

Full lesson transcript for Mr. Zulu of School C

Lesson 1: Meiosis 11 February 2020

Details

- This lesson transcript represents 35 minutes teaching time.
- A male black South African teacher was teaching the topic meiosis 21 male learner participants, all in grade 12.
- The lesson took place at a former model C Boys High School in Johannesburg East district in Gauteng on 11 February 2020.
- When used by the teacher, the learners' names have been changed to protect anonymity.
- The textbook utilized during the lesson is Focus Life Sciences: Grade 12 learner's book by Clitheroe, Dempster, Doidge, Singleton, Marsden, and van Aarde published by Maskew Miller Longman Pty. Ltd, South Africa.
- Used overhead projector and prepared transparencies.

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]

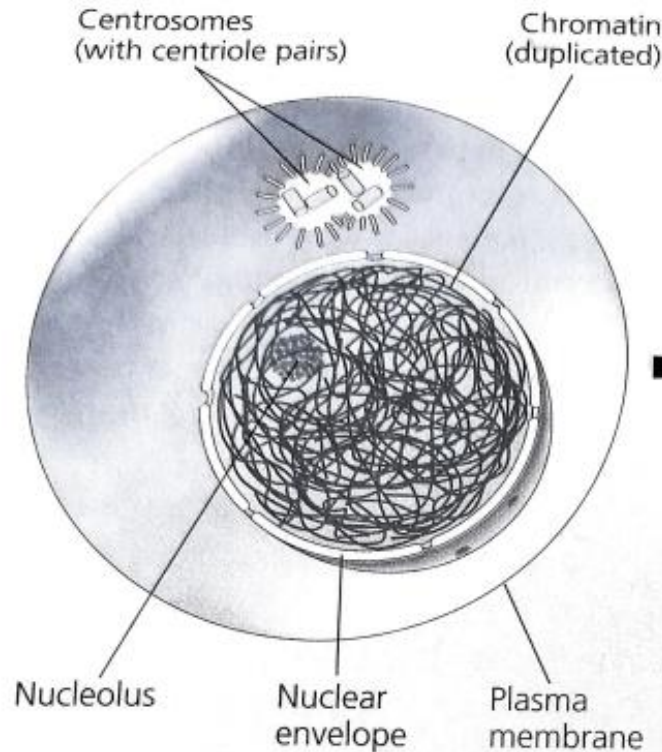
	Laughter, throat clearing, smile, applause, sigh happily/ warily/deeply, contently, swallowing, nodding, shaking head dance or movement towards/away
()	Parenthesis around tone units indicate words spoken in a sotto voice under one's breath (in a very quiet voice)
,	Slight pause
?	High rising intonation
.	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: RECAPPING MITOSIS

1. Mr. Zulu: ...we said one cell would form how many cells?
2. Ls: Two cells
3. Mr. Zulu: Two cells, that is mitosis remember and these two cells [pause] they are identical to each other okay and they are also identical to /the parent cell/.
4. /Mitosis/ is the process whereby one somatic or body cell makes identical copies of itself.
5. Right, so remember we spoke about eeh...the sex cells neh...okay, but in this case, we are talking about somatic cells or the body cells neh...
6. Right, so that is mitosis, it is the division of the body cells or the so eeh...somatic cells.
7. The two daughter cells produced are genetically identical to EACH OTHER and to the mother cell or parent cell.
8. So, they will be same as the mother cell or as the original cell okay, you are following.
9. Ls: Yes!

EPISODE 2: INTERPHASE

10. Mr. Zulu: Then the phases, okay [referring to diagrams in a transparency] this one before mitosis...

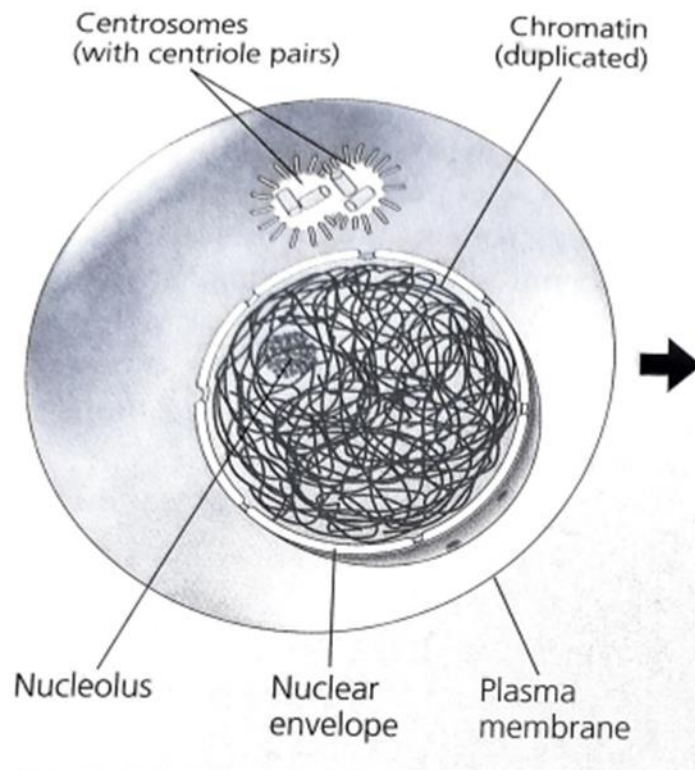


/ ? / and it also before meiosis and it is called interphase okay.

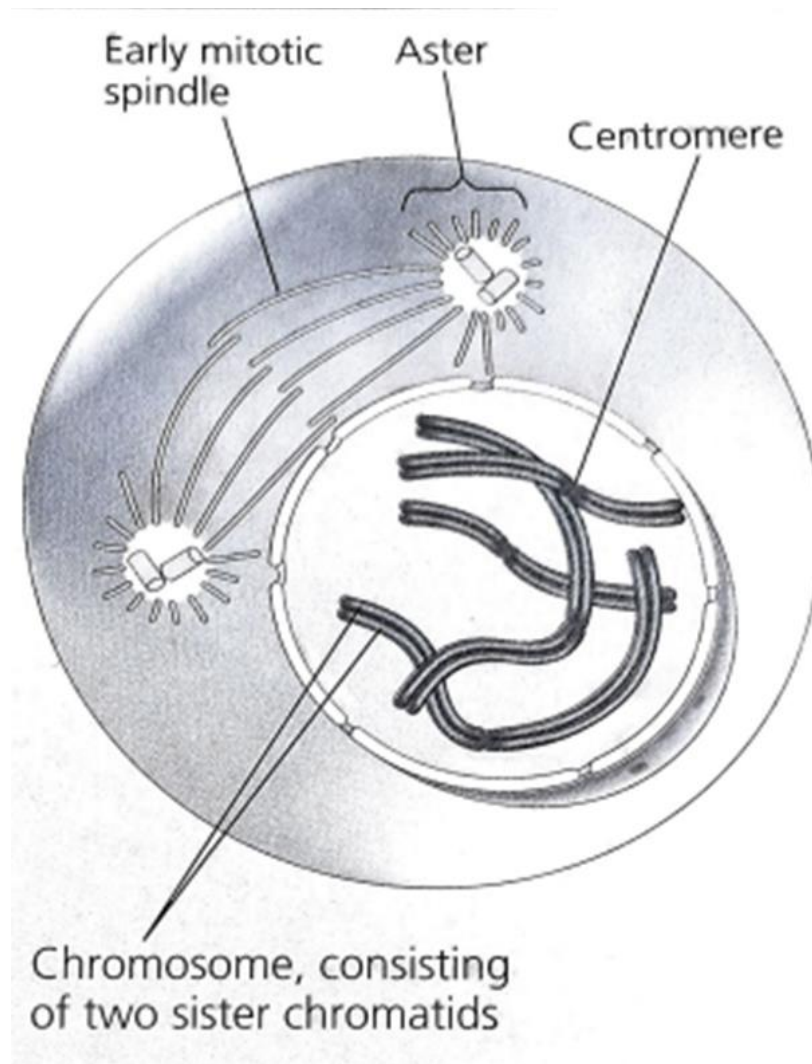
11. And you will not see anything happening if you observe the cell okay, because the cell still preparing for division okay and that is where DNA replication will take place okay.
12. DNA replication meaning that the DNA will make similar copies of itself— two copies of itself neh...okay it will take place in the interphase, right.

EPISODE 3: PHASES OF MITOSIS-COMPARING INTERPHASE AND PROPHASE

13. Then the phases of mitosis start with prophase [pause] and boys do you know [pause] with interpreting these phases neh... it is very easy / ? / because you just look at what is happening in the cell.
14. For example, [referring to a diagram in the transparency] if you can look at this cell...



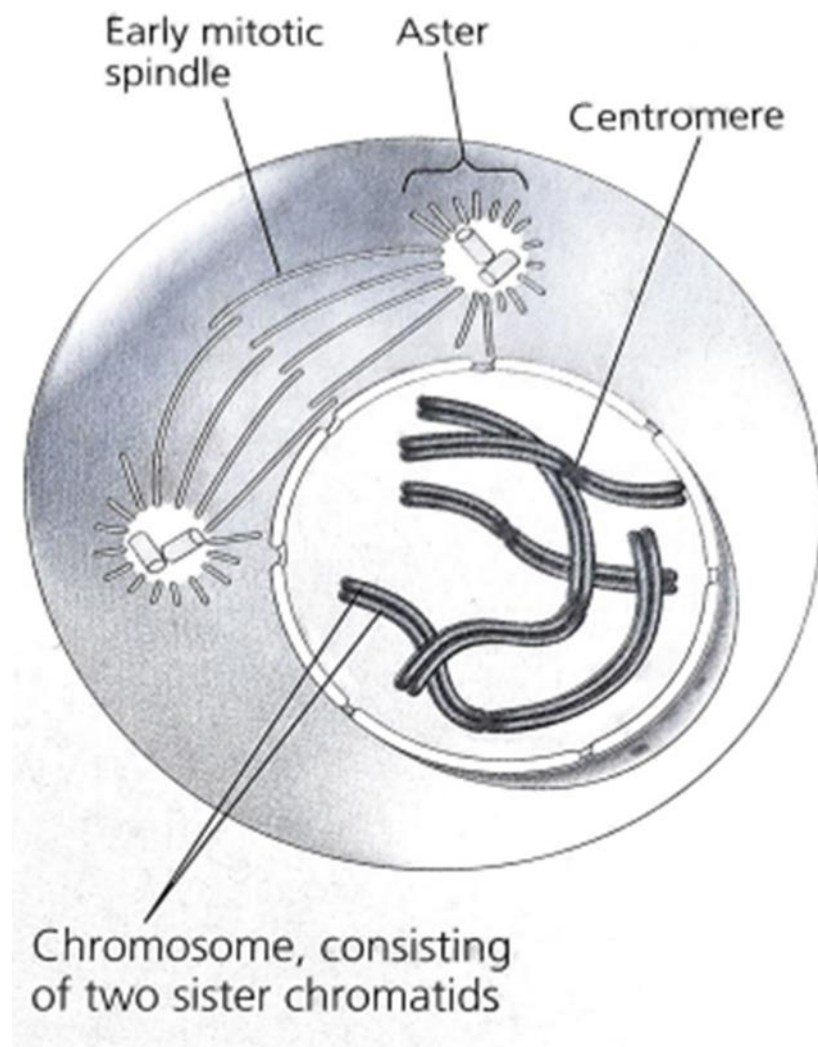
...and this one...



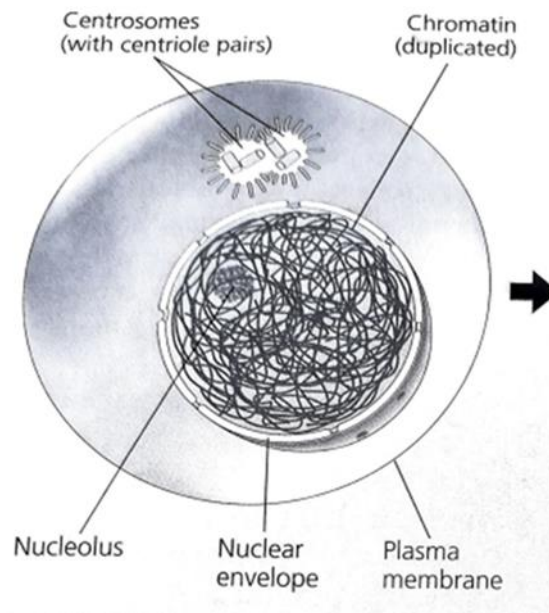
and we all see that they are not the same.

15. So, what do you notice...what do you notice? / ? /
16. We can all see that they are not all the same, Alumba what is the difference?
17. Alumba: [Whispers]
18. Mr. Zulu: Thembekile just tell us, what do you see?
19. Thembekile: The cells have replicated.
20. Mr. Zulu: But it is still one cell, how can you say--
21. Thembekile: [Shouts] DNA
22. Mr. Zulu: DNA! [Pause] NO!
23. Yes! [pointing to a learner]
24. Thulani: /Sir I...see spindle fibres.../

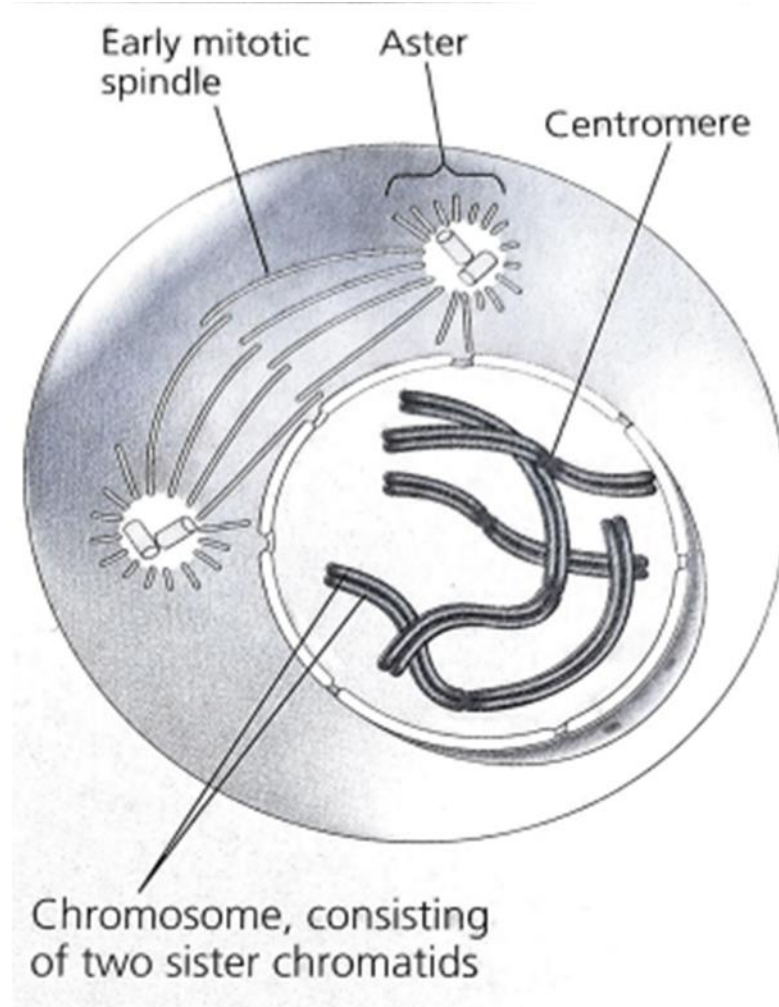
25. Mr. Zulu: Okay, you can see spindle fibres?
26. Thulani: Yes!
27. Mr. Zulu: That is correct!
28. Spindle fibres, what else [pause] do you notice about this? [Pointing to the diagram]



29. Yes, sir!
30. Reshaad: /Chromosomes/
31. Mr. Zulu: Okay, now the chromosomes are visible, the chromosomes are visible.
32. We just studied the chromatin network; [referring to chromatin network on the diagram]

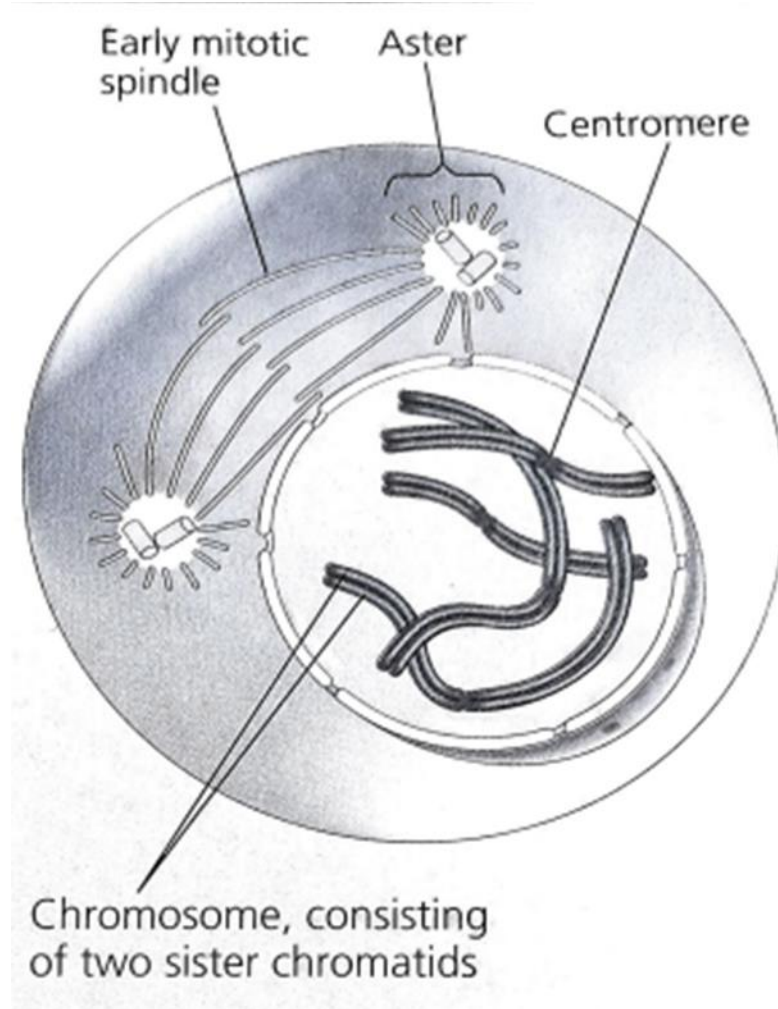


...we did not have any visible chromosomes when we looked at interphase
BUT NOW prophase, [pointing to the diagram]

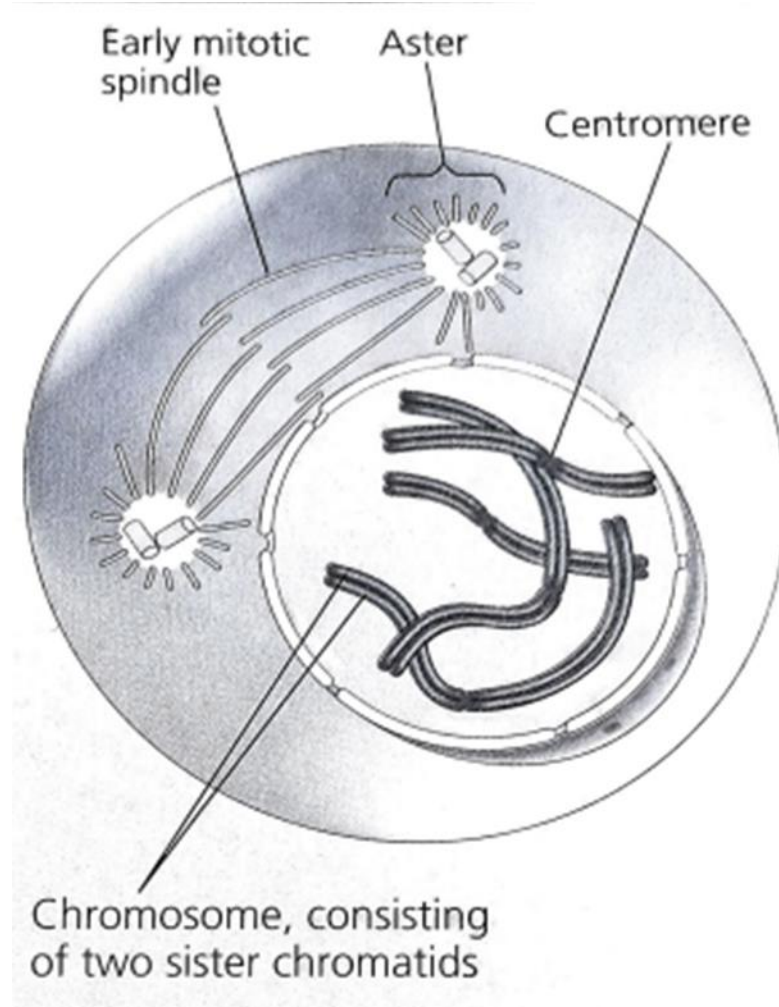


...we can see that these are chromosomes.

33. Is that correct?
34. Ls: Yes!
35. Mr. Zulu: Can you all see them? [Pointing to the diagram]



36. Ls: Yes!
37. Mr. Zulu: Okay what else do you see, or do you notice?



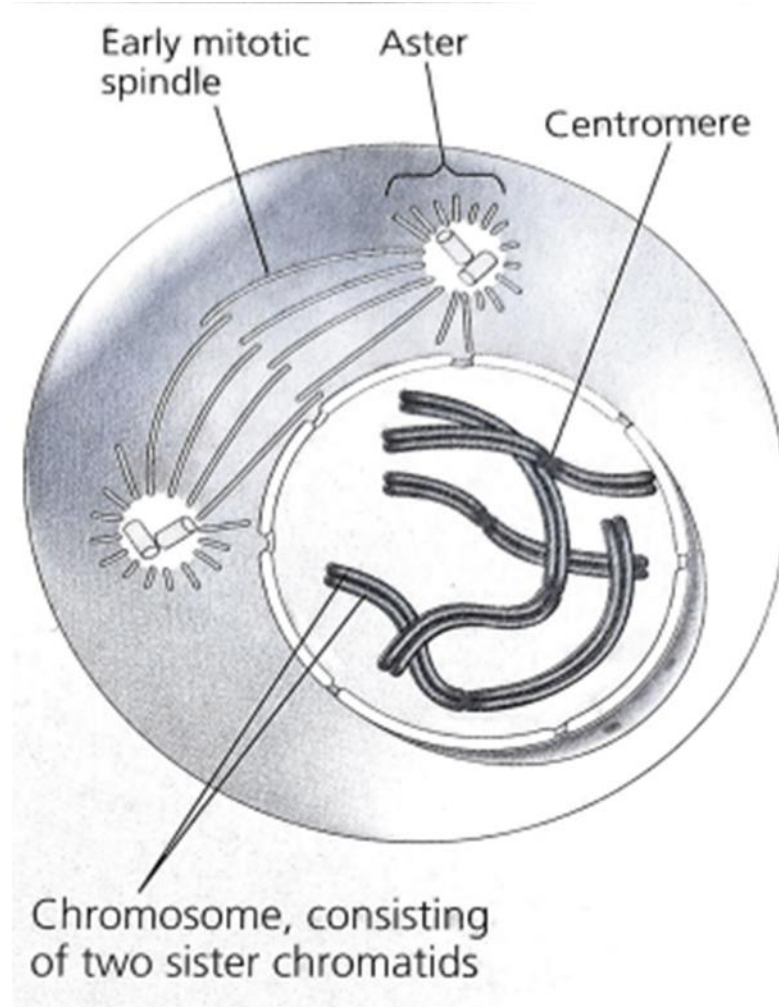
[Silence] eeh... Jonah!

38. Jonah: /Sir...nuclear membrane—

39. Mr. Zulu: THE...the nuclear membrane.

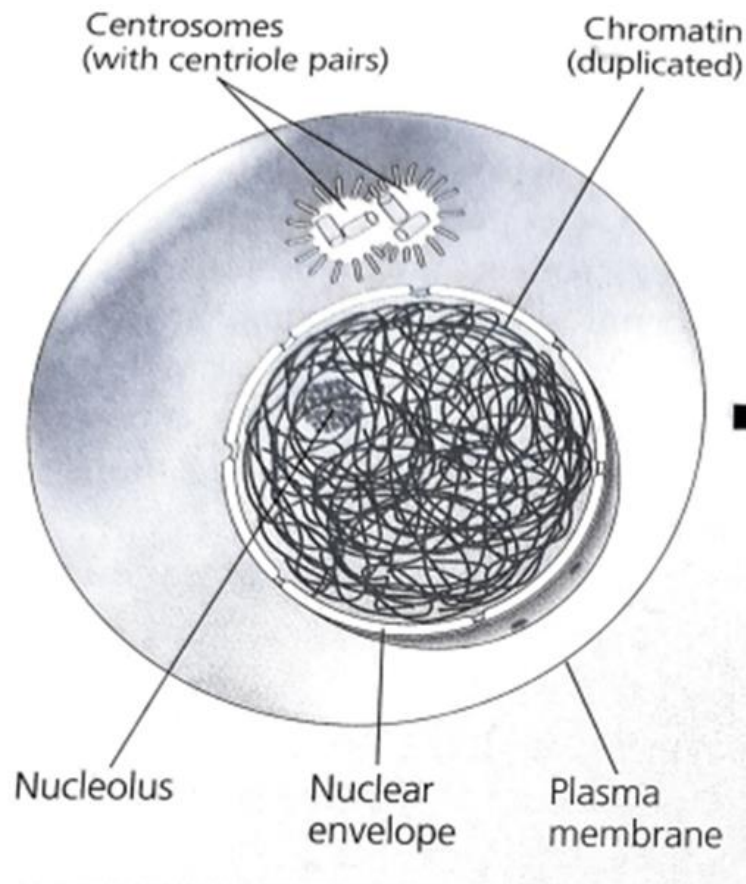
40. Yes!

41. Mr. Zulu: Can you see the nuclear membrane is sort of disintegrating [pause pointing to the diagram]



...can you see that?

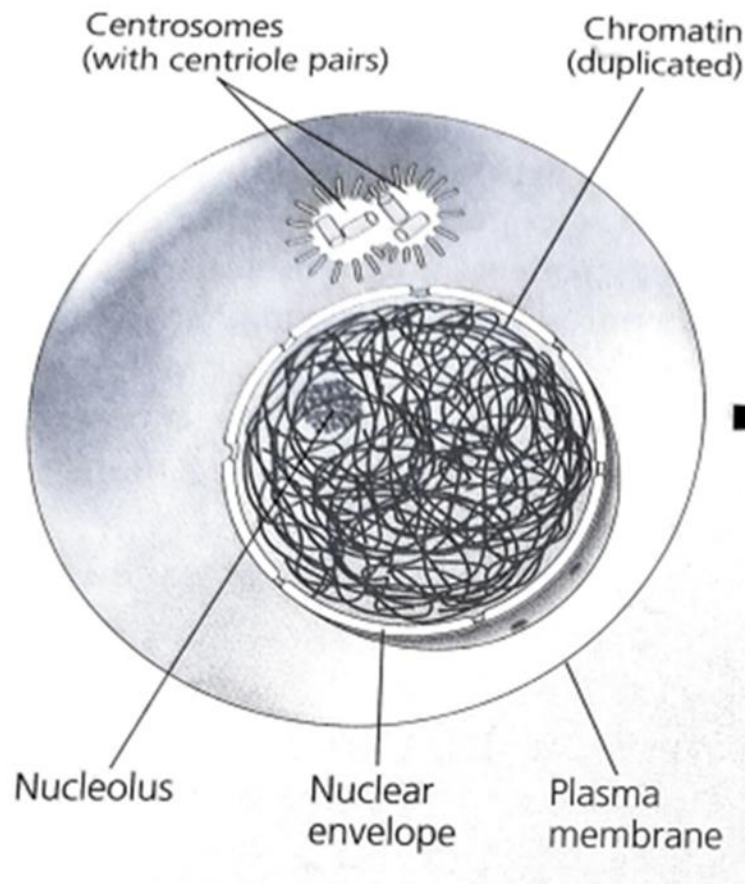
42. Ls: Yes!
43. Mr. Zulu: Okay, you are just saying yes!
44. You do not see it. Right – [pause].
45. Right boys if you look at this nuclear membrane, [Pointing to the diagram]



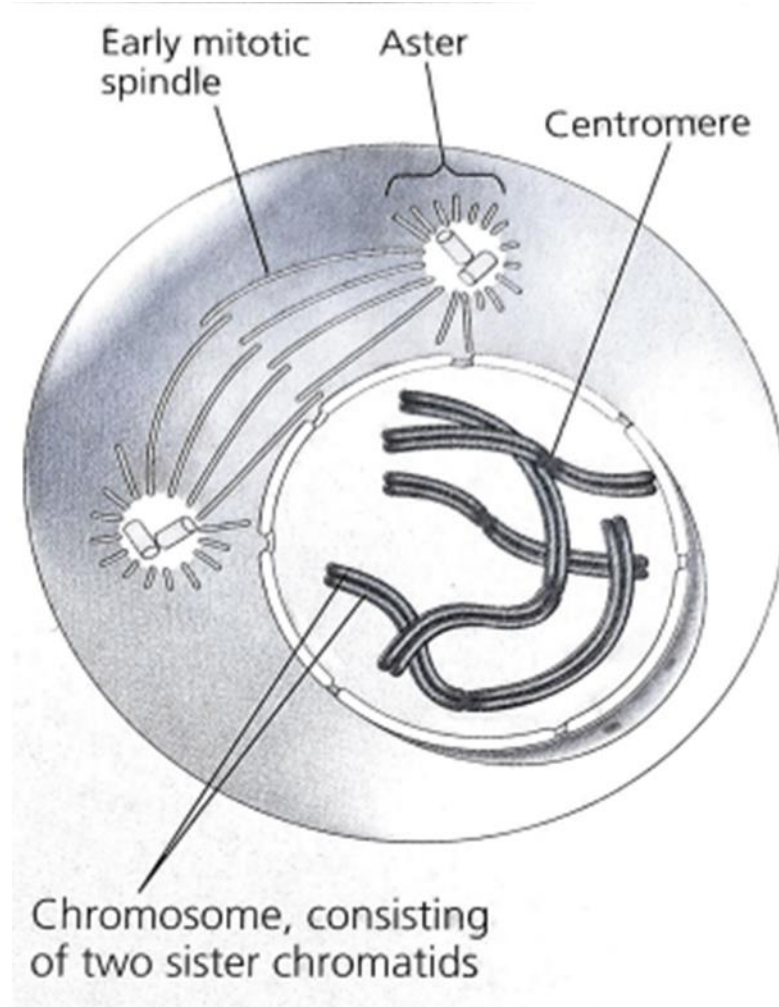
...this is our nuclear membrane right in interphase.

46.

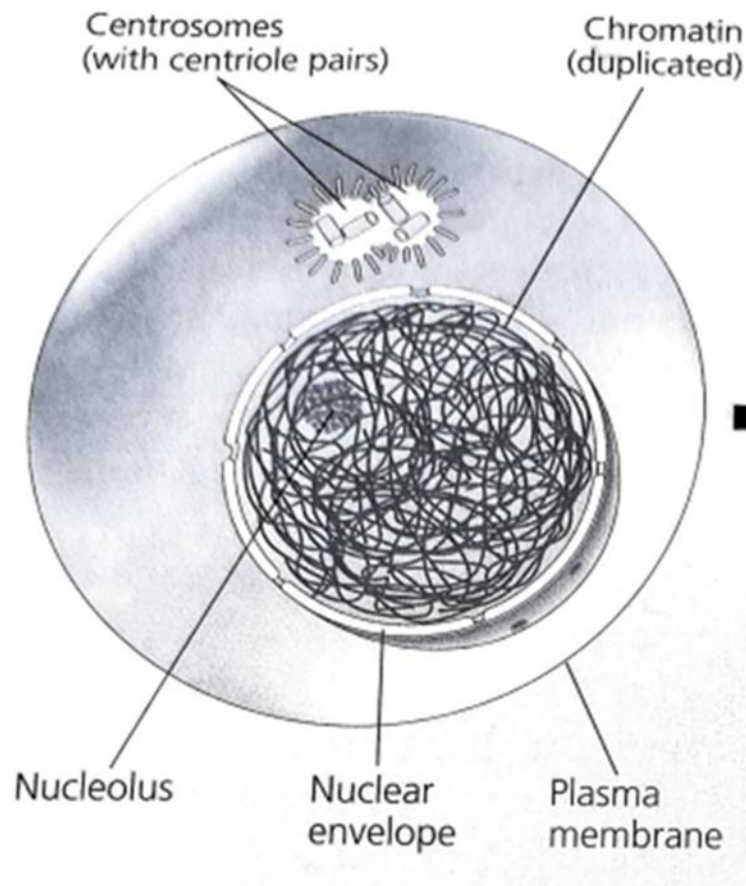
Can you see that it is still /intact/ [showing on the diagram]



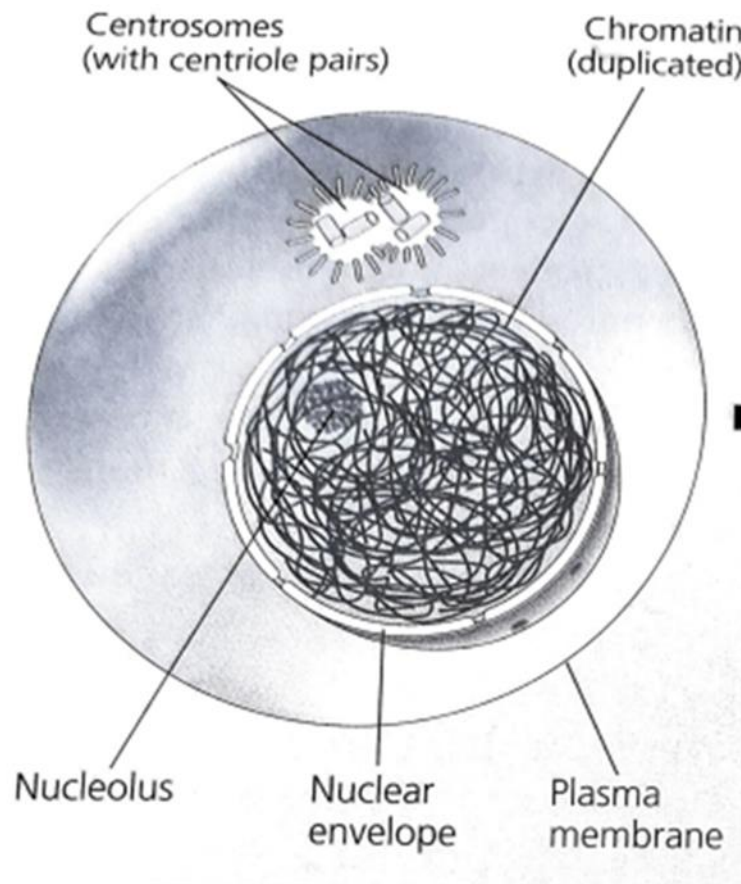
...okay although there are nuclear pores okay, but then here / ? /



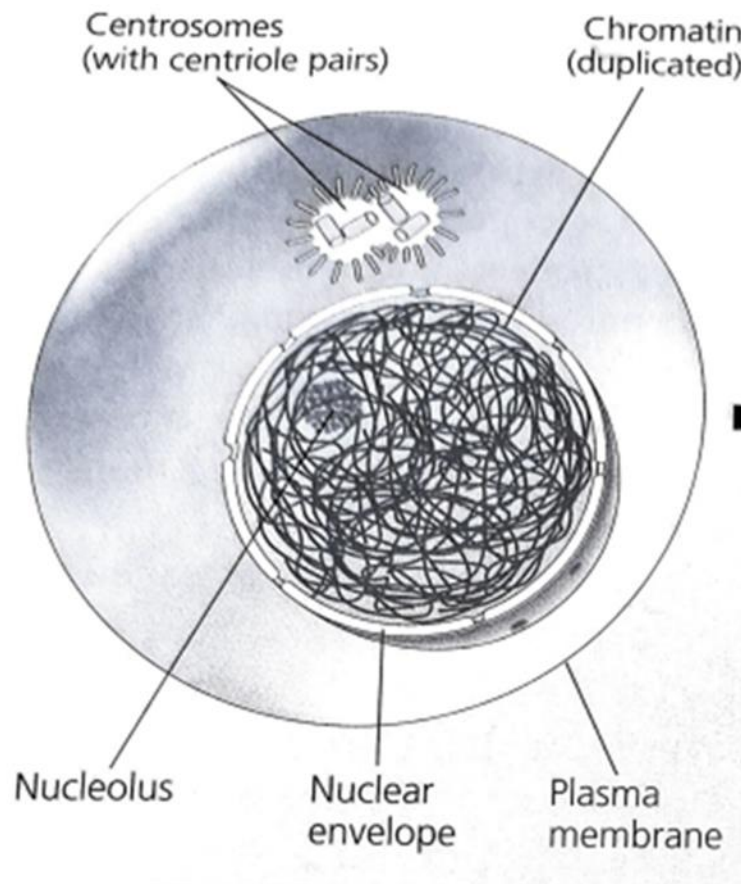
47. Can you see that the space is now big, right it means the nuclear membrane is starting to disintegrate when it is starting to disappear?
48. Does it make sense?
49. Ls: Yes!
50. Mr. Zulu: Yes! That is what we said, because you can notice it.
51. So, this is how this thing works, just observe what is there that is it okay.
52. So, I do not like to write these things okay.
53. Right ehh... what else do you notice here?
54. let us just look at this [referring to the diagram on the transparency]



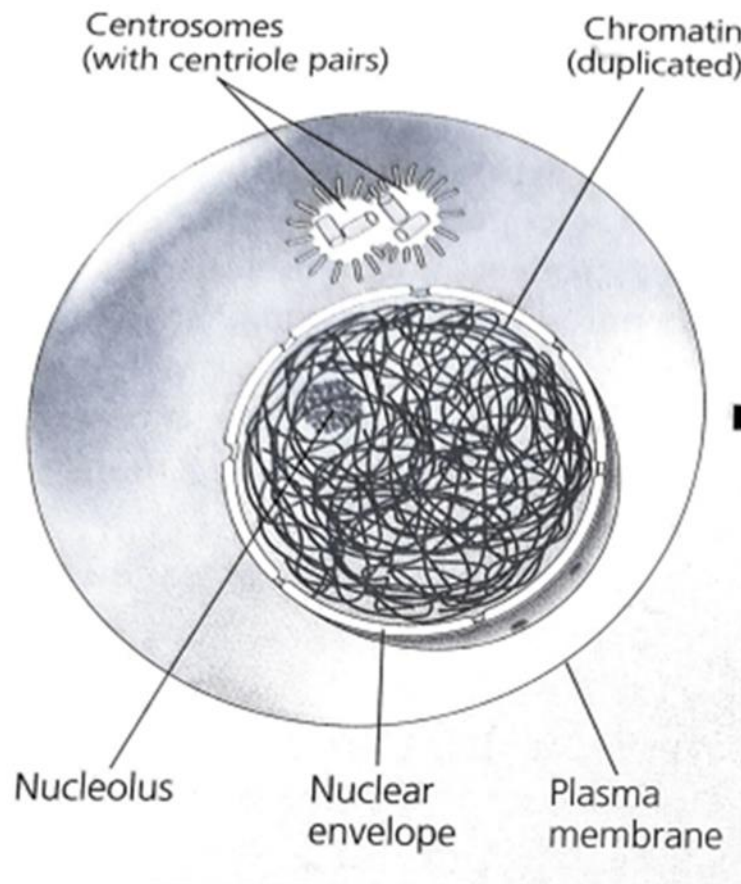
...what do you call these two things? [Referring to centrosomes]



55. Tshepang! [Silence]
56. Yes, Thembile!
57. What do we call these? [Referring to centrosomes]

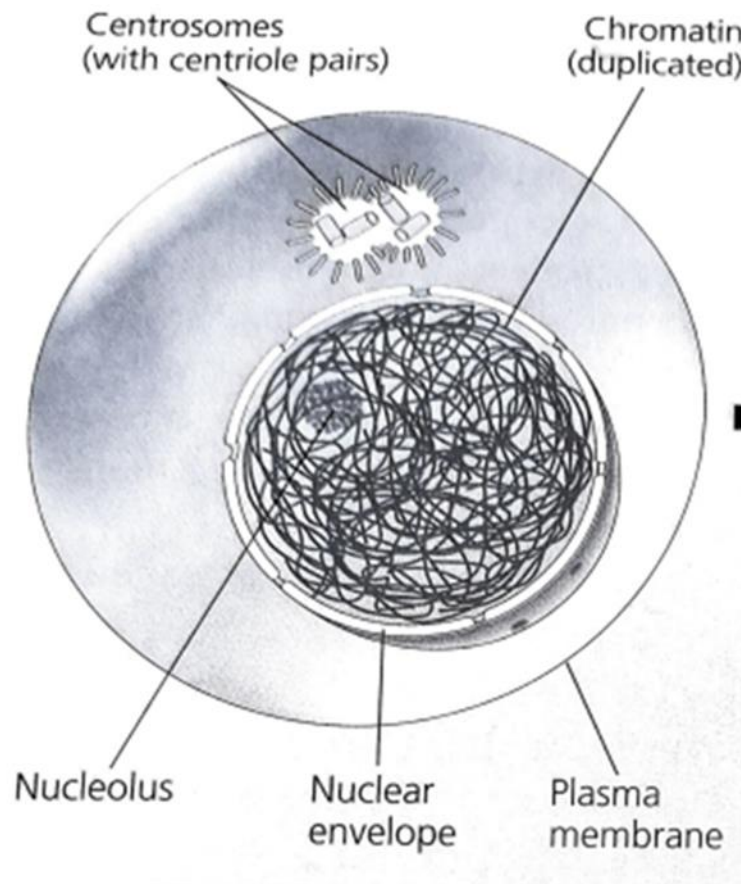


58. Thembile: Chromosomes.
59. Mr. Zulu: NO! [Pause] Eeh...Katlego.
60. Katlego: / ? /
61. Mr. Zulu: Haa...No!
62. Yes! [Pointing to learner]
63. Archippe: Centrosome.
64. Mr. Zulu: This is a centrosome... [referring to centrosome on the diagram]



...a centrosome.

65. Remember the three terms that I identified okay: centrosome, centriole centromere okay.
66. This will be a centro:some okay, a centrosome and you can see that this centrosome...[referring to centrosome]



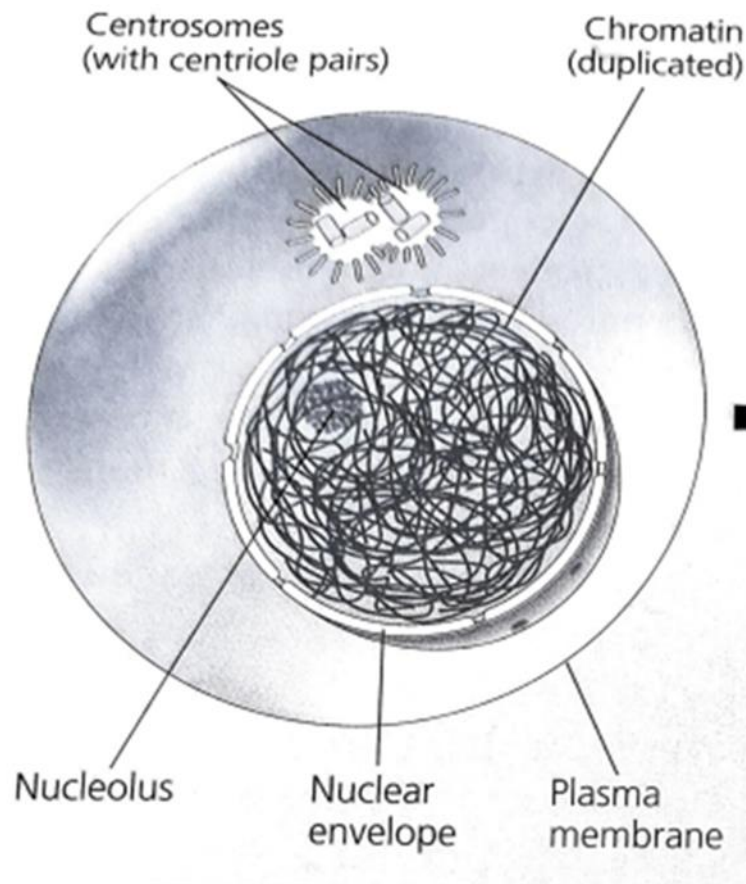
...is made up of two what?

67. Yes! Ehh...Ashton...

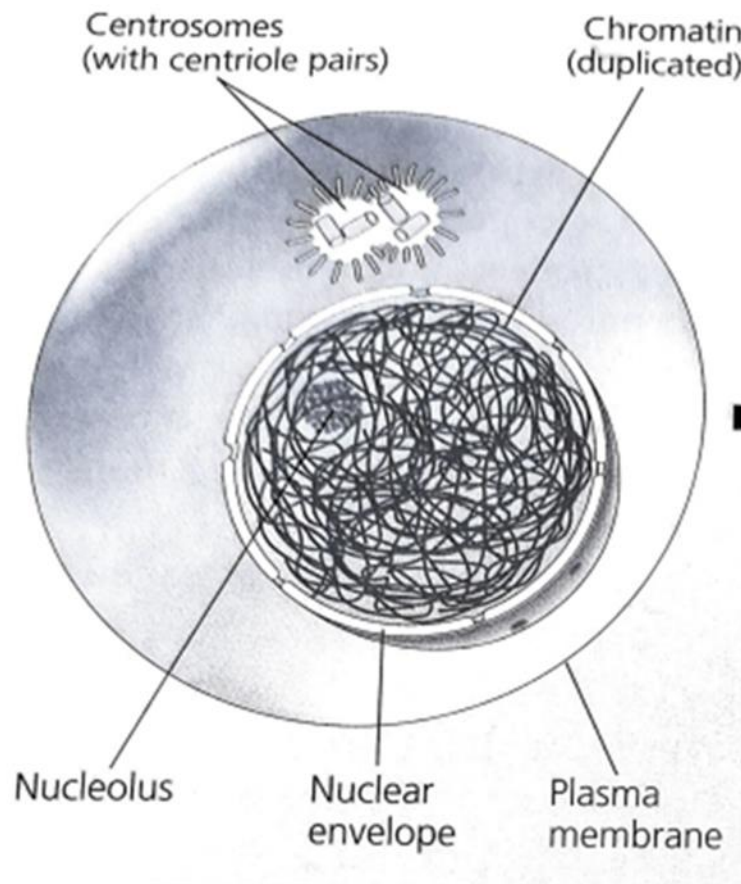
68. Yes! Ashton.

69. Ashton: It is a centriole.

70. Yes, it is made up of two centrioles okay, [referring to a diagram on the transparency]

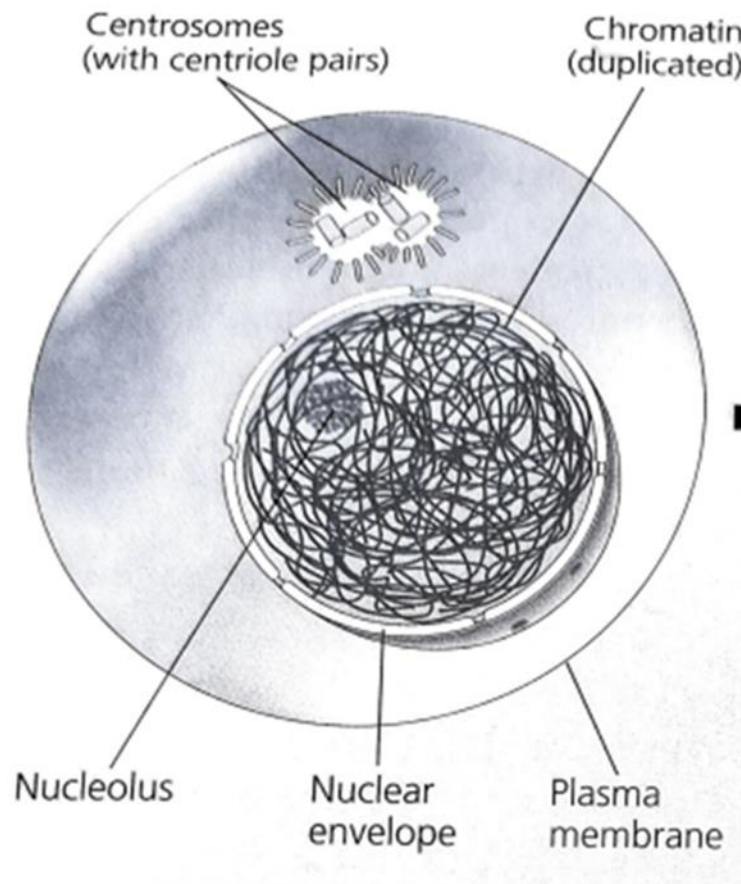


...let us check this centrio— this centrosome [referring to the diagram]



[learner coughs]

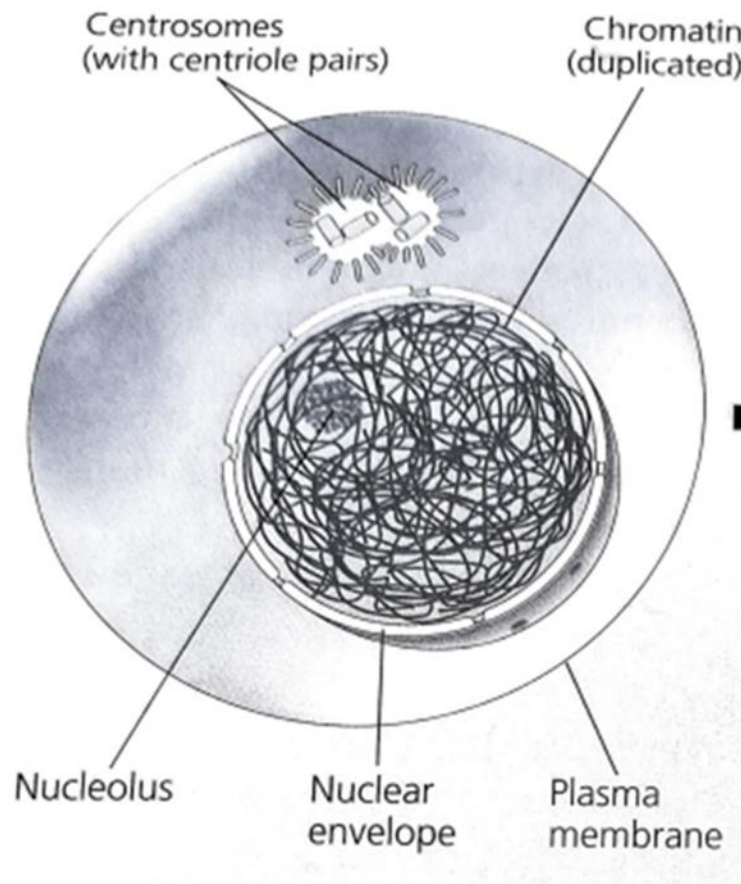
71. Siyamukela, what then do we have?
72. What do we have?
73. Yes, Caleb!
74. Caleb: This is a centromere.
75. Ls: [Laugh]
76. Mr. Zulu: Centromere is something else, eeh...that is why I do not want to bring notes, I always remind you to GO HOME and STUDY.
77. Yes! Ehh...Lesedi. [Silence] Siyabonga... hey boys we said this is a centrosome and centrosomes are made up of two what?
78. Ls: Centrioles.
79. Mr. Zulu: Centrioles and then what happens?
80. Ls: Centrioles.
81. Mr. Zulu: These are centrioles... [pointing to the two centrioles]



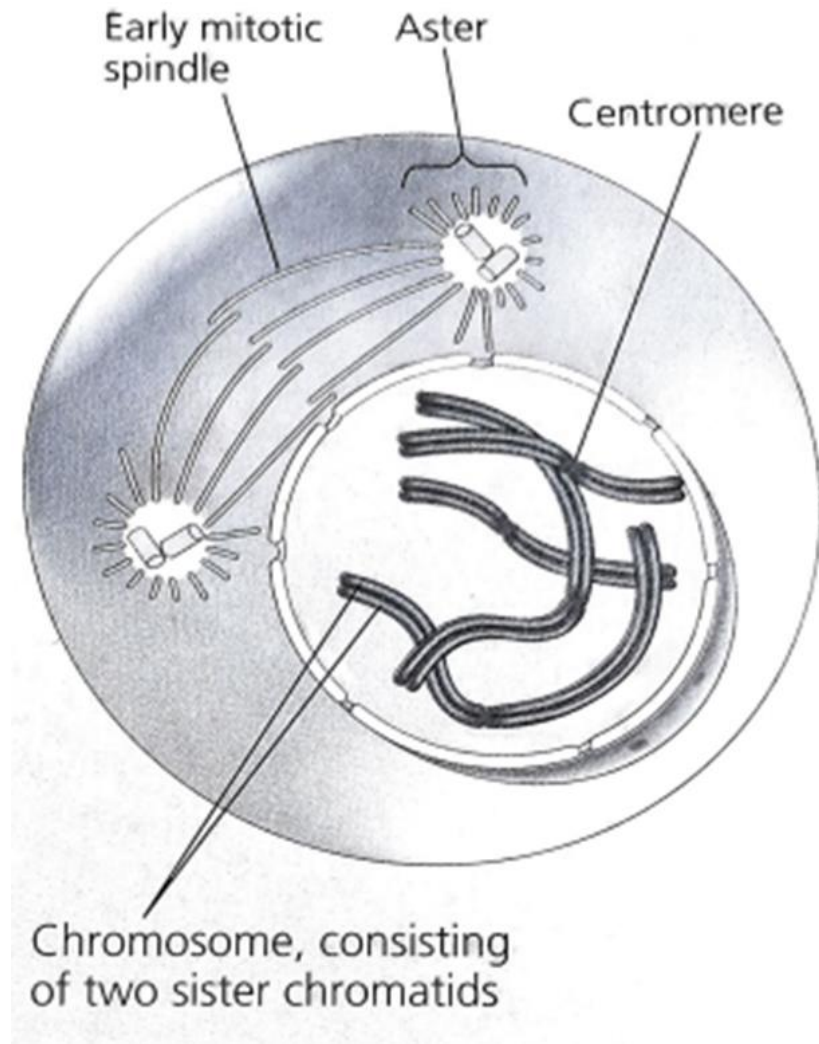
...[laughing] these are centrioles okay.

82.

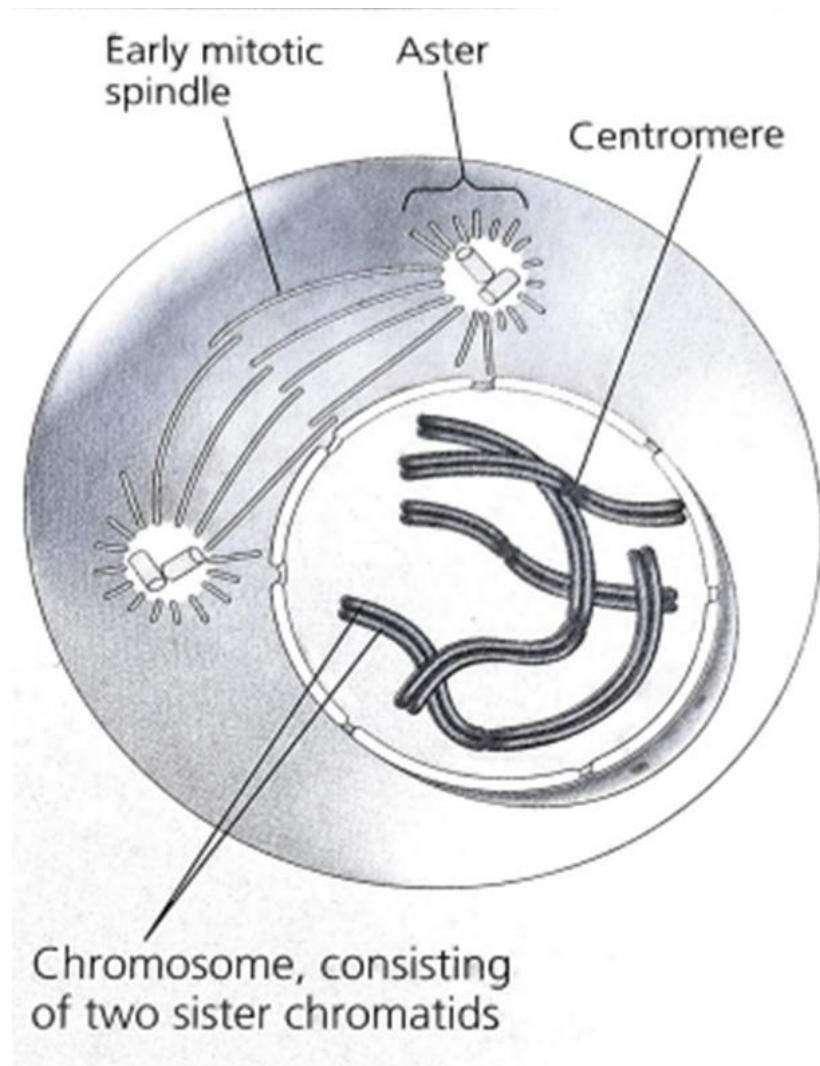
Then what is happening to these centrioles?



83. Lindani: Divide.
84. Mr. Zulu: They divide, okay they separated and then, where are they?
They are from... / ? /
85. Ls: [Chorus]
86. Mr. Zulu: Mills
87. Ls: [Laugh]
88. So / ? / ...so, these are what we call poles, they are in opposite pole or they are in opposite sides they move from here to there. [Showing poles on the diagram]

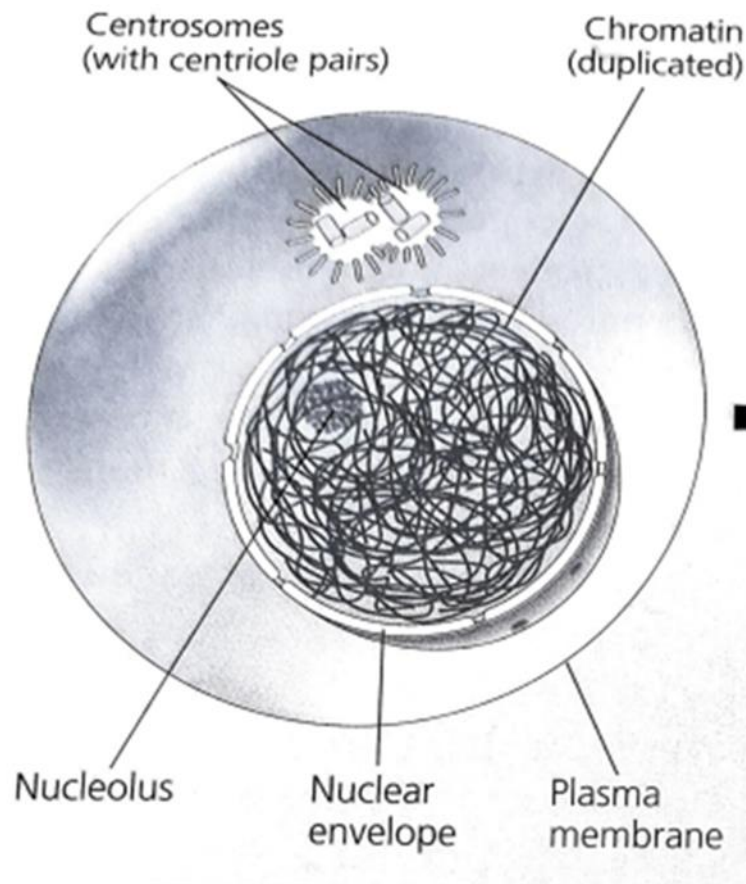


89. Now they are and th— we no longer have a centrosome; our centrioles have been separated and then— I mean they have separated right and— they are now in opposite sides... does it make sense?
90. Right, that is the point to raise here, we said the chromosomes are visible and we can all see that ehh...from the cell, [pointing to chromosomes]

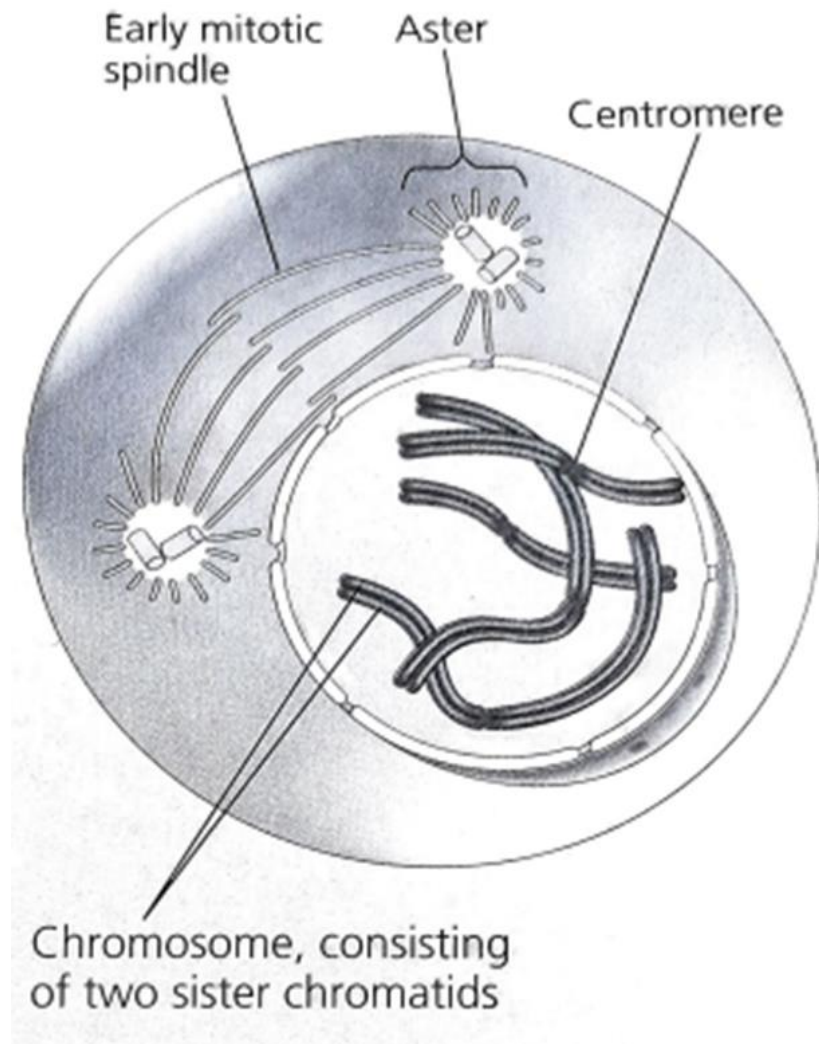


...the chromosomes are visible, is that correct?

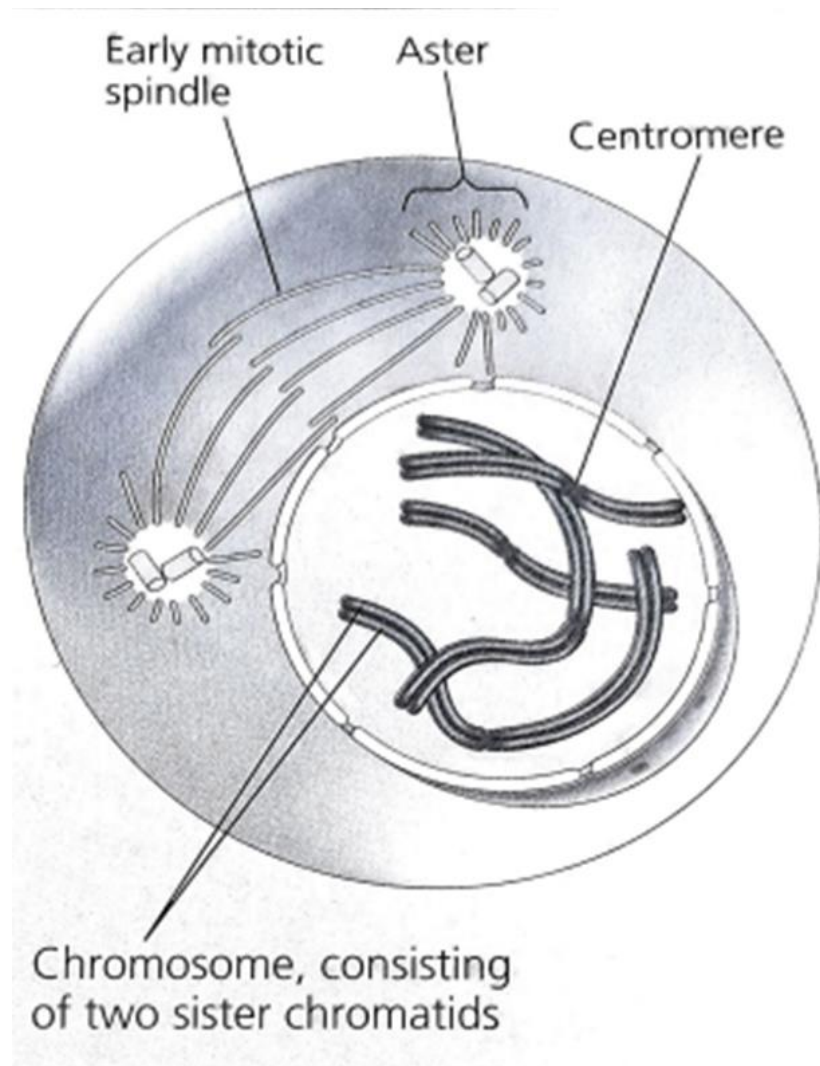
91. They were not visible during interphase... [referring to diagram showing interphase]



... but in prophase they are visible. [Referring to the diagram showing prophase]



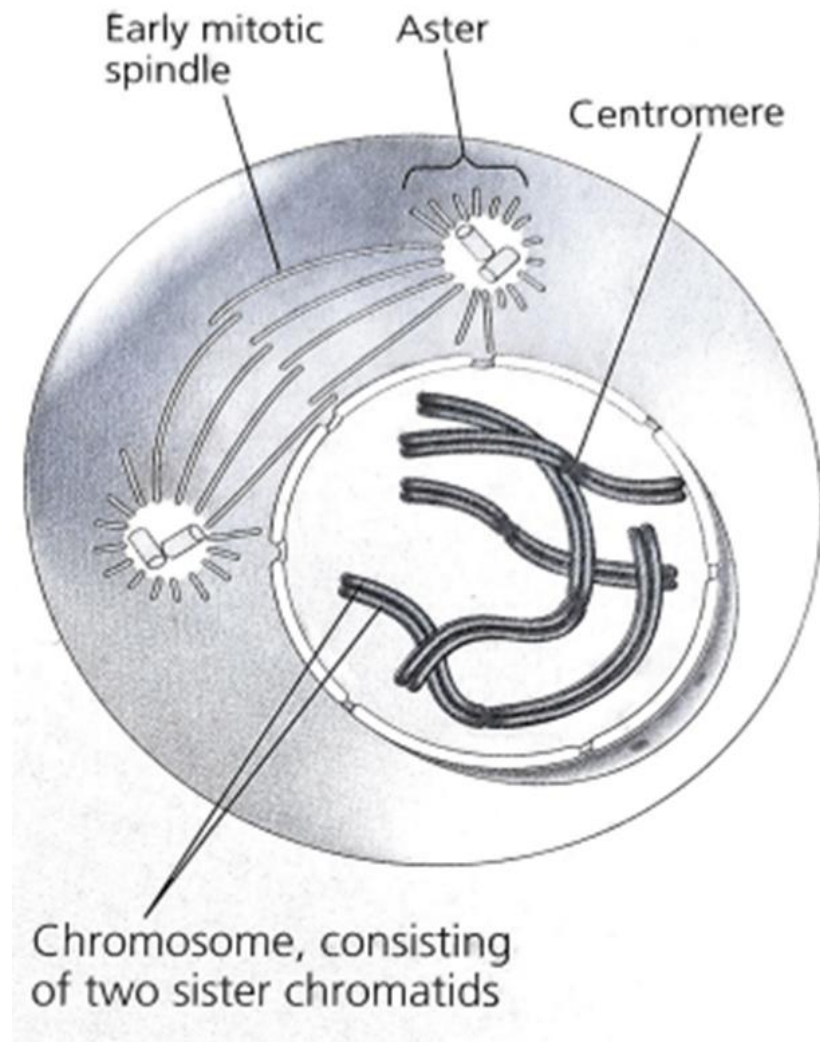
92. We said are they are / ? /and we can all see the spindle fibres.
93. Those who do not know spindle fibres you can see these lines here...
[showing spindle fibres on the diagram]



...which are coming from the centrioles.

94. Okay these are called spindle fibres and the spindle fibres are projected by the centrioles okay.

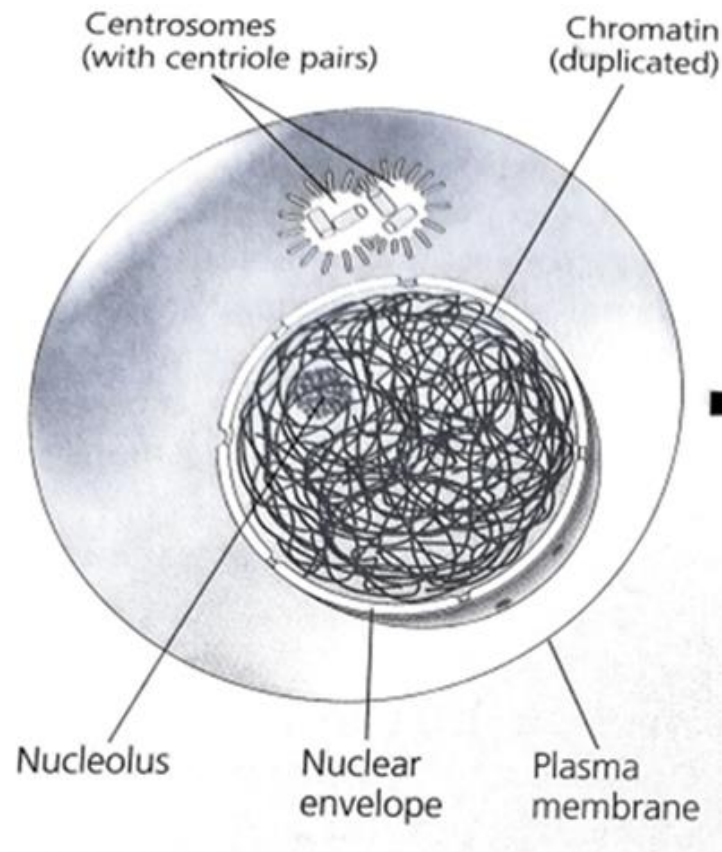
95. So, we now have spindle fibres which are visible, and the nucleus is disintegrating, and centrioles are now in opposite ehh...poles. [Showing on the diagram]



96. Are we still following?
97. Ls: Ehm...
98. Mr. Zulu: Ehh... boys / ? / ehh...if you have questions you raise your hand, raise your hand, and ask if there is anything confusing, raise your hand.

EPISODE 4: INTERPHASE RECAP

99. Right, then boys we said there is interphase before mitosis. What happens during interphase? [Referring to the diagram]



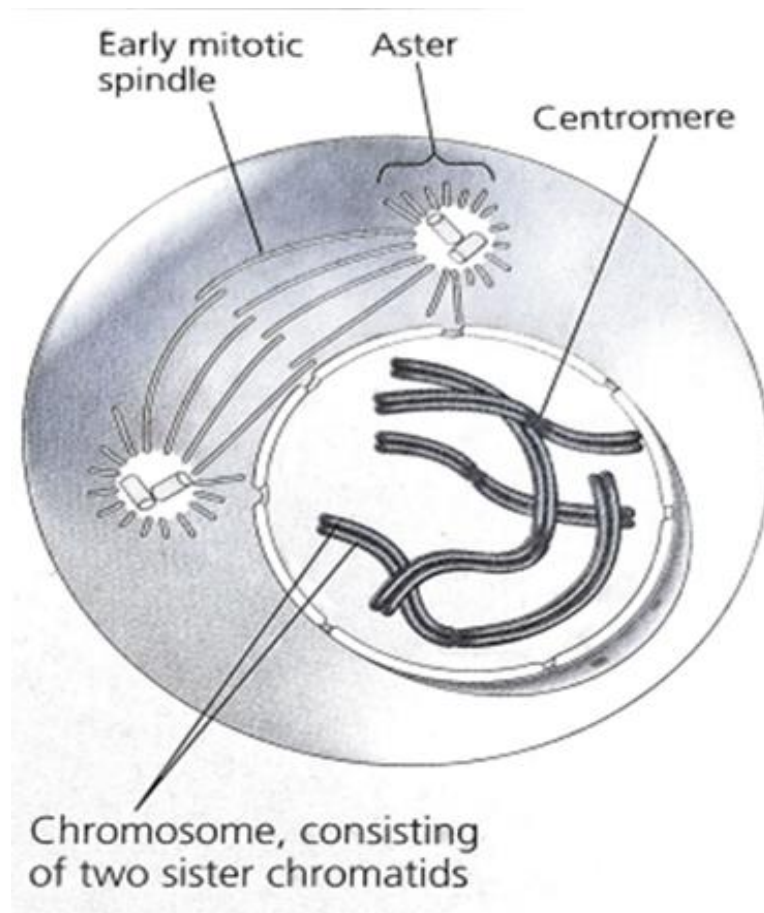
100. Samuel.
101. Samuel: The cell is preparing.
102. Mr. Zulu: Yes it's preparing / ? /, but then what is happening inside the nucleus?
103. Noel!
104. Noel: DNA replication
105. Mr. Zulu: There will be DNA replication taking place okay.
106. And then we said after that, DNA replication...there will be another stage of mitosis.
107. What do we call that stage...Mpho?
108. Mpho: / ? /
109. Mr. Zulu: NO!
110. Yes!
111. Lindani: Prophase.

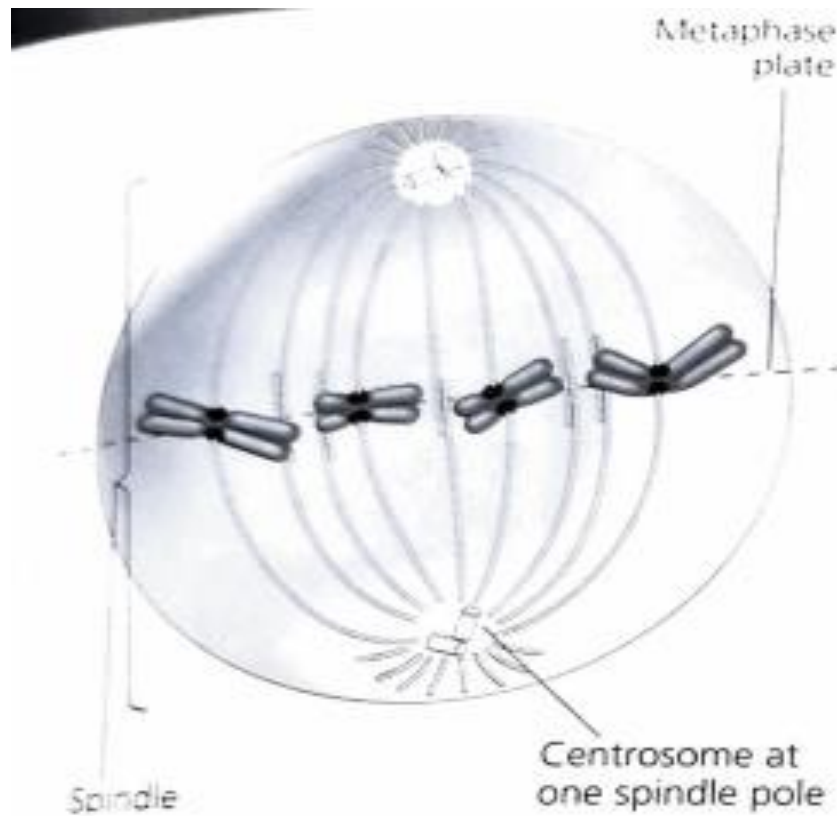
EPISODE 5: PROPHASE

112. Mr. Zulu: There is prophase, there is prophase but then we raised four points about prophase, what happens during prophase?
113. Yes, eh... Thembile!
114. Thembile: Spindle fibres
115. Mr. Zulu: Yes, the spindle fibres will be visible, projected from the eh... centrioles. Yes! [Referring to learner]
116. Lindani: The chromosomes become visible
117. Mr. Zulu: The chromosomes become visible.
118. Lindani: The nuclear membrane starts disappearing.
119. Mr. Zulu: The nuclear membrane starts disintegrating.
120. Lindani: / ? /
121. Mr. Zulu: Okay let us just say the nuclear membrane is disintegrating neh...
122. What else did we say?
123. Yes, Ben!
124. Ben: The centrosomes are separating. [Using hands]
125. Mr. Zulu: The centrosomes will now be separated into two centrioles moving into opposite directions neh...okay boys we said there is a phase after prophase eh...what is that phase?

EPISODE 6: METAPHASE

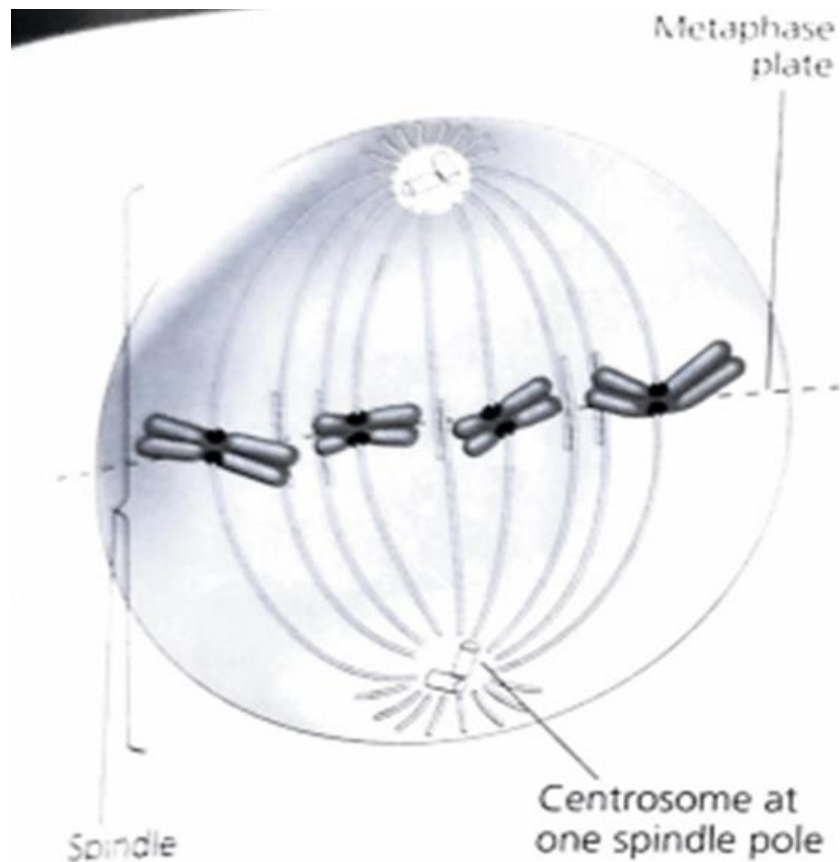
126. Ls: Metaphase
127. Mr. Zulu: Metaphase okay, and again in prophase we would like to compare it with the first one which is-- I mean metaphase will be compared to the prophase /these are the two cells/ [showing them diagrams on the transparency]



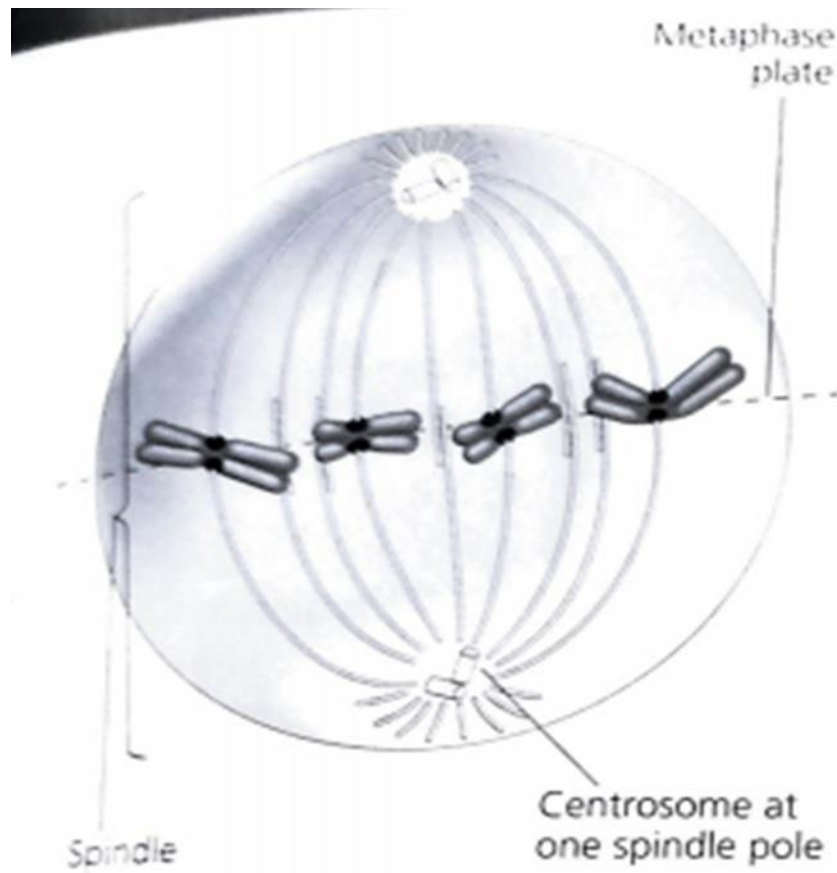


Arnold / ? /

128. Arnold: Forming that line.
129. Mr. Zulu: Yes, they are forming that line neh... we say that they align at the equator okay.
130. Can you see this is just one line? [Showing on the diagram]



131. Ls: Yes!
132. Mr. Zulu: Right, so chromosomes will form a line at the equator, or they will align at the equator neh... [bell rings] or you can just say centre of the cell.
133. Lindani: / ? /
134. Mr. Zulu: No, this one neh...ehh... it is because of this diagram,



...eeh... this diagram is not 100% correct / ? /. Yes! [Referring to a learner]

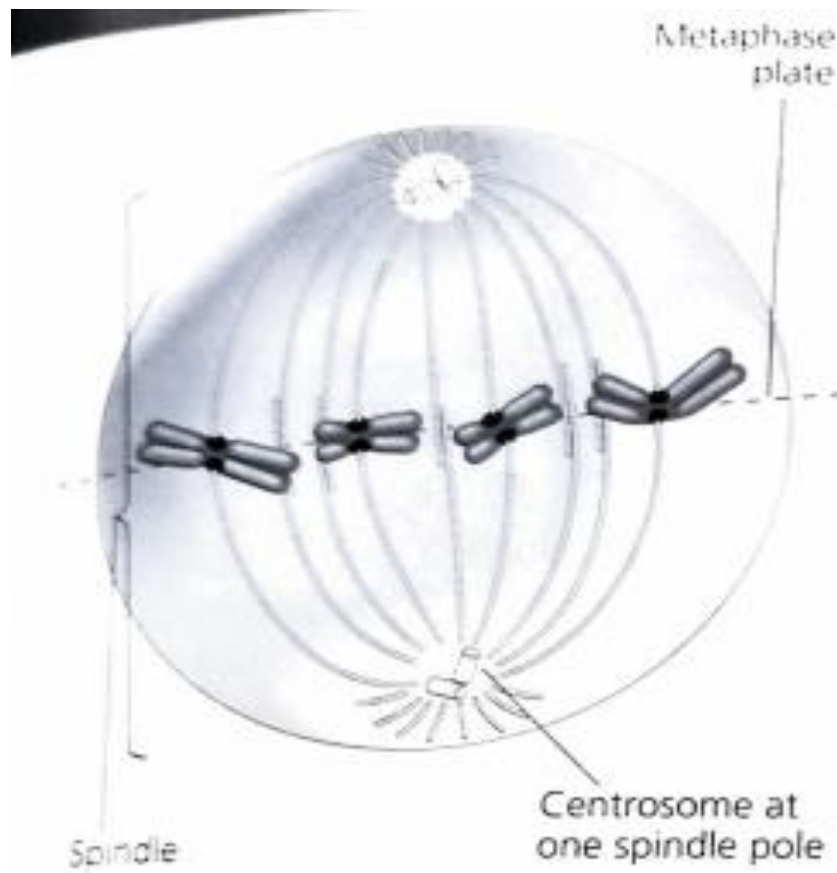
135. Lindani: / ? /

136. Mr. Zulu: Okay do not look at it like that ... / ? /

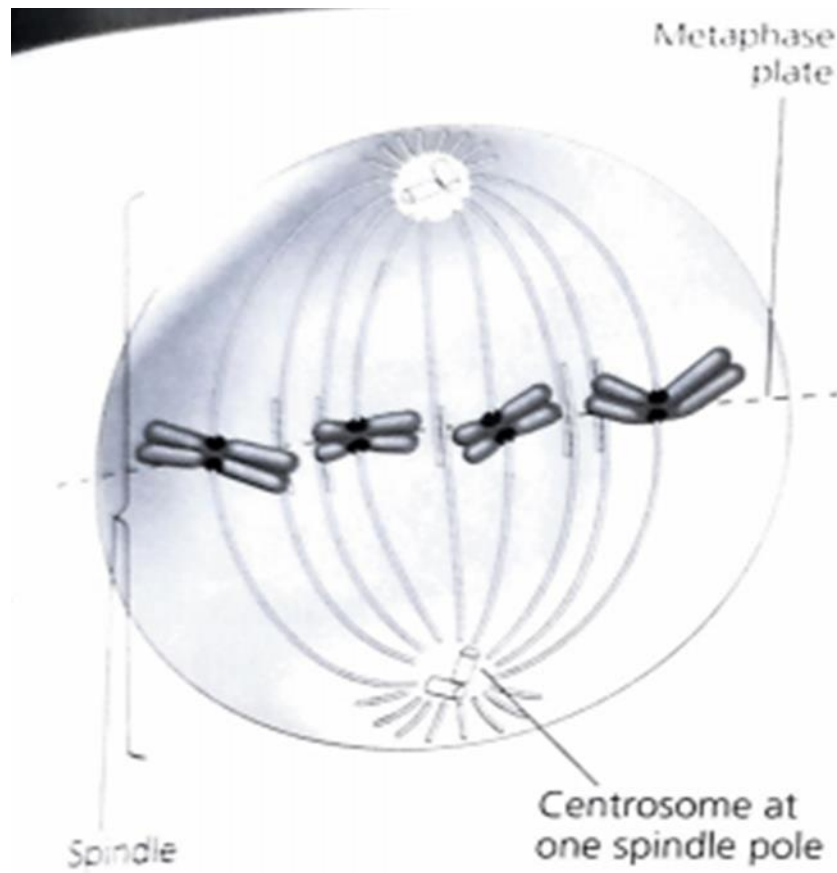
137. Yes! [Referring to a learner].

138. Lindani: The nuclear membrane!

139. Mr. Zulu: Yes! the nuclear membrane just disappeared neh... can you see the nucleus here?



140. There is no nucleus, the nuclear membrane just disappeared neh... yes!
141. Lindani: Chromosomes.
142. Mr. Zulu: Okay, yes if you look at the chromosomes, now they are attached ehh...to the spindle fibres neh... you can see that?



143. Ls: Yes!
144. Mr. Zulu: ...and what is the centre of chromosome where the spindle fibres are attached?
145. Arnold!
146. Arnold: Centromere
147. Mr. Zulu: It is the centromere so; we can say that the spindle fibers are attached to the spindle fibres /through the centromere/.

THE END