize are to _____.
    a. sample; population
    b. population; sample
    c. positive correlation; negative correlation
    d. negative correlation; positive correlation

    ANS: A

32. Increasing or decreasing together is to _____ as moving in an opposite direction is to _____.
    a. quasi-experimental method; experimental method
    b. experimental method; quasi-experimental method
    c. positive correlation; negative correlation
    d. negative correlation; positive correlation

    ANS: C

33. Which of the following is a participant (subject) variable?
    a. hair color
    b. gender
    c. political affiliation
    d. all of the above

    ANS: D

34. If a researcher assigns participants to groups based on, for example, their gender, the researcher would be employing
    a. a manipulated independent variable.
    b. random assignment.
    c. a participant variable.
    d. a manipulated dependent variable.

    ANS: C

35. If a researcher assigns participants to groups based on, for example, their gender, the researcher would be employing
    a. a manipulated independent variable.
    b. random assignment.
    c. the quasi-experimental method.
    d. a manipulated dependent variable.

    ANS: C

36. In order to discover the extent to which education can be used to predict political preferences, researchers are most likely to engage in
    a. correlational research.
    b. naturalistic observation.
    c. the case study approach.
    d. experimental research.

    ANS: A

37. Manipulated independent variable is to nonmanipulated independent variable as _____ method is to _____ method.
    a. experimental; quasi-experimental
    b. correlational; quasi-experimental
    c. experimental; correlational
    d. quasi-experimental; experimental

    ANS: A

38. In an experimental study of the effects of practice on reaction time, practice would be the
    a. control group.
    b. independent variable.
    c. experimental group.
    d. dependent variable.

    ANS: B

39. In an experimental study of the effects of practice on reaction time, reaction time would be the
    a. control group.
    b. independent variable.
    c. experimental group.
    d. dependent variable.

    ANS: D KEY: www

40. If participants are randomly assigned to conditions, then _____ research is being conducted.
    a. case study
    b. experimental
    c. correlational
    d. quasi-experimental

    ANS: B

41. The group of participants that serves as the baseline in a study is to _____ group as the group of participants that rec eives some level of treatment is to _____ group.
    a. independent; dependent
    b. dependent; independent
    c. control; experimental
    d. experimental; control

    ANS: C

42. In a study on the effects of sleep on driving performance, sleep would be the
    a. control group.
    b. independent variable.
    c. experimental group.
    d. dependent variable.

    ANS: B

43. In a study on the effects of sleep on driving performance, driving performance would be the
    a. control group.
    b. independent variable.
    c. experimental group.
    d. dependent variable.

    ANS: D

44. Manipulate is to measure as _____ is to _____.
    a. independent variable; dependent variable
    b. dependent variable; independent variable
    c. positive correlation; negative correlation
    d. negative correlation; positive correlation

    ANS: A

45. Independent variable is to dependent variable as _____ is to _____.
    a. manipulate; measure
    b. measure; manipulate
    c. controlled; uncontrolled
    d. uncontrolled; controlled

    ANS: A KEY: www

46. Descriptive methods include
    a. correlational and quasi-experimental methods.
    b. only the experimental method.
    c. observational, case study, and survey methods.
    d. only the quasi-experimental method.

    ANS: C

47. Random assignment is used exclusively in the _____ method.
    a. experimental
    b. quasi-experimental
    c. correlational
    d. case study

    ANS: A

SHORT ANSWER

1. Explain what it means to gain knowledge via science.

    ANS:
    Gaining knowledge via science involves a merger of rationalism and empiricism. Scientists collect data (make empirical observations) and test hypotheses with these data (assess them using rationalism). By merging rationalism with empiricism, we have the advantage of using a logical argument based on observation.

2. Briefly describe what a hypothesis is and what a theory is noting the relationship between these terms.

    ANS:
    A hypothesis is a prediction regarding the outcome of a study. Often, this prediction concerns the relationship between two variables. We may find that our hypothesis is not supported, and thus we have to reevaluate our position. On the other hand, our observati ons may support the hypothesis being tested. The goal of testing hypotheses is to arrive at or test a theory—an organized system of assumptions and principles that attempts to explain certain phenomena and how they are related.

3. Identify and briefly describe the three criteria that help to define science.

    ANS:
    The three criteria are: systematic empiricism; public verification; and solvable problems.
    Systematic empiricism involves making observations in a systematic manner in order to test hypotheses and refute or develop a theory. Public verification involves presenting research to the public so that it can be observed, replicated, criticized, and tested. Lastly, using solvable problems means that scientists study only questions that are potentially answerable by means of currently available rese arch techniques.

4. What is the principle of falsifiability and how is it related to pseudoscience and science?

   ANS:
   The principle of falsifiability is the idea that a scientific theory must be stated in such a way that it is possible to refute or disconfirm it. Scientific research must meet the principle of falsifiability, whereas pseudoscience usually falls short of this principle.

5. Identify and briefly describe the three goals of science.

   ANS:
   The three goals of science are to describe, predict, and explain. Describing involves carefully observing behavior and then describing it. Prediction allows us to identify the factors that indicate when an event or events will occur. Lastly, explanation involves identifying the causes that determine when and why a behavior occurs.

6. Give an example of basic research and an example of applied research.

   ANS:
   An example of basic research would be studying how the human memory system works simply because one is interested in this topic. An example of applied research would be studying how Alzheimer's disease affects memory in an attempt to help those with the disease.

7. Explain what a negative correlation between depression and self-esteem means.

   ANS:
   A negative correlation between depression and self-esteem indicates that those who are more depressed tend to also be those with lower self-esteem, whereas those who are less depressed tend to be those with higher self-esteem. It **does not** indicate that depression causes problems with self-esteem or that low self-esteem causes depression.

8. In a study of the effects of nicotine on concentration, participants who smoke are compared to those who do not on a measure of concentration. Identify the independent variable and dependent variable in this study. Is the independent variable a manipulated variable or a participant variable? What type of research method is used in this study?

   ANS:
   The independent variable is the amount of nicotine (the smoking versus nonsmoking groups) and the dependent variable is concentration level. The independent variable is a participant variable because we are using participants who either chose to smoke or not to smoke. The study utilizes the quasi-experimental method.

9. In a study comparing collaborative group learning to the traditional lecture/discussion method of learning, participants are randomly assigned to one of the two conditions. Identify the independent variable and dependent variable in this study. Is the independent variable a manipulated variable or a participant variable? What type of research method is used in this study?

   ANS:
   The independent variable is the type of learning (group or traditional) and the dependent variable is how well the information is learned. The independent variable is manipulated—participants are randomly assigned to the two conditions. The study utilizes the experimental method.

10. Test the hypothesis presented in the problem below.

    Each of the cards below has a number on one side and a letter on the other side. Two of the cards have their letter side showing and two have their number side showing. Here is a rule: "If a card has a vowel on one side, then it has an even number on the other side". In order to check that the rule is true or false, which card or cards below would you turn over? Turn over only the card or cards that you need to check to be sure.

    Answer the problem and explain how it relates to hypothesis testing, proof, and disproof as discussed in the text.

    ANS:
    The A card and the 7 card should be turned over. This relates to hypothesis testing in that when one tests a hypothesis, one tries to falsify that hypothesis, not confirm it or prove it true. Thus, the only cards that could potentially falsify the rule are the A card (there could be something other than an even number on the other side) and the 7 card (there could be a vowel on the other side). In other words, when testing hypotheses, one uses the principle of falsifiability. We cannot prove hypotheses true; instead we try to disprove them. If they cannot be falsified, we say they have been supported (not proven true).