## Name: Date: Period:

Genetics and Structure Study Guide

**Traits and Heredity**

1. Where is DNA located in your cells?

In the nucleus

## What are the four chemical bases that make up DNA? Which match up?

Adenine/Thymine and cytosine/guanine

## If DNA is made of only four chemicals, how does it contain so much information?

It is the order and combination of chemicals that code for the information, like morse code

## What is the difference between a gene and a chromosome?

A gene is a small section of a chromosome that contains the info for ONE trait

## What is the difference between inherited and acquired traits?

Inherited traits are controlled by DNA, acquired traits are not genetic

## What is the difference between a dominant and a recessive trait? Give an example of each.

A dominant trait (like free earlobes) masks a recessive trait (like attached earlobes)

## Are dominant traits always more common in a population than recessive? Explain.

No, although it is more likely that dominant traits would be more common because they cover up other traits, if the dominant trait is not favorable, it may not be common because organisms with this trait don’t reproduce very often

## What is the difference between a pure-bred and a hybrid?

Pure-bred organisms have 2 copies of the same gene (AA or aa), hybrids have two different copies (Aa)

## What do the words homozygous and heterozygous mean?

Homozygous is the same as pure-bred, heterozygous the same as hybrid

## What is the difference between genotype and phenotype?

Genotype is the combination of genes an organism has, phenotype is the physical trait of the organism

# Use this information to answer the following questions.

## Long horns (H) Short horns (h)

Tail (T) No tail (t)

No spots (G) Spots (g)

1. Write the genotype of a creature that is a pure-bred long horn, hybrid for tail, and has spots.

HH Tt gg

## What is the phenotype of this creature? Hh tt GG

Long horns, no tail, no spots

# Reproduction

## What is the difference between sexual and asexual reproduction?

Asexual reproduction passes down an exact copy of genes, sexual reproduction is a new mix of genes from two

organisms

## Name three ways that organisms can reproduce asexually.

Budding, regeneration, cloning, fragmentation, vegetative propagation

## Give three examples of organisms that reproduce asexually.

Starfish, bacteria, amoebas, many plants, some worms

## Give examples of organisms that reproduce sexually.

Mammals, birds, some plants

1. Name two **advantages** to reproducing sexually.

New combinations, more adaptable, sometimes more parental care

1. Name two **disadvantages** to reproducing sexually.

Some combinations produce bad offspring, you need two have two organisms

1. Name two **advantages** to reproducing asexually.

Only takes one organism, offspring have the same traits as the parent

1. Name two **disadvantages** to reproducing asexually.

Hard to adapt to the environment if it changes, no parental care

## If you lived in an environment that changes a lot, which would be a better way to reproduce?

Sexually—more variety in traits

# Adaptations

## What is an adaptation?

An inherited trait that helps an organism survive in its environment

## What is a structural adaptation? Give an example.

A physical trait. Trunk of an elephant, giraffe’s neck, a tiger’s stripes, bird wings

## What is a behavioral adaptation? Give an example.

An action or behavior of an organisms that helps it survive. Hibernation, flying, stalking prey, building nests

## How are adaptations connected to genetics?

Adaptations are passed on genetically

1. List some PLANT adaptations that would be useful in each of these environments: Tundra—*Grows low to ground, dark color* Wetlands—*Can float, waxy covering*

Desert—*Small leaves, spines* Deciduous Forest—*Broad leaves, grow in layers*

1. List some ANIMAL adaptations that would be useful in each of these environments: Prairie—*Burrow into ground, live in herds* Taiga—*Fur turns white, hibernation*

Temperate Rainforest—*small antlers, dark fur* Tropical Rainforest—*live in trees, beaks for fruit*

1. Give an example of an adaptation that would be useful to an organism in one environment, but harmful in another environment. *Large ears to lose heat in the desert would be a disaster for the tundra or the taiga*

## Explain how camouflage can be both a structural and a behavioral adaptation.

Animals often LOOK like their environment, but they must act in certain ways for the camouflage to work. They

must hold still and be in the right place to blend in. Some even ACT like objects (like leaves in the wind)

## What is mimicry? Give an example.

Trying to exactly match the color of your environment—a white seal in the arctic

## How is mimicry different from disguise? Give examples of each.

Mimicry is trying to look like another animal (like a poisonous snake when you aren’t poisonous), disguise is trying to look like something in your environment (like a rockfish or a leaf gecko)

## Shape can be important to adapting. List 3 shapes of bird beaks and what the bird would eat.

Duck bill: Plants and small fish Hawk beak: tearing flesh of prey

Woodpecker: chisel-like beak for digging out insects

## Give another example, besides bird beaks, of how the shape of a body part can be an adaptation.

Monkey tail, duck feet, elephant trunk

## Explain why pollution in England caused Peppered moth populations to change color.

Lighter colored moths didn’t blend in as well, got eaten more, and therefore did not reproduce as much as the black ones that could blend in

1. Do individuals creatures adapt or do adaptations form over an entire population? **Explain.** *Populations. Individuals cannot change their genetic traits. Populations change over time due to which organisms reproduce and pass on traits.*

## What is natural selection?

Organisms that fit their environment better will survive more and pass on their traits when they reproduce

## How does natural selection influence adaptations?

Whatever has the best traits will reproduce more, over time this means that some adaptations will become more common

## Give two examples of how selective breeding has changed a common plant or animal.

Selective breeding has changed dogs, cows, horses and most of the crops that we eat

## What is hybridization.

Hybridization is when you breed two very different organisms, inbreeding is when you breed two closely related organisms

## Give two examples of genetic engineering (genetic modification).

BT corn with its own pesticide, glow in the dark cats

## Give two examples of how genetic modification can be beneficial to us.

It can increase the production of crops with built-in pesticides and crops that are bigger. It can produce salmon that grow faster and it can correct genetic defects

## Give two risks that come with genetic modification.

Crops that are genetically engineered may pollinate natural plants. Genetically engineered products may

contain components that can trigger allergies.