

Mark scheme 5090/6 – Alternative to Practical November 2001

1(a)(i)	50 g / (0).05 kg ;	1	
(ii)	Some of soil lost / stuck to roots etc ;	1	
(iii)	Absorption of minerals / nutrients / NO ₃ [Not food] by plant / organic matter/humus decomposed / burnt off ;	1	
(b)(i)	Carbon dioxide (from the air) ; through stomata / leaf ; by diffusion/gas(eous) exchange;	1	(ii)
		2	
(c)(i)	Nitrogen / sulphur ;	1	
(ii)	Magnesium ; chlorophyll ; (Accept sulphur /nitrogen if not named in (i) ; for protein formation Accept phosphorus ; for ATP/DNA synthesis etc.)	2	
(d)	Reference to culture solutions ; control with all essential elements ; each other deficient in one element ; suitable plant suggested ; detail of aeration / covered container / sterility of apparatus ; result described ; compared with control ; [up to 4]	4	
2(a)(i)&(ii)	1. Record of measurements at 0.5 mm intervals ; [range 3 mm to 10 mm] 2. System e.g. tally, apparent ; 3. Table well ruled ; 4. Well labelled, including units in heading ; 5. 40 records ; 6. Accurate sub-totals ;	6	
(iii)	Reasonable attempt ;	1	
(b)	Histogram: 1. Clearly, and neatly ruled, at least 6 cm wide ; 2. accurate plotting of figures recorded (in equal columns) ; 3. axes labelled, x - length, mm y – number (of grains)/frequency ; 4. x-axis numbered correctly in middle of block ;	4	
(c)(i)	Bimodal /skewed / normal ; simple description ;	2	
(ii)	genetic difference ; two cultivars / varieties ; reference to growth conditions ; reference to age/maturity ; reference to position in plant /fruit ; [up to 2]	2	

(d)	Some round(er), others thin(ner) (or single comparative) ;	1
3(a)	Drawing marks:	4
	1. At least 7 cm diam., good proportions	
	2. Tripartite / six seed (compartments) shown	
	3. Vascular bundles	
	4. Angularity of pericarp relative to bundle.	
Two from: (not ovule)		Labels: seed ;
	vein / vascular bundle ;	
	pericarp ;	
	epicarp and mesocarp ;	2
(b)	Clear indication on Fig.3.1 of whatever drawn ; good shape of seed, at least 2.5 cm ;	2
(c)	Both size measurements correctly recorded to 1 mm / 0.1 cm ; expression drawing size over object size [numbers required] ; allowance shown for Fig 3.1 being x 0.5 ; magnification correct & well expressed ; [up to 3] [up to 2 places of decimals, no mark for rounding in excess of 0.2]	3