

TEST BANK - CHAPTER 1

PLEASE READ THIS

This test bank is provided for your convenience – primarily for instructors of large classes who find it necessary to give multiple-choice tests.

I am aware that multiple-choice and other short-answer tests are opposed to the constructivist view. However, given that there may be a need for an easy-to-score test bank, I have tried to make this test bank as constructivist as possible.

- Many questions have choices for “All of the above” and “None of the above.”
- Most questions have a blank line where students can provide a comment about their selection so you can tell what the student was thinking and can determine whether their selection was valid according to their constructions.
- Most questions are intended to foster student understanding of constructivism.

It is my fervent hope that, if you choose to use this test bank, you explain to your students *why* you are using it so students don't get the idea that their thinking doesn't count after all – that you and the textbook are teaching something that really isn't valued – and that once again, it is someone else's thinking that counts and that ultimately they, the students, are expected to say what the instructor or textbook author wants them to say.

Perhaps the best uses for this test bank are:

- Tests or quizzes that may be required by your institution
- Quick assessments of students in very large classes
- Periodic check-ups to see how your students are constructing the material in this course
- Student self-checks
- Sparking class discussions (using clicker technology if it is available)

Questions marked with a “W” can be found in the student quizzing of the Education CourseMate Web Site.

Chapter 1 The Science Education Imperative

- 1.1 **W** How much science do you remember from elementary school?
- a. None
 - b. Some
 - c. Lots
- Brief explanation if desired: _____
- 1.2 The amount of science known today is
- a. *Increasing.
 - b. Decreasing.
 - c. Remaining about the same as it always has.
- Brief explanation if desired: _____
- 1.3 **W** What is the likelihood that a science teacher will know all the science that might come up in a class?
- a. *Low
 - b. Medium
 - c. High
 - d. Very high if the teacher studied enough science
- Brief explanation if desired: _____
- 1.4 What are some problems with trying to know all the science you might ever teach?
- a. There will be more scientific knowledge by time you teach it that was known when you studied it.
 - b. Scientific knowledge is changing.
 - c. Some of what you learned may be replaced by new and different knowledge.
 - d. There is too much scientific knowledge known for any one person to be able to learn it all.
 - e. *All of the above
 - f. None of the above
- Brief explanation if desired: _____
- 1.5 **W** The theory of plate tectonics suggests that
- a. Continents and oceans are stationary on earth.
 - b. Continents lie on moving plates.
 - c. Oceans lie on moving plates.
 - d. *Both continents and oceans lie on moving plates.
- Brief explanation if desired: _____
- 1.6 How many planets have been found outside our solar system?
- a. None.
 - b. 1
 - c. Between 1 and 100.
 - d. *Nearly 500
 - e. billions
- Brief explanation if desired: _____
- 1.7 **W** What characterizes a plutoid?
- a. A plutoid is a small planet-like body.
 - b. A plutoid is spherical or nearly spherical in shape.
 - c. The orbit of a plutoid is located primarily beyond the orbit of Neptune.
 - d. *All of the above
 - e. None of the above
 - f. Brief explanation if desired: _____

- 1.8 What is a "Goldilocks Planet?"
- *A planet that has the properties to support life as we know it
 - A yellow planet
 - A planet that is very hot
 - A planet that is very cold
 - Brief explanation if desired: _____
- 1.9 **W** One of the main reasons for planetary exploration is
- *To find information that might support a theory of the origin of life on earth.
 - To satisfy curiosity.
 - To test technology.
 - To take interesting pictures.
 - All of the above
 - None of the above
- Brief explanation if desired: _____
- 1.10 Information transmitted to earth from the Phoenix Mars Lander suggests which of the following?
- *Mars may have had water on its surface at one time.
 - Mars seems to be populated by small green creatures.
 - Mars is made mostly of ice.
 - Mars is so inhospitable to man that it probably would be a bad idea to send people to Mars for exploration purposes
 - Brief explanation if desired: _____
- 1.11 **W** Approximately how many new species of plants and animals have been discovered in the past ten years?
- None – We already know all the living species
 - *More than 6000
 - Only a few deep-sea bacteria
 - Thirty to forty
 - Brief explanation if desired: _____
- 1.12 What is a genome?
- *The set of all genes in a cell
 - Half the genes in a cell
 - The set of genes in a reproductive cell
 - The set of genes in a fruit fly
- Brief explanation if desired: _____
- 1.13 **W** Results of the human genome project include which of the following?
- Development of new treatments for diseases
 - Shedding light on the theory of human evolution
 - Finding genetic sources for certain traits
 - Predicting the possibility of acquiring certain diseases
 - *All of the above
 - None of the above
- Brief explanation if desired: _____
- 1.14 Controversies in science include which of the following?
- Theory of evolution
 - Global warming
 - Preservation of the spotted owl
 - Stem cell research
 - *All of the above
 - None of the above

Brief explanation if desired: _____

1.15 **W** According to the science education professional organizations, what science do elementary and middle grades science teachers need to know?

- a. Content
- b. Methodology
- c. The nature of science
- d. Science in technology and society
- e. *All of the above
- f. None of the above

Brief explanation if desired: _____

1.16 How have American children performed on the TIMSS?

- a. *Elementary school children have performed very well and middle grades children have performed in the middle when compared with the performance of children from other countries.
- b. Elementary and middle grades children have performed very well when compared with the performance of children from other countries.
- c. Elementary and middle grades children have performed poorly when compared with the performance of children from other countries.
- d. Middle grades children have performed very well and elementary children have performed in the middle when compared with the performance of children from other countries.

Brief explanation if desired: _____

1.17 **W** How have American children performed in science on the Nation's Report Card?

- a. *The scores of elementary school children have been increasing.
- b. The scores of middle grades children have been increasing.
- c. The scores of high school students have been increasing.
- d. The scores of all students have been increasing.

Brief explanation if desired: _____

1.18 The constructivist perspective suggests that elementary science teachers

- a. *Should know the basic principles and concepts of science.
- b. Should learn as much science as they can.
- c. Don't have to know any science.
- d. Should look up information about questions the children may ask.
- e. All of the above
- f. None of the above

Brief explanation if desired: _____

1.19 **W** The constructivist perspective in science education suggests that

- a. Teachers should impart as much science as they can in the time allotted.
- b. Teachers should do as many demonstrations as they have time for.
- c. *Teachers should encourage students to learn how to do science.
- d. Teachers should encourage students to memorize important scientific facts and principles.

Brief explanation if desired: _____

1.20 In the constructivist perspective of science education

- a. Answers are either correct or incorrect.
- b. *No answer is either correct or incorrect.
- c. Some answers are correct and should be acknowledged as such.
- d. Some answers are incorrect and students should work to find the correct answers.

Brief explanation if desired: _____

- 1.21 **W** Much new knowledge is the result of which of the following?
- a. Accidental discoveries
 - b. Methodological experimentation
 - c. Wondering about something
 - d. Observation
 - e. *All of the above
 - f. None of the above
- Brief explanation if desired: _____
- 1.22 Perception is
- a. The same for all people.
 - b. *Different for each individual.
 - c. The result of methodical inquiry.
 - d. The result of loud talk.
- Brief explanation if desired: _____
- 1.23 **W** In the constructivist view, the best way to understand what children are thinking is to
- a. Ask them.
 - b. Listen to them.
 - c. Watch them.
 - d. Look at their notes and drawings.
 - e. *All of the above
 - f. None of the above
- Brief explanation if desired: _____
- 1.24 The processes of science are
- a. Scientific actions.
 - b. A means of doing science.
 - c. A set of procedures that ensure accurate scientific investigations.
 - d. The primary focus of constructivist science education.
 - e. *All of the above
 - f. None of the above
- Brief explanation if desired: _____
- 1.25 **W** What historical event spurred a revolution in science teaching?
- a. *Sputnik
 - b. World War II
 - c. The discovery of DNA
 - d. The International Space Station
- Brief explanation if desired: _____
- 1.26 Which of the following most closely represents The Learning Cycle as originally established by Robert Karplus?
- a. *Exploration – Concept Introduction – Concept application
 - b. Hypothesis formation – Experimentation – Conclusion
 - c. Exploration – Research – Conclusions
 - d. Observation – Experimentation – Evidence-based conclusion
- Brief explanation if desired: _____

1.27 **W** Which is a main characteristic of the 5E learning cycle developed by Roger Bybee of the Biological Sciences Curriculum Study?

- a. It is useful primarily in the life sciences.
- b. *It is patterned after the original learning cycle.
- c. It ignores the evaluation element.
- d. It requires students to develop their own totally unique conclusions.
- e. Brief explanation if desired: _____

1.28 **W** Why should teachers foster children's ownership of knowledge?

- a. *So the children will learn
- b. So the children will know what the teacher feels is important
- c. So the children can come up with the correct responses and answers
- d. So the children will volunteer in class

Brief explanation if desired: _____

1.29 Which of the following is/are open-ended questions?

- a. How many acres are in a typical small farm?
- b. What kind of fertilizer is best for azaleas?
- c. *Which outdoor plants grow best in the shade?
- d. How much does a bulldozer weigh?
- e. All of the above
- f. None of the above

Brief explanation if desired: _____

1.30 **W** Which of the following is/are closed questions?

- a. Which kind of ice cream do you like?
- b. How far is it to the nearest hospital?
- c. How many miles per gallon does your car get?
- d. What are the names of the planets closer to the sun than the earth?
- e. *All of the above
- f. None of the above

Brief explanation if desired: _____

1.31 Why is it useful for elementary teachers to examine their attitudes about teaching science?

- a. *So they will know if they like to teach science
- b. So they will know what science to study
- c. So they will know whether they will be effective science teachers
- d. So they will know what problems they will encounter in teaching science
- e. All of the above
- f. None of the above

Brief explanation if desired: _____