

Meiosis Poker

Name: _____ Hour: _____

- Obtain one deck of playing cards.
- Group the cards by number (i.e. find all the 2's, all the jacks, etc.)
- Select four groups of cards to work with (i.e. Jack, King, Queen, Ace).
- Separate the cards by color

The red suites will represent chromosomes from the mother.

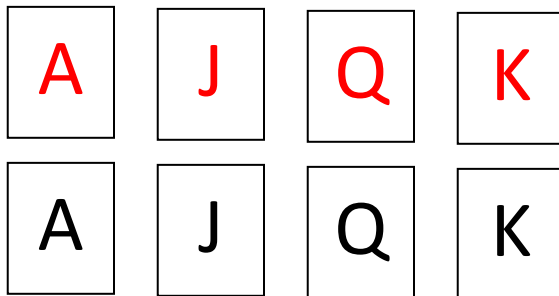
The black suites will represent chromosomes from the father.

The different suites (diamonds, hearts, etc.) represent genetic information passed on to the parents from the grandparents.

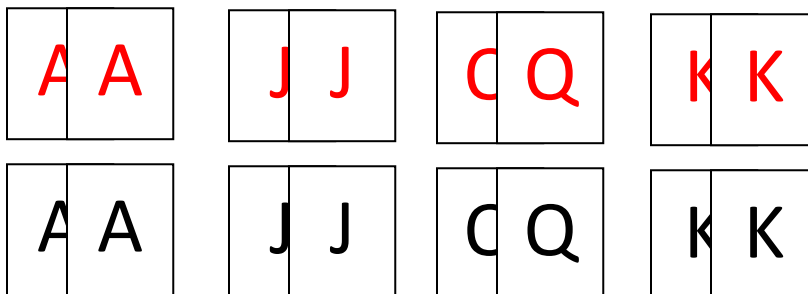
Please fill in all blanks before turning lab in. You may use external resources (textbook/worksheets) if needed.

Begin by selecting four red cards (all different) and four black cards (all different). Line them up in a parallel line. You should end up with four different numbers (four will be red and four will be black).

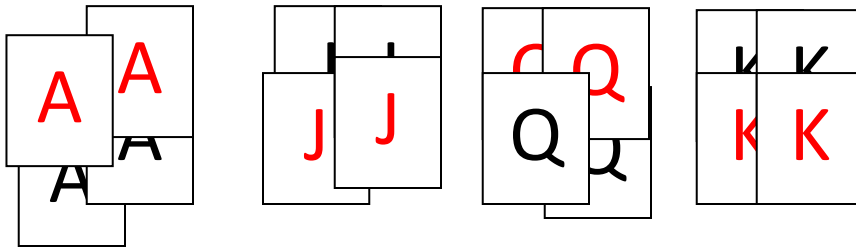
This is the G₁ phase of _____. Each card represents a _____ chromosome. This _____ (2n) cell has four pair of chromosomes. Every cell has two copies of each chromosome, one from each parent.



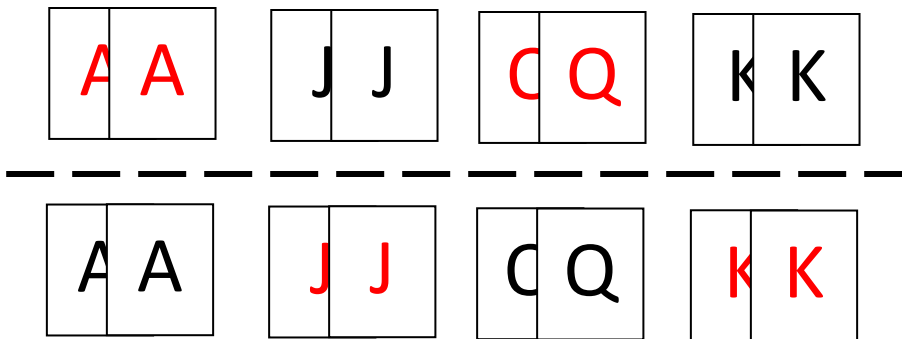
Add the additional red and black cards to their corresponding pair to simulate chromosome replication. This is _____ of interphase I. Each group of two represents a _____ chromatid. After an additional period of growth, division begins.



During _____ I of meiosis I, the homologous chromosomes and their sister chromatids are paired together into a _____ (group of four). Simulate this by combining all of the suits together. The chromosomes are packed very tightly together and _____ may occur at this time.



In _____ of meiosis the tetrads line up on the equator of the cell. The chromosomes are pulled apart in _____ I. Sister chromatids are still attached. Simulate anaphase I by separating the cards into two piles. Do this randomly so that you have some red suits and some black suits in each pile. **In meiosis, a cell membrane would form around these two groups of chromosomes, forming two haploid (1n) daughter cells.**



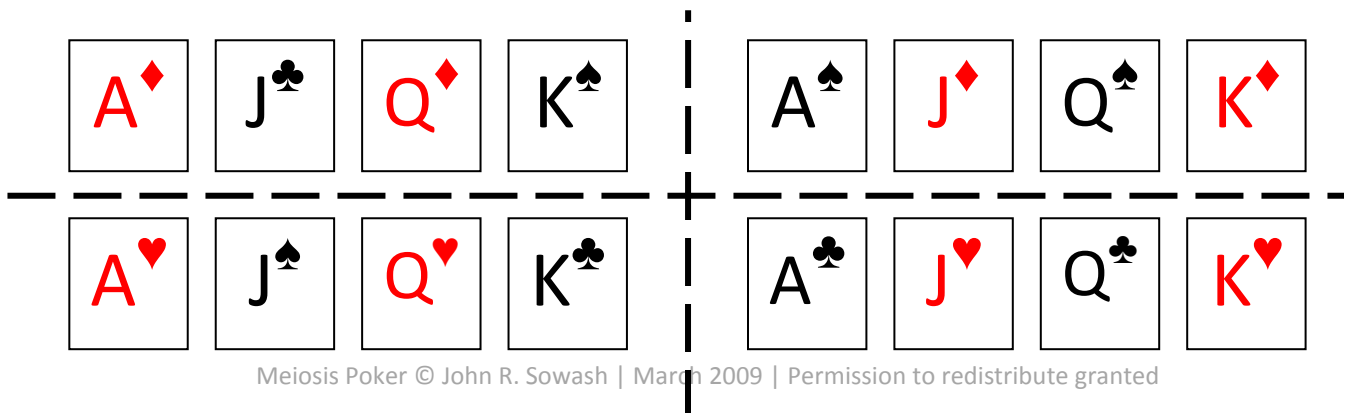
Meiosis II (occurring in each of the new cells created above)

_____ does NOT occur (no replication)

_____ II: chromosomes are already paired with their duplicate.

_____ II: Chromosomes line up on equator (center) of cell.

_____ II: chromosomes are pulled apart. Simulate this by separating your cards into four piles. Note that although you have one of each kind of card, there is a random assortment color and suits. A cell membrane would appear around each of these cells during telophase/cytokinesis. Meiosis is now complete. Four _____ (1n) cells have been created from one diploid cell. These cells are called _____.



Post-lab questions

1. **What is the benefit of starting with two copies of each chromosome in interphase I?**
2. **Why isn't there an interphase II in meiosis?**
3. **What would happen if there was an interphase II of meiosis?**
4. **How does crossover increase genetic diversity in organisms?**
5. **In the playing card model of meiosis, how could crossover be illustrated?**
6. **What do you notice about the composition of your final groups of cards in anaphase II of meiosis?**