Full lesson transcript for Mr. Zindi of School A

Lesson 2: Genetics and Inheritance on 2 July 2020

Details

- This lesson transcript represents 35 minutes teaching time.
- A black Zimbabwean male teacher was teaching the topic meiosis 32 male and female student participants all in grade 12.
- The lesson took place at a former model C co-educational High School in Johannesburg East district in Gauteng on 2 July 2020.
- When used by the teacher, the learners' names have been changed to protect anonymity.
- The textbooks utilised during the lesson are Exam Fever Life Sciences Grade 12 1st edition published by Exam Fever Publishers and Study and Master Life Sciences Learner's Book Grade 12 Published by Cambridge University Press.
- Used PowerPoint presentation slides, laptop, and data projector.
- White board and board markers

Transcription conventions

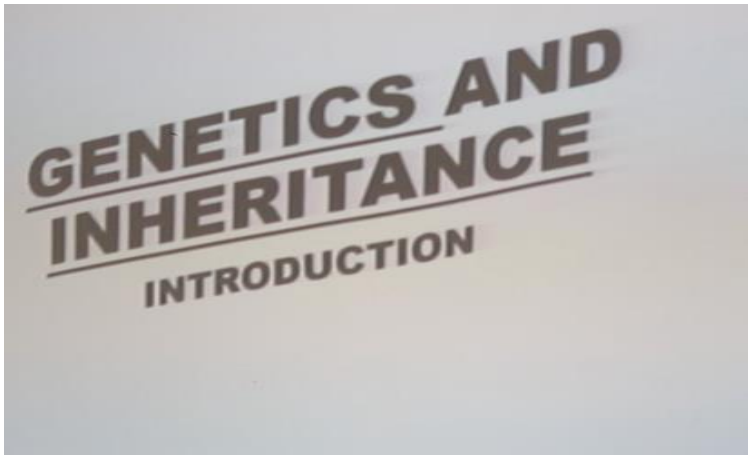
Symbol	Signification
T:	A verbal contribution belonging the teacher
L:	A verbal contribution belonging to any individual learner
Ls:	A verbal contribution belonging to two or more learners
…	Noticeable pause of less than 1 second in a turn, which could be due to reformulation or hesitation
—	Sound abruptly cut off e.g false start Truncated word Formal made shorter e.g S-

/ /	Words between slashes show uncertain transcription (not clearly known or understood.
/ ? /	Inaudible utterances
[ ]	Words in brackets indicate non-linguistic information eg [pause for 1 second] Laughter, throat clearing, smile, applause, sigh happily/ werily/deeply, contently, swallowing, nodding, shaking head dance or movement towards/away
( )	Parenthesis around tone units indicate words spoken in a sotto voice under one's breath (in a very quiet voice)
,	Slight pause
?	High rising intonation
.	Falling intonation at the end of tone unit
:	Colon following a vowel, indicates elongated vowel sound or extending length of sound e.g Die:d
::	Extra colon indicates longer elongation
↑	A step up in pitch/ high pitch (high quality sound)
↓	A shift down in pitch (low quality sound)
^	A caret indicating high pitch level e.g ^weird
-	Low pitch level
——	Self-interruption or repair
Abc	Best guess transcription

ALL CAPS	Utterance is louder/said with extra stress/emphasised compared with surrounding words
/	Rise tone e.g …saying something, /
\	Fall tone
V	Fall-rise-tone
Λ	Rise-fall-tone
CAPS	Prominent syllable e.g sOn or FAthEr

EPISODE 1: INTRODUCTION OF RESEARCHER AND THE DAYS TOPIC

1. Mr. Zindi: We are going to look at genetics and inheritance, if you remember last term, I gave you some forms which you read and signed.
2. Ehh… you agreed that you were going to assist Mrs. Mupfawa in her research problem.
3. So, she is here to observe certain things as we go about our lesson.
4. That is why she is here, and she is recording so that when she goes home, she can sit down and analyse to get whatever conclusions and hypothesis to check out the research.
5. So, write the date and topic Genetics and inheritance.



6. ↑Now how are we going to have this lesson?
7. We are going to focus mainly on concepts because whatever we do today…at the end of the topic we are going to be using some key words.
8. During the discussion whenever you see a word that has come along, you must write it down as a key word.
9. Okay, as we have been doing our things you do not need to be…be writing notes / ? /.
10. The notes will be sent to you, what is important is listening and understanding but today what we are going to write are…the underlined word.
11. So, when you write your date, you write the sub-heading, keywords.
12. Our topic is Genetics and inheritance, and we are going to use some introduction where we discuss these key words.
13. Whenever we get to a word that has come along, you must write it down.
14. You do not have to explain it but just write it down…

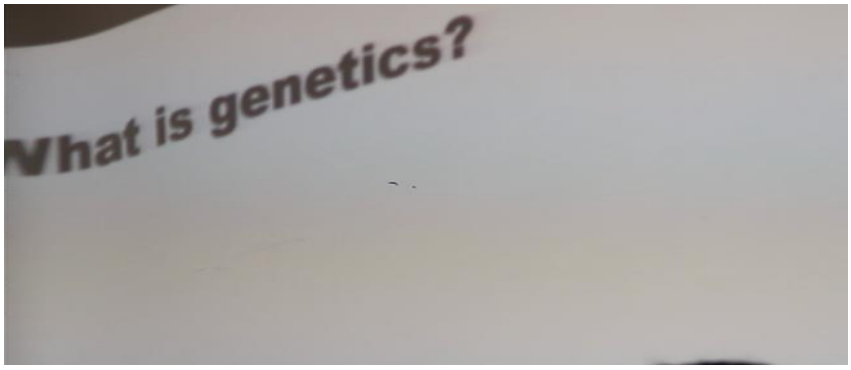
…and when we have a collection…

…of these words, we are going to tabulate and write the meanings of these words.

15. Of course, we will be discussing some of the meanings as we go through our lesson.
16. I hope everyone has written the topic so I can move on.
17. How many words so far have you written down?
18. How many key words?
19. Ls: [Chorus]
20. Mr. Zindi How many? [Pointing to a learner]
21. Alvin: Genetics and inheritance.
22. Mr. Zindi: Genetics ↑ and inheritance.

EPISODE 2: GENETICS AND INHERITANCE

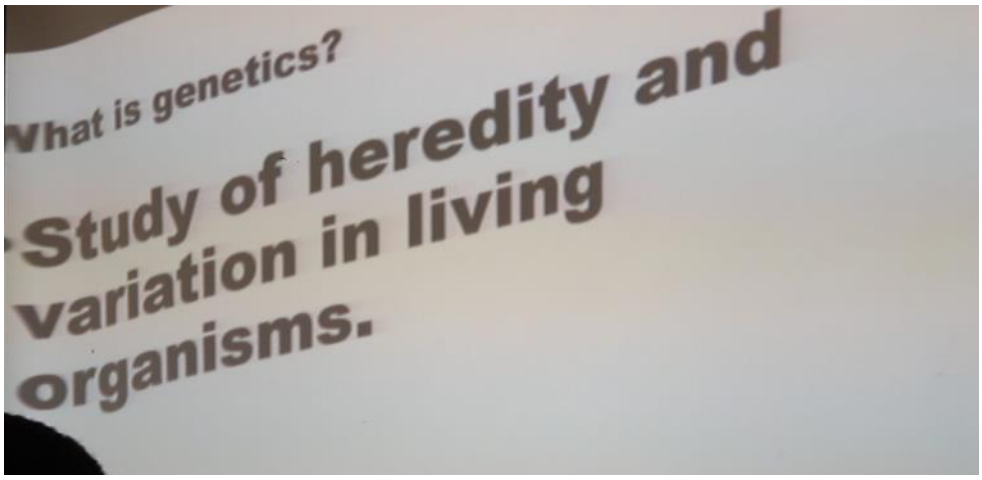
23.		Then our first question is… what is genetics?



24.		Who can explain in your own words?
25.		I am not looking for the correct answer; I am looking for your opinion.
26.		What is genetics… any idea…yes, Morrison!
27.	Morrison:	I think, it is genes that are passed on from parents to offspring.
28.	Mr. Zindi:	Right, that is his opinion!
29.		According to him, it is about genes being passed on from parents to offspring.
30.		Any additions or subtractions?
31.	Mr. Zindi:	Is he correct to say that? Yes, Collins!
32.	Collins:	Sir, I think [unclear]
33.	Mr. Zindi:	Unfortunately, the sound is not able to come out of the mask.
34.	Ls:	[Laughter]
35:	Collins:	[With mask down] Genetics refers to types of genes that someone has in them…
36.	Mr. Zindi:	When someone has some types of genes, he thinks that is genetics…types if genes.
37.		Anyone else…yes!
38.	Kelly:	I think genetics is inherited by…
39.	Mr. Zindi:	The last one, yes Richmond!
40.	Richmond:	/ ? / Is it not a study?
41.	Mr. Zindi:	Right from…what everyone else has said there is inheritance, there is genetics, there was genes but now there is the missing part which is reference to the study.
42.		When we look at genetics, we look at it as a study.
43.		And what is a study?
44.		You have mentioned in your various explanations and we can sum that up as heredity.

45. So, here genes are passed on from parents to offspring, that is referred to as heredity because the offspring is inheriting the genes okay.

46. So, our definition…will be… [shown on slide]



…the study of heredity and variation in living organisms.

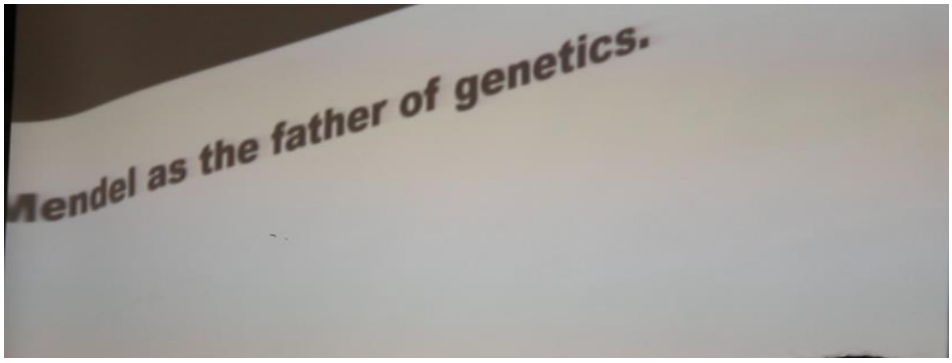
47. As simple as all that.

48. So, this is what we are going to look at in this topic, the study of heredity and variation in organisms.

EPISODE 3: MENDEL AND HIS EXPERIMENTS

49. Now… when did all this start?

50. It started with this man known as Mendel, Gregor Mendel and now he is referred to as the 'Father of Genetics?'

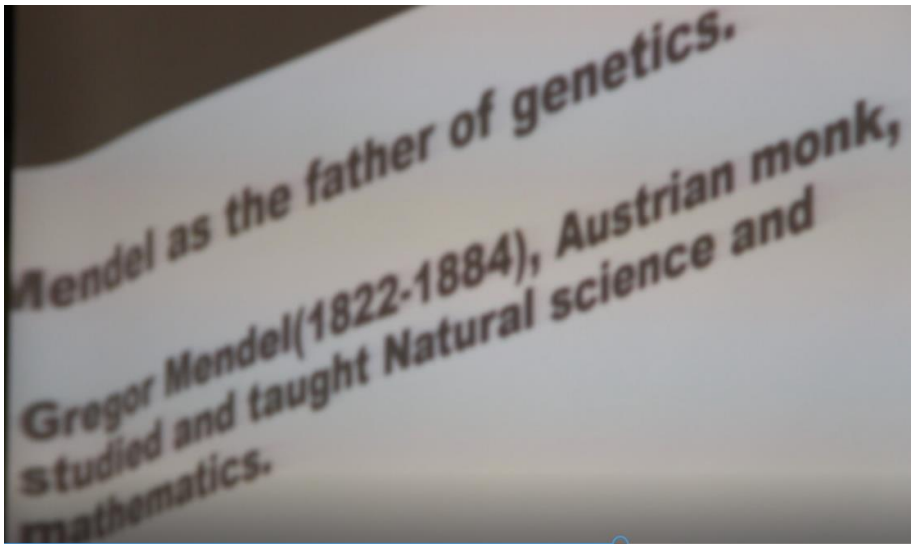


If you know what a father is…

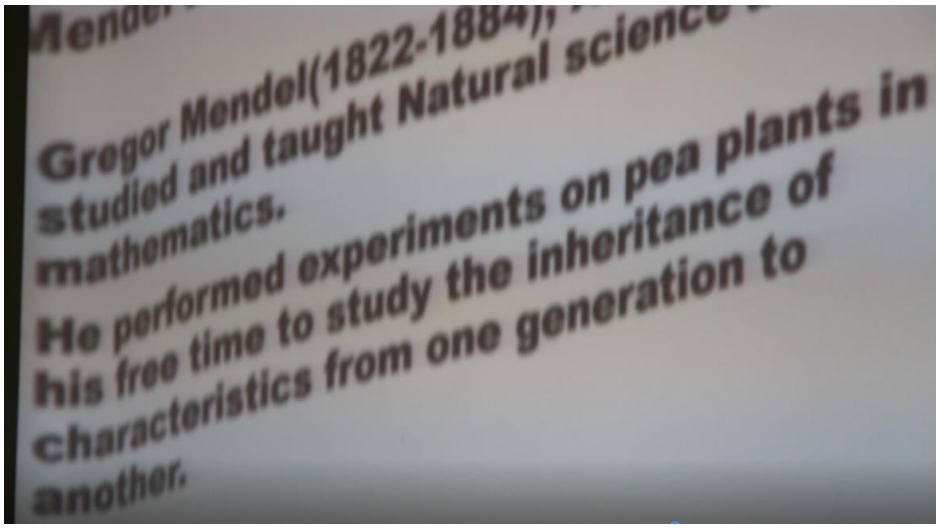
51. Ls: [Laughter]

52. Mr. Zindi: …you can relate this to why Gregor Mendel is referred to as the 'Father of Genetics'.

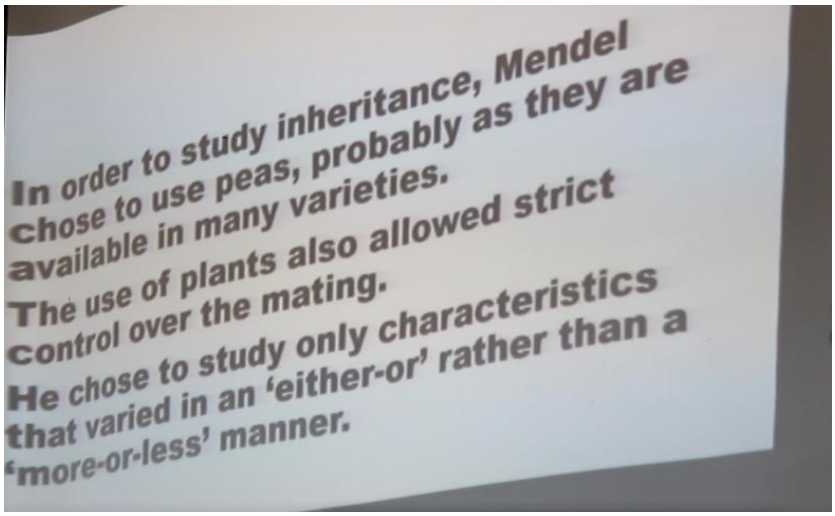
53. The same two people Morrison and Collins…what about the rest?
54. Yes, Harrison lead them!
55. Morrison: It is because he came up with the idea of genetics.
56. Mr. Zindi: / ? / The idea of genetics, that is correct!
57. In other words, he did a lot in the study of genetics…he did quite a lot!
58. So, now in this introduction…we are going to look at ways that Mendel did that resulted in people calling him the 'Father of Genetics'.
59. He was born in eighteen twenty-two and died in eighteen eighty-four.
60. Ahh…he originated from Austria and was a monk who studied natural sciences and mathematics right.



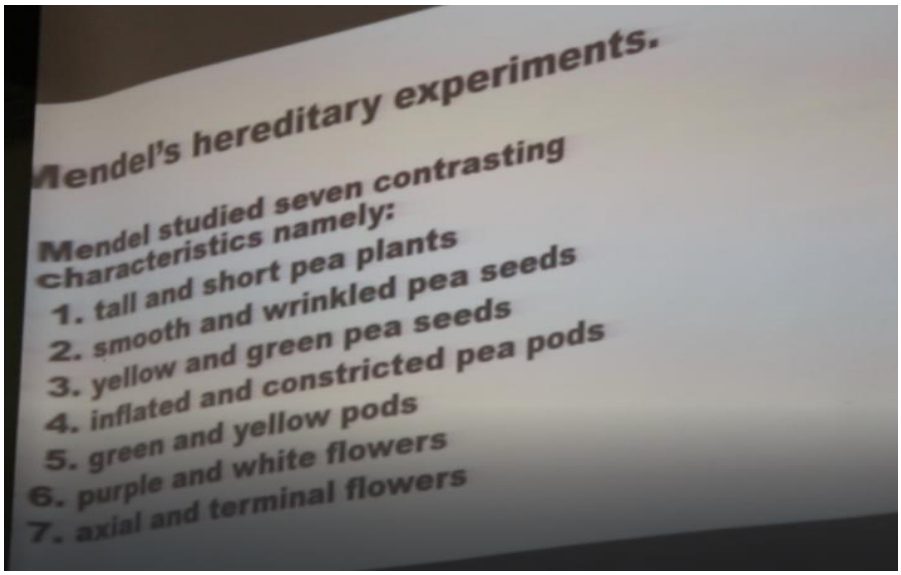
61. So, he was quite a learned ehh…person.
62. What did Mendel do?
63. How did it start?
64. Mendel was using his own free time.
65. I wonder if…you use your free time for ehh…useful things.
66. Ls: [Laughter]
67. Mr. Zindi: What Mendel was doing, he probably-- we cannot say he had nothing to do.
68. He had quite a lot of things to do but he was observant as a scientist.
69. So, he was observing pea plants growing and he got interest in that.
70. So, he performed a lot of experiments on pea plants during his free ehh…time and he was looking at how certain traits or characteristics were inherited in these ehh…pea plants from one generation to the other.



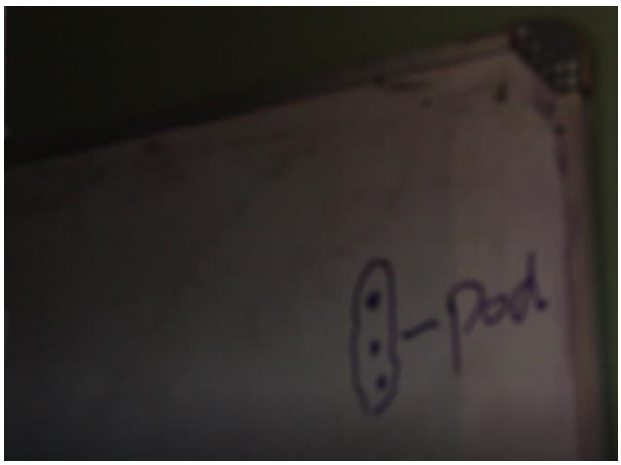
71. So, why did he choose pea plants?
72. Because he observed that pea plants were available in different varieties.
73. They were available in different varieties.
74. The other reason; he also observed that usually or normally the plants do self-pollinate.
75. They do not rely on cross pollination as such.
76. So, he chose to study the characteristics that varied in an either-or-rather than in a ‘more-less’ manner.



77. So, it was …his characteristic was either this characteristic or it was this characteristic.
78. So, let us look at Mendel or the characteristics that he observed.
79. Mendel studied seven contrasting characteristics, and these are…



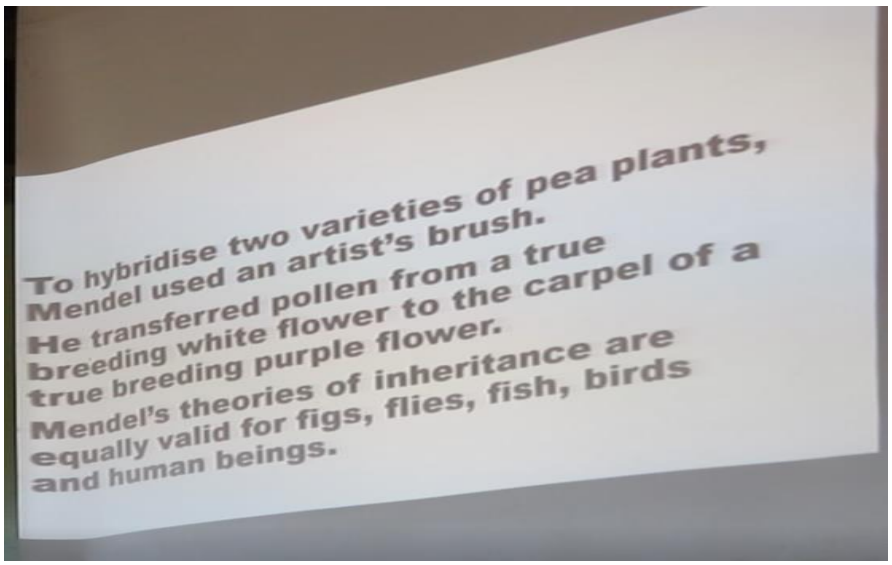
80. He was looking at tall and short pea plants, smooth and wrinkled ehh…seeds or pea seeds.
81. Yellow and green pea seeds.
82. He inflated and constricted pea pods.
83. Do you know what that is?
84. Pea pods?
85. Does anyone know? Yes, Collins!
86. Collins: / ? /
87. Mr. Zindi: Right, plant reproduction that you did in grade 11, where the ovary develops into a fruit and inside the fruit what do we find?
88. We find seeds, so the pea plants …that's the pod… [drawing on the board]



… with seeds inside and he also looked at purple and white flowers' axial and terminal flowers.

89. Those are the characteristics… the characteristics that Mendel was looking at.

90. Right, what-- how did he go about it?



91. To have…these hybrids or hybridize two varieties of pea plant he used.

92. What was he using?

93. He used a brush; he had his plant and what he did was to cut the stamens of another plant.

94. Then he was collecting the pollen grains from another plant and brushing them on the stigma of the other plant.

95. What was the purpose of this?

96. Why did he use a brush? [Silence]

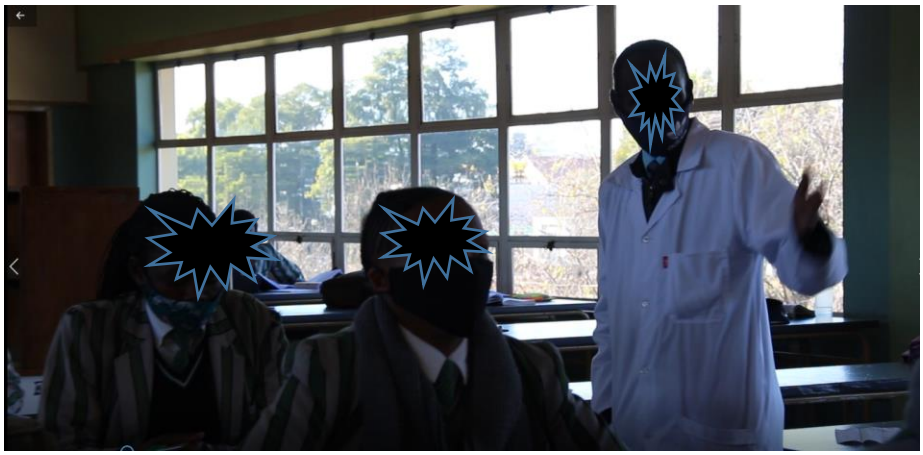
97. He was acting like a bee.

98. Bees pollinate plants right.

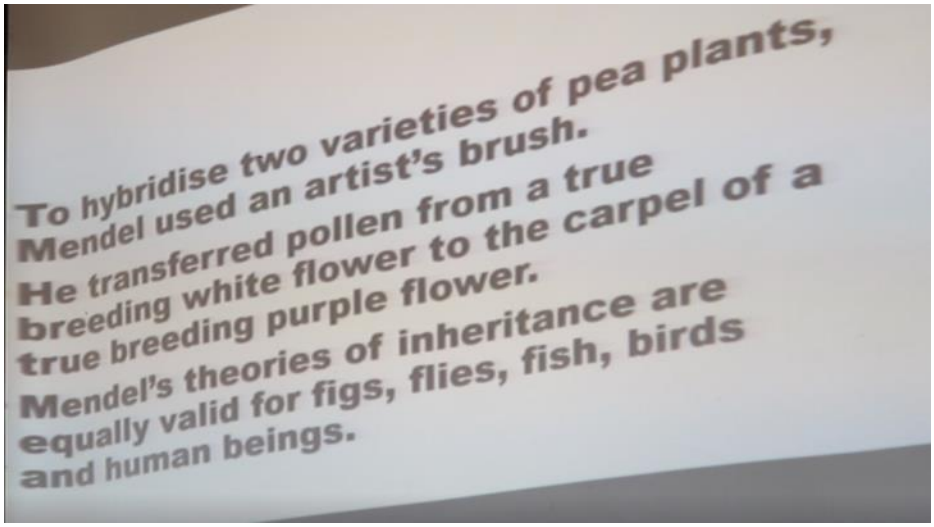
99. So, during the…these experiments that is what he was doing.

100. He transferred pollen from true breeding white flower to the carpel or stigma of a true breeding purple flower.

101. Mendel's theory is also valid in animals as listed there.



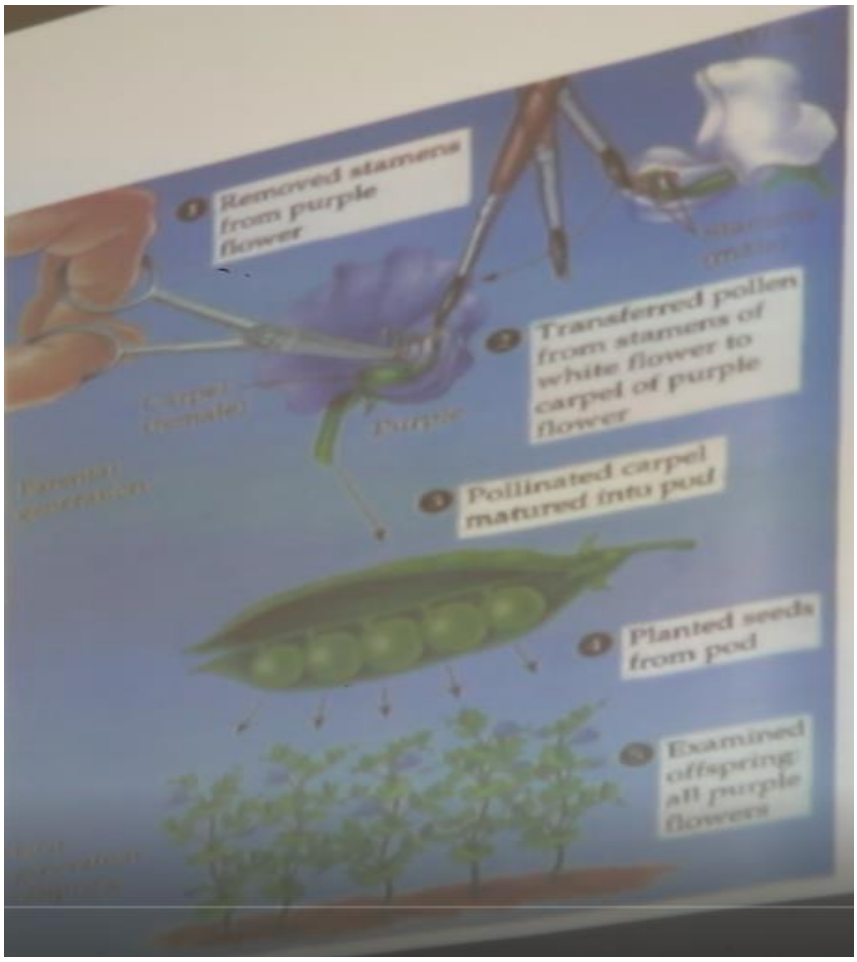
102. It is also valid to figs that is plants, flies, fish, birds and human beings.



103. So, whatever we are going to be discussing when we look at crosses, it applies to all other organisms.

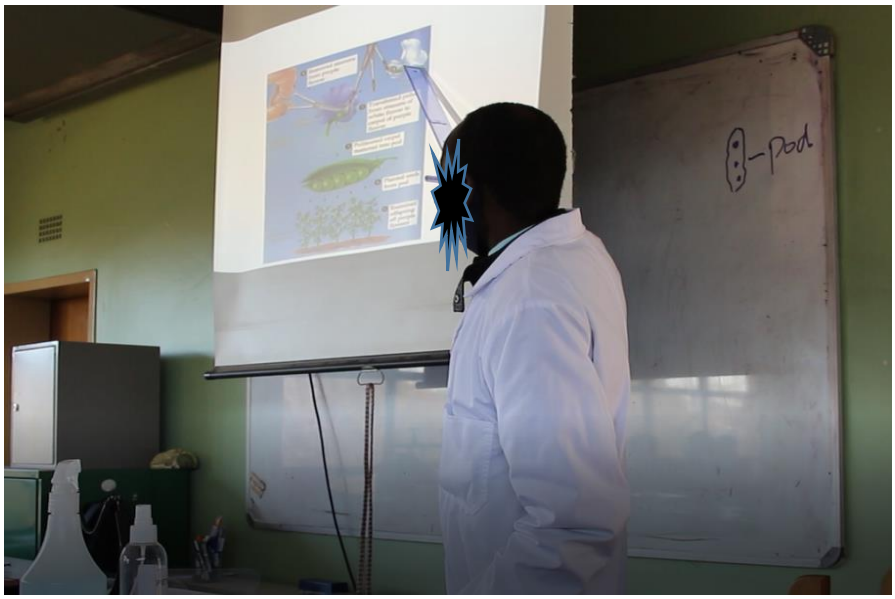
EPISODE 4: EXPLAINING MENDEL'S EXPERIMENTS USING A DIAGRAM

104. Let us look at this diagram to explain how Mendel carried out ehh…these experiments.



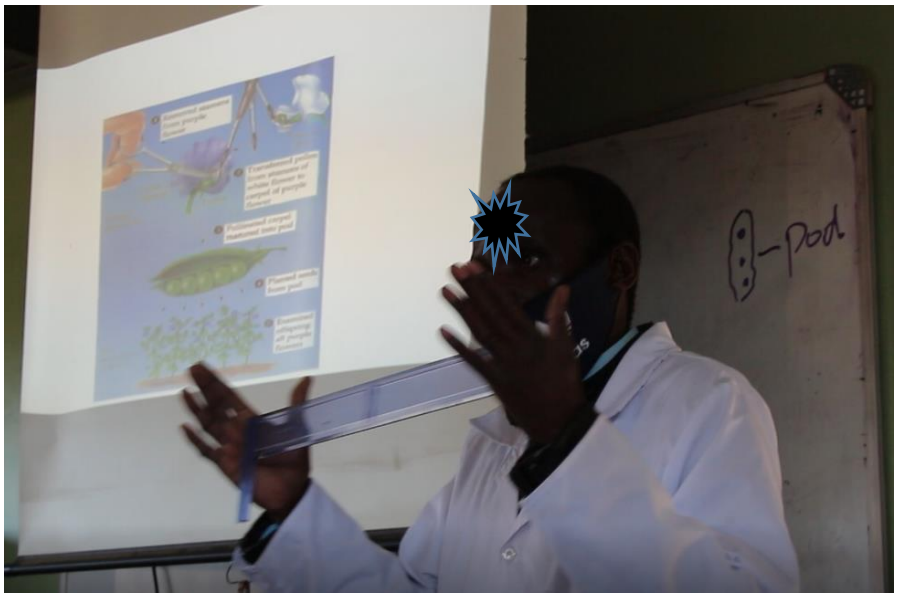
105. He was using a plant with purple flowers…

…and another one with white flowers…



…what are these?

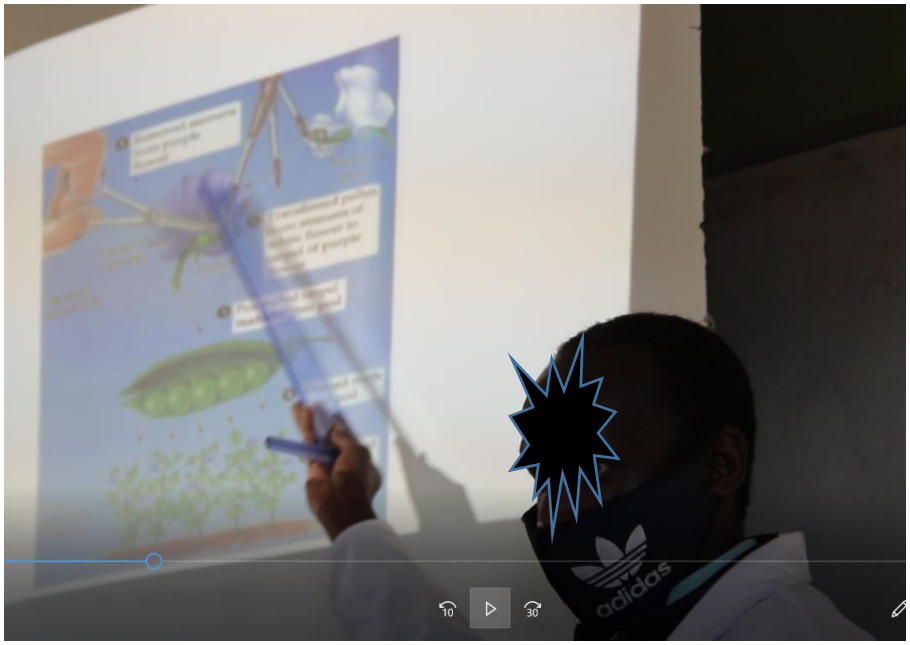
106. These are pea plants,



…but they are different because they are different varieties.

107. As we know from evolution that there is variation among organisms, so there is also variation among pea plants.

108. Some have purple flowers…



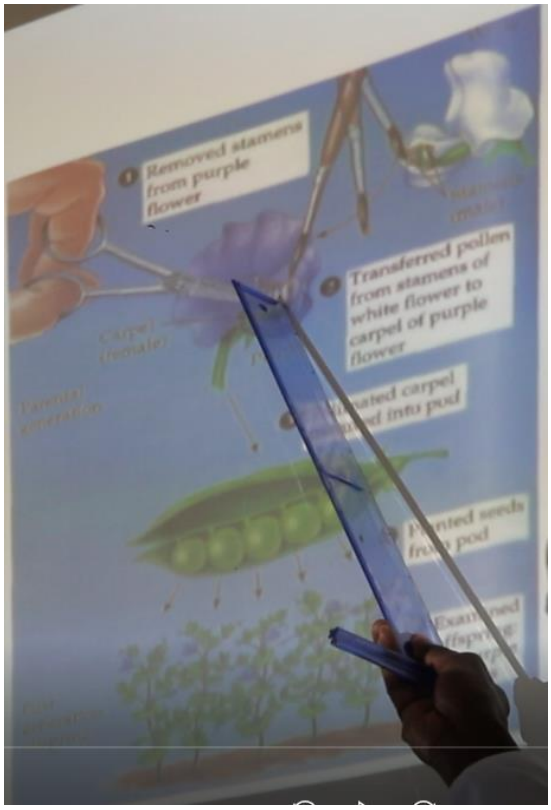
…some have white flowers.

109. So, what he did…he removed the stamens from the purple flower and it was only left with the stigma.

110. Remember the stamens are the ones that produce pollen grains.

111. These are the male parts of the flower and the stigma is the female part of the flower.

112. So, all the stamens were removed from the purple flower [pointing].



113. Why did he do that? [Silence]

114. You do not know?

115. Christy, what do you think?

116. Why did he remove the male organs? [Silence]

117. If we take all the boys in this class and we cut off their male organs…

118. Ls: [Laughter]

119. Mr. Zindi: …what is going to happen?

120. Are they going to be able to reproduce?

121. Ls: No!

122. Mr. Zindi: No! So, why did he remove the male organs there?

123. To prevent what?

124. Ls: Fertilization.

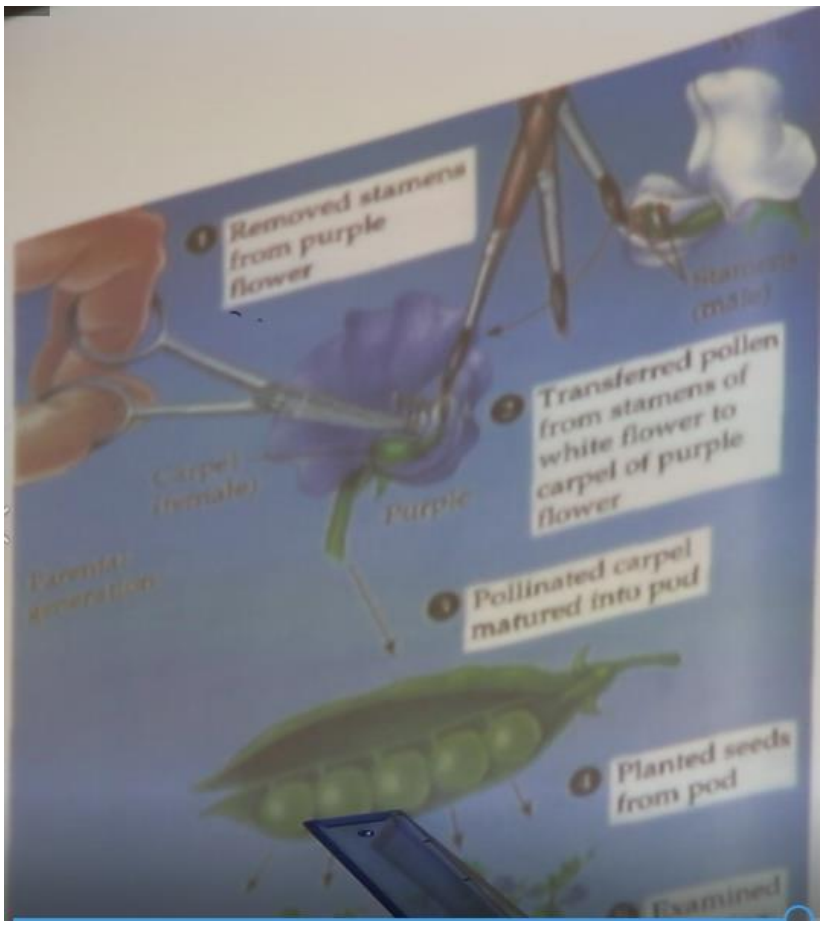
125. Mr. Zindi: To prevent fertilization…. fertilization comes after pollination…pollination in plants, you remember that.

126. So, he was trying to avoid or prevent self-pollination.

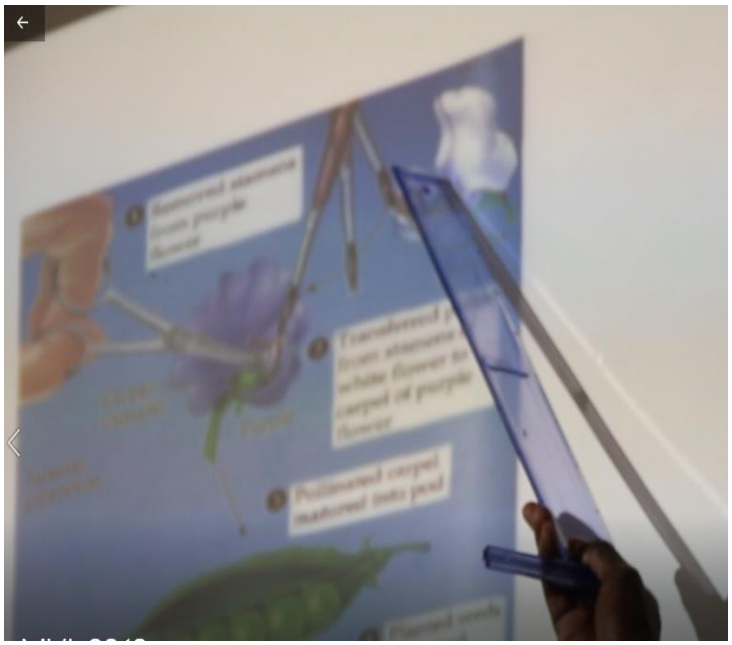
127. He did not want the purple flower to self-pollinate right and he took the stamens from the male…I mean from the white, he took the pollen grains using an artist brush that we discussed.

128. He was transferring [showing on slide] …he transferred the pollen grains to the purple flower, right, what was the result?

129. The seeds were produced as you see there [showing]



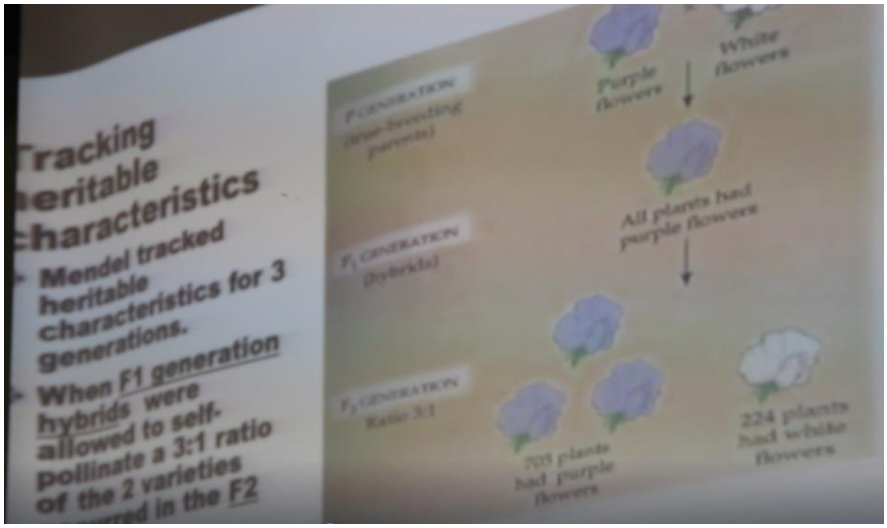
130. These are the pods from the purple flower and he planted these seeds from the purple flowers and the result was all the plants despite taking pollen grains from the white flower… [pointing]



…all the plants had purple flowers.

131. Right, all the offspring were purple.

132. On the next slide, let us look at tracking inheritable characteristics.



133. What was happening there?

134. Mendel tracked inheritable characteristics for three generations.

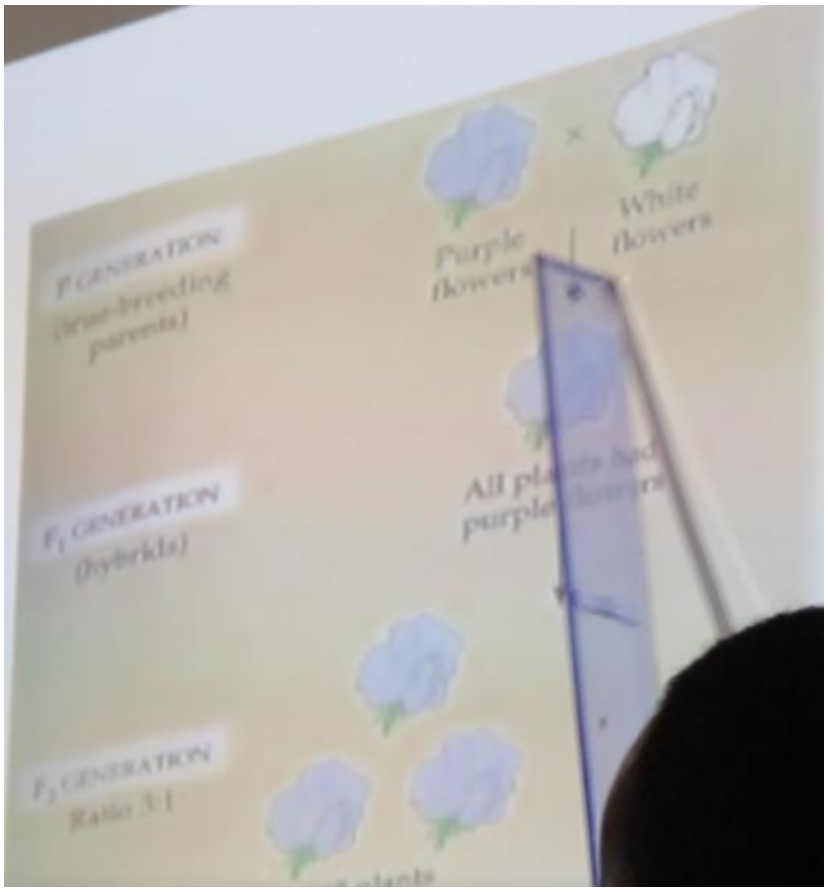
135. In other words, [using hands]

…he had the first generation which were the parents and the second generation.

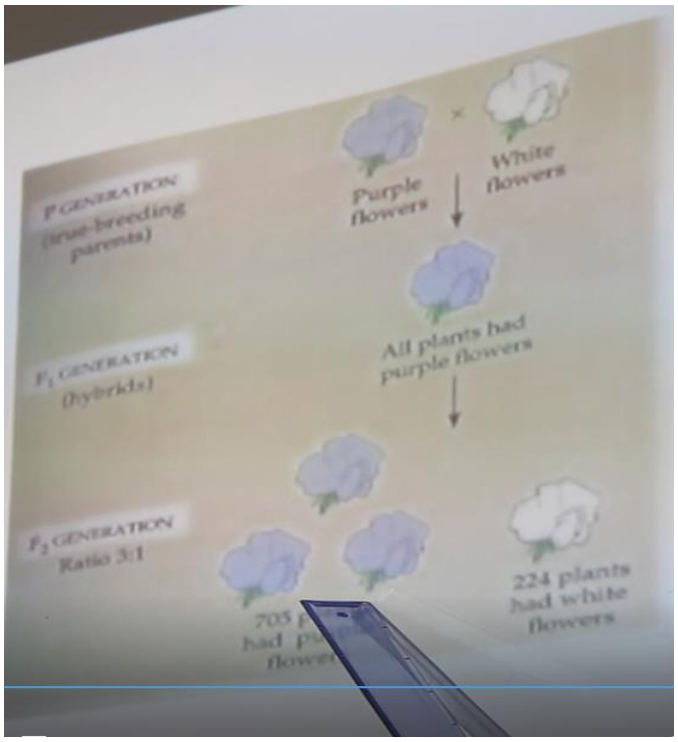
136. That is the first generation, that is the offspring of the parents and then he planted and obtained the third generation.

137. So, he analysed this through three generations.

138. Where F_1 hybrids were allowed to self-pollinate and a ratio of 3:1 was found that is three purple and one white as shown in the diagram here [showing]… these are the parents.



139. First filial generation all the plants were purple as we have seen…have seen before then in the second generation a ratio of three purple [pointing].



…and one white was obtained. How many key words so far?

140. How many…do you have genetics?

141. Ls: Yes!

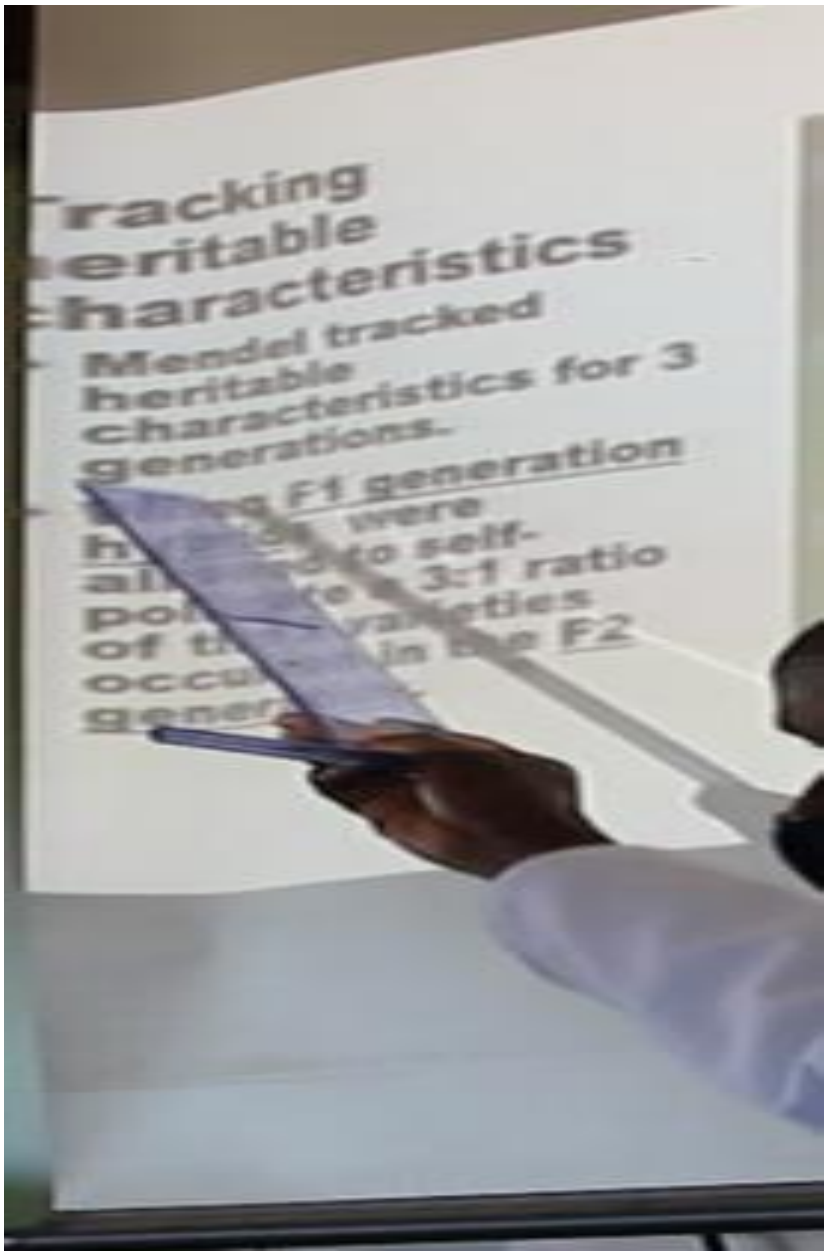
142. Mr. Zindi: Hybrid?

143. Ls: Yes!

144. Mr. Zindi: F_1 generation?

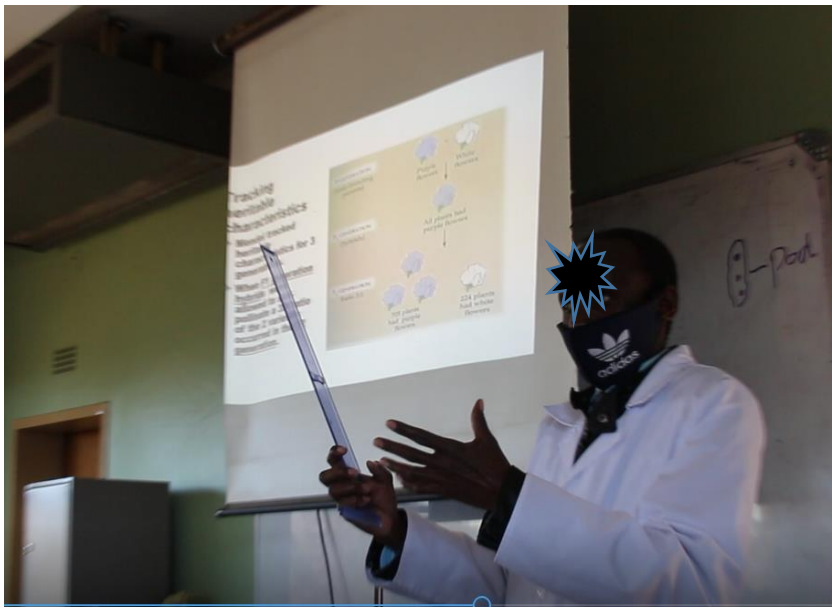
145. F_2 generation [silence].

146. Right, now before we proceed, using this diagram [Mendel's] and our underlined… [showing]

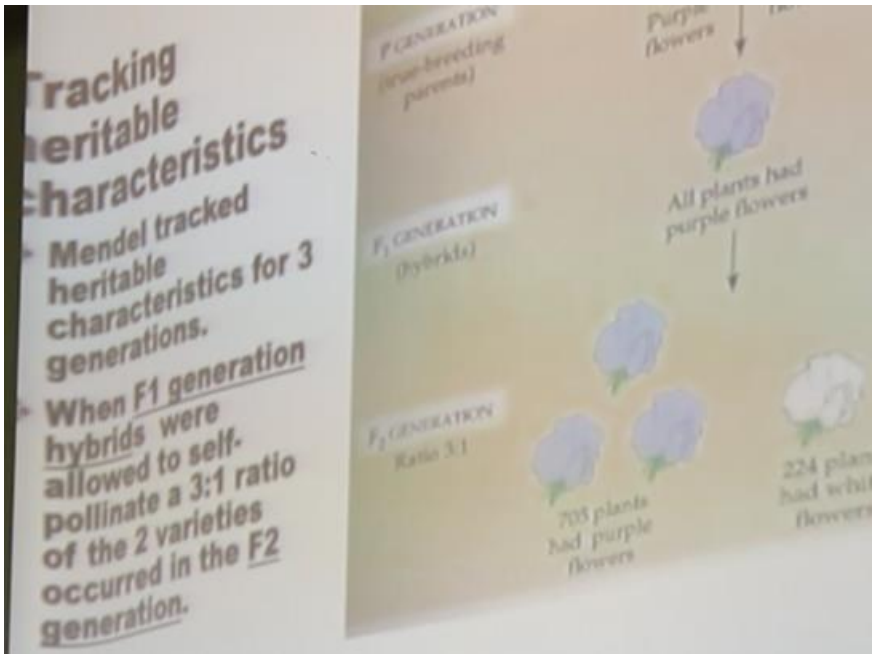


…words there; hybrid.

147. Can you derive a description or definition of what a hybrid is?



148. We have hybrid there [referring to diagram] …



…yes! [referring to learner].

149. Collins: [Removing mask] Two different species that…

150. Mr. Zindi: Two different varieties right.

151. So, we have purple variety and the white variety and MATING was done and the offspring is now a hybrid because it is product of two different varieties okay.

152. The F_1 generation, what does F…what do you think F_1 stands for?

153. Probably I forgot to give you reference [holding book] genetics Study and Master pages 120-155 and Exam Fever pages 34-50 but Exam Fever might be different depending on the edition.

154. So, if it is not pages 34-50, just use your index to find the topic.

155. Right, now this class…this lesson is dominated by Collins and Morrison and that is not a healthy situation at all.

156. So, whether your hand is up or not, you are going to be obliged…

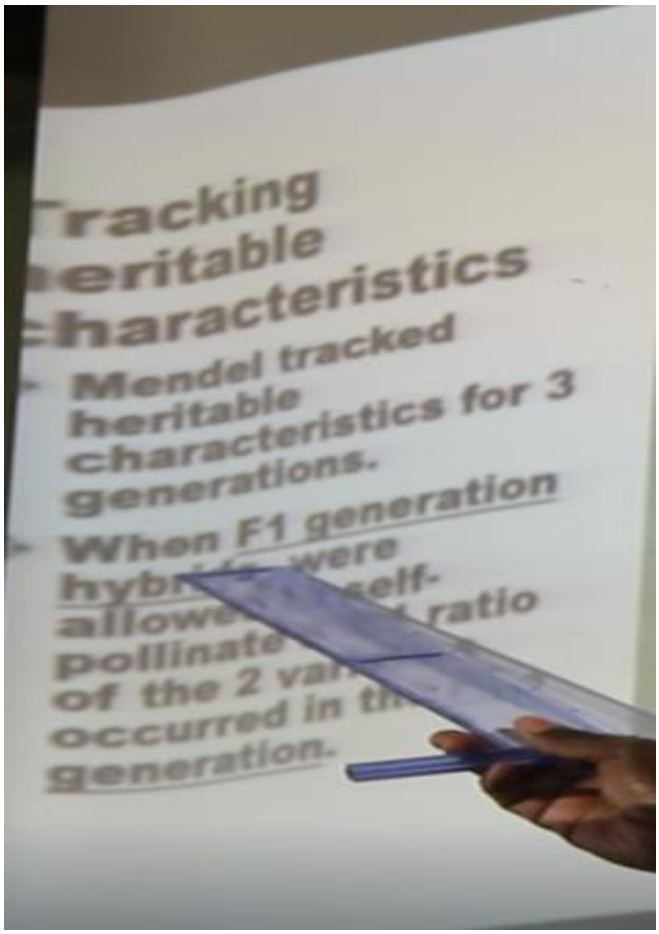
157. Ls: [Laughter]

158. Mr. Zindi: …and it's your right to participate.

159. Ls: [Laughter]

160. Mr. Zindi: So, we have obtained a hybrid as a result of mating two varieties.

161. Now we have our F_1 generation… [pointing]



162. What is F_1 generation?

163. F stands for what…stands for?

164. Lerato: Stands for filial.

165. That is correct, stands for filial.

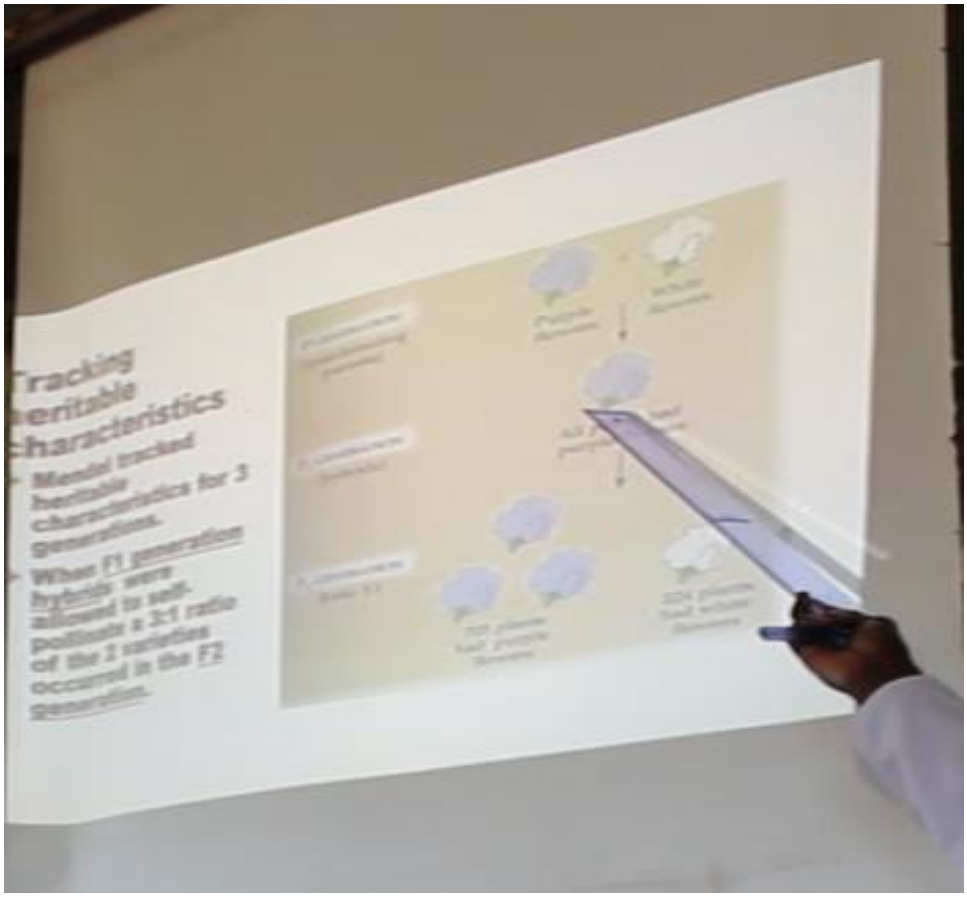
166. So, from now on F stands for filial.

167. So, we have our first filial generation that resulted from a cross between the two varieties that produces all purple plants.

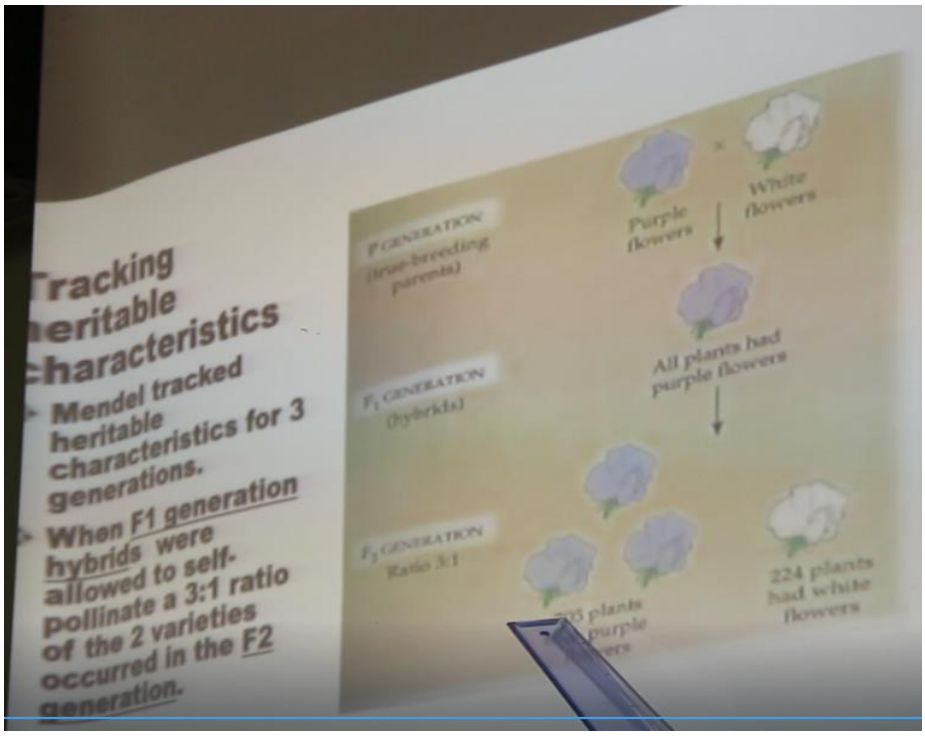
168. Right, you must be able to come with a definition of that.

169. To explain what the first filial generation is.

170. Then F_2 generation [Pointing to diagram]

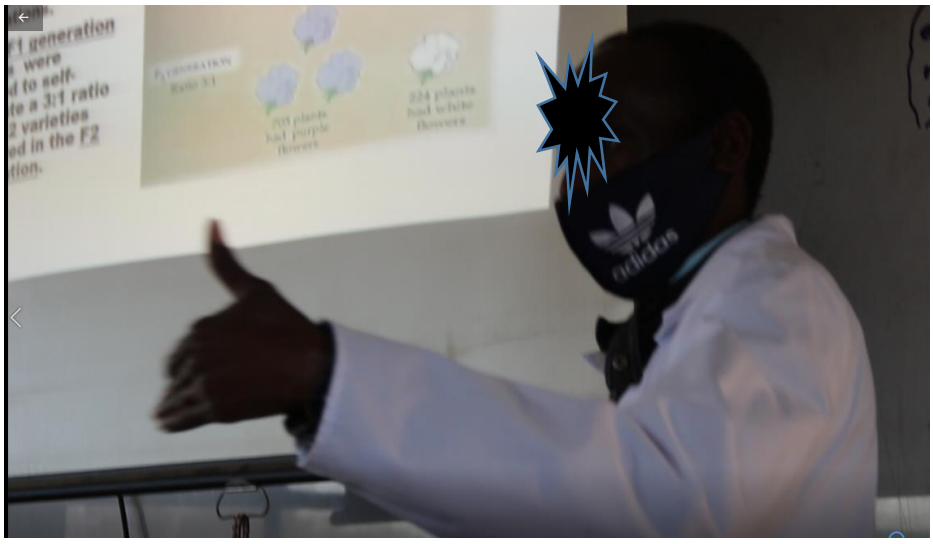


…we have taken seeds from this plant that is the F_1 generation, planted them and we have produced this generation… [pointing]



…which is now our F_2 GENERATION.

171. In your own words, you must be able to explain…



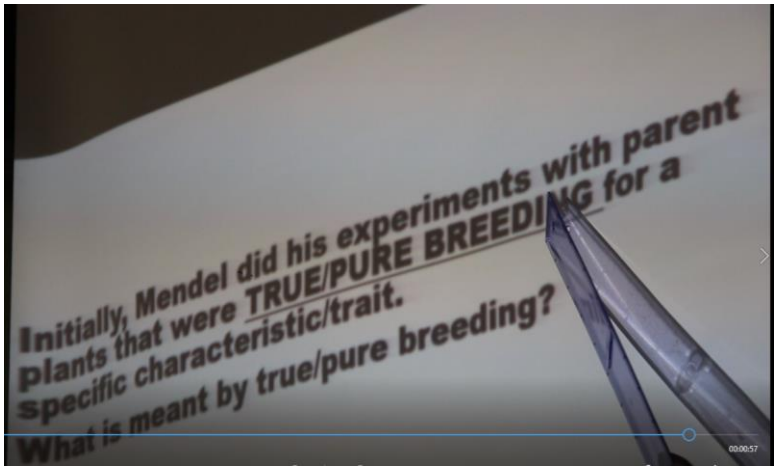
…what it is okay.

172. Then next we were talking about Mendel carrying out experiments and how exactly did he do this? [Pointing to the slide]

173. He did his experiments with parent plants that were true or pure breeding for a specific characteristic.

174. Whatever characteristic he was looking at, whether it was length or height of the plant.

175. Whether it was about colour of the flowers, he used pure breeding plants, that another key word… [pointing to slide]



…and what is meant by pure breeding? [Silence]

176. Using the previous example on the ehh…diagram.

177. Can you understand from there, what does true breeding mean?

178. Yes, Maria!

179. Maria: Sir, I think it is two fertile mating partners.

180. Mr. Zindi: Two fertile mating partners.

181. That is not correct, thank you for your contribution.

182. Khensani: Sir let us say… / ? /.

183: Mr. Zindi: That is what he did, he crossed a tall plant and a short plant…he crossed them and produced offspring.

184. He did the same with purple and white plants, but our challenge is all about what is it?

185. When we talk of pure breeding or true breeding pea plants can you use those / ? / to make it clear. Yes, Morrison!

186. Morrison: / ? /

187. Mr. Zindi: That is not correct!

188. Thanks for your contribution.

189. Collins : [Inaudible, with mask down]

190. Mr. Zindi: You are missing the point…you are missing the point…yes, Enhle!

191. You have been quiet for some time.

192: Enhle: Stanley wants to answer.

193. Stanley: I think true breeding is the one that breeds naturally [inaudible and using hands]

194. Mr. Zindi: What I got from your answer and what I liked there is the use of the word self-pollinate…

…that will be true breeding.

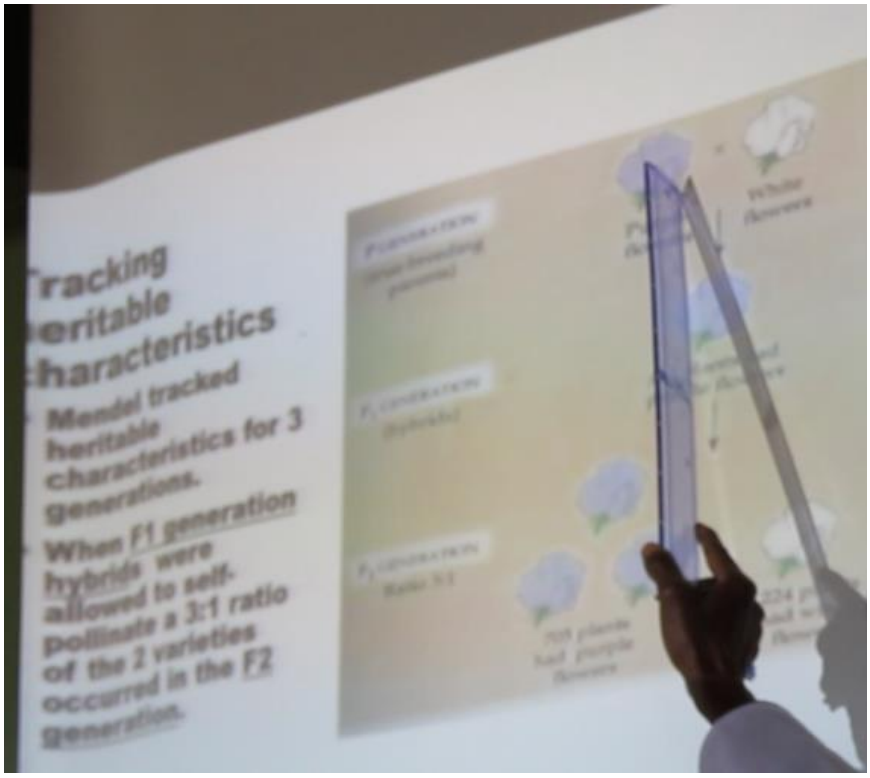
195. Right, let us take for example before— okay you want to say something?

196. Collins: [With mask down] Sir, I wanted to say specific or particular tree whereby it breeds with another true breeding organism and then pass their genes to the coming generation.

197. Mr. Zindi: Right, let me go back to our diagram there, you see this type of—

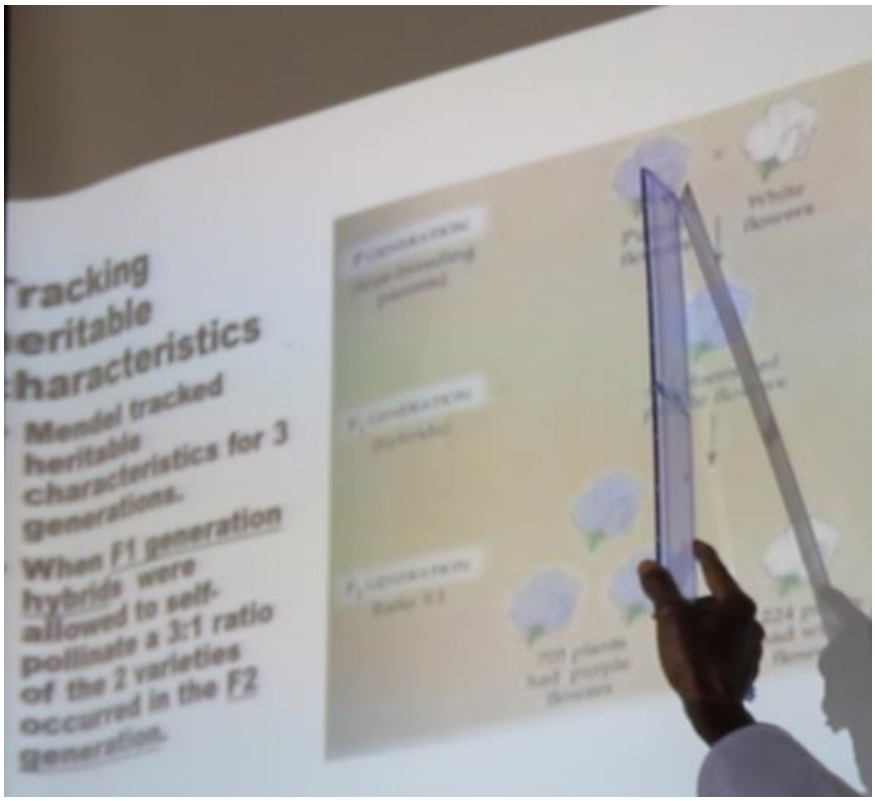
198. Ls: Yes!

199. Mr. Zindi: [Showing]



…flower…it belongs a plant that only produces purple…flowers and this one

…produces white flowers. So, this purple flowered plant[pointing]



…is a true breeding plant provided it self-pollinates.

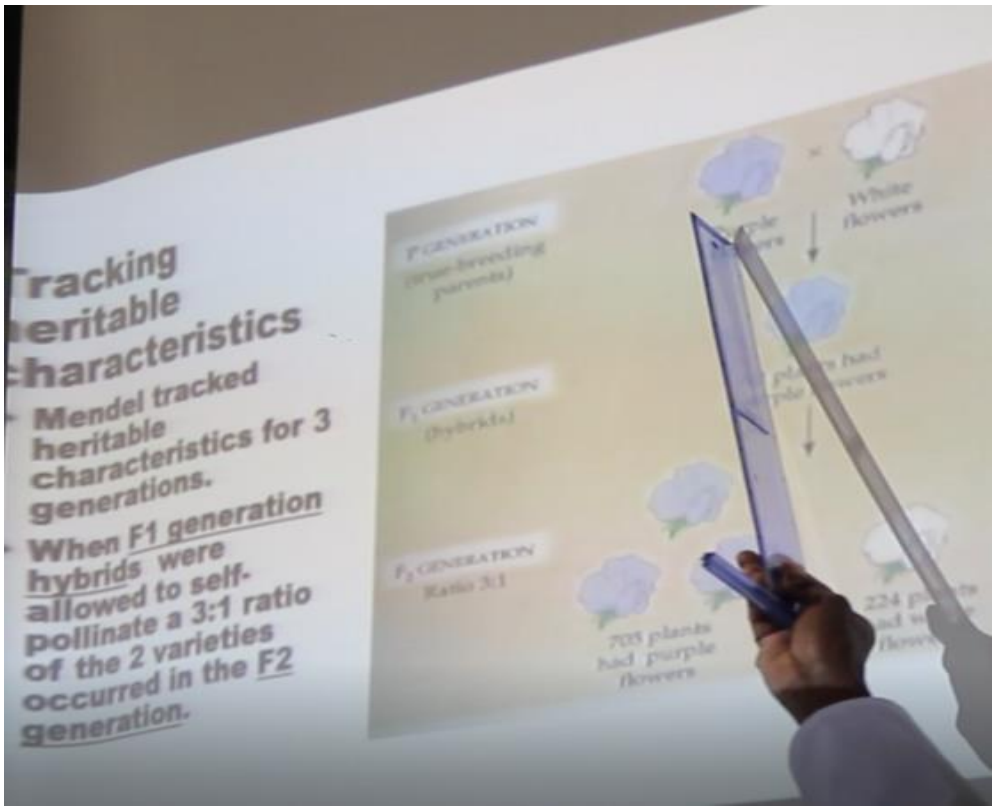
200. When it self-pollinates, it will always produce purple flowered plants and this one… [showing]

…if it self-pollinates, it will always produce white plants.

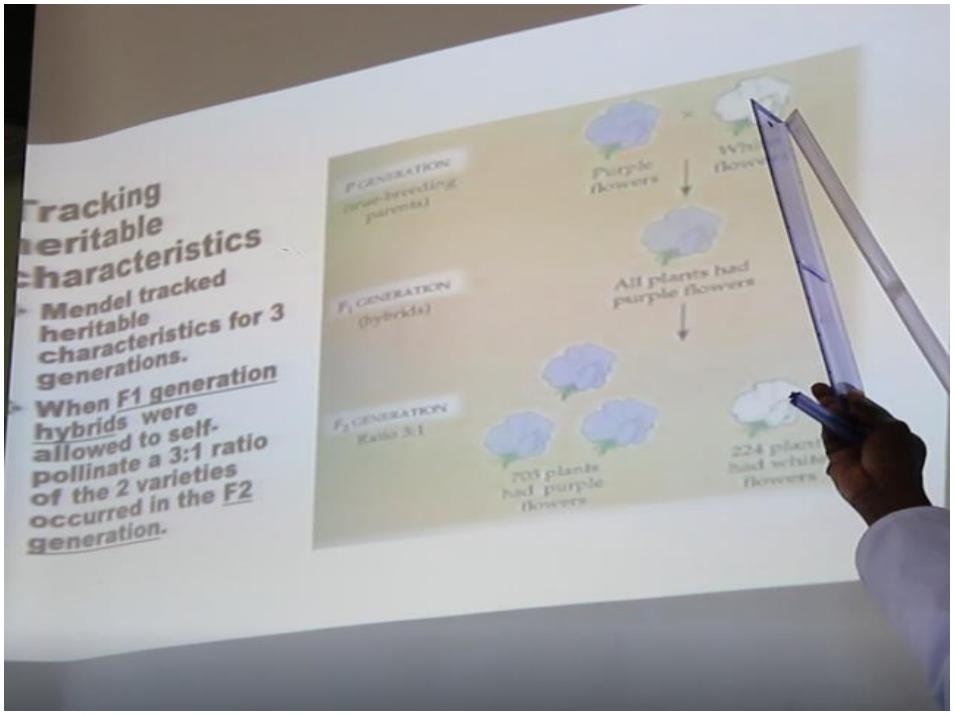
201. Tall…tall pea plants, if they self-pollinate, they will always produce tall plants.

202. Short plants if they self-pollinate, they will always produce short plants…

[Showing]

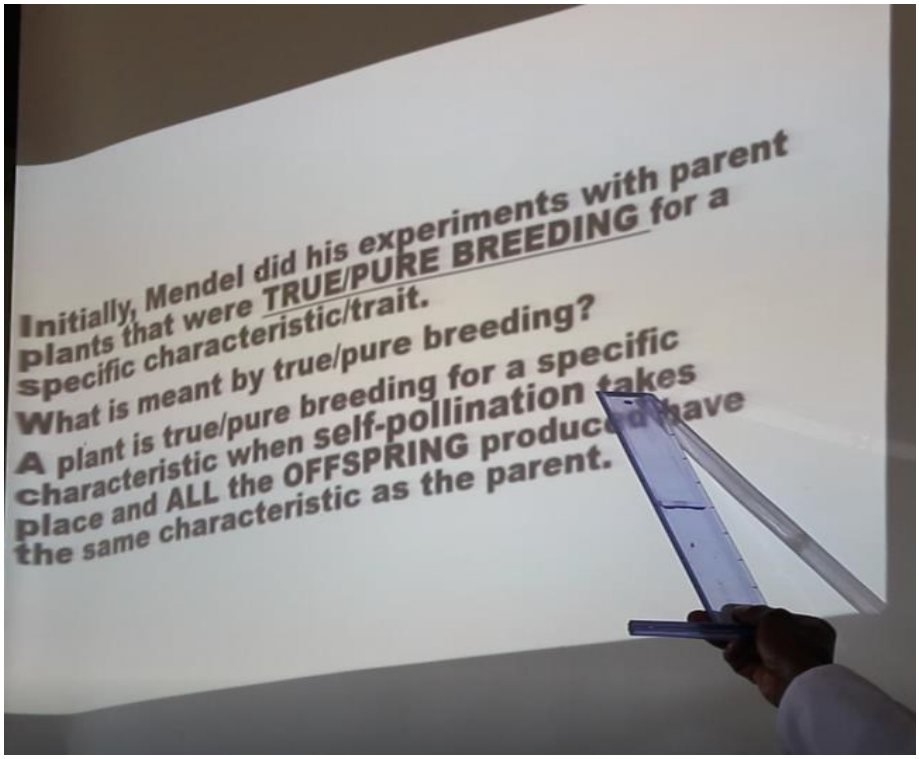


203. We say this is true breeding plant and this one… [pointing]

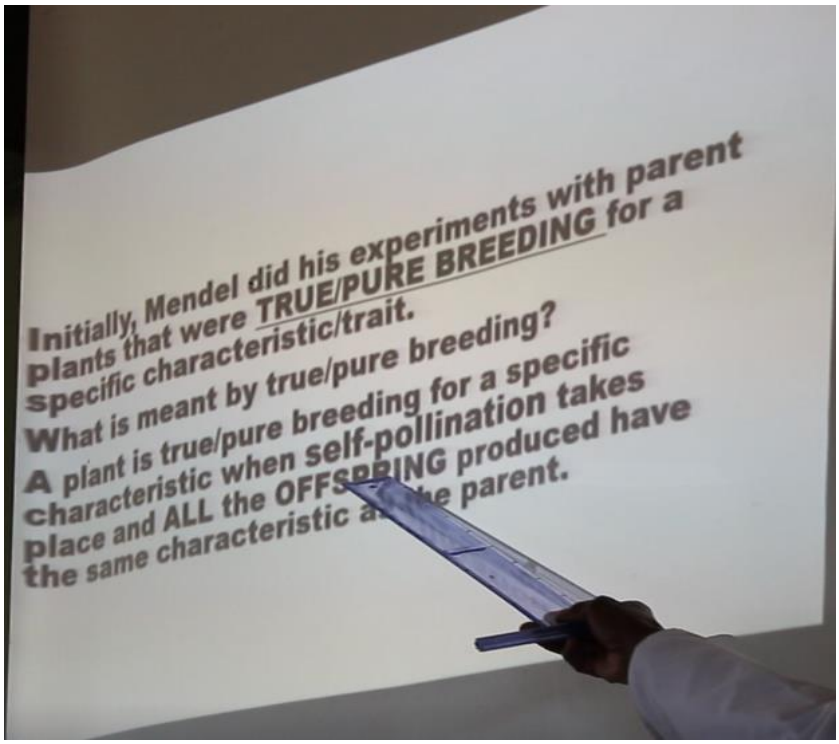


…is also a true breeding plant right.

204. Meaning a plant is true breeding for a specific characteristic when it…when self-pollination takes place… [showing]



…all the offspring produced have the same characteristics… [showing]

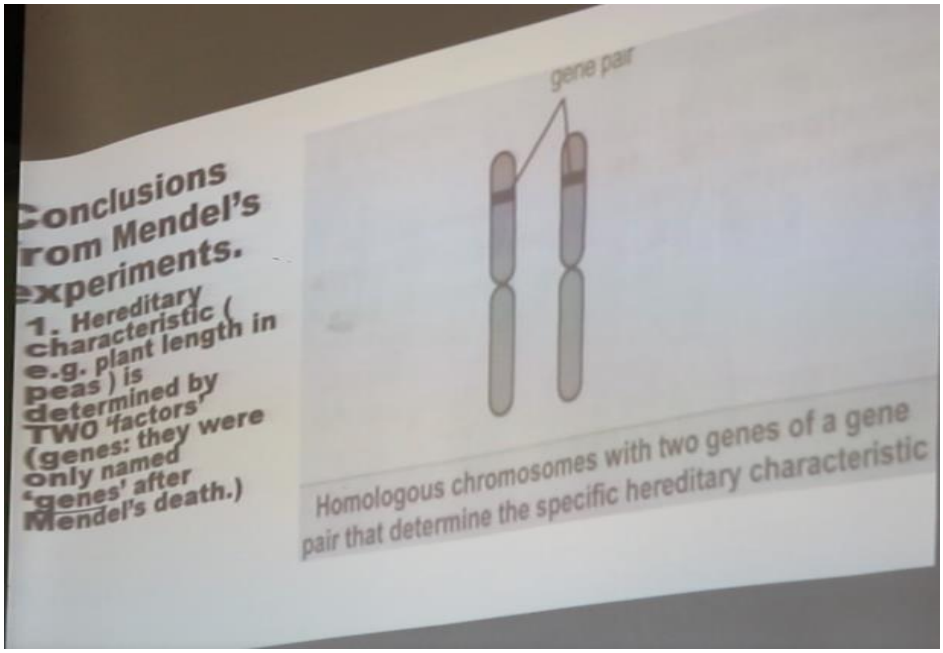


…as the parent plant.

205. Tall plant breeding ehh…tall plants, yellow plants ehh…yellow plants ehh…flowered plants breeding yellow ehh…plants right.

EPISODE 5: MENDEL'S CONCLUSIONS-CONCLUSION NUMBER 1

206. Right, let us look at the conclusions from Mendel's experiments.



207. Conclusion number one, hereditary characteristics for example, the length of the plant is determined by two factors, what is the name of these two factors?

208. According to the information here.

209. Enhle: It is genes!

210. Mr. Zindi: What do we call those factors?

211. Enhle: Genes!

212. Mr. Zindi: They are called genes but now did Mendel know genes?

213. Ls: No!

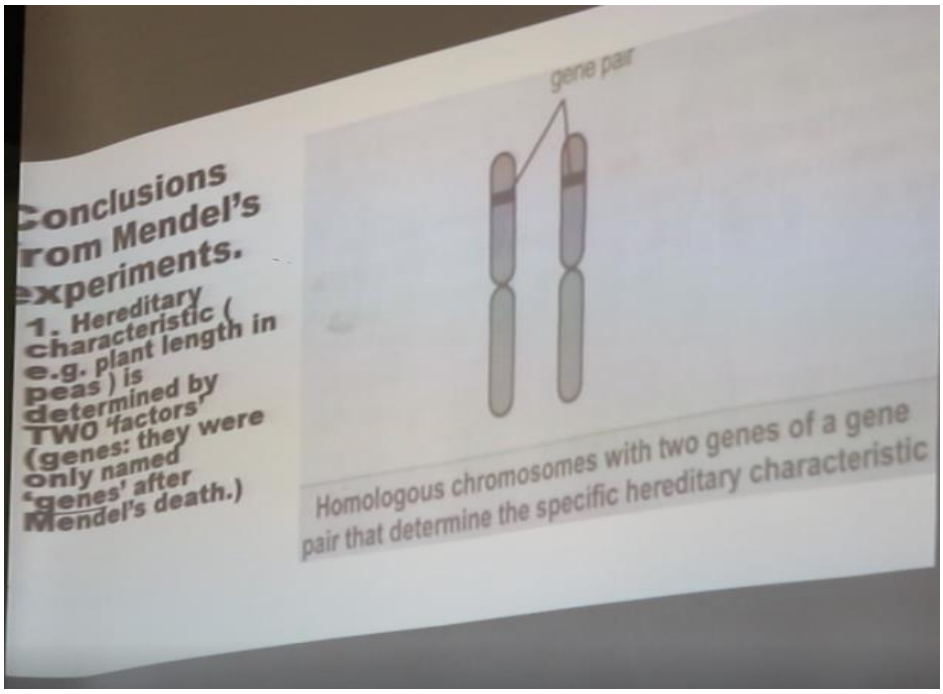
214. Mr. Zindi …because that time he did not know…he did not call them genes.

215. They were named genes after the death of Mendel.

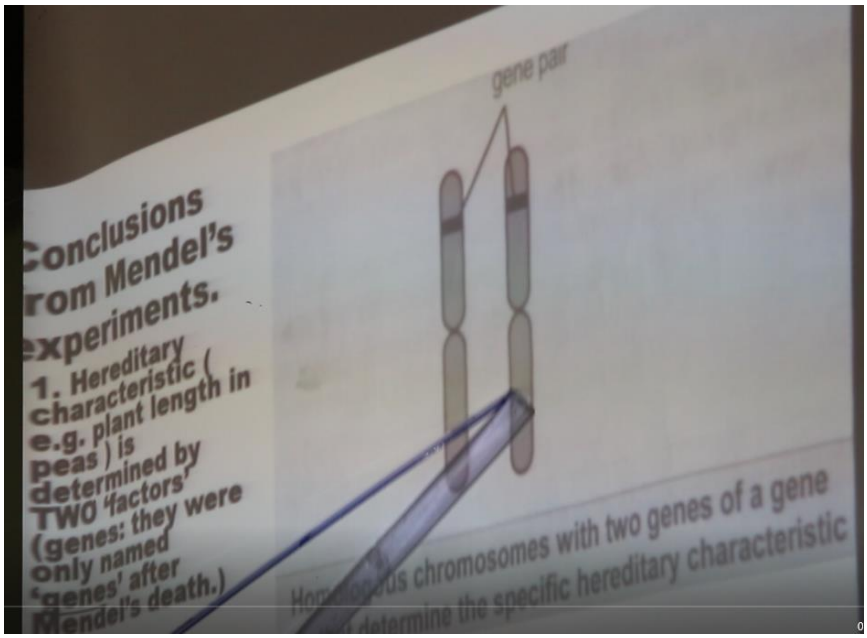
216. Okay so, that is another key word…take it down.

217. The word genes, we have also dealt with this before.

218. Now if you look at the diagram there…



…you can see the structures, what do these structures represent? [Showing on slide]



219. Ls: Chromosomes!

220. Mr. Zindi: What do they represent?

221. Ls: Chromosomes!

222. Mr. Zindi: Chromosomes, right and it is a pair of chromosomes.

223. What name do we give to these chromosomes?

224. Ls: Homologous chromosomes.

225. Mr. Zindi: They are homologous chromosomes.

226. So, now we have homologous chromosomes showing a pair of genes and what is a gene?

227. Can you try and explain what you see from the diagram?

228. What a definition can probably be of a gene?

229. Enhle: It is a small portion of DNA that codes for a particular characteristic.

230. Mr. Zindi: That is correct!

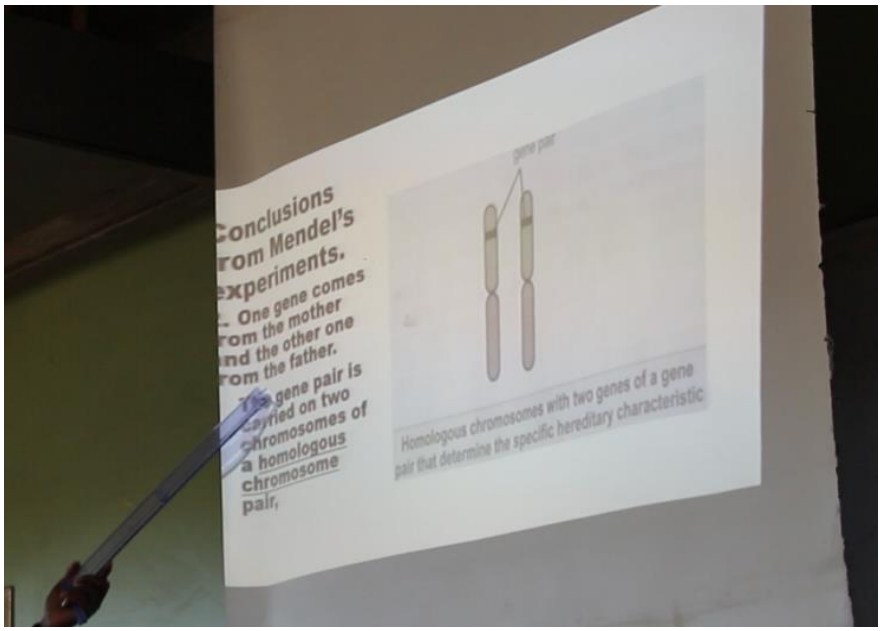
231. We have done this before, a segment of the DNA that [demonstrating with a ruler]

…that will code for a specific characteristic is called a gene.

232. So, you can see that we have a pair of genes on the diagram there.

EPISODE 6: MENDEL'S CONCLUSION NUMBER 2

233. Now let us look at conclusion number two. [Pointing]



234. One gene comes from the mother and the other from the father.

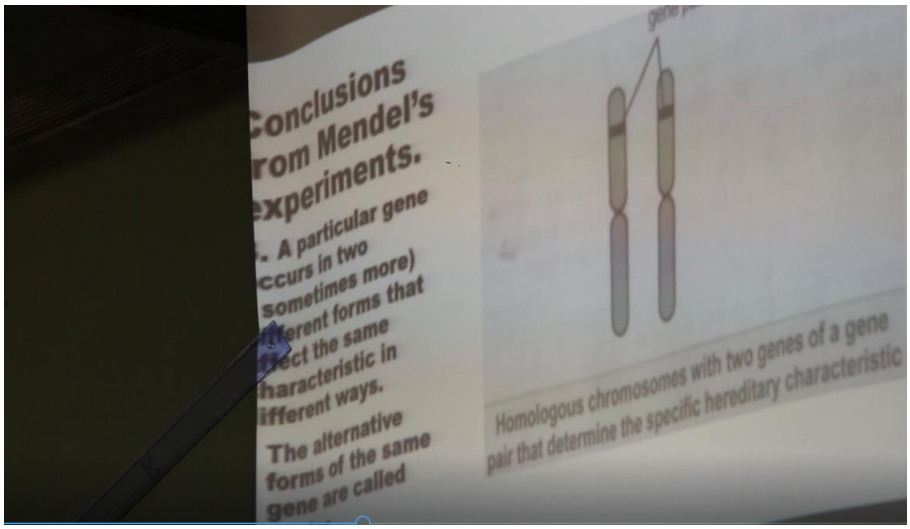
235. This is the concept that we discussed when we looked at ehh…the DNA and nucleotides and the gene pair is carried on two chromosomes of a homologous chromosome pair.

236. I would like you to take down the word homologous then you will tabulate and find the definition of homologous chromosomes.

237. All these words, we are compiling them because we are going to use them in explaining the genetic concepts aw are to come across.

EPISODE 7: MENDEL'S CONCLUSION 3

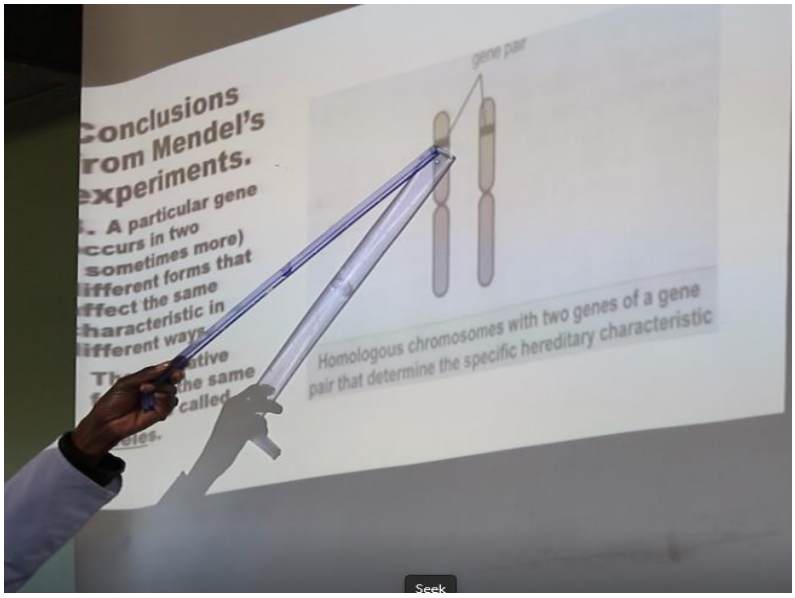
238. Right…right conclusion number three… [showing]



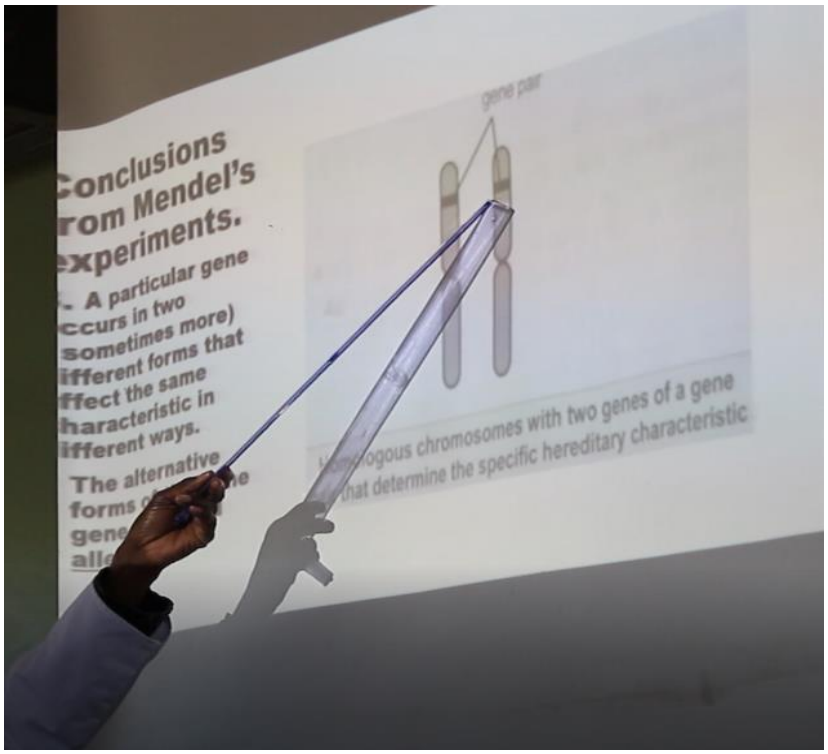
…a particular gene occurs in two or sometimes more different forms right; this alternative form is known a s a gene allele.

239. We have one gene and there is another form of a gene known as a gene allele.

240. So, if you look at [pointing] the diagram.



241. We have a gene on this, and we have another alternative form of a gene… [pointing]



…and that is known as the allele but how do they work together?

242. They code for the same characteristic or trait for example a gene that codes for the length…

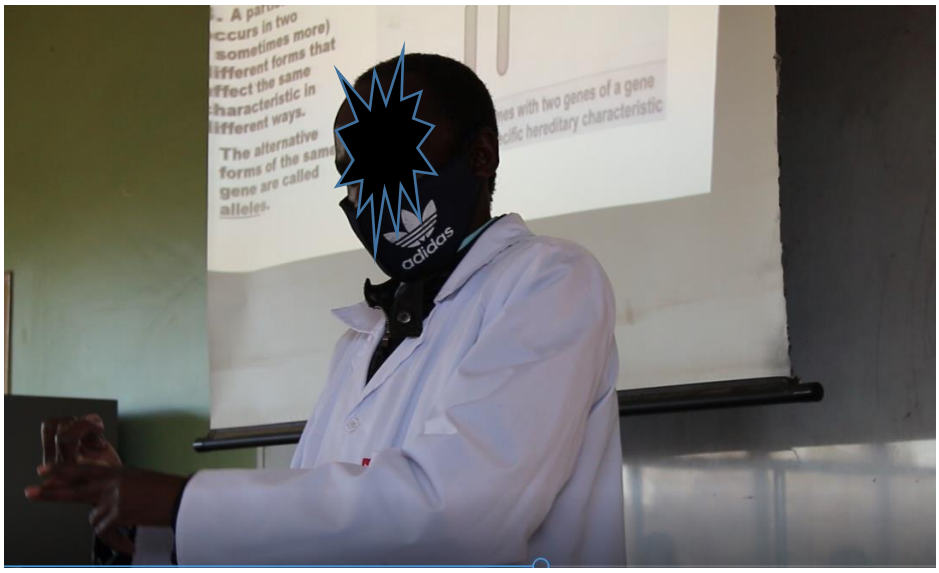
…of the pea plant.

243. We are going to just continue giving examples of Mendel's pea plants.

244. We have a gene that determines…

…the height of the plant but there is another alternative gene…

…that will determine…I mean whether it is going to be short.



245. The other one…

…determines that the plant will be tall [using hands]

…but both…

…will code for the same characteristic that is length or height.

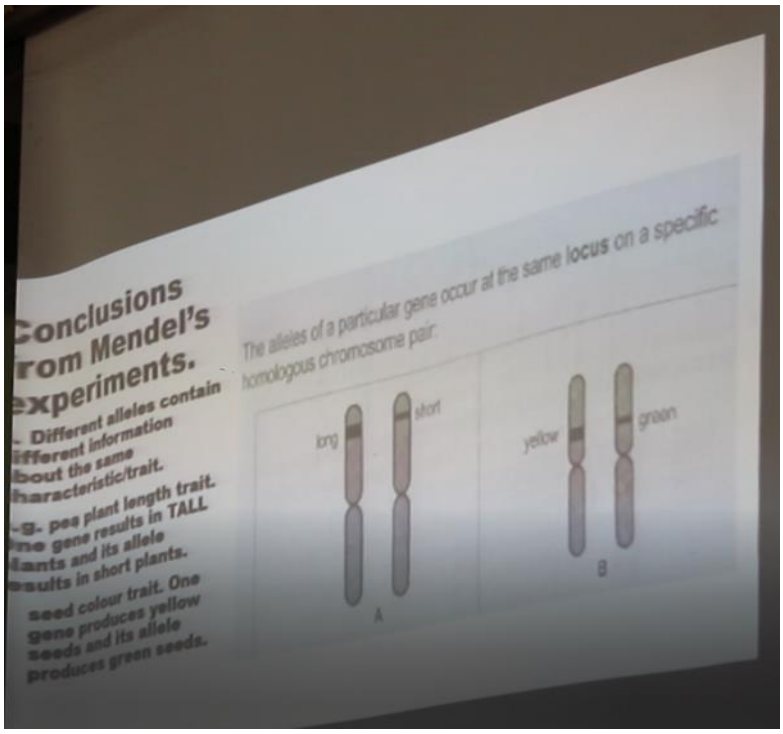
247. Do you get the point there?

248. Ls: Yes!

249. Mr. Zindi: Right so, an alternative form of a gene is called an allele.

EPISODE 8: CONCLUSION NUMBER 4

250. Number four different alleles contain different information about the same characteristic.



251. Do you understand what that means?

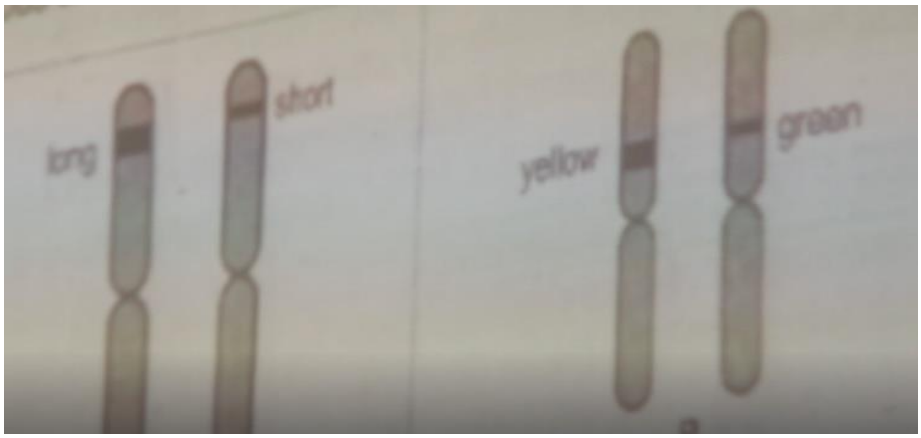
252. Different alleles contain different information about the same characteristic…for example…the same…the trait is height of the…of the plant but the plant can come up…out as short or tall.

253. That is what that statement is-- they contain different information.

254. One information can result in a tall plant and another information can result in a short plant, but it is the same characteristic which is height of the plant.

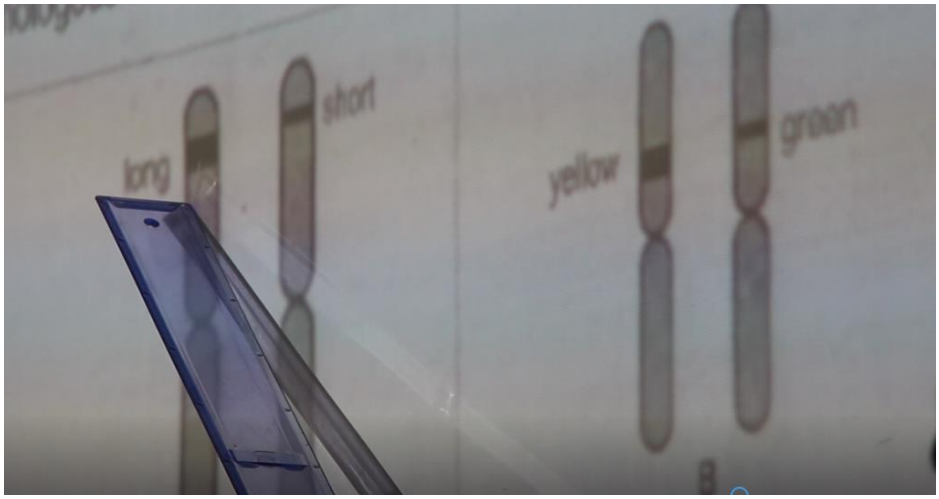
255. Right, same applies to colour, the seed colour trait.

256. One gene produces yellow for example yellow seeds and another can produce green seeds and… [showing]

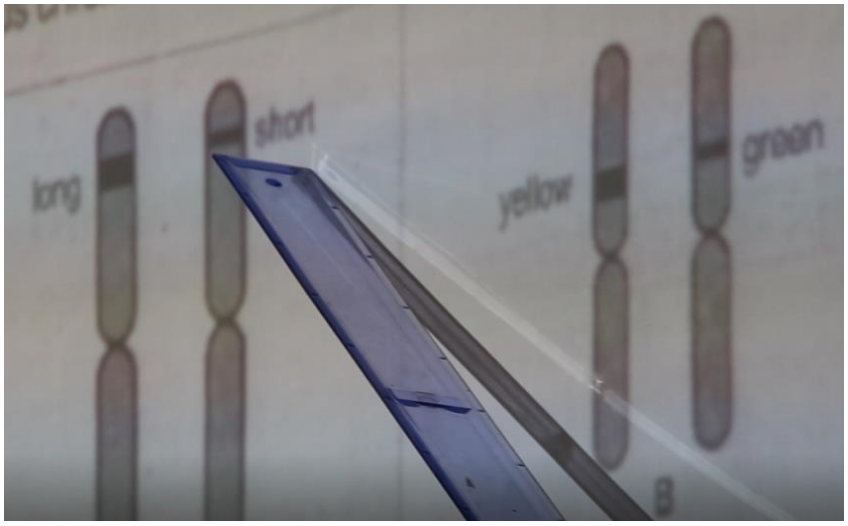


…here this what we are talking about.

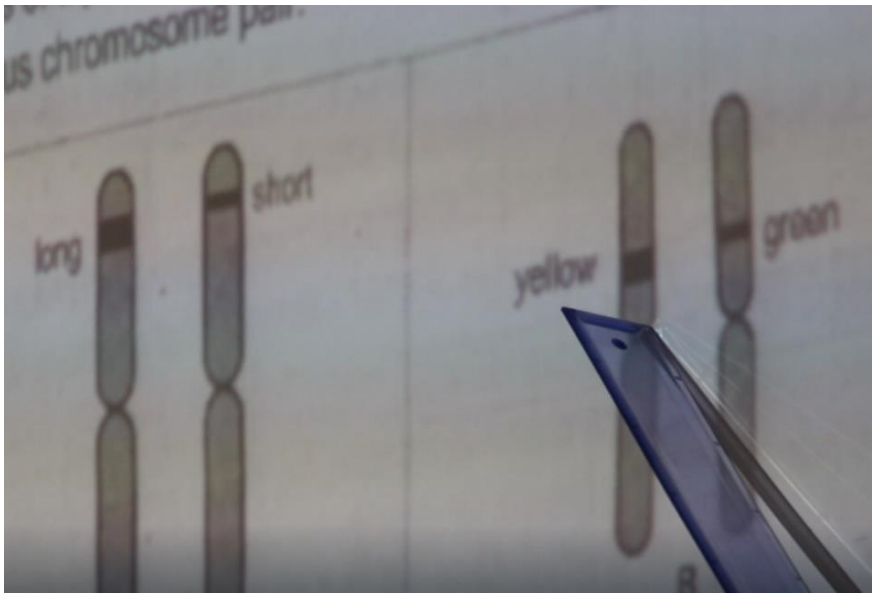
257. The one is for long or tall…



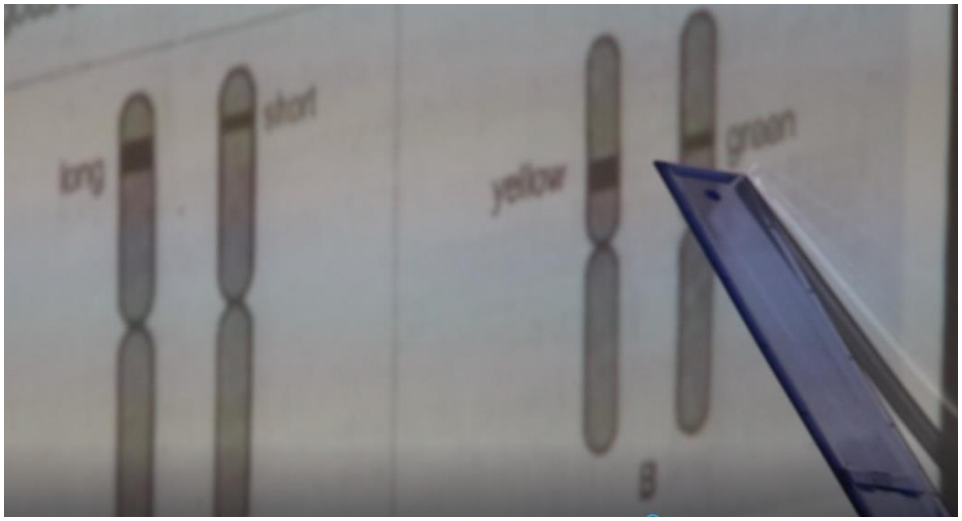
…and the other is for short… [showing]



…the other is for yellow



…and the other one produces green…



…but where are these found?

258. That word is not new to you, take it down.

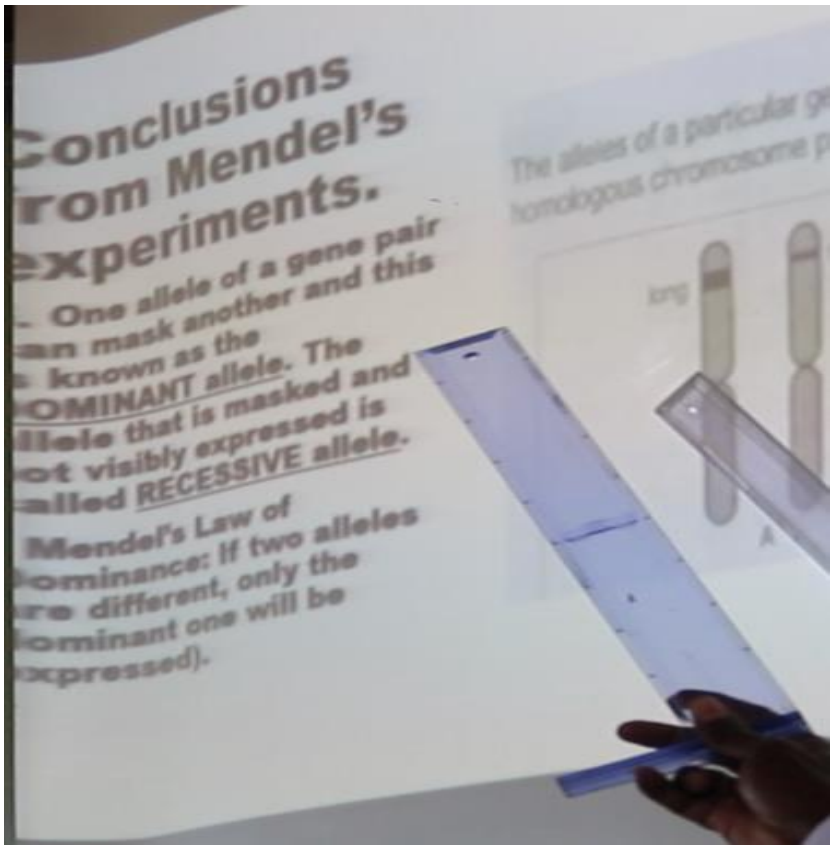
259. The word locus, so we call this gene locus. It has to do with position of the genes.

260. We say they occupy the same locus or the same position that we call gene locus okay, that is another concept.

EPISODE 9: MENDEL'S CONCLUSION NUMBER 5

261. Right, number five, a conclusion from these experiments.

262. He noted that one allele… [pointing]



…of a gene pair can mask another and this is known as dominant, another concept.

263. Today, Collins and Morrison dominated…the lesson.

264. What does this mean?

265. It means we are looking at participation as a characteristic and they dominated because they were always participating.

266. Right so, Mendel noted that one allele masked the other, it was dominant and the other was… [using head]

… masked though it was there but it was not seen physically and that is known as a recessive allele. It is not expressed visibly… [using body]

… in a characteristic.

267. This happened…

…when the purple flower was cross-pollinated with white flower.

268. What was the result of that ehh… cross fertilization?

269. Purple and white, first generation…what colour were they?

270. All were purple but where has white colour gone?

271. It has been suppressed…

…by the purple colour which means the purple colour is dominant and the white colour is recessive.

272. It cannot express itself in the physical appearance of the flower-- I mean of the plant.

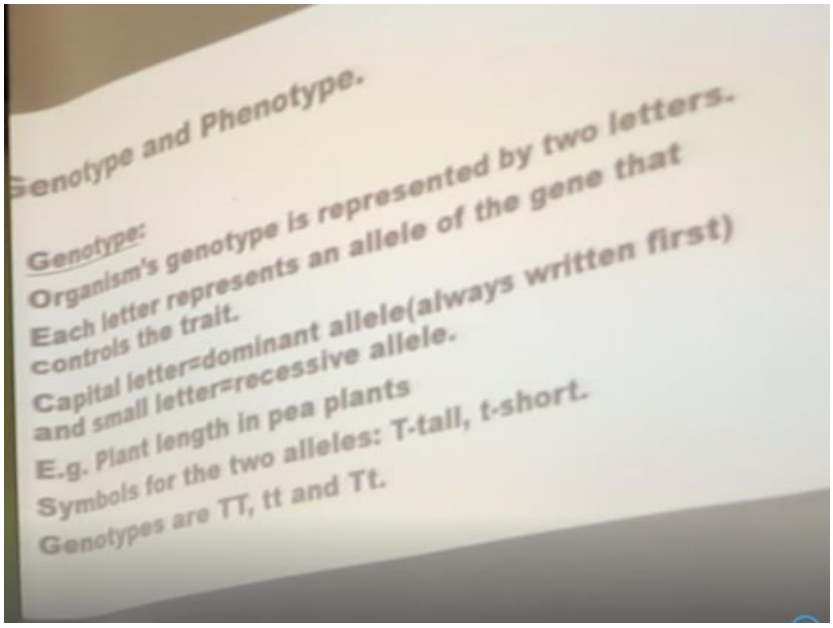
EPISODE 10: TERMINOLOGY

273. Right, we have two more concepts dominant allele and recessive allele.

274. Have you taken that down?

275. Ls: Yes!

276. Mr. Zindi: The concept of genotype and phenotype.



277. Let us start with genotype, what do we mean by genotype, what do we mean by genotype of an organism?

278. Bright! You cannot leave without saying anything.

279. Ls: [Laughter]

280. Mr. Zindi: What do you think…genotype?

281. Bright: Sir, I think maybe the type of genes that a specific animal will have.

282. Mr. Zindi: That is, it! Very good!

283. Geno- for genes, -type you know what it means.

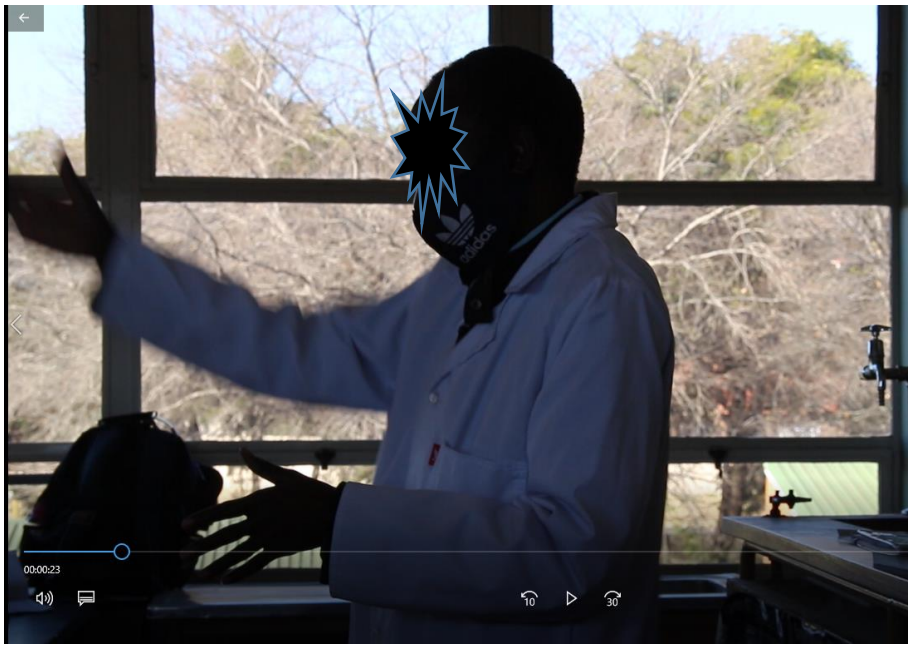
284. We are looking at the type of genes that an organism has but can we see a genotype?

285. Ls: No!

286. Mr. Zindi: [Using the body] We cannot see…

…the genotype in an organism but now how so we determine the genotype of a particular genotype in an organism?

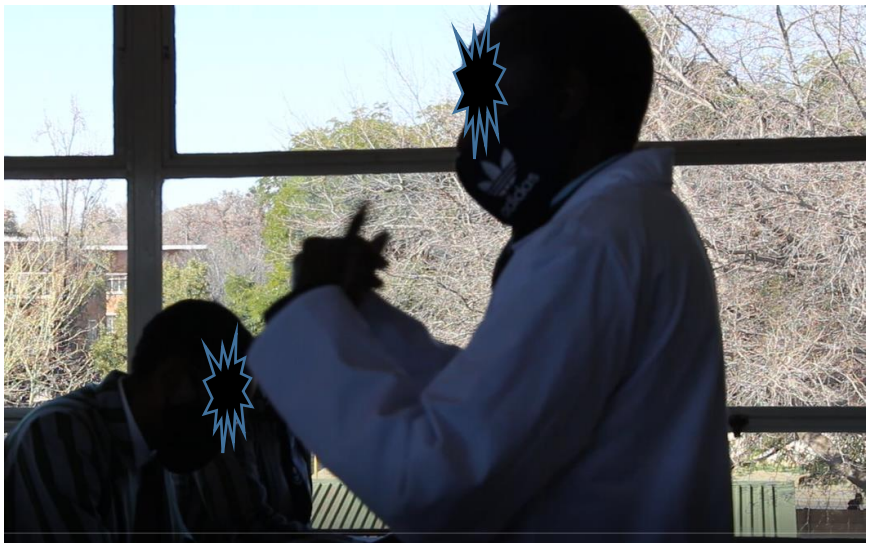
287. Where do you observe it? [Pointing to learner]



288. Collins: Sir, the phenotype!

289. Mr. Zindi: We observe this in the phenotype like when a white and purple flower, purple flowered pea plants were cross-pollinated.

290. The result was all the plants were purple and you cannot see…

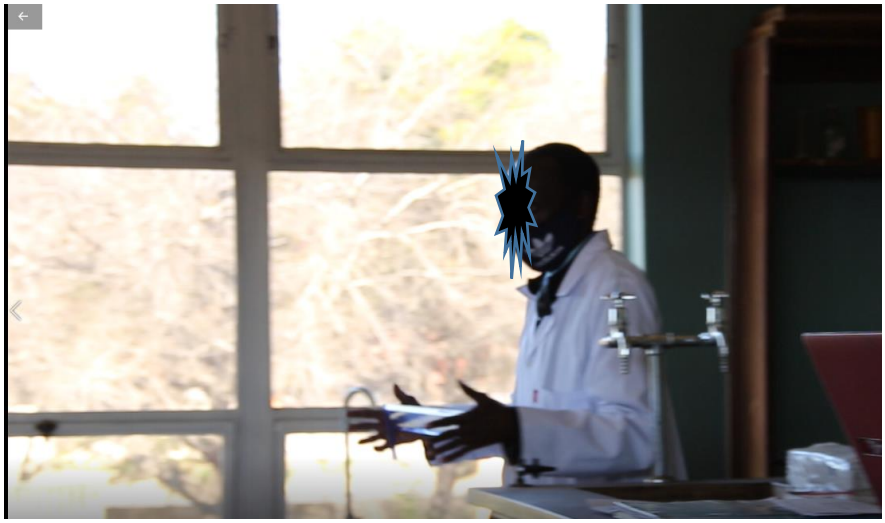


…the genes in that purple colour.

EPISODE 11: GENES AND GENETIC CROSSES

291. So, we represent these genes by letters when we do our genetic crosses.

292. We must use letters…



…for tall…for length of plant…tall we must use capital letter T and for short plant we can use capital letter T-- I mean small letter t.

293. Why do we not use T and S?

294. Why is it that we do not we use T and S?

295. What do you think?

296. When we are representing our genotype, for instance double capital letter T, double capital letter ehh-- I mean small letter t and the other genotype is bit T and small letter t.

297. Why do we use t…big T for tall plants and note we use S for short?

298. Refer to the GENES…

…and alleles.

299. Right, think about it that way, an allele is an alternative form of a gene.

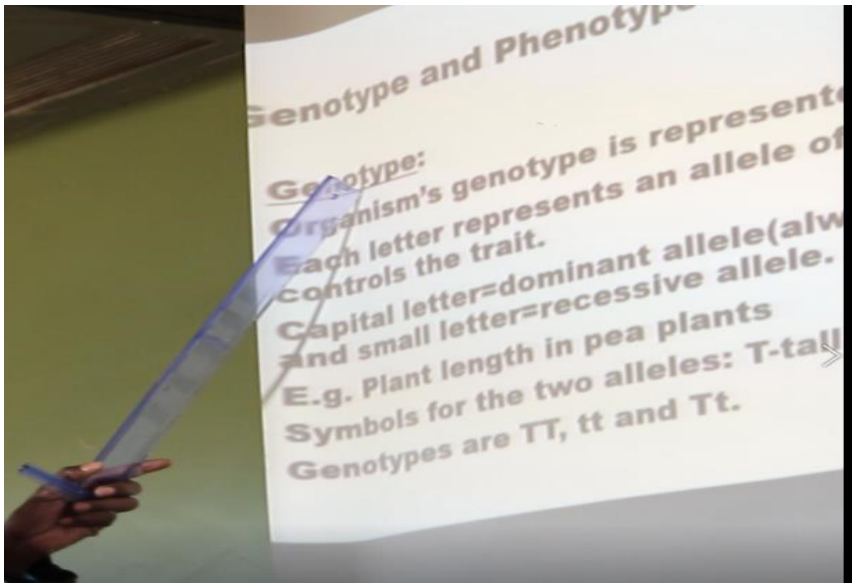
300. So, if it is an alternative form it has to be same.

301. We have to use the same letters.

302. If we use different letters then we are going to be…we will be talking about different genes, you understand!

303. Ls: Yes!

304. Mr. Zindi: To avoid that confusion the same letter is used one capital letter and the other small letter. [Pointing to the word genotype]



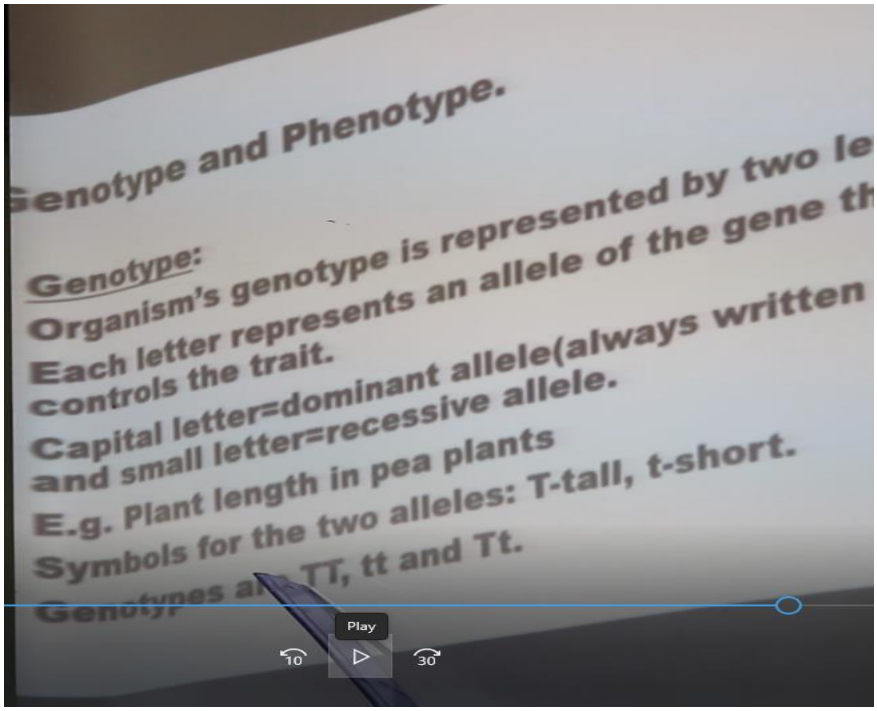
305. A new concept… what is a gene?

306. He explained it, we have been looking at genes.

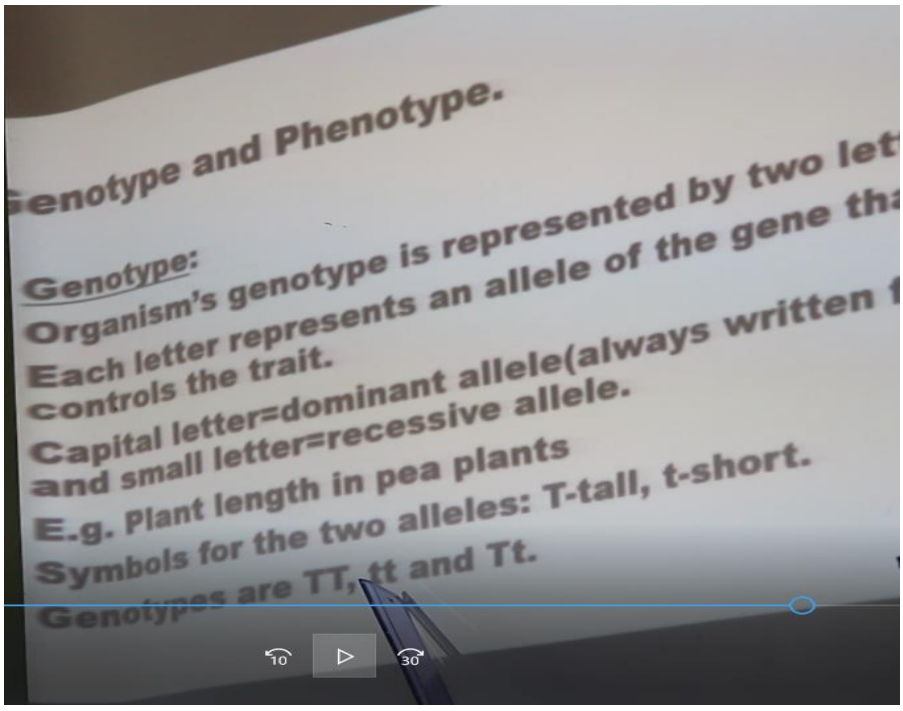
307. He said a genotype is simply the genetic make up of an organism.

308. The genetic make-up of an organism.

309. So, from this slide we can see that the dominant gene is represented by a capital letter… [pointing]



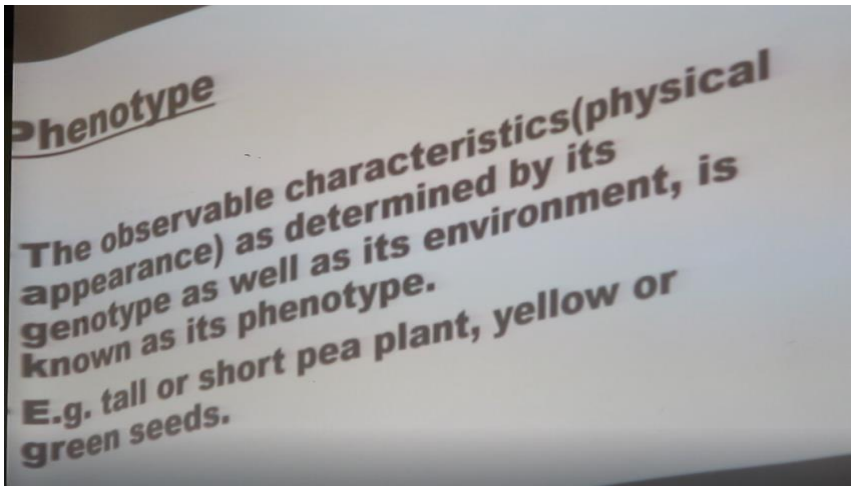
...and the recessive by a small letter… [Pointing]



310. So, the purple flower, flowered plant was dominant over white flowered plants.

EPISODE 12: THE CONCEPT OF PHENOTYPE

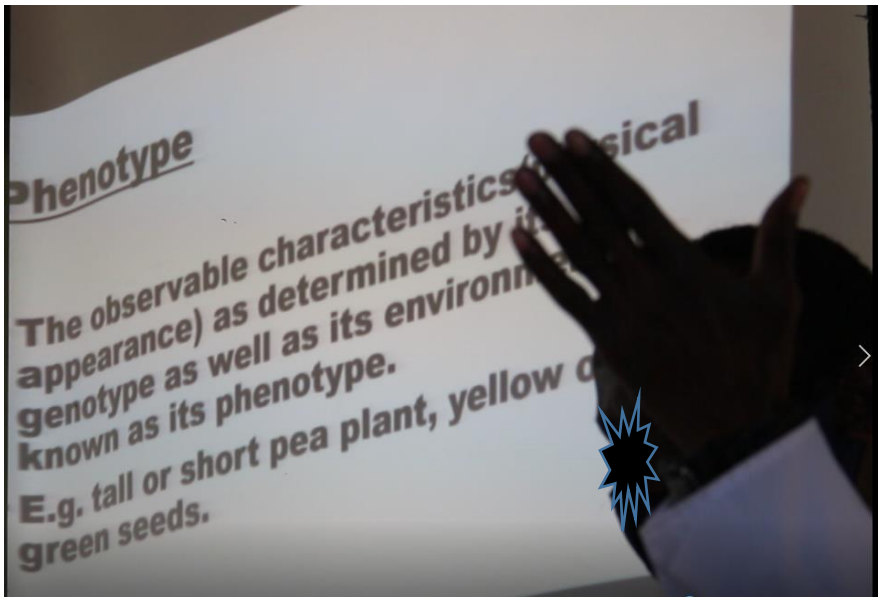
311. Yah…then the phenotype…



…he has highlighted that.

312. When you look at the phenotype, it is the outward appearance of an organism.

313. So, you can see that someone is tall,



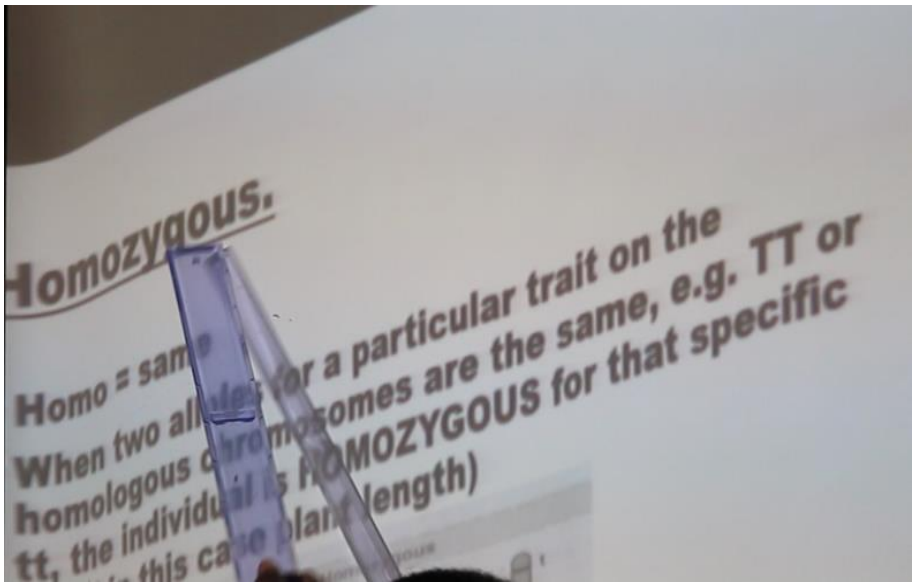
…that is the phenotype but off course you determine…you can see the phenotype right.

314. You can see that the plant is short, that is the phenotype…the physical appearance of an organism.

EPISODE 13: HOMOZYGOUS

315. The next concept take it down.

316. That is homozygous…[pointing]



…that is homozygous, homo in this case.

317. Right, representing…represented in the chromosomes, capital letter, capital letter, that's homozygous.

318. Small letter, small letter that is homozygous.

319. This one is recessive and that one is dominant.

320. The last one is heterozygous… [pointing]

321. Hetero— means different.

322. If you look at the phenotype, the plants were purple, when two alleles controlling a characteristic differ from each other so, when two alleles on the homologous chromosomes different from each other for example when we represent capital letter T…

…and small letter t.

323. The individual that result from that has that kind of genotype is heterozygous for that particular trait. In the case…in the case that we are analysing the plant length.

324. SO, these are the concepts.

325. How many do you have there?

326. In case you missed some.

327. How many?

328. Count them.

329. How many?

330. Ls: [Chorus]

331. Mr. Zindi: Sixteen!

332. It means you missed two because I have got 18.

333. Check!

END!