## UNIT 2: HOW IS CONTINUITY OF LIFE MAINTAINED?

## AREA OF STUDY 2: HOW IS INHERITANCE EXPLAINED?

## Key knowledge

## **Genotypes and phenotypes**

2.3.4 qualitative treatment of polygenic inheritance as contributing to continuous variation in a population, illustrated by the determination of human skin colour through the genes involved in melanin production or by variation in height.

2.3.4.1.	Define polygenetic inheritance, using human height as an example						
2.3.4.2. variat	Use the graph provided to explain to in a phenotype.	the difference between continu	ous and discontinuous				
		Output 1 2 3 4 5 6  Number of upper case alleles (for 3 genes each with 2 alleles)	Recessive Dominant trait				

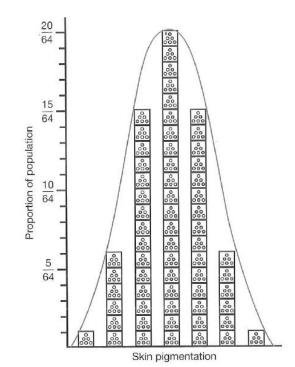
2.3	3.4.3.	Why is discontinuous variation sometimes referred to as Mendelian Inheritance?				
2.3	three g (domin	In humans skin colour is determined by at least genes. If these genes are designated A,B,C ant alleles) and a,b,c (recessive) alleles, then skin will range from	Parents	aabbcc AABBCC (very light) (very dark)		
	AABBC	C (very dark) to aabbcc (very light).  agram shows a cross between AABBCC and aabbcc	Offspring	AaBbCc AaBbCc		

All the possible genotypes for the gametes are listed in the table below;

(a) Complete the following grid by colouring the circles to show the probability of a child having a particular skin colour.

	abc O O O	abC ○ ○ ●	aBc O O	Abc O O O	aBC O	AbC O	ABc	ABC
abc O	000	000	000	000	000	000	000	000
abC	000	000	000	000	000	000	000	0 00 000
aBc O	000	000	000	000	000	000	000	000
Abc	000	000	000	000	000	000	0 00 000	0 00 000
aBC	000	000	000	000	000	000	000	000
AbC	000	000	000	000	000	000	000	000
ABc	000	000	000	000	000	000	000	000
ABC	000	000	000	000	0 000	0 000	0 00 000	0 00 000

(b) Using the results from (a) a graph was constructed to show the skin colour distribution. Discuss why this graph represents polygenetic inheritance.



(c) Draw a graph to show Mendelian inheritance of height of pea plants for heterozygous cross of Tt x Tt