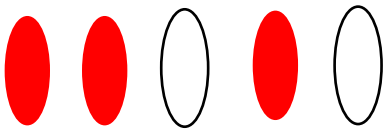
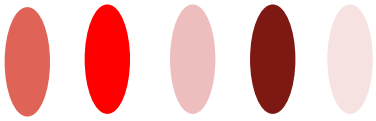
CONCEPT: PENETRANCE AND EXPRESSIVITY

- Organisms sometimes have a genotype that doesn't completely _____ their phenotype
  - There are three reasons a genotype wouldn't give the expected phenotype
    1. Environmental factors influence or mask the phenotype
    2. Influence of other interacting genes (*epistasis, modifiers, suppressors)*
    3. The phenotype is subtle and difficult to observe
  - **Penetrance** is the percentage of individuals with a given allele who exhibit the phenotype
  - **Expressivity** measures the degree to which a given allele is expressed at a phenotypic level
    - Ex: Brown fur can have different intensities of brown (light to dark)

EXAMPLE: Penetrance vs. Expressivity



Penetrance



Expressivity

PRACTICE:

1. A group of individuals exhibit a range of intermediate phenotype between dominant and recessive. What term measures this phenotype?
    a. Incomplete dominance
    b. Penetrance
    c. Expressivity
    d. Epistasis

2. Penetrance measures which of the following?
    a. The degree to which an allele is expressed
    b. The effect of two genes on a single trait
    c. A single intermediate phenotype between dominant and recessive
    d. The percentage of individuals with a given allele who exhibit the phenotype