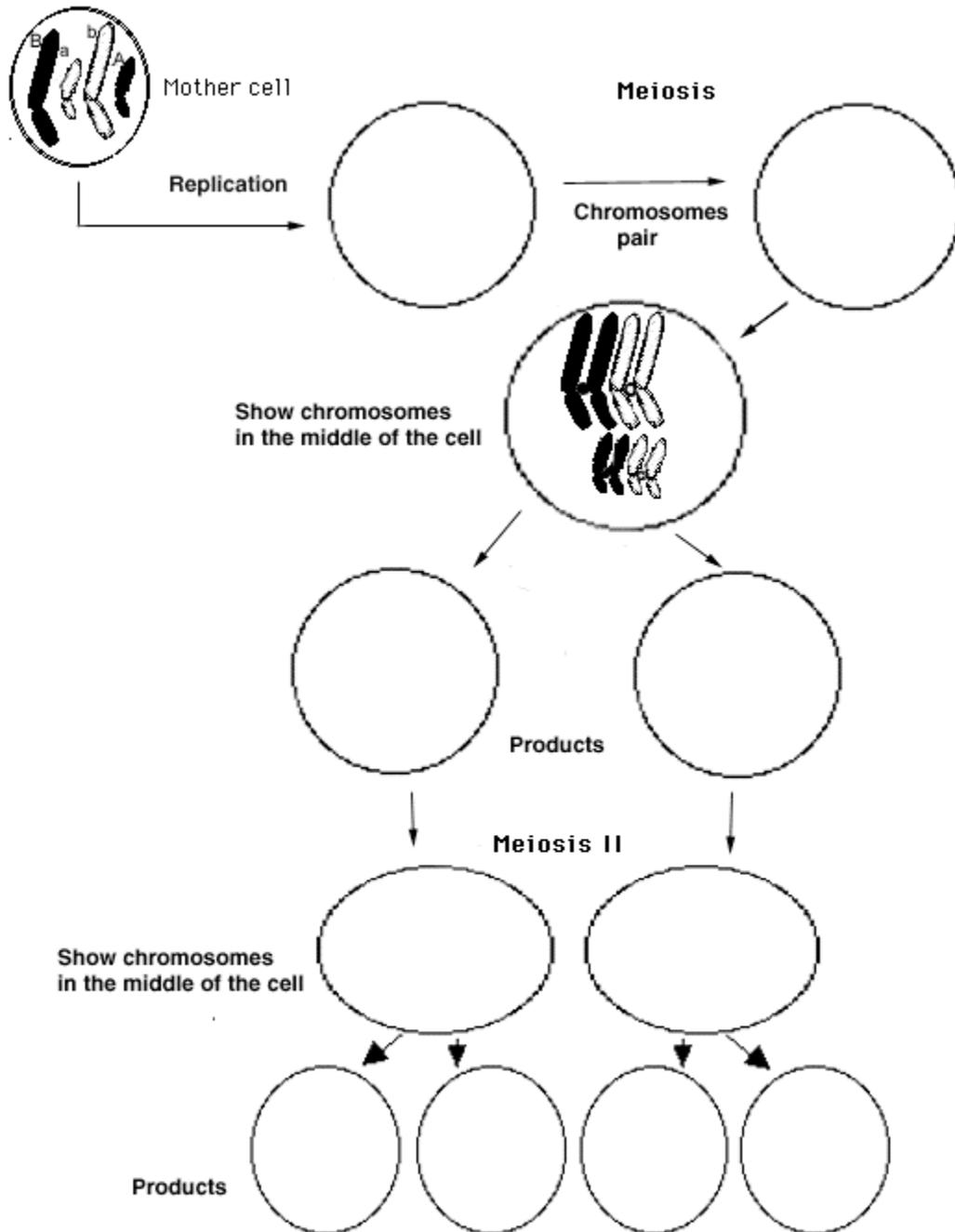


Diagram 1. For use in Activity 2

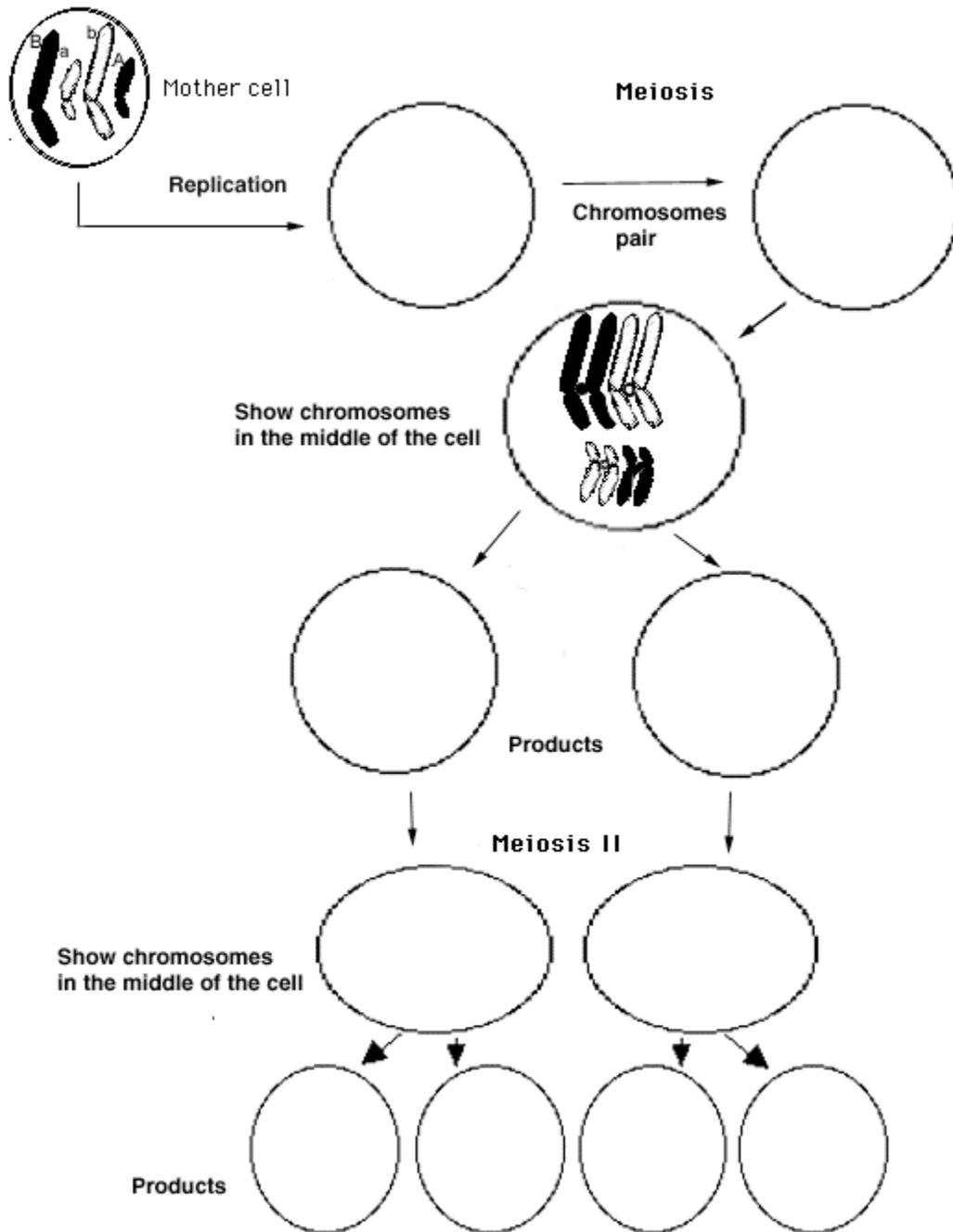
Draw the chromosomes, with appropriate letters, for each stage of meiosis. The mother cell is heterozygous for genes A and B.

“Replication” means that the DNA replicates, so draw each chromosome as a pair of sister chromatids. “Chromosomes pair” is prophase I and the next cell is metaphase I. Note that anaphase and telophase are omitted for brevity in both meiotic divisions.

A. First possible alignment of homologous pairs at metaphase I



B. Second possible alignment of homologous pairs at metaphase I



C. Fill in the Punnett square to see all possible genotypes from a dihybrid cross.

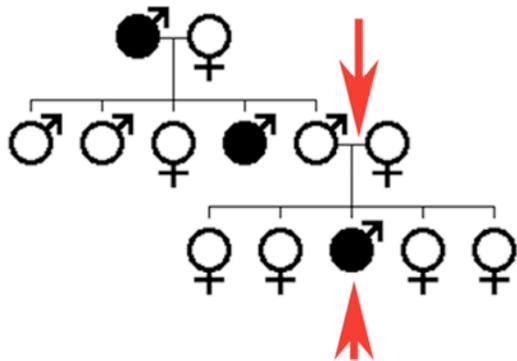
Cross : AaBb x AaBb		Maternal gametes			
		AB	Ab	aB	ab
Paternal gametes	AB				
	Ab				
	aB				
	ab				

Diagram 2. For use in Activity 4

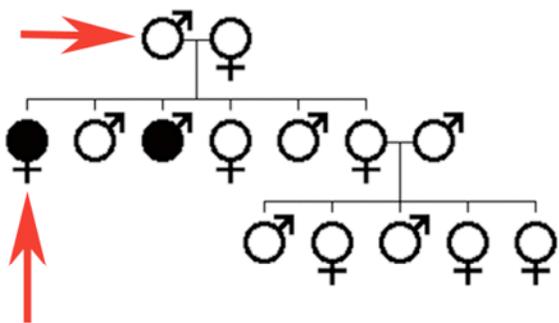
Study the diagrams below for hints on how to be successful at pedigree analyses.

Look for informative matings:

In the following pedigree, parents not showing a trait give rise to a child showing the trait. This indicates that the trait must be recessive. If the trait were dominant, one of the parents would have to exhibit the trait.



In the pedigree below, parents have offspring of both sexes who do not show the trait. This not only indicates that the trait is recessive, but that it is autosomal recessive. Fathers give their only X to their daughters. That the daughter shows a recessive trait would demand (if it were sex-linked) that she receive an X carrying the recessive allele from each parent. But then the father who only has one X would have to exhibit the trait. Since he does not, this pedigree indicates that the inheritance involves an autosomal pair in which both parents carry two alleles. This allows a recessive allele to be “hidden” by a dominant allele in a heterozygous genotype.



For sex-linked traits, it is easy to find a mating like the one above which indicates autosomal inheritance and rules out sex linkage. However, it is almost impossible to do the reverse. Sex linkage, if it cannot be ruled out, is often suggested by mother-to-son inheritance and by a greater number of male progeny showing the trait.