

# Chapter 16

## Section 2

# Allele Frequencies

Scientists wondered if \_\_\_\_\_  
alleles were more \_\_\_\_\_ than  
recessive alleles.

Hardy and Weinberg showed that the \_\_\_\_\_ of alleles and the ratio of heterozygous and homozygous does not \_\_\_\_\_ from one \_\_\_\_\_ to the next.

It only changes if there is something that acts on one like a \_\_\_\_\_ dominant.

Hardy-Weinberg principle-- states that the \_\_\_\_\_ of alleles in a population do not change \_\_\_\_\_ evolutionary forces act on a \_\_\_\_\_.

HW holds true if a population is  
\_\_\_\_\_ enough that its members  
will not mate with \_\_\_\_\_ AND as  
long as evolutionary forces are not  
\_\_\_\_\_.

# Five principles of evolution:

Mutation

Gene Flow

Nonrandom mating

Genetic drift

Natural Selection

## Mutation

Most genes only mutate 1 to 10 times per \_\_\_\_\_ cell divisions.

Mutation though is the \_\_\_\_\_ of variation.

## Gene Flow

The movement of individual  
\_\_\_\_\_ into or out of a population.

Gene flow occurs because \_\_\_\_\_  
or emigrants add or \_\_\_\_\_ alleles.

## Nonrandom Mating

Some individuals prefer to mate with others that line \_\_\_\_\_ or are of their own \_\_\_\_\_.

## Interbreeding

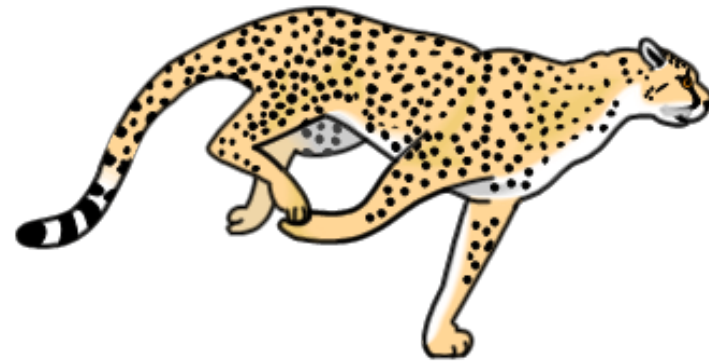
The entire population of Old Order Amish of Pennsylvania (17,000) are descended from only a few \_\_\_\_\_.

As a result 13% of the people are \_\_\_\_\_ recessive for a rare allele that is a disease with a combination of dwarfism and \_\_\_\_\_ fingers.

Since the early 1770's  
\_\_\_\_\_ cases have been  
reported this is about as  
many as the rest of the world

## Genetic Drift

A fire or landslide can reduce a large population to a \_\_\_\_\_ group. This can have a major effect on a population.



## Natural Selection

The frequency of an allele will change \_\_\_\_\_ on the allele's effects on \_\_\_\_\_ and reproduction.

Natural Selection acts on \_\_\_\_\_  
not on \_\_\_\_\_ because it does not  
change actual alleles.

Rare \_\_\_\_\_ alleles cannot be affected until the traits are showed.

This would mean that \_\_\_\_\_ individuals will have to mate to create homozygous \_\_\_\_\_ alleles.

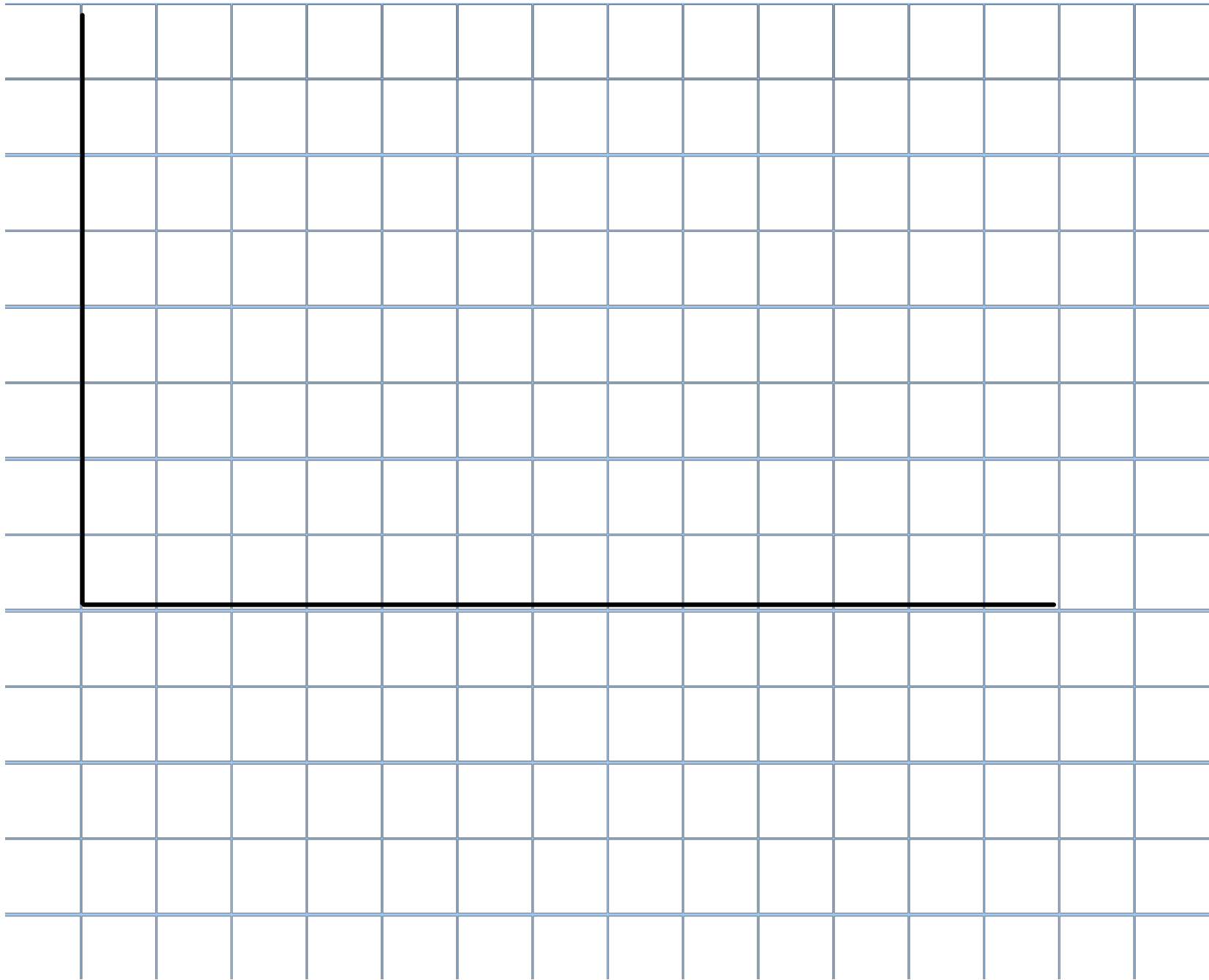
For example hemophilia has the potential of causing \_\_\_\_\_ from uncontrolled \_\_\_\_\_.

This would remove the homozygous person from the \_\_\_\_\_, but since heterozygotes do not \_\_\_\_\_ hemophilia they are not \_\_\_\_\_ and so that condition still exist.

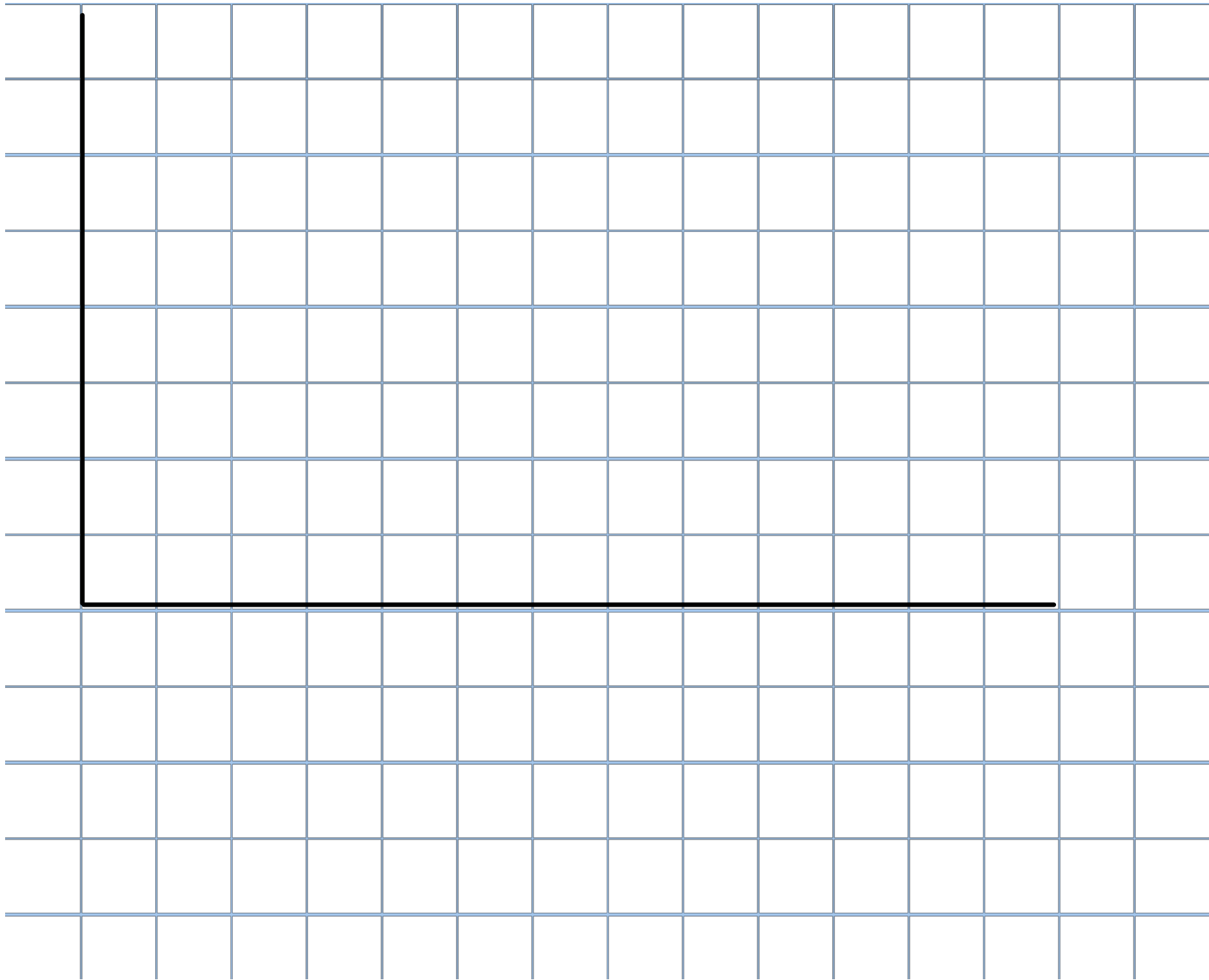
If a recessive allele is homozygous in only 1 out of 100 then \_\_\_\_\_ out of 100 will be heterozygotes. So \_\_\_\_\_ selection can only act on 1 out of every 19 \_\_\_\_\_ that carry the allele.

Polygenic \_\_\_\_\_ - a trait that influenced by several genes like human \_\_\_\_\_ and hair color.

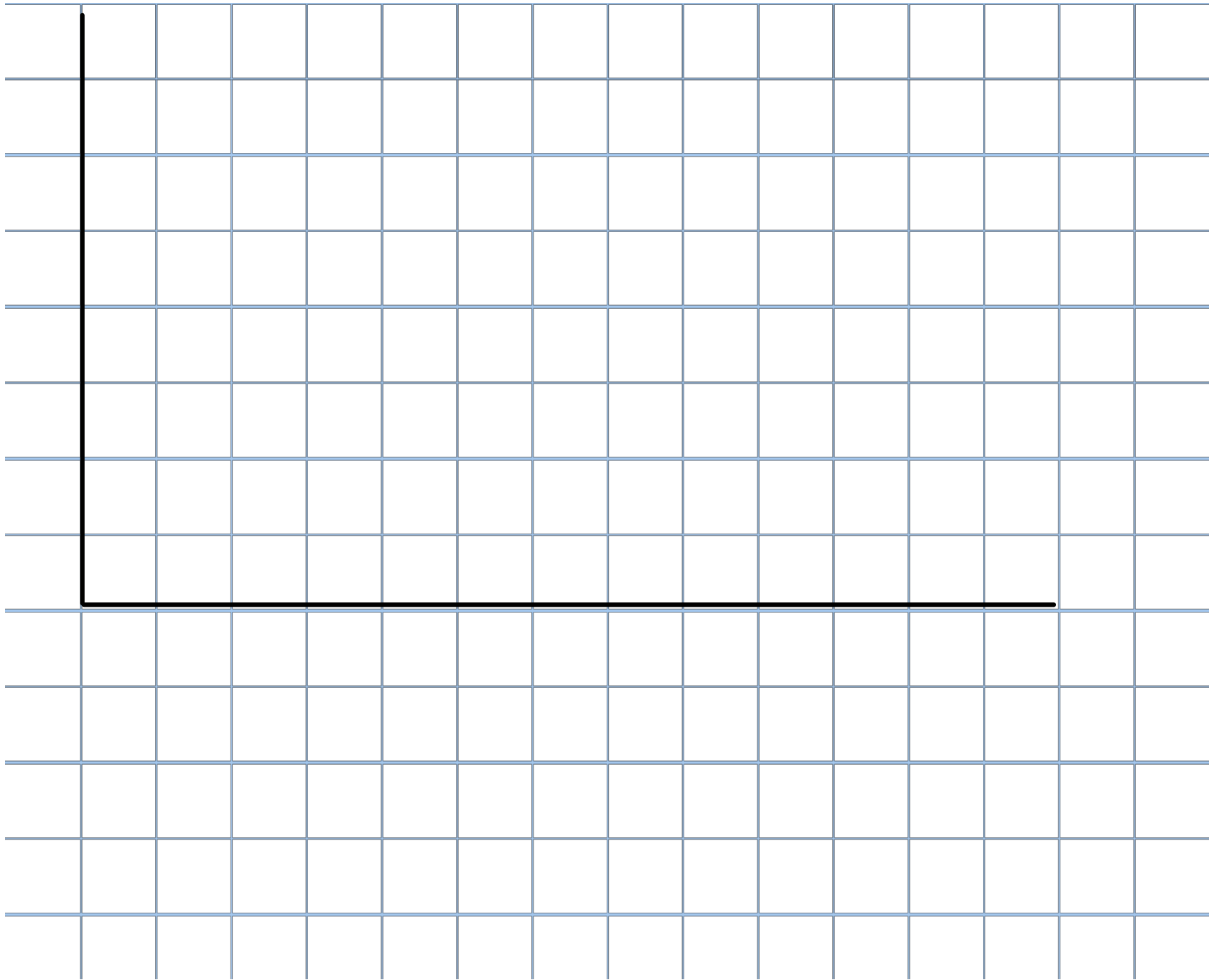
Polygenic traits exhibit a range \_\_\_\_\_ around an average.



Normal distribution----  
hill-shaped \_\_\_\_\_ with the  
average as the summit.



When selection eliminates one  
\_\_\_\_\_ and the selection moves on  
one \_\_\_\_\_ this is called  
directional selection. This is also  
\_\_\_\_\_ by single-gene traits



When selection eliminates extremes at both ends of the \_\_\_\_\_, then the frequency of the intermediate increase. This is called \_\_\_\_\_ selection.

