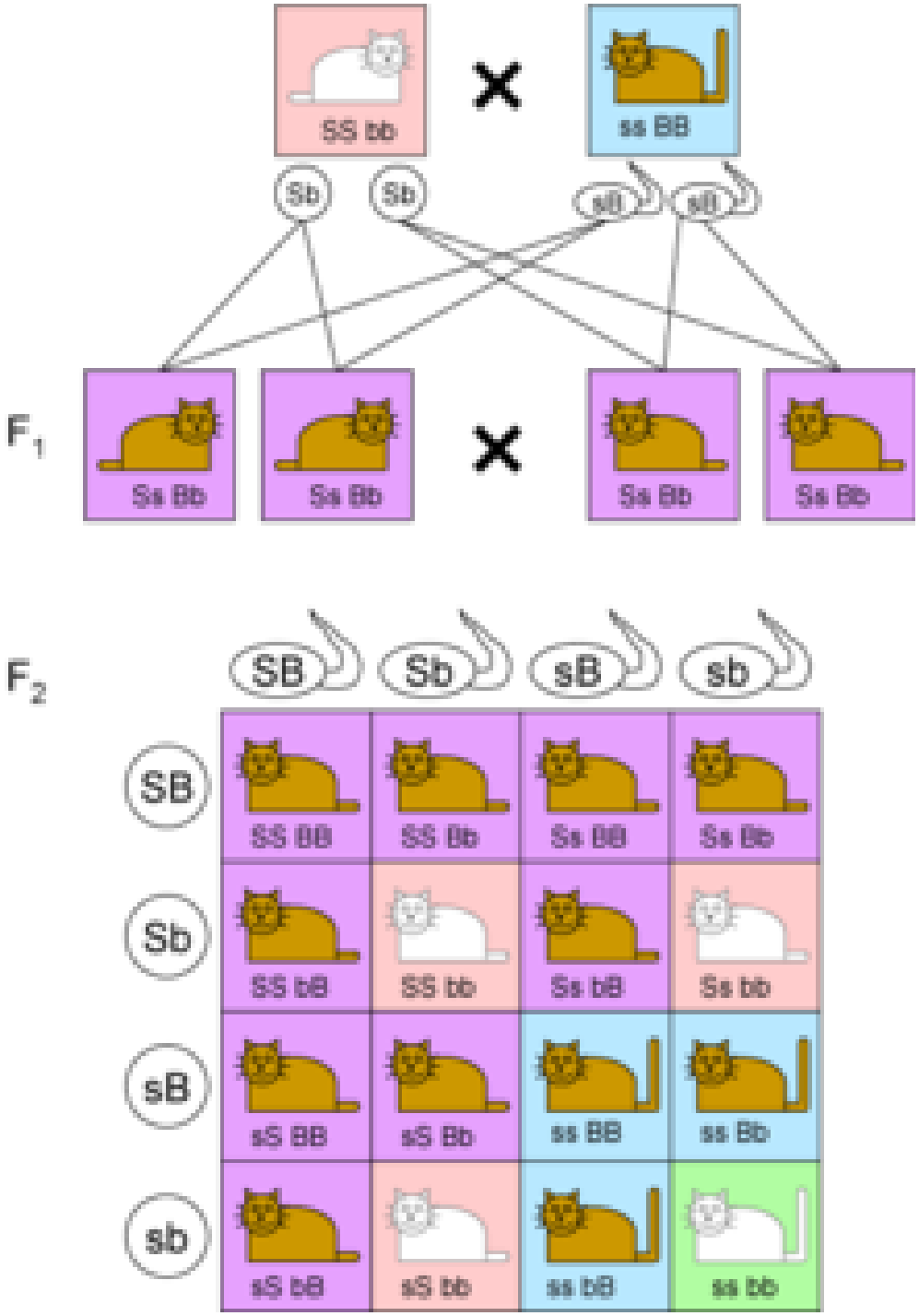
Dihybrid and 10.3 Gene Linkage and Polyploidy

A. Dihybrid cross
    1. Looking at 2 traits simultaneously
    2. Parents: hybrid both traits
    3. Ex. TtRr x TtRr



Pheno. ratio is 9:3:3:1

B. Genetic recombination

1. Can calculate the possible combos using 2^n

2. 2 = alleles (mom & dad)

3. n = number of chrom's

4. Fruit flies = 2^8
(256 combos for 1 gamete)

Now cross egg x sperm

256 x256 = 65536
possible offspring combos

5. Humans = 2^{23}

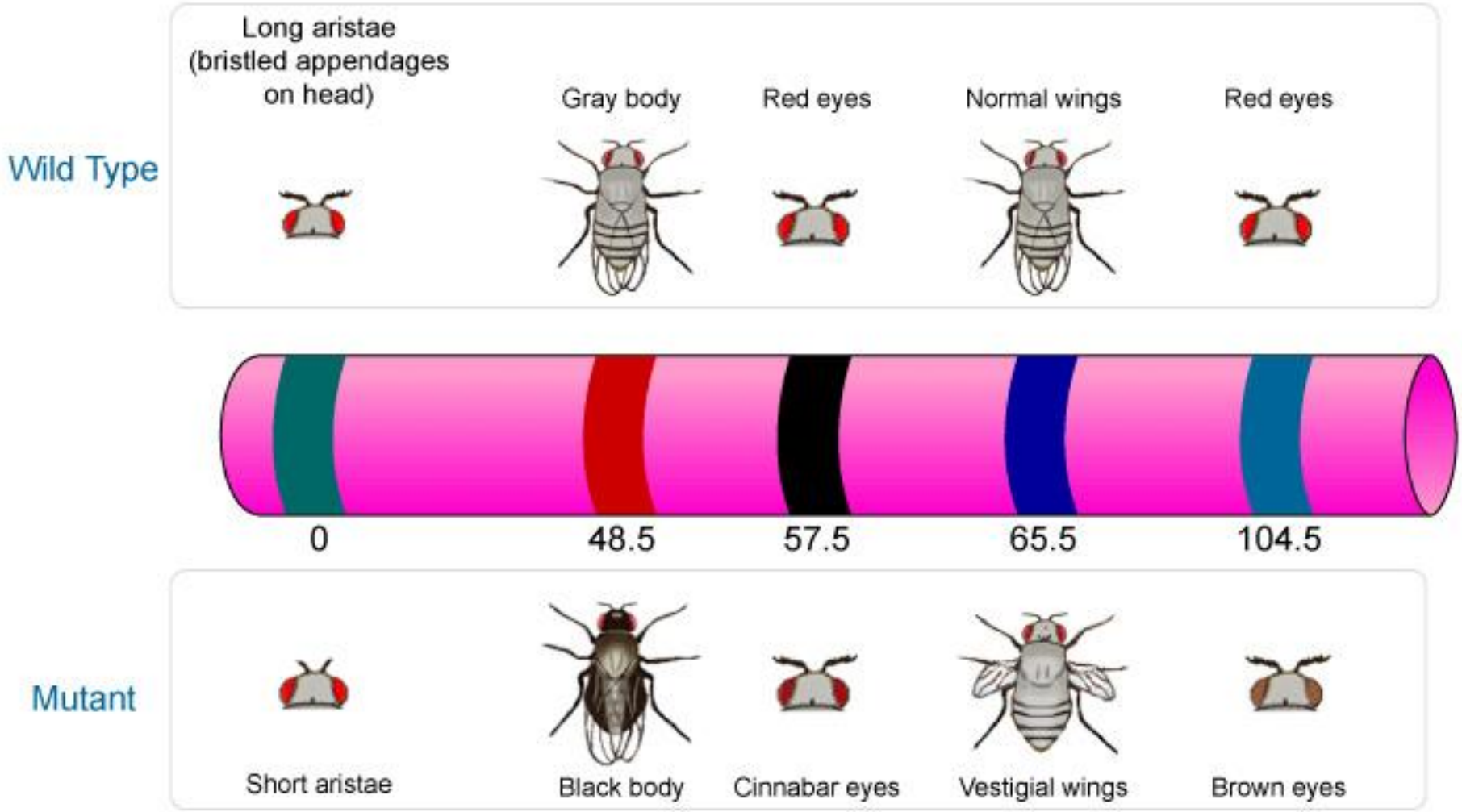
(8,388,608 combos)

Now cross egg x sperm

8million x 8million =
7×10^{13} combos

C. Gene Linkage

1. Genes close to each other on a chrom. have higher chance of being inherited together
2. *crossing over
3. Maps of chrom's indicate % of chance of crossover as distance



Practice: Making a map

If: AB = 3, AC = 1, AD = 4, BC = 2,
BD = 7, CD = 5

Then: What does the chromosome map look like?

Look first at a few of the data points:

AB = 3 AC = 1 BC = 2

Draw AB first: A---B

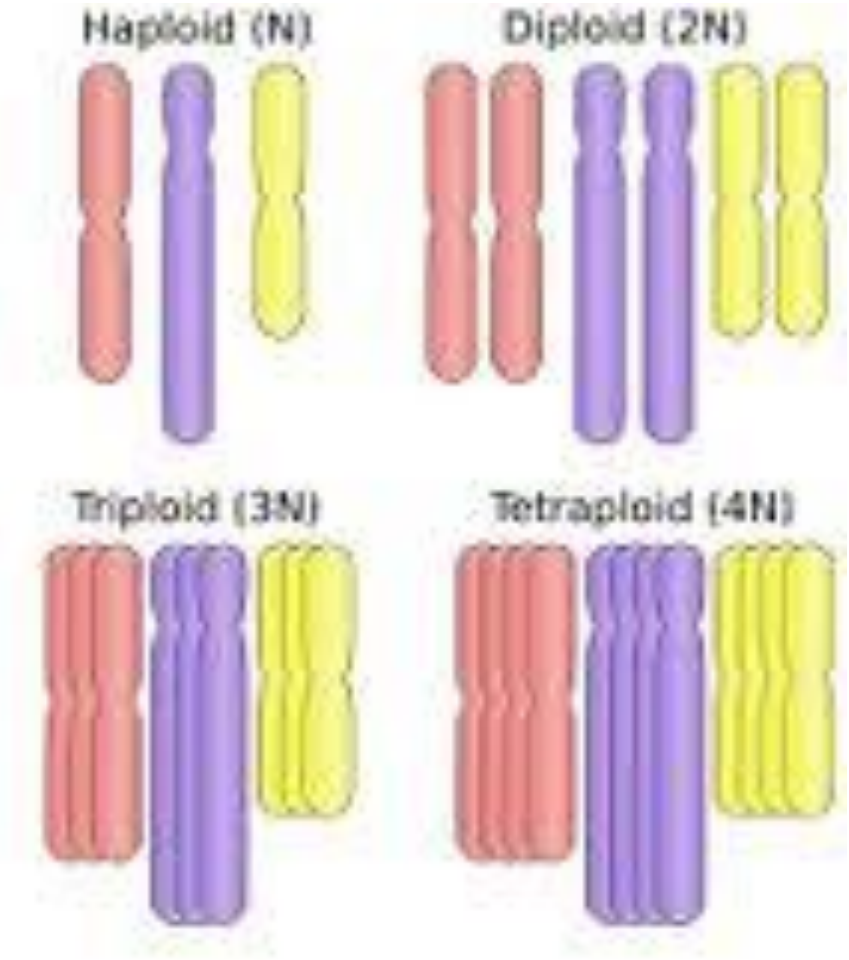
Then consider where C can go to make the next 2 equations work:

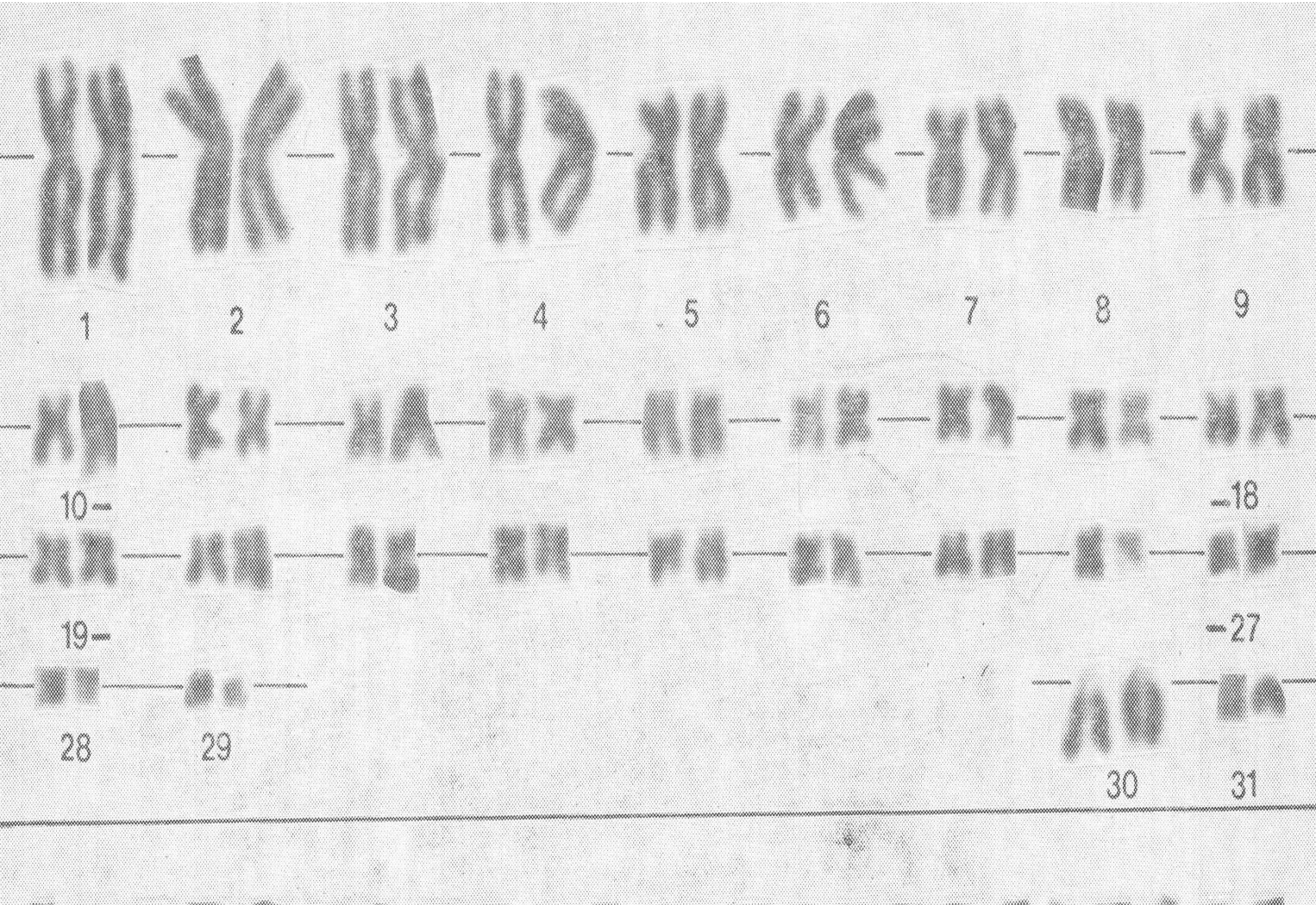
A-C--B

Answer:

D----A-C--B

C. Polyploidy: many sets of chr.
   1. Most species = diploid (2n)
   2. Rarely in animals (lethal) but 1 in 3 flowering plants
   3. Hexaploid (6n) bread wheat and oats
   4. Octoploid (8n) strawberries
   5. Increases vigor and size


Haploid (N)
Diploid (2N)
Triploid (3N)
Tetraploid (4N)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