

I. Make vocabulary flips of the following words:

Trait- a characteristic

Gene-a set of instructions for a trait

Alleles-different forms of a trait

Dominant- a trait that will always show itself

Recessive- a trait that stays hidden unless both genes are recessive

Genotype- the genes present for a trait

Phenotype- the trait that shows up for the genes

Homozygous- an organism that has the same alleles for a gene

Heterozygous- an organism that has different alleles for a gene

- Take a normal lined paper. Fold the top to the bottom. Fold top to bottom again.
- Cut into 4 flip books.
- Write the word on the outer flap, definition on the glued down flap and a picture of the backside of the word.
- These go in the notebook on page 98 (Genetics Vocabulary)

2. Read the 2 readings and answer the questions (to replace the video you will miss).

3. Turn in your notebook when you return!

# Cloning

When many people think of cloning, they think of putting an animal or person in a machine, pressing a button and having an exact copy come out. Cloning is much more complicated than this idea.

A clone is really a genetic copy of another living thing. Some cloning is really simple. For example, some plants can send off shoots to create a new genetically identical plant. But most cloning is much more difficult.

To create a clone, there are several steps and at least two animals involved. A cell is taken from one animal and the nucleus is removed. Then another cell from a different animal is taken and the DNA is taken out of it (this is the DNA for the clone). The DNA is put carefully into the empty cell. Then a jolt of electricity is put on the egg. This tricks the egg into acting as if it is a new cell developing. Once it is large enough it is moved to the uterus of an animal (normally of the same species) and develops normally (stays in the uterus and grows until it is born).

The first animal to be cloned was a tadpole in the 1970's. The first mammal to be cloned was a sheep named Dolly in 1997. Scientists have cloned other animals since then, including cows, pigs, mice rabbits, goats and cats.

Some other animals have been more difficult to clone and no one successfully has done it. For example, people have tried but not cloned chickens, dogs, horses and monkeys. For some species, the egg does not develop after the new DNA is put into it. Even in successful cloning, it takes many tries and a long time. Dolly was the only successful egg out of 276 times they tried!

Many scientists think cloning will be very useful. Some scientists study cloning endangered, or even extinct, species. Two types of endangered species have been cloned, a gaur (a type wild ox) and a mouflon (a type of wild sheep). If animals can be made with special qualities, they can be cloned. For example, scientists hope to clone pigs that have organs that people can use.

There are many problems with cloning. It is expensive and doesn't work very well. Only about 1 in 100 attempts create a living clone. One problem with cloning is that many clones have died early or developed diseases quickly. When scientists studied, it they discovered that some of the genes are not working correctly.

It doesn't look like anyone will clone a human anytime soon. Since only about 1 in every 100 eggs created becomes a living thing, scientists are concerned that cloning people would be wrong. Since clones often die young or develop diseases, many people think we must know a lot more about cloning before we could clone other

primates like humans. We can see what happens to the animals, but we don't know what it could do for a human's ability to think.

[http://www.ornl.gov/sci/techresources/Human\\_Genome/elsi/cloning.shtml](http://www.ornl.gov/sci/techresources/Human_Genome/elsi/cloning.shtml)  
<http://www.howstuffworks.com/cloning.htm>

## Cloning Questions

1. What is a clone?
2. A \_\_\_\_\_ is taken from one animal and the nucleus is \_\_\_\_\_. Then another \_\_\_\_\_ from a different animal is taken and the \_\_\_\_\_ is taken out of it (this is the DNA for the clone). The \_\_\_\_\_ is put carefully into the \_\_\_\_\_ cell. Then a jolt of \_\_\_\_\_ is put on the egg.
3. Why is cloning difficult?
4. What is 1 way cloning can be used?
5. What are 2 problems with cloning?
6. Why are scientists not trying to clone people?

## Twins

There are 2 kinds of twins, identical and fraternal. Most of the time we notice identical twins because they look the same, but there are different kinds of multiple births.

Identical twins come from the same egg. The egg divides into two and there are two individuals with the same DNA and traits. They will be the same gender (two boys or two girls). The two ways they are not identical is their fingerprints and teeth marks. They will similar foot and hand shape, but have unique fingerprints from each other. About one in every 250 births are identical twins.

Fraternal twins come from two eggs that are fertilized at a similar time by two different sperm. Most of the time the mother produces more than one egg in a month. These two eggs develop differently. They have different genes, so they will look different. They can look as different as any brothers and sisters. They can be the same gender or they can be different genders. The chances of having a fraternal birth are about one in 60.

Sometimes more than two babies can be born at the same time. They can be all fraternal, all identical or a combination of both identical and fraternal. This is less common than identical or fraternal twins.

No one really understands what causes twins. Identical twins seem to be more likely to happen to older and younger mothers. More mothers are using hormones to help have children. Sometimes the hormones help the woman by creating more than 1 egg each month. Some women are more likely to have fraternal twins because they naturally create more than one egg at a time. Fraternal twins can run in families, so many people think there is a genetic link. Mothers of fraternal twins are more likely to be over 35.

Sometimes twins are born attached in some way. These are called conjoined twins. The term Siamese twins came from a very famous pair of twins who were an exhibit in the American Museum (P. T. Barnum). This happens when the egg does not fully separate and the twins are born connected in some part of the body. This happens in one out of 200,000 births. The twins are girls 70% of the time. Conjoined twins are not likely to survive (only 5% of the time).

There are a few interesting facts about twins. Twins are more likely to be left-handed. Over one-third of twins are left handed, but about one in ten people are left-handed. Twins are likely to have similar personalities even if they are raised in separate homes. The twin birth rate has gone up in the last 25 years.

<http://www.nomotc.org/>

<http://www.twinsworld.com/stats.html>

<http://www.answers.com>

[http://www.keepkidshealthy.com/twins/twin\\_statistics.html](http://www.keepkidshealthy.com/twins/twin_statistics.html)

## Twins

1. What are the 2 types of twins and how are they different?
2. Why do identical twins happen?
3. Why do fraternal twins happen?
4. How likely is someone to have twins?
5. What is a conjoined twin and how does this happen?