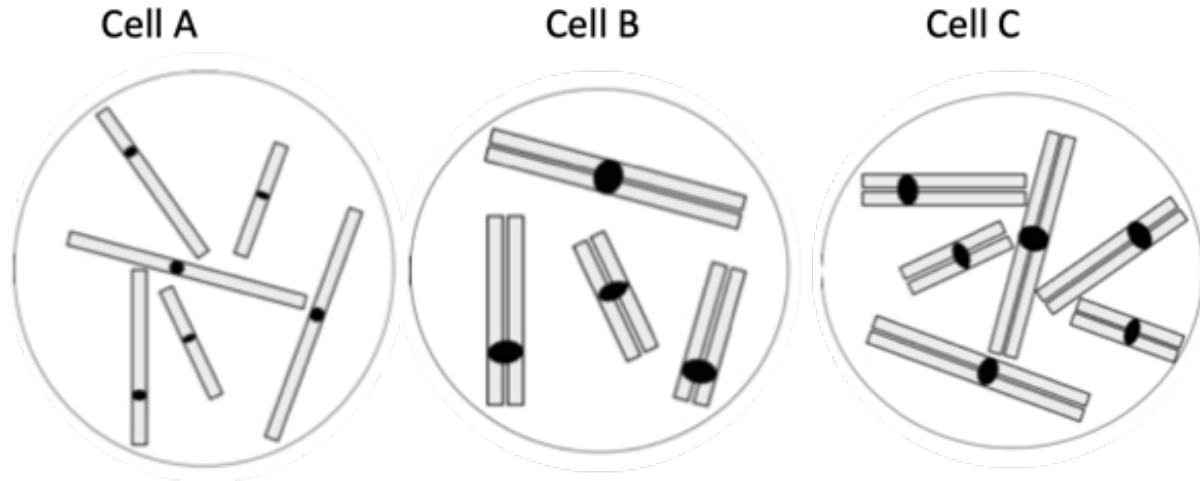


Which cells are 1c?

- A) Cell A only.
- B) Cell B only.
- C) Cell C only.
- D) Cells A and B.
- E) Cells A and C.

Answer: NONE

This question was set up this way to gain students' maximum attention and have them realize that they should always maintain a critical eye (and be confident in their understanding!). Suggested follow up: asking a student to draw on the board/document camera a diagram showing a cell that is 1c.



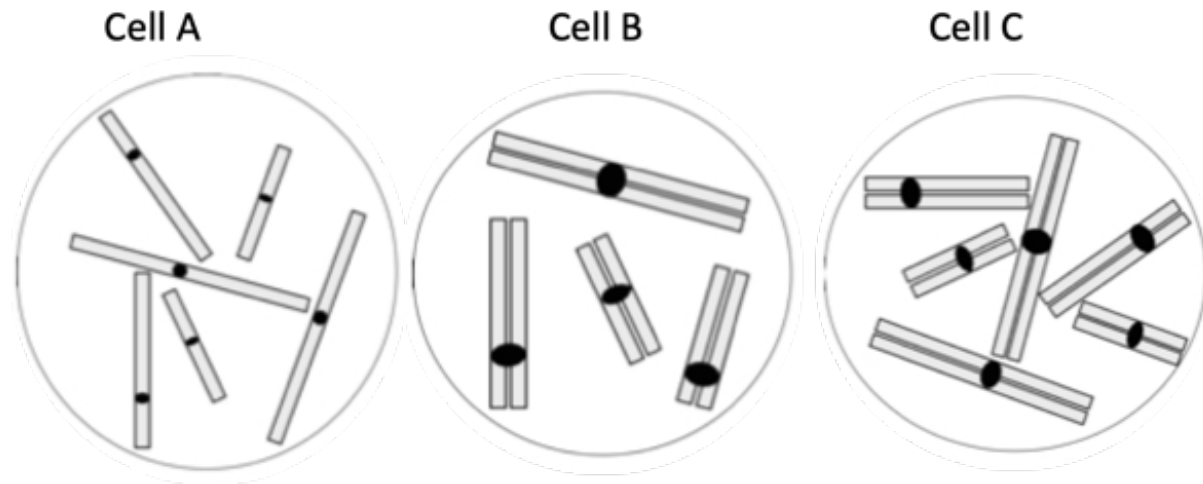
Which cells are 2c?

- A) Cell A only.
- B) Cell B only.
- C) Cell C only.
- D) Cells A and B.
- E) Cells A and C.

Answer: D) Cells A and B

Both cells A and B have two full genomes/two copies of a full genome.

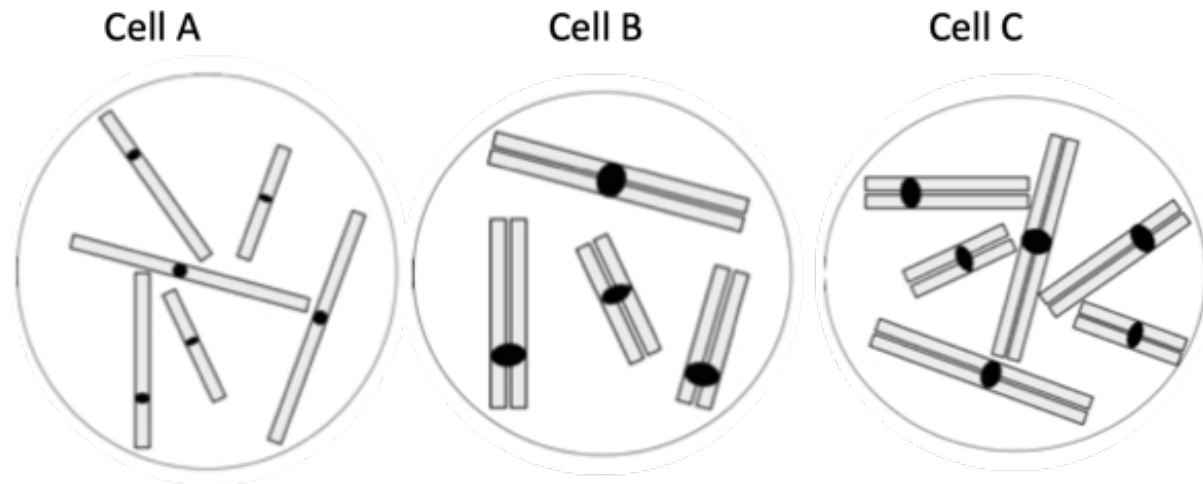
Suggested follow-up: Ask students how many c Cell C is/has (A: Cell C has four full genomes - 4c).



Answer: C) Cell C only.
(Cell C has four full genomes - 4c).

Which cells are neither 1c nor 2c?

- A) Cell A only.
- B) Cell B only.
- C) Cell C only.
- D) Cells A and B.
- E) Cells A and C.

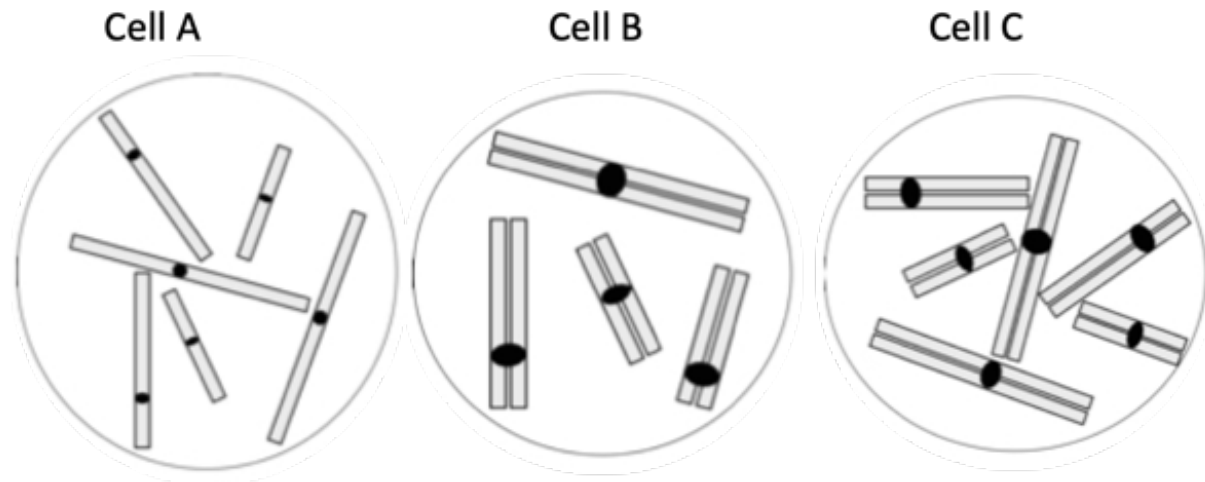


Which cells are haploid?

- A) Cell A only.
- B) Cell B only.
- C) Cell C only.
- D) Cells A and B.
- E) Cells A and C.

Answer: B) Cells B only

Cell B has “one of each chromosome type” – one long chromosome, one short with a centromere around the middle, one short with the centromere toward one end, and one of medium/long length with the centromere toward one end. Cells A and C have “two of each chromosome type”.



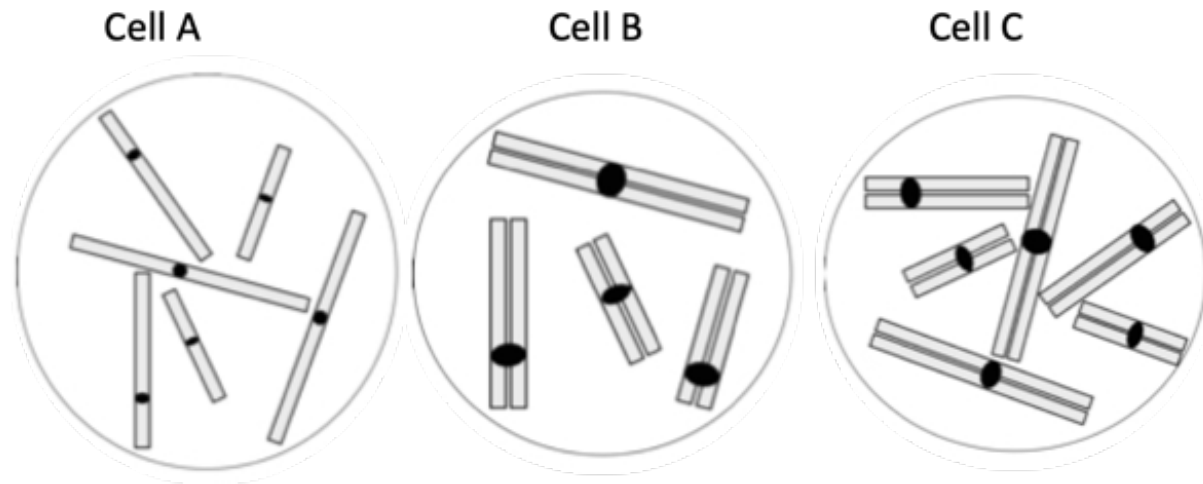
Which cells are diploid?

- A) Cell A only.
- B) Cell B only.
- C) Cell C only.
- D) Cells A and B.
- E) Cells A and C.

Answer: E) Cells A and C

Cells A and C have “two of each chromosome type”.

Students often think that the correct answer is Cells B and C (they may have this answer on their worksheet), and are surprised to see that this is not an option in this question. They may want to choose “none of the above answers” as an answer, and it is OK to give them the opportunity to do so (e.g. by not voting, or by raising their hand).



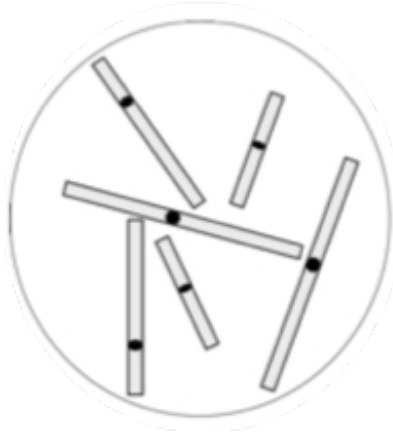
Which cells have replicated chromosomes?

- A) Cell A only.
- B) Cell B only.
- C) Cells A and B only.
- D) Cells B and C only.
- E) Cells A, B, and C.

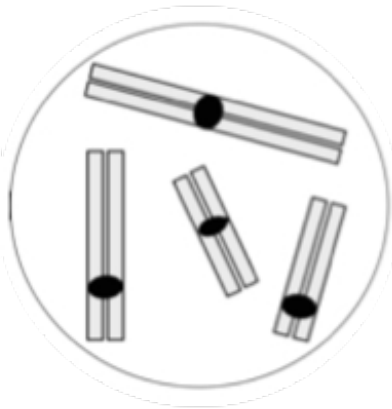
Answer: D) Cells B and C only.

Cells B and C have chromosomes composed of two sister chromatids, indicating that they have undergone DNA replication.

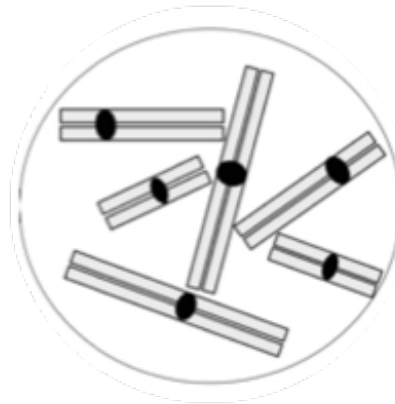
Cell A



Cell B



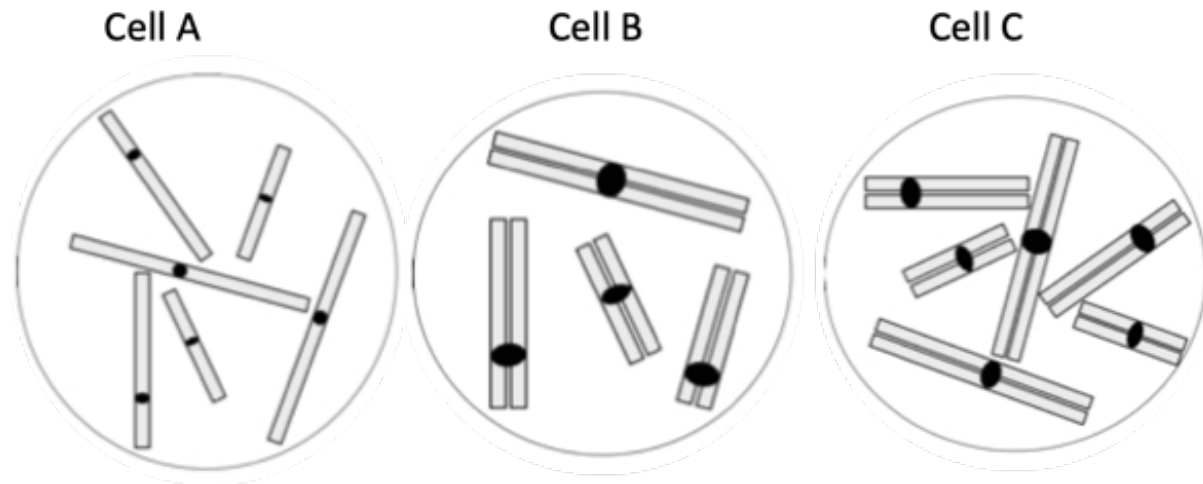
Cell C



How many chromosomes does cell A have?

- A) 1
- B) 2
- C) 3
- D) 4
- E) 6

Answer: E) 6

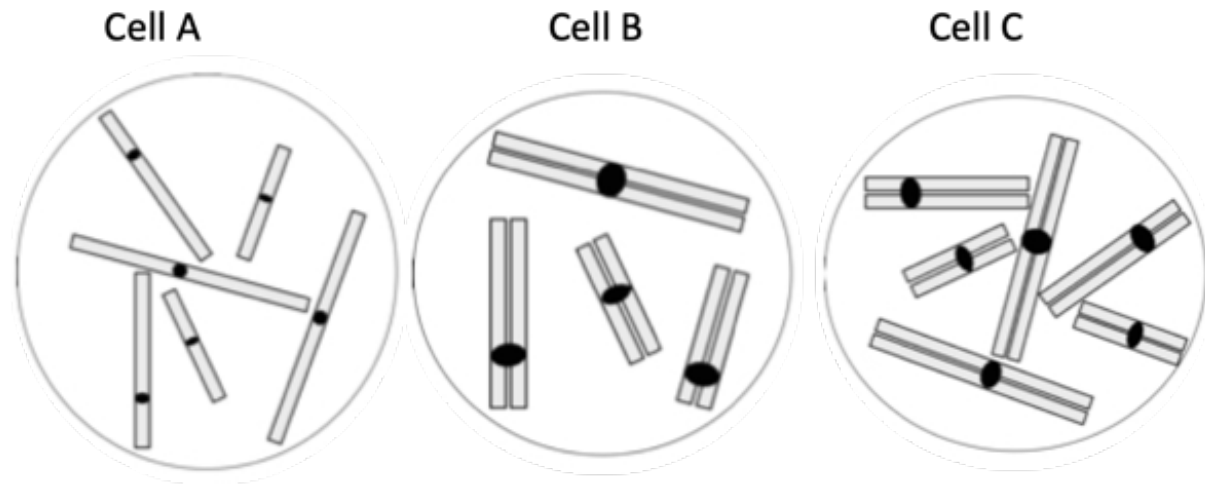


How many chromosomes does cell B have?

- A) 1
- B) 2
- C) 3
- D) 4
- E) 6

Answer: D) 4

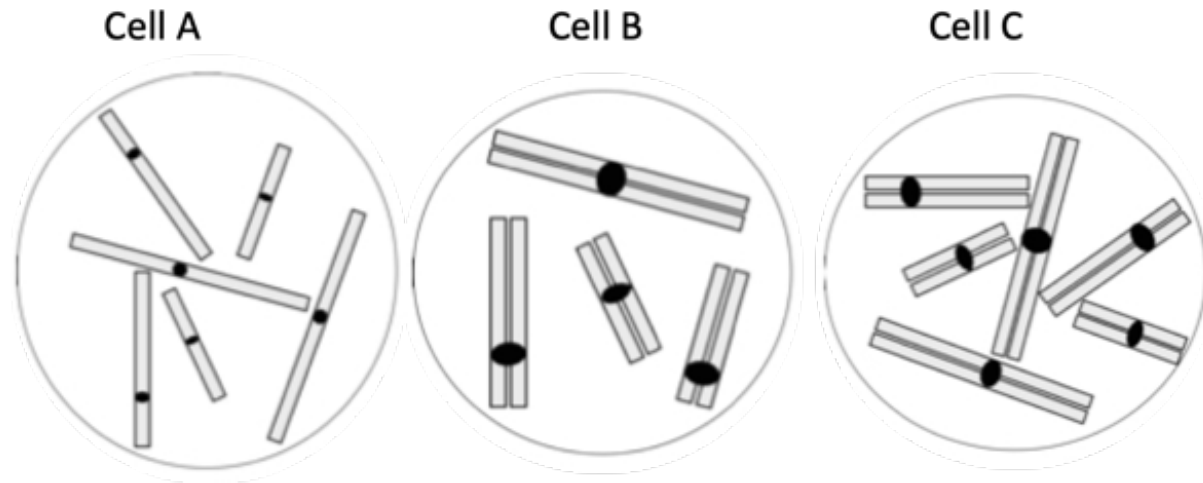
Suggested follow-up: Ask students how many chromosomes cell C has (A: 6)



Which cells are $2n=6$?

- A) Cell A only.
- B) Cell C only.
- C) Cells A and C only.
- D) None of these cells.

Answer: C) Cells A and C only.

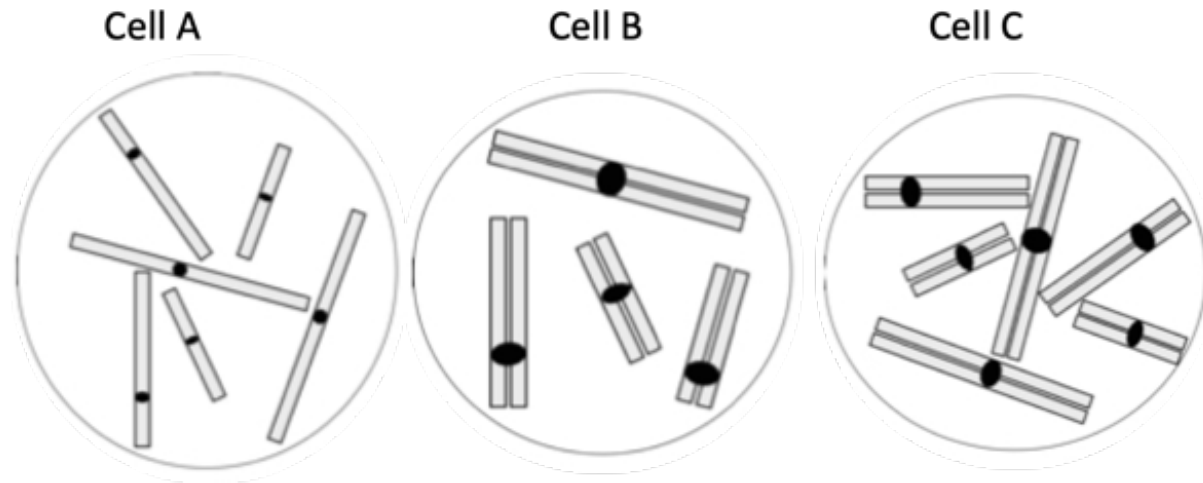


Which cells could do mitosis right away?

- A) Cell A only.
- B) Cell B only.
- C) Cell C only.
- D) Cells A and B.
- E) Cells B and C.

Answer: E) Cells B and C only.

Cells B and C have replicated chromosomes, so (assuming they have undergone their growth phase and passed all the necessary checkpoints – none of which we are covering here), they could start mitosis. Cell A would need to first undergo DNA replication.



Which cells could do meiosis right away?

- A) Cell A only.
- B) Cell B only.
- C) Cell C only.
- D) Cells A and B.
- E) Cells B and C.

Answer: C) Cell C only.

Cell C is diploid and has undergone DNA replication, so (assuming growth and checkpoints are cleared) it could do meiosis. Cell A first needs to undergo DNA replication, while Cell B is haploid, which prevents it from doing meiosis (or at the very least, completing it successfully).