

## 6.0 SCIENCE

The fifty (50) questions in the 2008 KCPE Science paper were sampled from all the topics in the syllabus. The questions tested all the skills; *Knowledge, Comprehension, Application* and *Higher abilities* (analysis and evaluation).

### 6.1 CANDIDATES' GENERAL PERFORMANCE

In the year 2008, **688,049** candidates took the Science paper. The details of the performance are given in the table below which also shows data for 2006 and 2007 for comparison.

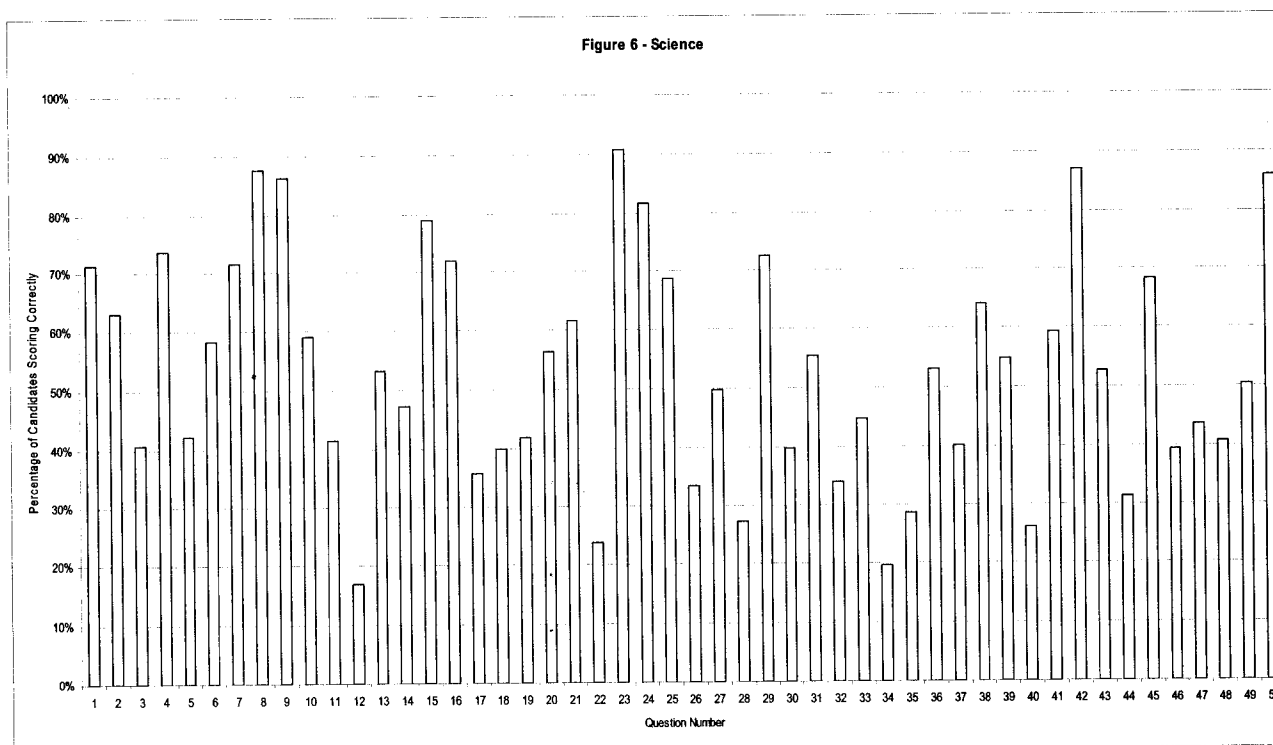
**Table 14: Candidates' Performance**

YEAR	2006	2007	2008
Number Sat	660,388	698,299	688,049
Mean Raw Marks/50	26.51	29.72	27.62
Standard Deviation	8.01	9.20	7.40
Mode Mark	26	33	28

From the table, it can be observed that the performance in 2008 KCPE Science dropped compared to that of 2007 but better than that of 2006. The mean mark, standard deviation and mode mark dropped compared to 2007.

### 6.2 ANALYSIS OF PERFORMANCE IN SELECTED ITEMS

The figure below shows the facility index of each of the **50 questions** offered in the 2008 KCPE Science examination paper.



A question that is scored by less than 30% of the candidates is considered as having been poorly performed. In 2008, five (5) out of the fifty (50) questions had less than 30% of the candidates scoring correctly.

The question numbers and the percentage of candidates choosing the correct response are shown in the table below:

**Table 15: Questions with a Facility Index of 30% and below**

QUESTION NUMBER	22	28	34	35	40
% of candidates choosing the correct response	23.81	27.23	19.70	28.50	26.05

**Question 22:**

When sand particles are put in a glass of cold water and heated at the bottom, the particles are seen to rise and fall. This is because sand particles

- A. are carried by hot water which comes down on cooling
- B. rise when heated and come down on cooling
- C. become lighter than water when heated
- D. and water rise when heated and come down on cooling.

**Response Pattern**

Option	A*	B	C	D
% Choosing Option	23.81	25.02	23.72	26.58
% of candidates Choosing Correct Response	30.00	24.55	25.96	26.80

The question tested experimental design to demonstrate convection. The experiment is a practical activity in the pupils' text book but the responses indicate that the experimental approach was not used to teach the concept.

When particles of sand are heated alone, the particles will not rise and fall. That means the particles alone will not rise when heated. This eliminates option **B (rise when heated and come down on cooling)**. There is nothing to make them lighter than water whether hot or cold. This eliminates option **C (become lighter than water when heated)**. Both particles and water do not rise when heated thus eliminating option **D (and water rise when heated and come down on cooling)**. It is the water that rises when heated and carries with it the sand particles. The hot water cools and when coming down on cooling comes down with the sand particles hence option **A (are carried by hot water which comes down on cooling)**.

**Question 28:**

The **MOST** appropriate method of separating a mixture of sand and salt after addition of water is

- A. decanting
- B. filtering
- C. sieving
- D. evaporating.

**Response Pattern**

Option	A	B*	C	D
% Choosing Option	25.37	27.23	8.05	38.55
% of candidates Choosing Correct Response	26.05	29.80	22.32	26.11

The word **MOST** means that all the four methods of separating mixtures are appropriate but one of them is most appropriate.

Decanting is appropriate but will not allow separation of all the salty water from the sand. When decanting, there is a certain angle at which the container can be tilted otherwise some of the sand might come out with the salty water making it difficult to drain all the water with salt dissolved in it. Sieving depends on the size of holes of the sieve otherwise if not too small the tiny grains of sand might pass through. Evaporating will remove the water but leave salt and sand un-separated.

Filtering is the most appropriate because the sand will remain in the filter paper or cloth with no grains however small passing through but all the salty water will filter through, thus option **B (filtering)** was the correct answer.

**Question 34:**

Which one of the following statements is **NOT TRUE** about manures? They

- A. improve the ability of the soil to hold water
- B. bind soil particles
- C. release nutrients very fast to the soil
- D. improve air circulation in the soil.

**Response Pattern**

Option	A	B	C*	D
% Choosing Option	16.52	37.17	19.70	25.74
% of candidates Choosing Correct Response	25.40	25.90	29.01	27.30

Out of the four statements about manure three of them are true but one of them is **NOT**. The only statement that is not true is option **C (release nutrients very fast to the soil)** because manure does not release nutrients to the soil as fast as fertilizers which release nutrients instantly.

**Question 35:**

Which one of the following is a function of fibre in the diet?

- A. Helps in getting rid of undigested food.
- B. Helps in absorption of digested food.
- C. Adds nutrients to the body.
- D. Helps in digestion of food.

**Response Pattern**

Option	A*	B	C	D
% Choosing Option	28.50	14.10	21.16	35.35
% of candidates Choosing Correct Response	30.11	22.10	22.12	28.81

This was a knowledge question which required candidates to know the functions of fibre in the diet. Fibre, otherwise known as roughage, is important in peristalsis thus helping in the movement of undigested food through the alimentary canal and has nothing to do with digestion of food, food nutritional value or helping in the absorption of digested food.

**Question 40:**

Which one of the following statements is **NOT CORRECT** about a windsock?

A windsock

- A. is open at both ends
- B. gets filled with air and rises
- C. points to the direction from which wind blows
- D. should be placed in the open field.

**Response Pattern**

Option	A	B	C*	D
% Choosing Option	57.80	9.78	26.05	5.60
% of candidates Choosing Correct Response	26.57	23.29	29.89	20.93

The syllabus requires pupils to construct a windsock together with other weather instruments and even know how to use it.

If pupils had constructed a windsock or seen it in use they would have known that both ends are open and thus option A would not attract such a large number (57.8%). Seeing it in use or using it would make them know that it gets filled with air in order to rise. To demonstrate its use, it has to be placed in an open field to avoid obstruction of air.

A windsock gets filled with air at the wider end near the pole and the strength of the wind will push it to the direction the wind is blowing to, hence it does not point to the direction where wind blows from.