

## Guidelines for Writing GOOD Multiple-Choice Questions

1. Each question should assess a single objective only.
2. The problem should be clearly stated in the stem. For example:

WRONG

The alkali metals:

- a. Have names that end in -ium
- b. Are found in Group II of the Periodic Table
- c. Can be found freely in nature
- \*d. React vigorously with water

RIGHT

Which one of the following is a property of the alkali metals?

- a. Are stored in acids
- b. React vigorously with helium
- c. Are hard metals
- \*d. React vigorously with water

In the second example, the stem outlines that the question is based on the properties of the alkali metals, while the first example is very much vague as to what it wants to solve.

3. Blanks used at the beginning or middle of a stem should be avoided. Blanks if they have to be used, should be placed at the end of the stem.

WRONG

\_\_\_\_\_ have the general formula  $C_NH_{2N-1}OH$

- a. Alkanes
- \*b. Alcohols
- c. Aldehydes
- d. Alkynes

RIGHT

The organic family of compounds with the general formula of  $C_NH_{2N-1}OH$  is called the \_\_\_\_\_

- a. Alkanes
- \*b. Alcohols
- c. Aldehydes
- d. Alkynes

RIGHT

Alcohols have the general formula \_\_\_\_\_

- a.  $C_NH_{2N+2}$
- \*b.  $C_NH_{2N-1}OH$
- c.  $C_NH_{2N-2}$
- d.  $C_NH_{2N-1}COOH$

4. Avoid negative stems as students often misread negatively phrased questions. If you have to use a negative stem, then it should be emphasised by underlining or capitalising.

WRONG

Which one of the following is not a property of hydrogen gas?

- a. It is less dense than air
- \*b. It has a yellow colour
- c. It reacts with oxygen to form water
- d. It burns in air with a 'pop'

RIGHT

Why would you NOT store potassium in a bottle of water?

- a. It is less dense than water and would float on the surface
- \*b. It reacts quite vigorously with water
- c. Potassium would react with and burn through the bottle
- d. Potassium is a group I metal, and these are very reactive

5. All distractors should be plausible, but must be incorrect. Use common errors and misconceptions. In the next 'wrong' example, three of the distractors are not plausible, while in the following example, two of the distractors are close enough to the correct answer to be considered plausible.

WRONG

Normal body temperature is around

- a.  $0^\circ C$
- b.  $5^\circ C$
- c.  $37^\circ C$
- d.  $95^\circ C$

RIGHT

Normal body temperature is around

- a.  $20^\circ C$
- b.  $34^\circ C$
- c.  $37^\circ C$
- d.  $42^\circ C$

6. Avoid using complex multiple-choice questions. Complex multiple-choice questions consist of a number of potentially correct answers, followed by different combinations of these primary responses. If the student knows that one of the primary responses is wrong, and this is contained in two or more combinations, then he/she can reach the correct answer by a process of elimination.

WRONG

Which of the following elements is/are in the gaseous state at room temperature?

Hydrogen

Sulfur

Mercury

Chlorine

- a. Chlorine only
- \*b. Chlorine and Sulfur
- c. Sulfur, mercury and hydrogen
- d. Sulfur only

Here, if the student knows that sulfur is not a gas, then they may also reason that B, C and D are not correct.

7. Options should be around the same length. Too much detail can sometimes give the answer away.

8. Avoid using “all of the above” or “none of the above” in your options. Using “all of the above”, the student may be able to guess the correct option with only partial knowledge. Using “none of the above” may lead the student getting the question right without knowing the right answer.

9. Do not write the test in a single day. Questions that require higher level thinking take longer to design. Write a few questions after each class while the material is still fresh in your mind.

10. Avoid copying phrases exactly from text-books as this encourages simple recall of facts.

11. If a key word appears in the correct answer, then it should appear in some of the other options as well.

12. Avoid using trick questions.

13. Hav a colleegue revu your questions!

### **Other Suggested Types of Question**

- Use pictures that require the applications of concepts or principles.
- Base question on practical application of a principle.
- Get student to interpret a table or chart
- Give quotation from newspaper/magazine/journal and ask for interpretation or evaluation