

6.0 SCIENCE

The KCPE Science Syllabus consists of concepts in Agriculture, Science, Home Science and Emerging issues like environment and HIV/AIDS. 2013 was the eighth time the Syllabus was being tested. The questions were sampled from all the topics in the syllabus and all cognitive levels were tested.

6.1 GENERAL PERFORMANCE OF CANDIDATES

The table below gives a summary on the candidature, mean raw mark and standard deviation in Science for the year 2013. The years 2008, 2009, 2010, 2011, 2012 are also included for comparison.

Table 12: Performance of Candidates

YEAR	2008	2009	2010	2011	2012	2013
Number Sat	688,049	719,376	739,620	766,712	811,706	837,722
Mean Raw Mark	27.62	29.96	29.82	33.63	32.02	30.91
Standard Deviation	7.40	8.69	8.94	9.11	9.51	8.54

From the table, the year 2013 KCPE Science performance was slightly lower compared to the last five years (2012, 2011, 2010, 2009 and 2008). The performance is however comparable to that of the year 2009 and 2010 in terms of the mean raw mark and the standard deviation. This is an indication that the paper is comparable to those of the previous years. The candidature increased by 3.21% (811,706 candidates in 2012 to 837,722 candidates in 2013).

6.2 SYLLABUS COVERAGE

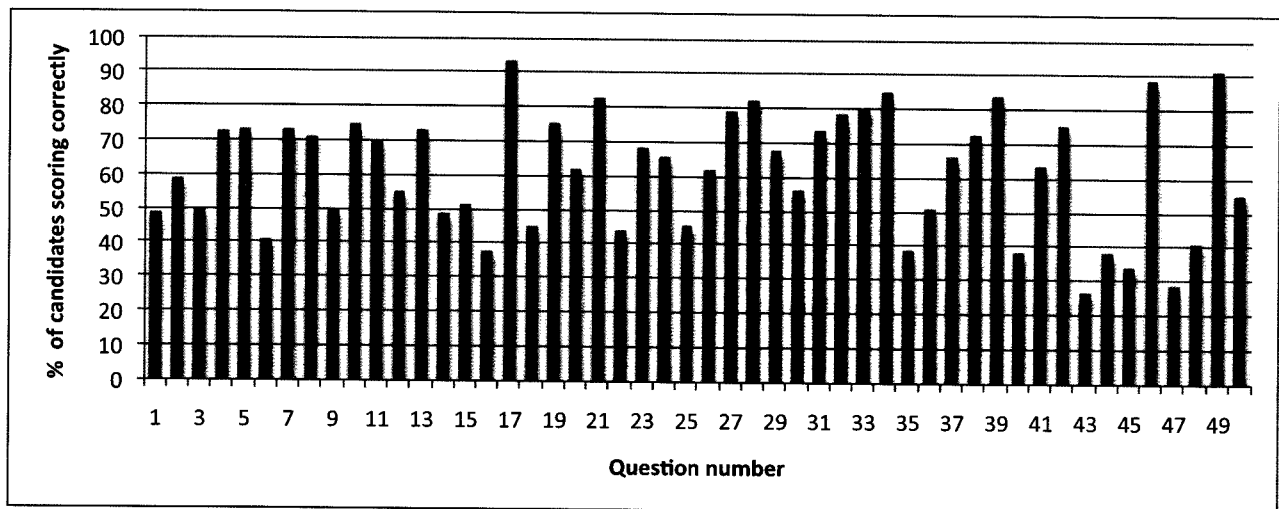
Table 13: Syllabus coverage in the year 2013 KCPE Science

No.	Topic	No. of Items	Percentage
1.0	Human Body	3	06
2.0	Health Education	2	04
3.0	Weather and Astronomy	3	06
4.0	Plants	4	08
5.0	Animals	5	10
6.0	Water	4	08
7.0	Making Work Easier	4	08
8.0	Properties of Matter	8	16
9.0	Energy	8	16
10.0	Food and Nutrition	4	08
11.0	Environment	2	04
12.0	Soil	3	06
TOTAL		50	100

The number of items per topic is determined by the number of specific objectives allocated to each topic in the Primary Science Spiral Syllabus.

6.3 ANALYSIS OF PERFORMANCE IN SCIENCE ITEMS

The figure 6 below shows the facility index of each of the 50 Questions offered in 2013 KCPE Science.



From the graph, seven items (17, 21, 28, 34, 39, 46 and 49) were popular to the candidates. More than 80% of the candidates scored correctly on these items. The popularity of the items could be attributed to adequate instruction by teachers or high difficult index of the items. These popular items combined well with a set of 17 items which were scored correctly by less than 50% of the candidates.

Any item scored by 30% and below of the candidates is considered as having been poorly performed and hence unpopular to the candidates. In the 2013 KCPE Science, two items (43 and 47) had a facility index below 30%. These Questions and the percentage of candidates choosing the correct response are shown in the table below followed with a brief discussion on the response patterns.

Table 14: Question with a facility Index below 30% and below

Question Number	43	47
% of candidates choosing the correct response	25.82	28.06

Question 43

The following processes are involved in the formation of a zygote in plants:

- (i) Growth of pollen tube
- (ii) Pollination
- (iii) Fusion
- (iv) Pollen tube breaks.

The correct order of the processes is

- A. (ii), (i), (iv), (iii)
- B. (i), (ii), (iv), (iii)
- C. (ii), (i), (iii), (iv)
- D. (iv), (i), (iii), (ii).

Response Patterns

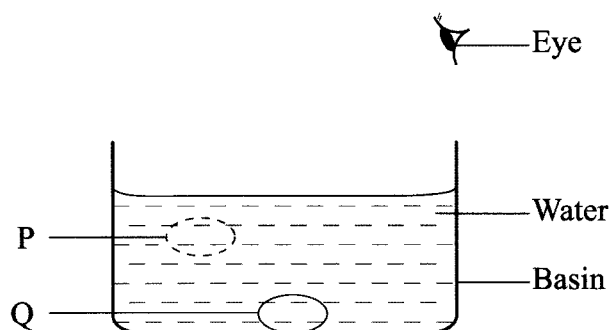
OPTION	A*	B	C	D	No Answer
% Choosing the option	25.82	23.13	42.69	7.07	1.25
Mean Mark in other Questions	31.89	29.09	32.24	25.87	26.95

Pollination and fertilization is taught in class six. The Learners are required to describe pollination and fertilization. Many candidates went for an incorrect response (option C), an indication that they did not understand the sequence of events during pollination and fertilization. In particular, the candidates did not understand that the pollen tube breaks before fusion occurs.

Instruction in schools should target the objective which clearly states that the candidates are required to describe pollination and fertilization. Performance on this item indicates that the objective may not have been adequately addressed during instruction.

Question 47

The diagram below represents a set up used to demonstrate a certain property of light.



Which one of the following statements is **correct** about the set up? Light is

- refracted from P to the eye
- reflected from Q to the eye
- refracted from Q to the eye
- reflected from P to the eye.

Response Patterns

OPTION	A	B	C*	D	No Answer
% Choosing the option	31.80	15.82	28.06	23.09	1.16
Mean Mark in other Questions	32.47	27.22	34.15	27.54	26.88

The Question was from the topic Energy (sub-topic Refraction of light). The syllabus requires learners to investigate refraction of light. What the learners did not understand is that in water, refraction makes the image of the object to appear at a shallow depth. Light from the object is refracted (bent) as it leaves the water to the eye. It appears the candidates were not able to distinguish the image from the object. The concept of refraction may not have been fully understood by the learners during instruction.

However, it should be noted that the correct response was selected by the bright candidates (who had a mean score of 34.15 on the test).

6.4 GENERAL COMMENTS

In 2013, KCPE Science was well done with a Mean raw mark of 30.91. The Mean raw mark for females was 29.63 compared to 30.30 in 2012. The one for males was 32.14 compared to 33.67 in 2012. Teachers should strive to bridge this gap by using approaches that motivate female pupils towards sciences at an early stage in learning. The gap should be adequately addressed so that it is not transferred to the next level of learning.