

* ANSWER KEY *

~~Genetics~~ Review Packet

BIOTECHNOLOGY

Section 1: Vocabulary Matching

Match each definition to the word it correctly describes

M Genetic Modification
G Selective Breeding
A Gel Electrophoresis
J Restriction Enzyme
K Recombinant DNA
F Transgenic Organism
E Plasmid

I Human Genome Project
C Gene Sequencing
H Gene Therapy
L Vector
B Stem Cell
D Clone
N DNA Ligase

- Process which creates a DNA fingerprint by applying electricity to DNA fragments
- Undifferentiated cell
- The process of determining the order of nucleotides in a segment of DNA
- An identical copy of an organism
- Small ring of DNA, typically seen in bacteria
- An organism with recombinant DNA
- Choosing organisms to breed together in an effort to achieve a certain genetic outcome
- Inserting healthy DNA segments into organisms to replace damaged or faulty segments
- A project which lasted from 1990-2003 through which the entire human genome was sequenced
- Protein that cuts DNA when it encounters certain sequences
- A DNA segment which is made up of the DNA of more than one organism
- Used to deliver DNA into cells during gene therapy
- Any change or human influence to a DNA sequence
- Binds together sticky ends of DNA

Section 2: True or False

- T F An ethical concern of genetically modified crops is that farmers cannot contain the organism's spread
- T F A paternity/maternity test uses a DNA fingerprint to determine heredity
- T F Choosing which cows breed together in hopes of offspring having specific genes is an example of gene therapy
- T F During gel electrophoresis, DNA travels from the positive end of the gel toward the negative end of the gel
- T F Cloning is a biotechnology used to treat diseases

Section 3: DNA Fingerprinting

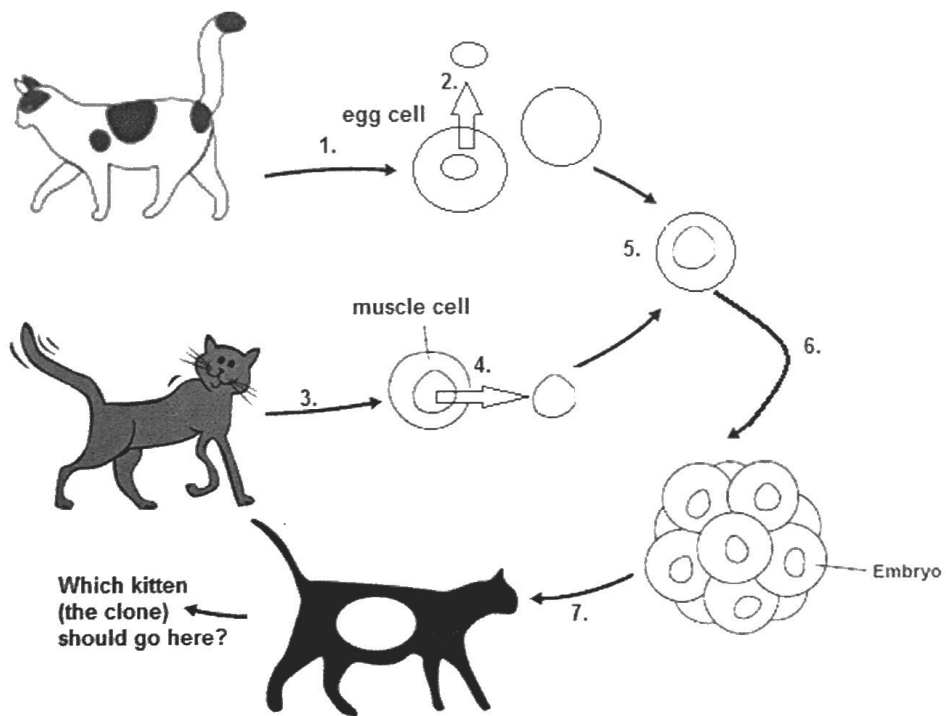
Place the steps in the correct order using the numbers 1-7


- 5 The DNA begins to move towards the positive side of the chamber.
- 7 The gel is taken out of the chamber and stained.
- 1 DNA from blood or other tissues is collected and restriction enzymes are added to the DNA sample.
- 6 The DNA separates based on size, with smaller fragments traveling further towards the positive end.
- 3 Small amounts of DNA are placed inside each of the wells using a micropipette. Each time a new sample is loaded, a new tip is placed on the end of the micropipette.
- 4 The chamber is then hooked up to an electrical source.
- 2 A gel electrophoresis chamber is set up. Inside is a gel with wells at the negative end of the chamber.


Section 4: Cloning


Place the steps in the correct order using the numbers 1-8

- 6 Let the egg cell divide to form an embryo.
- 5 Place the diploid nucleus into the egg cell. This has the full set of chromosomes.
- 8 The cloned animal is born.
- 1 Take an egg cell from a female.
- 4 Remove the nucleus from the diploid cell.
- 7 Place the embryo into a surrogate female.
- 2 Remove the haploid nucleus. The nucleus must be removed or there will be too many chromosomes.
- 3 Take a diploid cell from an animal.









Circle the correct clone.

Explain the process of cloning using complete sentences: _____

Explain the process of gene therapy using complete sentences: _____

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