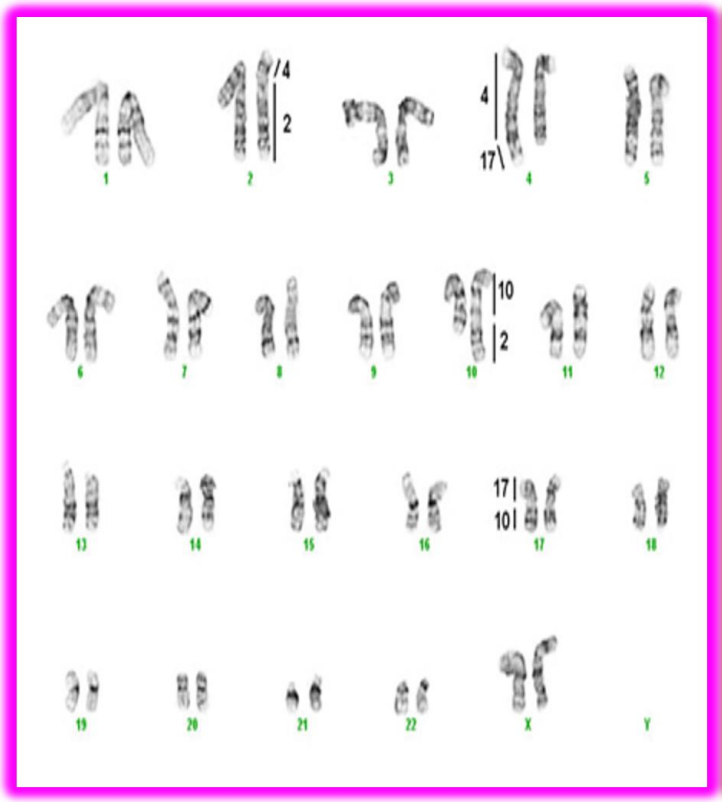
Part 6 Karyotypes, Genetic Disorders, Bioethics

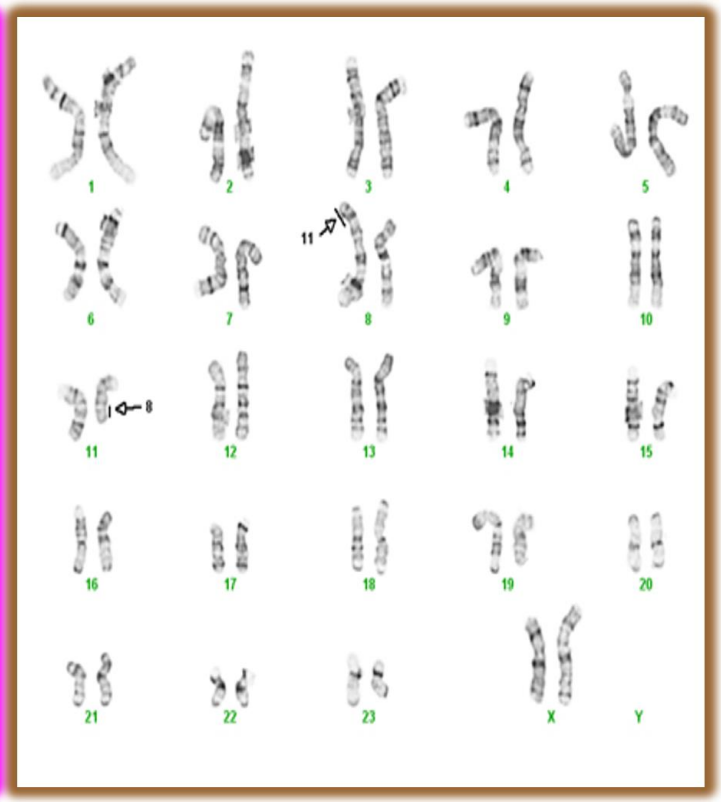
Name:
Due:

Part 6 Lesson 1 Karotypes and Genetic Disorders

Karyotype: The number and visual appearance of the _____ in the cell nuclei of an organism or species.

Which is the human, and which is a chimpanzee karyotype? Why? Male or Female?





In humans, they're _____ numbered pairs of chromosomes called _____.

The _____ pair of chromosomes are the sex chromosomes.

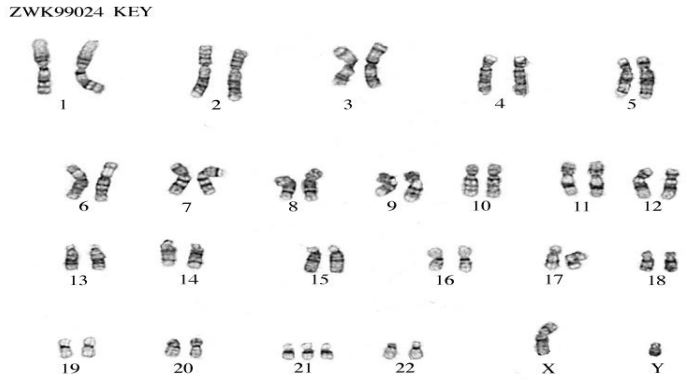
They determine an individual's gender.

Females have _____ chromosomes,

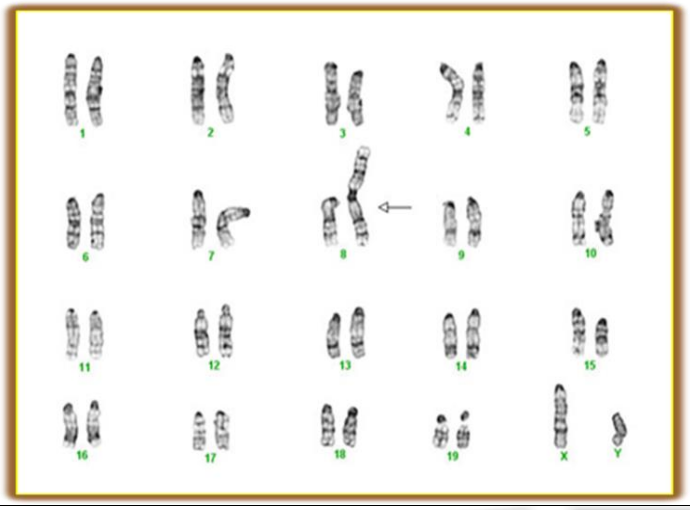
Males have an _____chromosome.

Which sex chromosome is which? Which is a male, and which is a female?

Please describe any abnormalities in the karyotypes below and provide information about the disorder / syndrome? Male or Female?



Is this a mouse or human karotype? Why?



Can you find the abnormality in this karyotype? Describe below.

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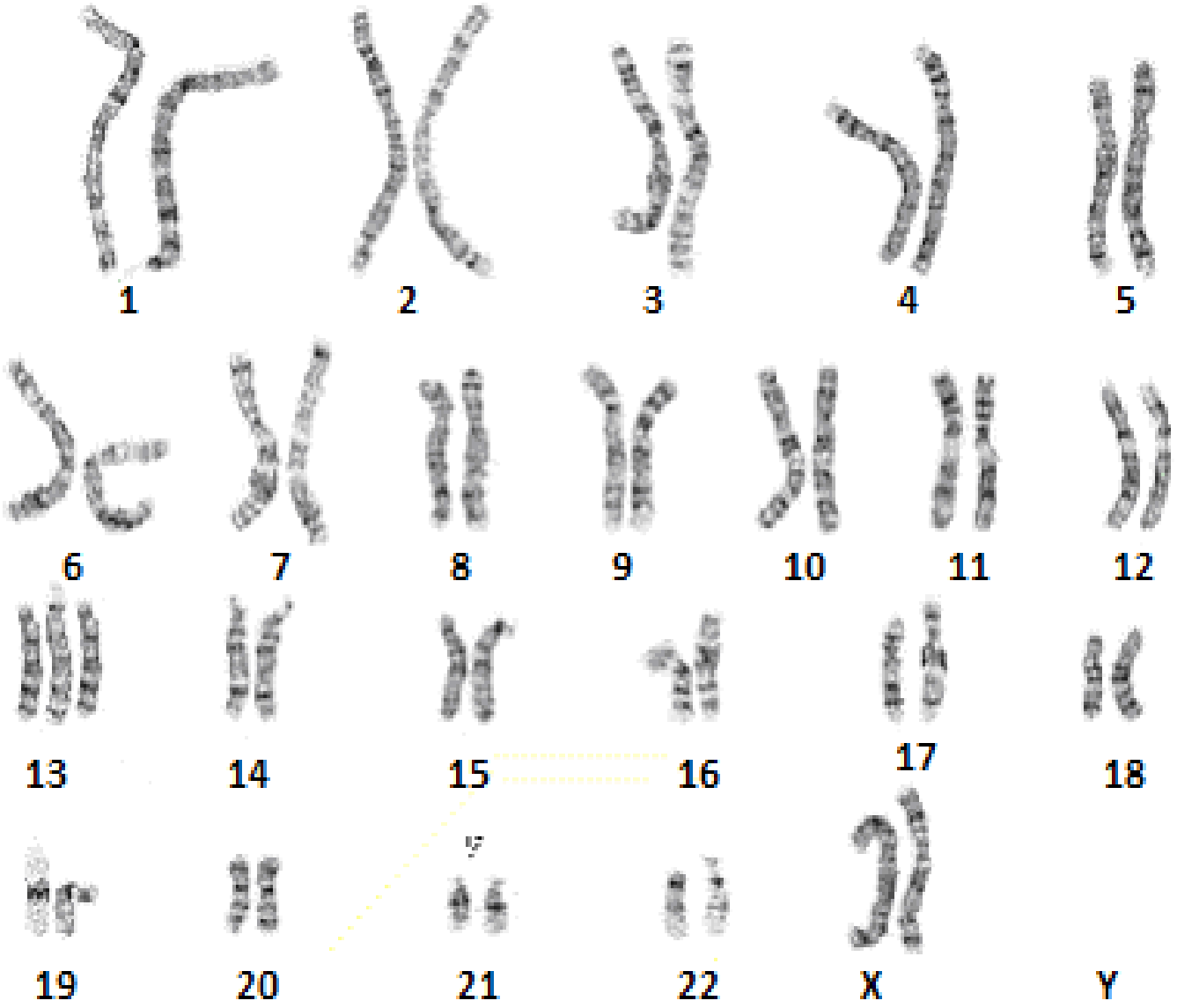

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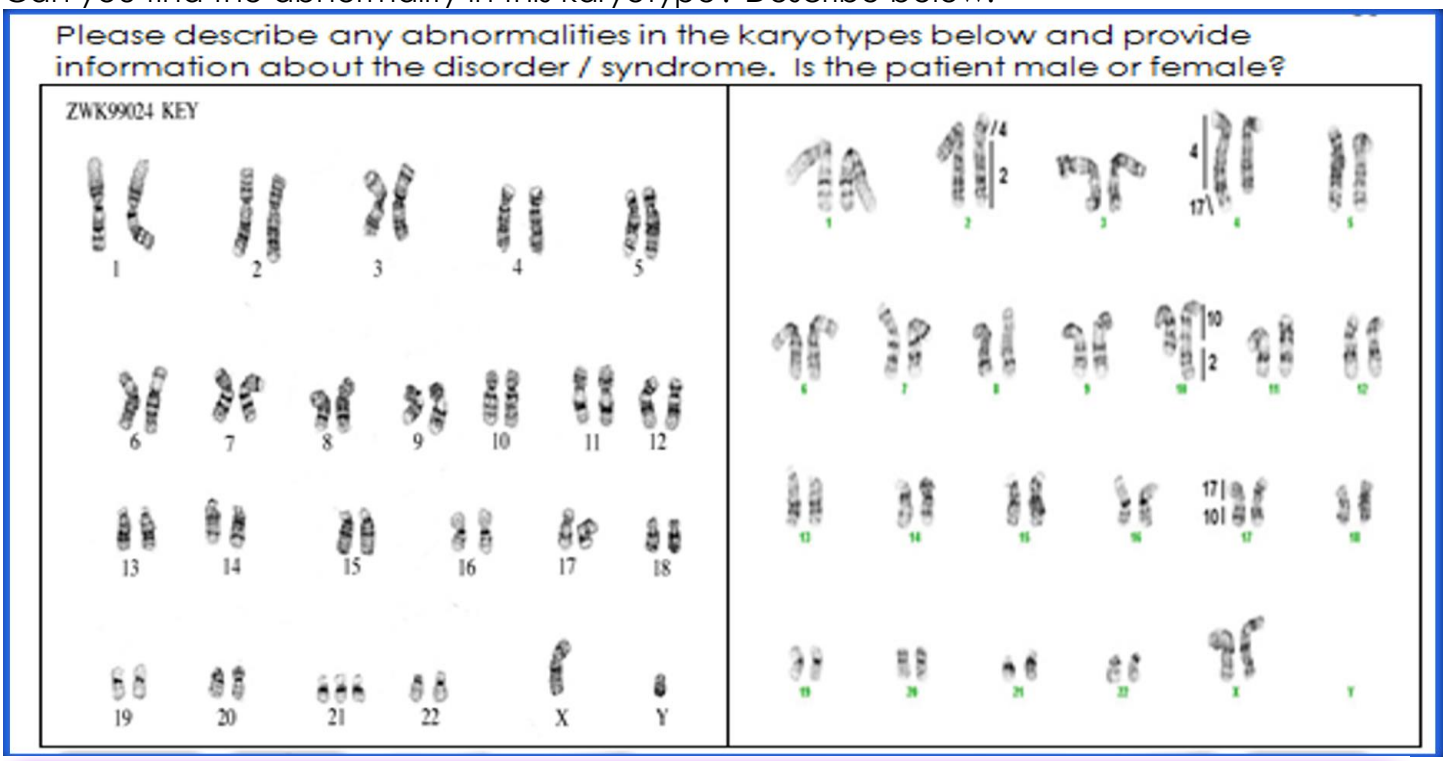
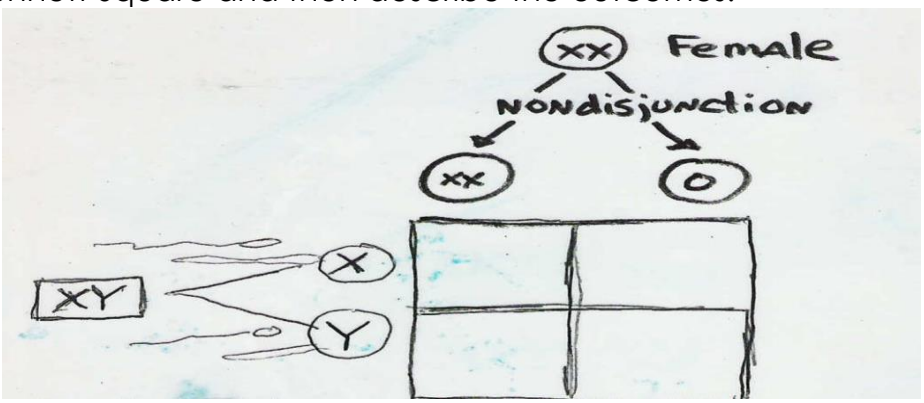
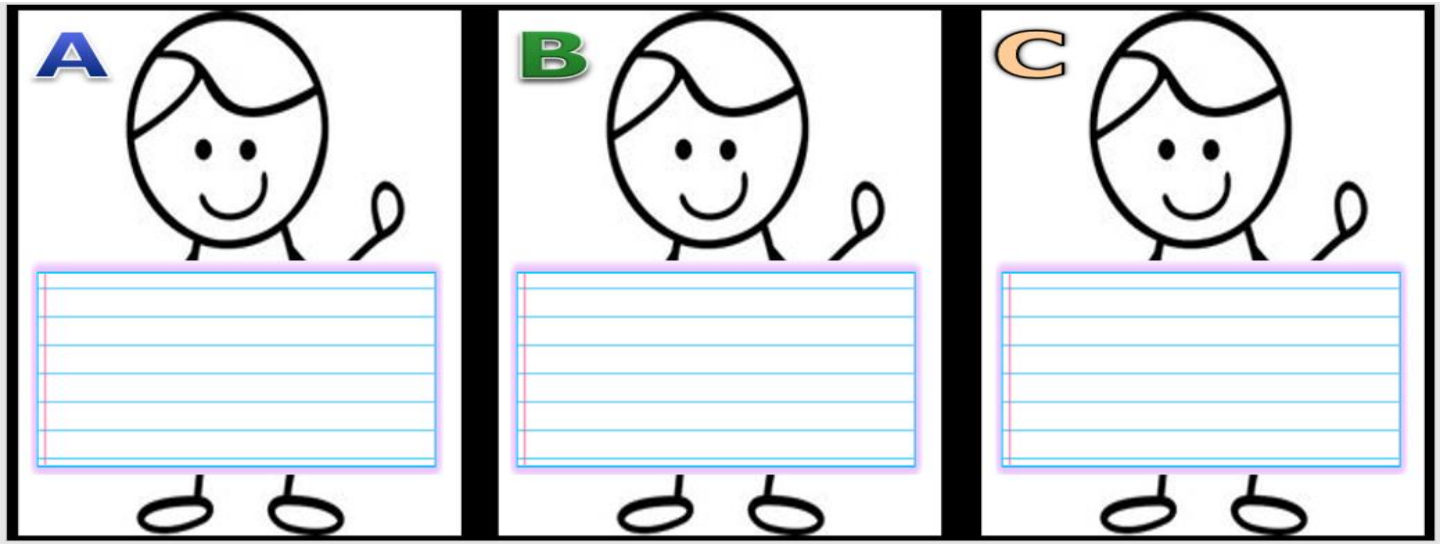


Can you find the abnormality in this karyotype? Describe below.

Complete the Punnett Square and then describe the outcomes.



Virtual Karyotype Lesson (Easy / Quick Option without cutting out 46 chromosomes)
http://www.biology.arizona.edu/human_bio/activities/karyotyping/karyotyping.html
Tell me about their karyotype / disorder as you navigate the site above. Additional Research = ☺ teacher



Genetic Disorder Help Center
Part 6 Lesson 2 & 3 Research and Present Genetic Disorder Partner:

Name of the genetic disorder facing your child_____

How did you and your partner meet? (For those with partners)_____

Describe information about your disorder (Example-It is caused by recessive…)

What are the symptoms of this disorder? _____

What are the health effects of this disorder?_____

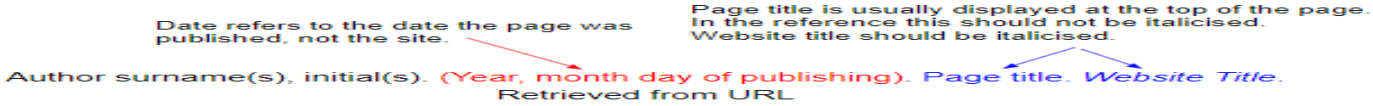
What, if any, are the treatments to this disorder?_____

Additional Information for Center Discussion:_____

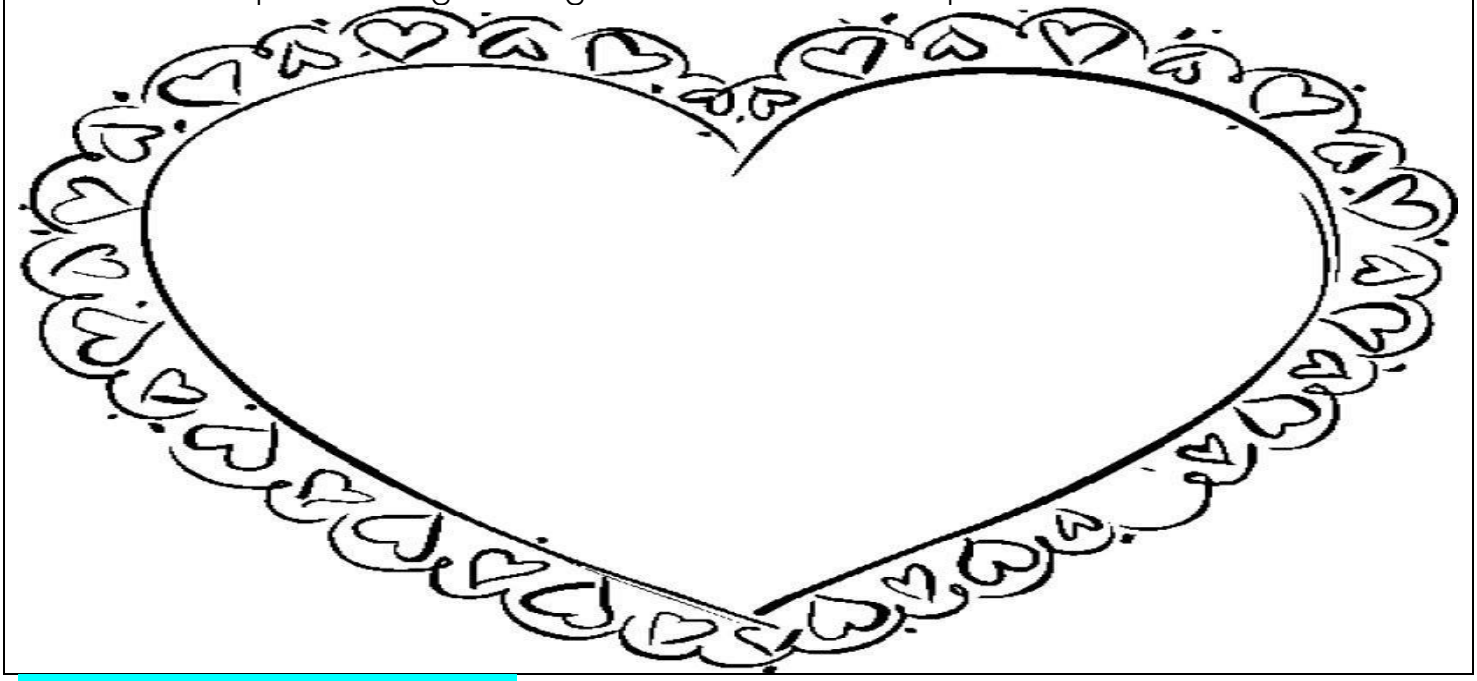
In the next science class you will be participating in an activity that requires you to attend a help group with your spouse. You are required to bring your drawing or a doll with you for the discussion. **You are also required to have knowledge of everything mentioned on this sheet**. You will be graded on your knowledge of the genetic disorder and participation. I will be calling on you to share information about your disorder to the class, and expecting you to be very dramatic.

Please prepare a short introduction that you will speak to the class. Your introduction should include…
-Your names
-Child's name
-Genetic disorder your child has
-How you found out
-What you felt like/your concerns
-How your life has changed
- -Treatment
- - Lifestyle changes
- - What is the hardest part?
- - Who helps you?
- How has this disorder affected your marriage?

Sources:



Please reflect upon learning about genetic disorders in the space below.



Part 6 Lesson 3 Issues in Bioethics

Bio-ethics: The study of ethical issues raised by the developments in life science _____.

SINKING SHIP Optional Lesson -What do we value?

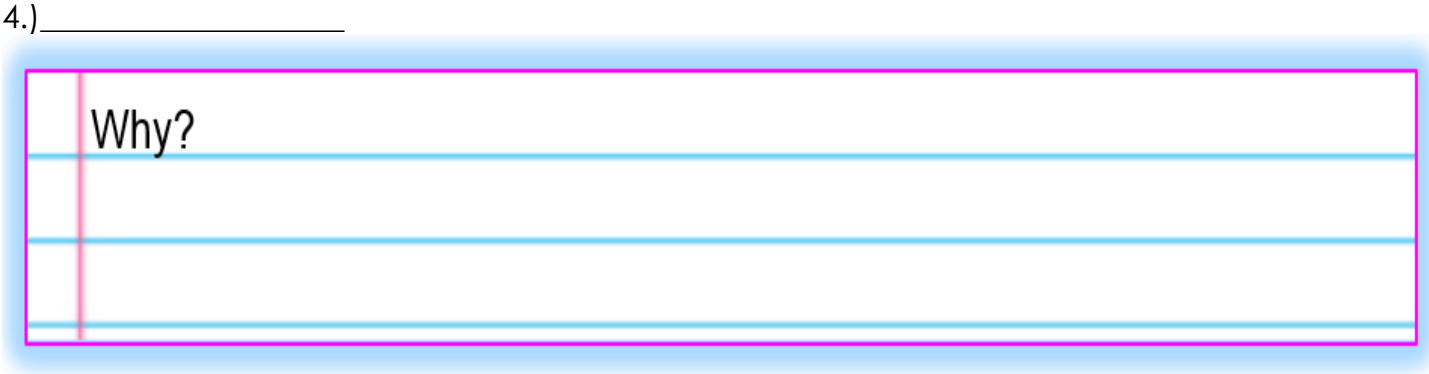
In the following exercise, you asked to make a difficult decision. You are the captain of a sinking ship. There is only one life boat and it can only hold 8 people. A large storm is arriving and hanging over the edge or overloading the boat is out of the question. No distress call was made so help is unlikely. Currents should bring the boat to shore in a few days. Please choose which 8 people should be allowed to board the raft.

1.)_____

2.)_____

3.)_____

4.)_____



5.)_____

Why?

6.)_____

Why?

7.)_____

Why?

8.)_____

Why?

#1) 28 year old Woman who is six weeks pregnant.
#2) 70 year old former Marine with combat experience.
#3) Recently married couple (third marriage) ages 44 and 56. (2 people)
#4) Senior citizen who worked for 50 years in a charitable organization.
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#7) 22 year old gay male who runs a homeless shelter in the city.
#8) 65 year old Doctor who claims to have the cure for cancer.
#9) 35 year old male popstar with ideas for new hit single.
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#11) 24 year old released convict who did time for using drugs
#12) 65 year old pharmaceutical executive worth billions.
#13) 12 year old boy with down syndrome, son of pharmaceutical executive.
#14) 29 year old female house keeper who is an undocumented worker.
#15) 9 year old honor roll student of the undocumented worker.
#16) 16 year old obese boy. Counts as two people due to weight limits / raft.
#17) U.S. Senator age 65 with 30 years of service to the country
#18) 54 year old wheel chair bound U.S. Gold Medal Paralympian

Part 6 Lesson 4 GMO's

What are GMO's?

Why use them now?

Are they dangerous?

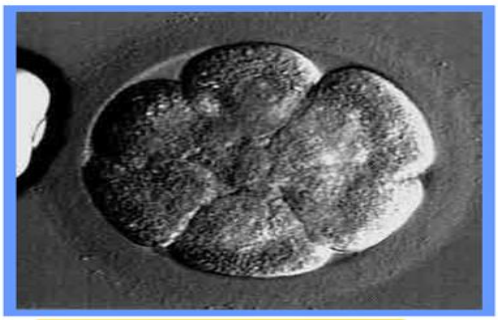
Are they regulated?

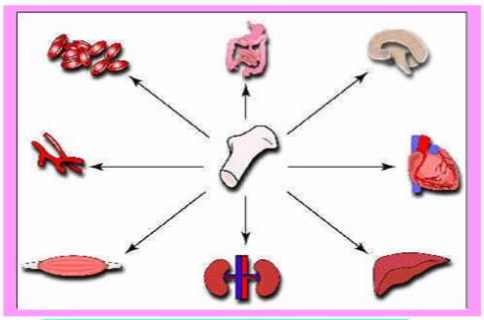
What does the opposition say?

Part 6 Lesson 4 and 5 Issues in Bioethics Stem Cells and Cloning

Stem cells**:** Cells that have the remarkable potential to develop into many different cell _____ in the body.

What are the three types of stem cells?





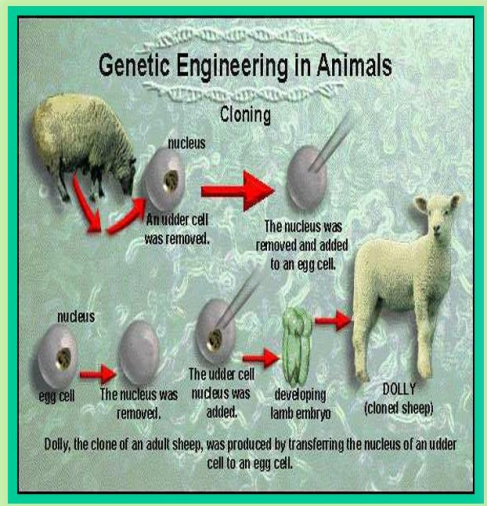
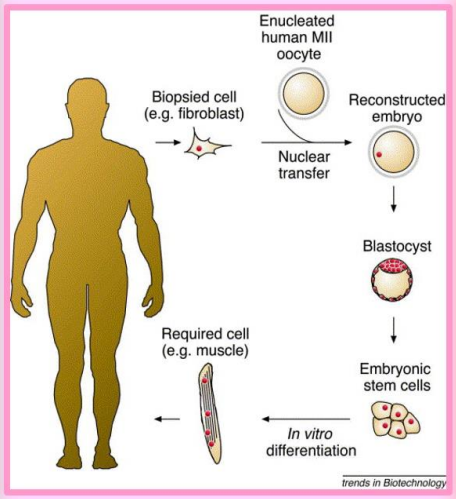
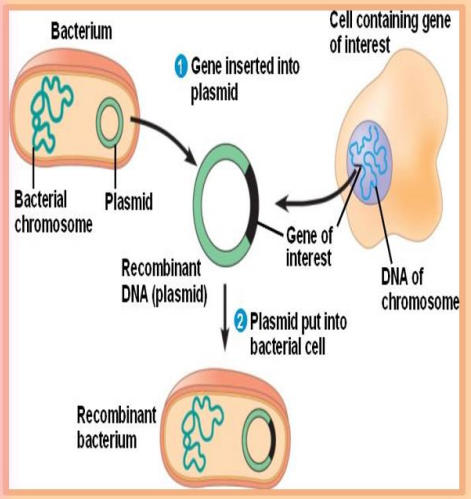
What are some of the arguments for both sides of the stem cell debate.

Cloning: A method of reproduction used to copy a cell or an individual (producing a clone) from their _____.

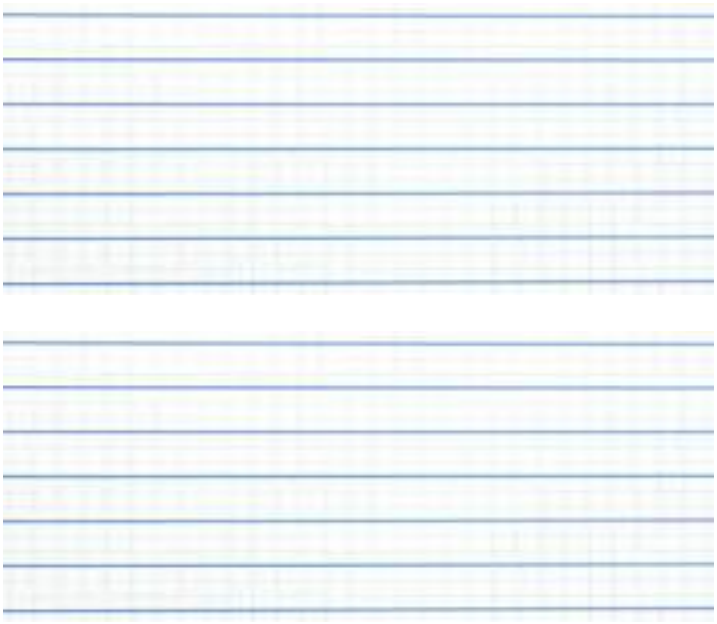
Three different types of cloning:

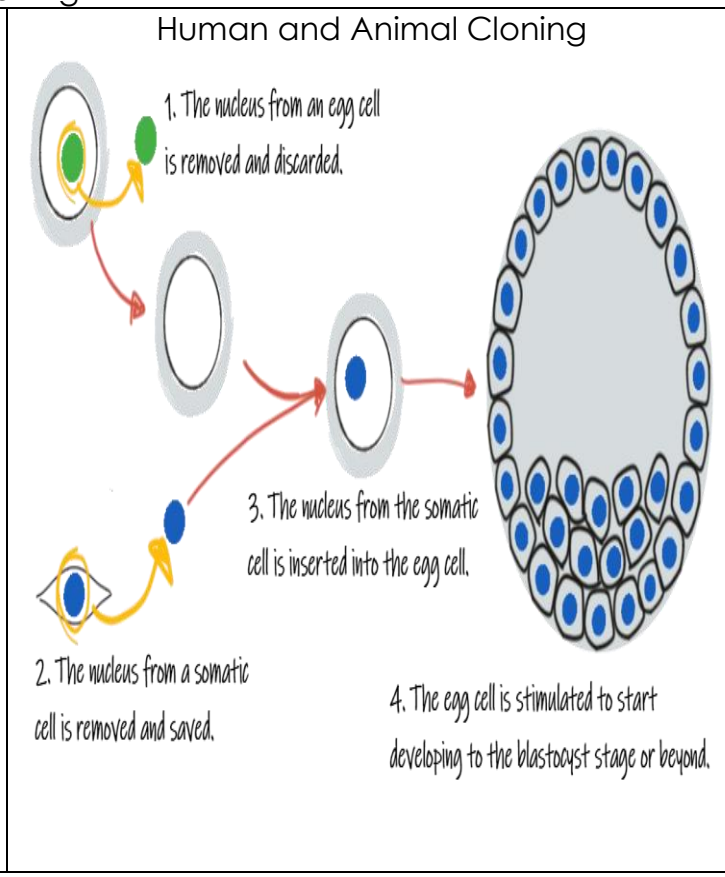
- _____ cloning, which creates copies of genes or segments of DNA.
- _____ cloning, which creates copies of whole animals.
- _____cloning, which creates embryonic stem cells.

Name each type of Cloning below?

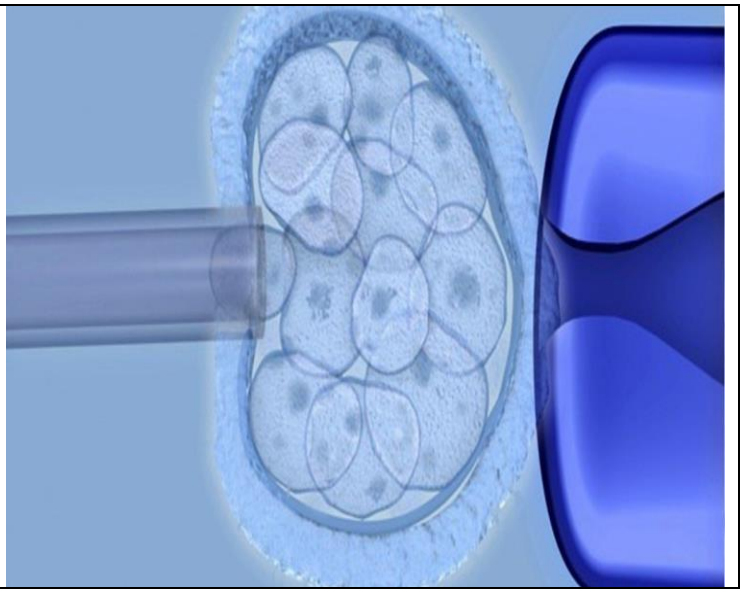
		

Please list some of the bio-ethics involved in cloning





Please list some of the bio-ethics involved in stem cell research.



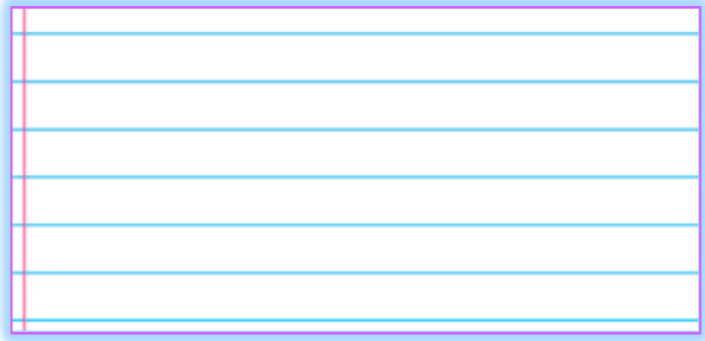
The Last Topics will be about Designer Babies and Artificial Life. What are these two topics? What are some of the concerns / benefits?

GATTACA

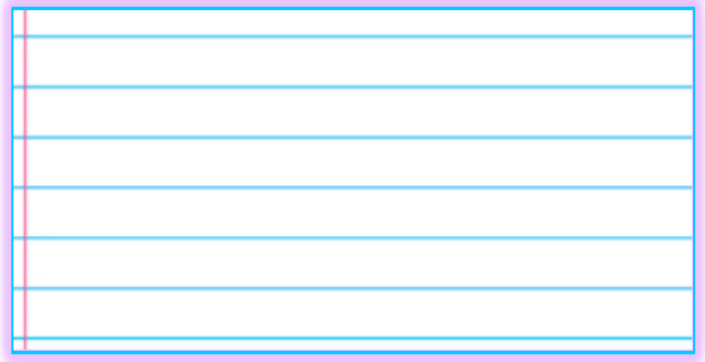
Name:
Due:

This worksheet should be completed upon the conclusion of the film. Please put the same amount of effort into this assignment as Vincent put into following his dream.

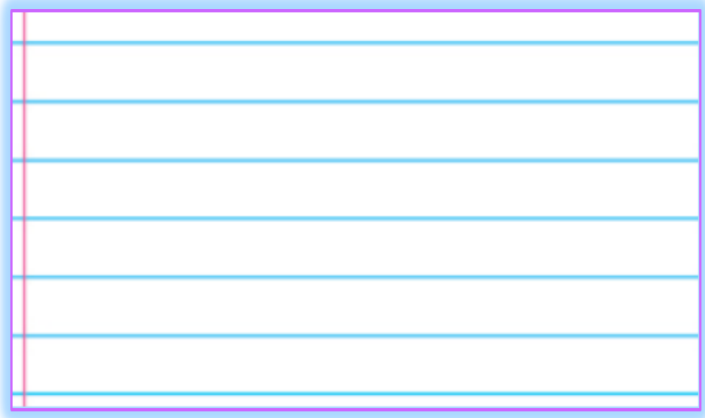
What were some of the negative impacts that faced Vincent (Gerome) (Ethan Hawke) because of his DNA/and being considered an Invalid?



How was DNA used to discriminate in the movie?

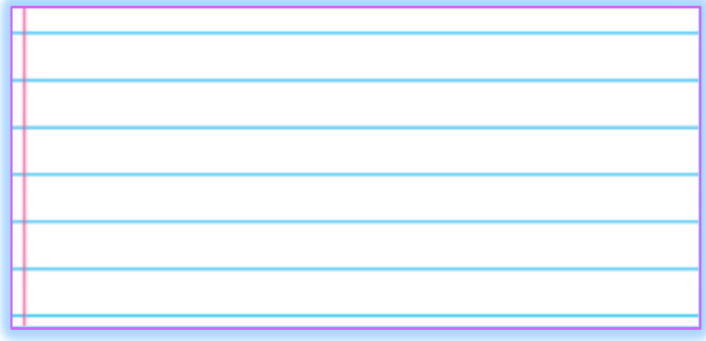


What were some ways that DNA was collected?



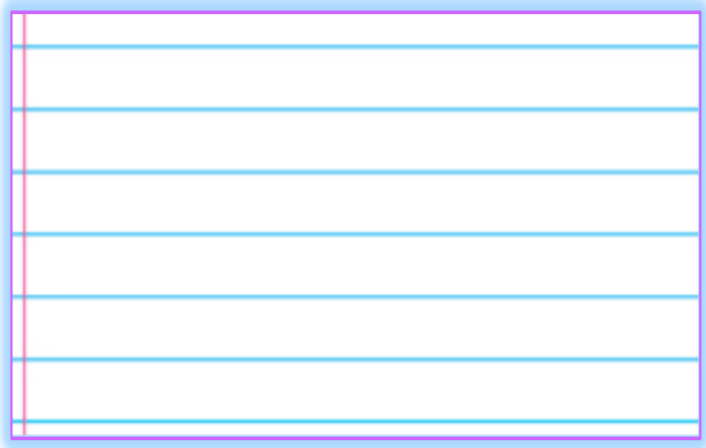
..What does GATTACA stand for?

Describe his work ethic. Make sure to list specific examples from the movie? How hard must he work to overcome the problems facing him?



How does his work ethic compare to your own?

What do you feel was the message in the movie GATTACA?



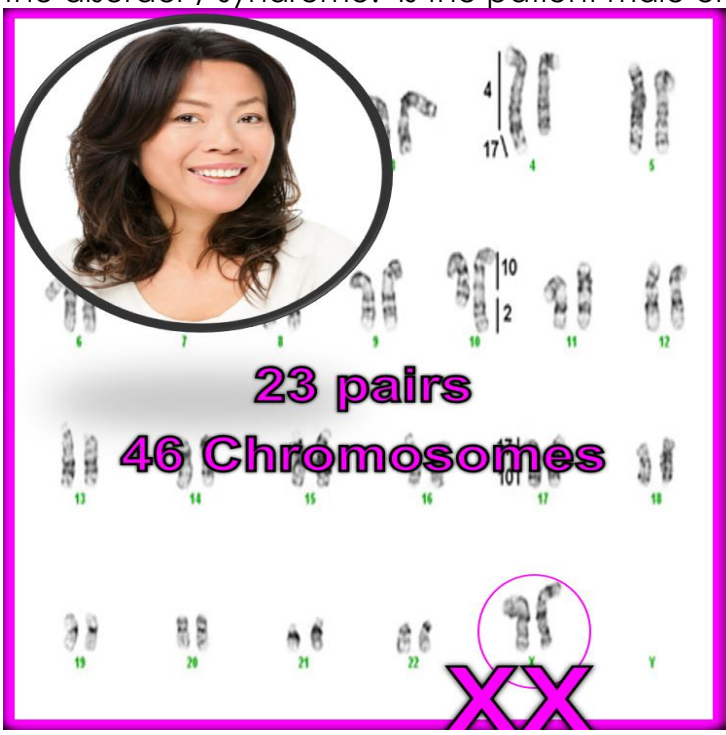
Part 6 Karyotypes, Genetic Disorders, Bioethics

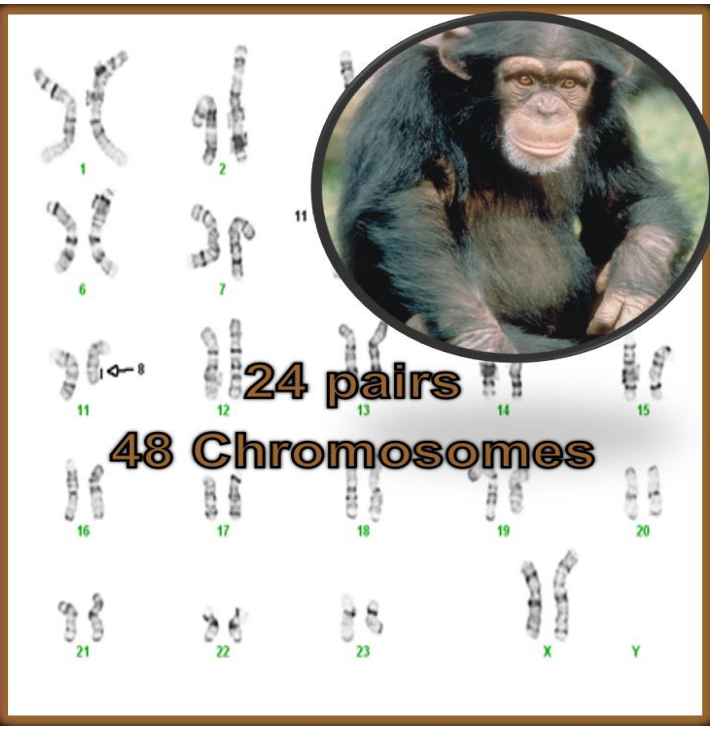
Name:
Due:

Part 6 Lesson 1 Karotypes and Genetic Disorders

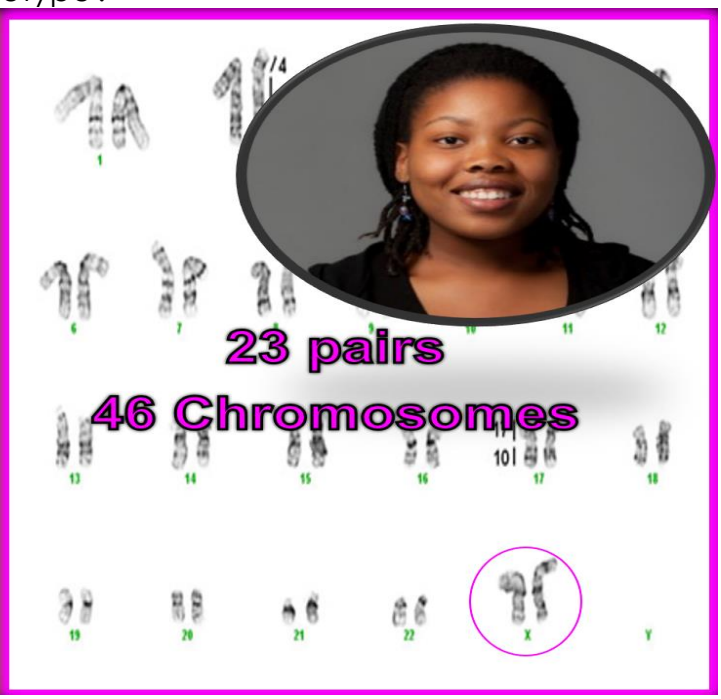
Karyotype: The number and visual appearance of the chromosomes in the cell nuclei of an organism or species.

Please describe any abnormalities in the karyotypes below and provide information about the disorder / syndrome. Is the patient male or female?





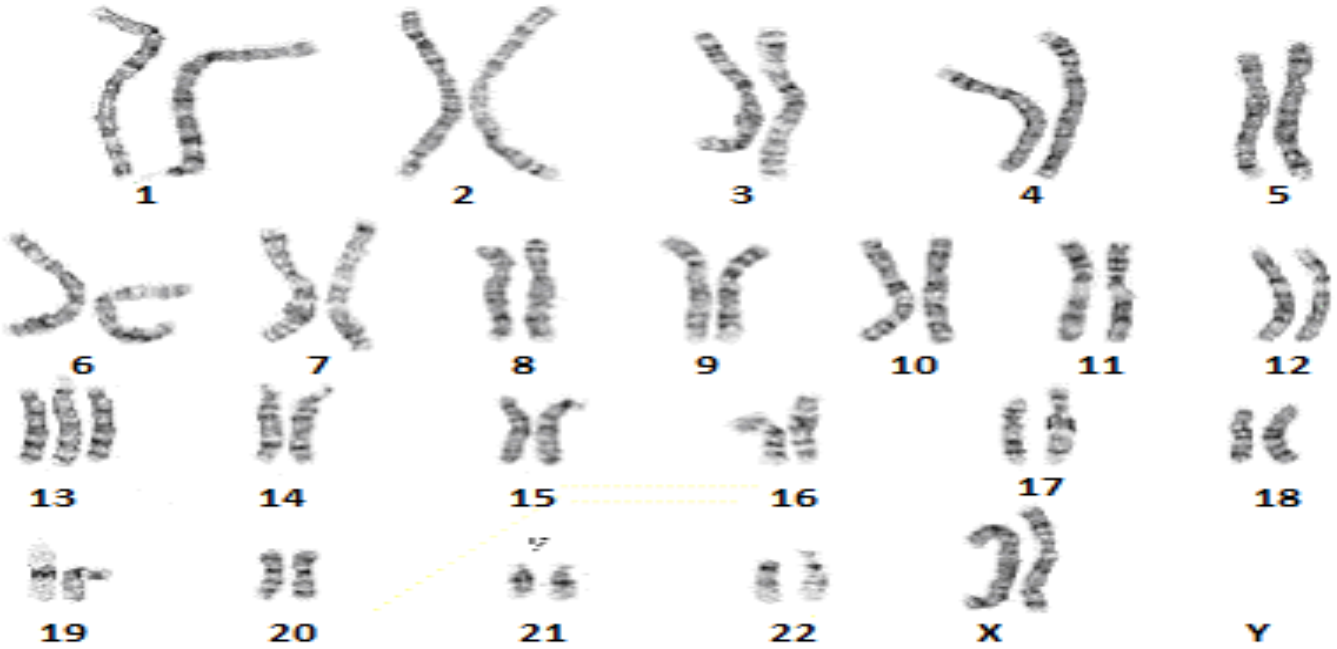
Which is the human and which is a mouse karyotype?



Can you find the abnormality in this karyotype? Describe below.

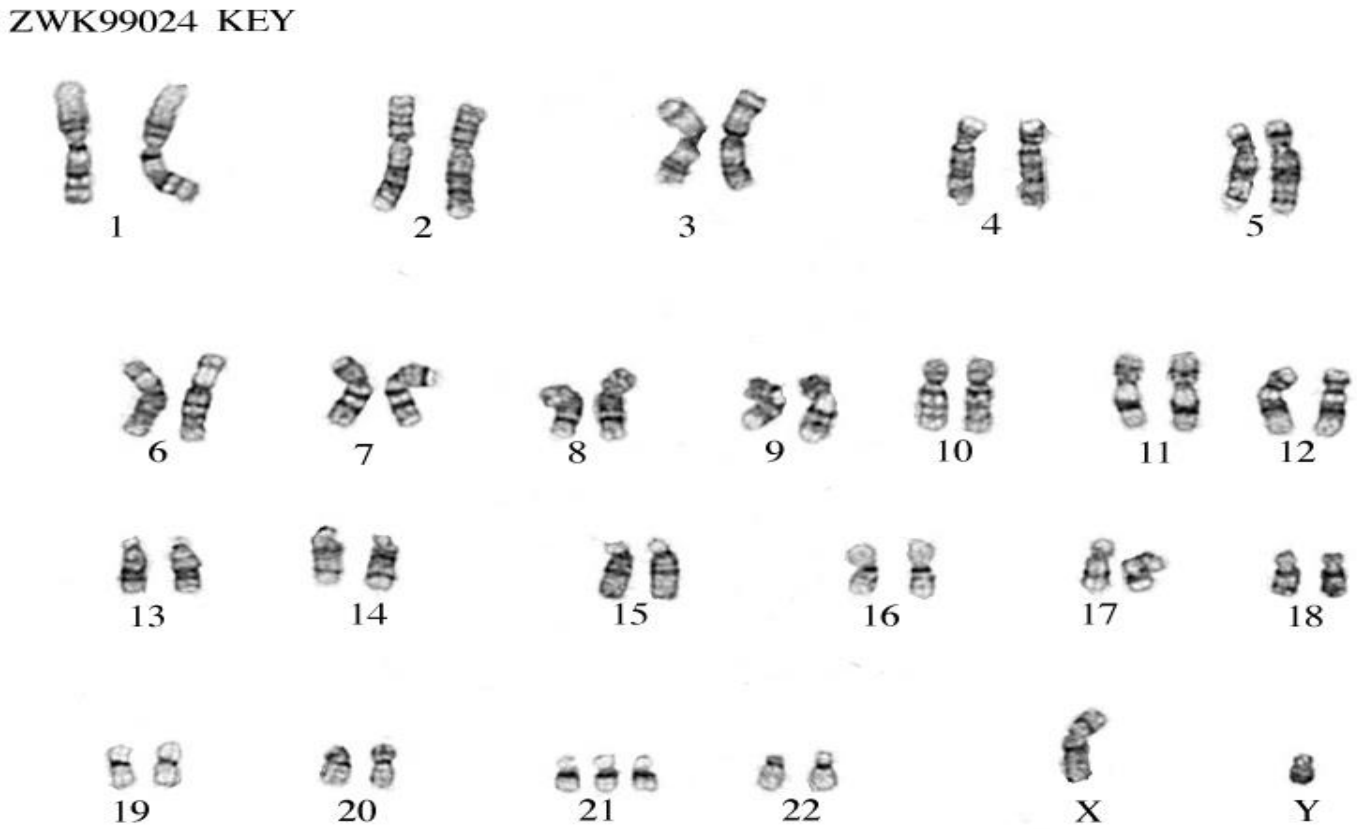
Edwards syndrome, aka (trisomy 18), is a genetic disorder caused by the presence of all, or part of a third copy of chromosome number 18. Most babies will die before birth or shortly after.

Can you find the abnormality in this karyotype? Describe below.



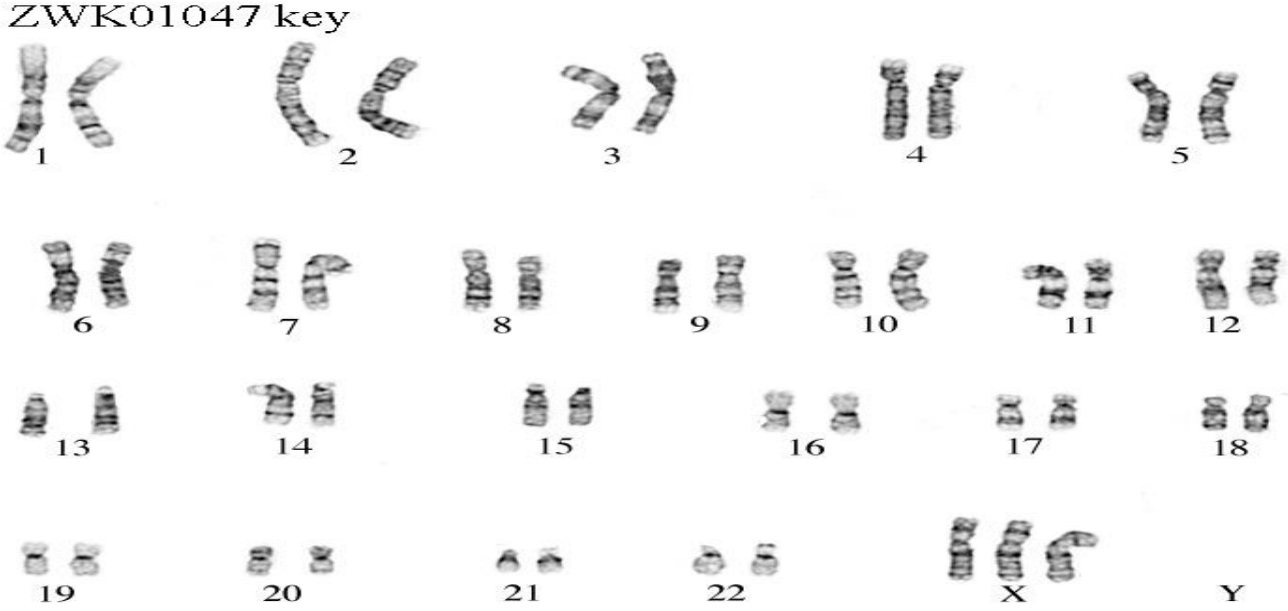
Trisomy 13, also called Patau syndrome, is a chromosomal condition associated with severe intellectual disability and physical abnormalities in many parts of the body. Most babies will die before birth or within the first week.

Can you find the abnormality in this karyotype? Describe below.



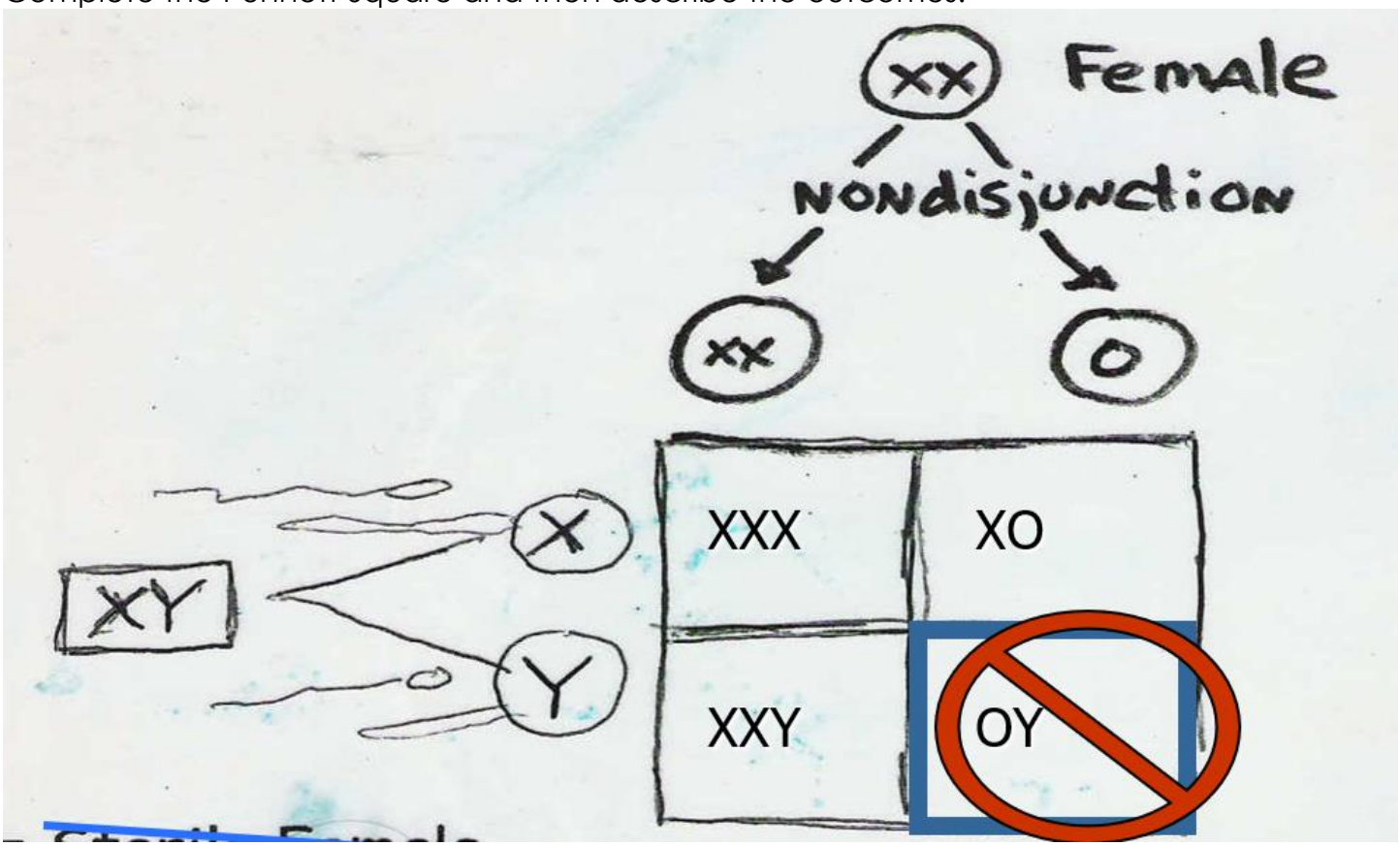
Down syndrome occurs when an individual has a full or partial extra copy of chromosome 21

Can you find the abnormality in this karyotype? Describe below.



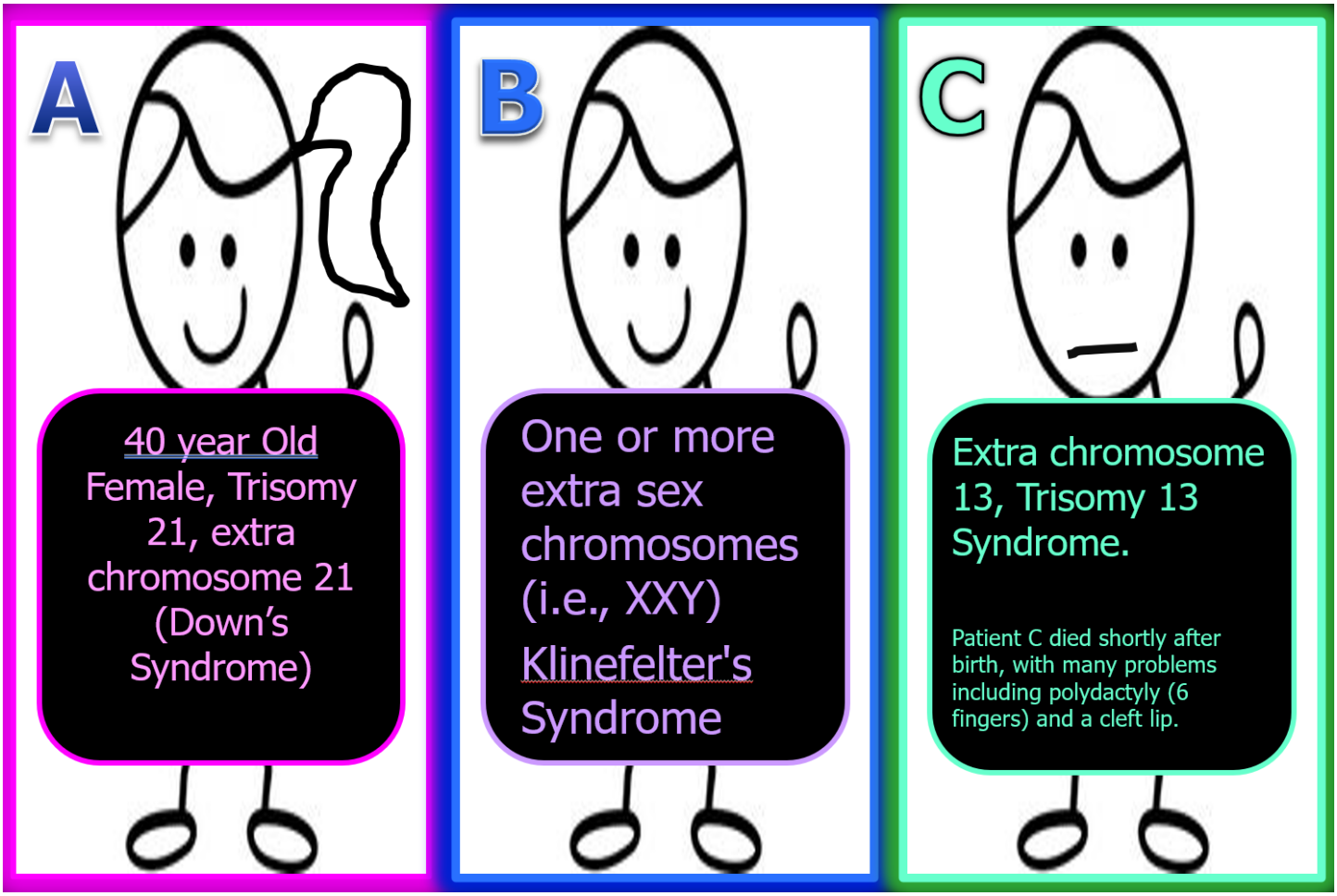
Triple X syndrome, also called trisomy X or 47,XXX, is characterized by the presence of an additional X chromosome in each of a female's cells. No unusual physical features and varied complications

Complete the Punnett Square and then describe the outcomes.



Triple X syndrome, also called trisomy X or 47,XXX, is characterized by the presence of an additional X chromosome in each of a female's cells. No unusual physical features and varied complications	Turner Syndrome: XO A women who doesn't have two XX's.
Klinefelters Syndrome: XXY – Male offspring with some aspects of a female.	Nonviable

Virtual Karyotype Lesson (Easy / Quick Option without cutting out 46 chromosomes)
http://www.biology.arizona.edu/human_bio/activities/karyotyping/karyotyping.html
Tell me about their karyotype / disorder as you navigate the site above. Additional Research = ☺ teacher



Genetic Disorder Help Center
Part 6 Lesson 2 & 3 Research and Present Genetic Disorder Partner:

Name of the genetic disorder facing your child_____

How did you and your partner meet? (For those with partners)_____

_____

_____

Describe information about your disorder (Example-It is caused by recessive…)

_____

_____

_____

What are the symptoms of this disorder? _____

_____

What are the health effects of this disorder?_____

What, if any, are the treatments to this disorder?_____

Additional Information for Center Discussion:_____

In the next science class you will be participating in an activity that requires you to attend a help group with your spouse. You are required to bring your drawing or a doll with you for the discussion. **You are also required to have knowledge of everything mentioned on this sheet**. You will be graded on your knowledge of the genetic disorder and participation. I will be calling on you to share information about your disorder to the class, and expecting you to be very dramatic.

Please prepare a short introduction that you will speak to the class. Your introduction should include…

-Your names
-Child's name
-Genetic disorder your child has
-How you found out
-What you felt like/your concerns
-How your life has changed
    -Treatment
    - Lifestyle changes
    - What is the hardest part?
    - Who helps you?
- How has this disorder affected your marriage?

Notes/Sharing of responsibilities for the presentation:_____

_____

_____

_____

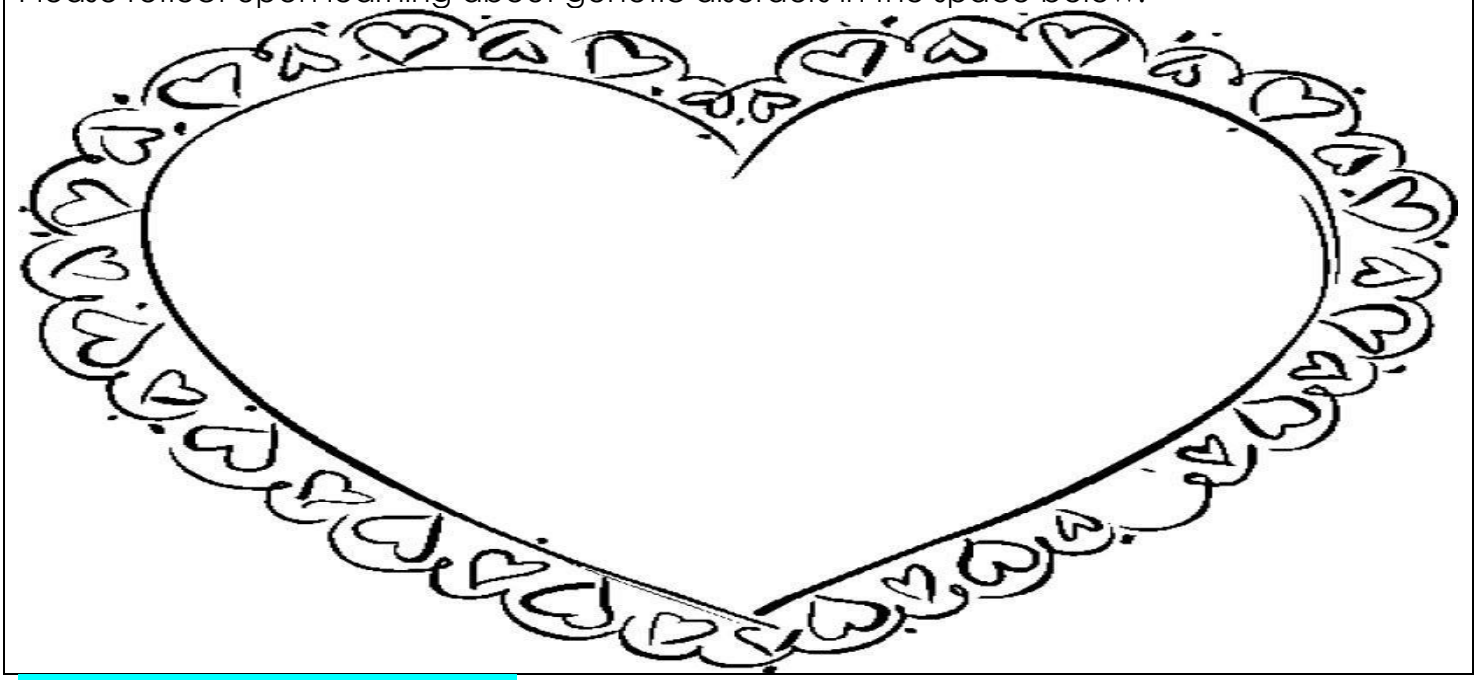
Sources:

Date refers to the date the page was published, not the site.

Page title is usually displayed at the top of the page. In the reference this should not be italicised. Website title should be italicised.

Author surname(s), initial(s). (Year, month day of publishing). Page title. *Website Title*. Retrieved from URL

Please reflect upon learning about genetic disorders in the space below.



Part 6 Lesson 3 Issues in Bioethics

Bio-ethics: The study of ethical issues raised by the developments in life science _____.

SINKING SHIP Optional Lesson -What do we value?

In the following exercise, you asked to make a difficult decision. You are the captain of a sinking ship. There is only one life boat and it can only hold 8 people. A large storm is arriving and hanging over the edge or overloading the boat is out of the question. No distress call was made so help is unlikely. Currents should bring the boat to shore in a few days. Please choose which 8 people should be allowed to board the raft.

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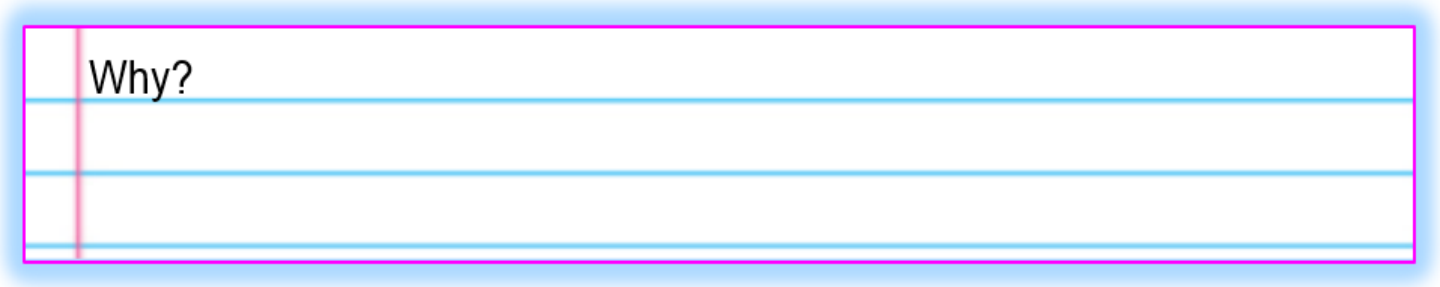
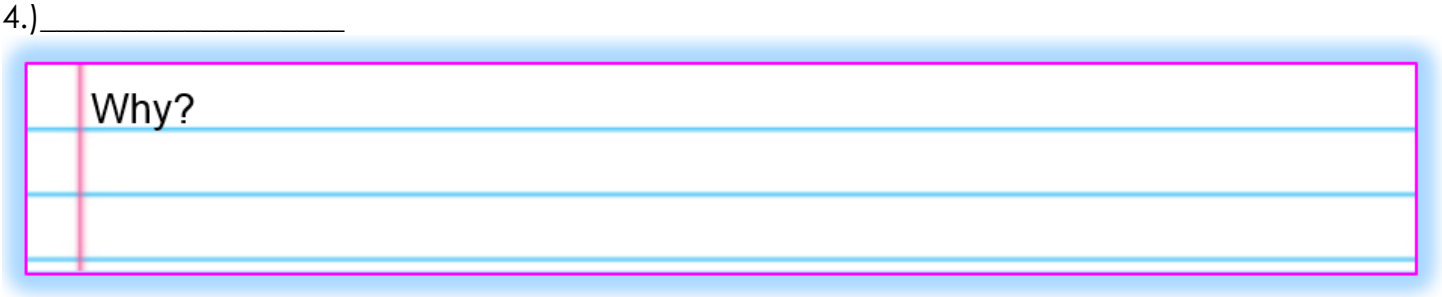


3.)_____

4.)_____



5.)_____

6.)_____

Why?

7.)_____

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Why?

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- #17) U.S. Senator age 65 with 30 years of service to the country
- #18) 54 year old wheel chair bound U.S. Gold Medal Paralympian

Part 6 Lesson 4 GMO's

What are GMO's?

GMO stands for Genetically Modified Organism. GMOs are living beings that have had their genetic code changed in some way. This change is generally a targeted one to improve a desired trait. A gene is usually inserted into a plants genetic code.

GMO's are usually plants, but they can also be microorganisms and animals.

Why use them now?

Most of the GM crops grown around the world today address problems caused by insects or weeds such drought resistance or insect resistance. Some GMO's can enhance a plants nutrition.

Are they dangerous?

There is no data to indicate that consumption of GMOs is bad for human health. They are being studied for adverse health impacts. There are no health benefits to eating GMO products over non-GMO foods.

Are they regulated?

The regulation of genetically modified crops in the United States is divided among three regulatory agencies: the United States Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS), the U.S. Environmental Protection Agency (EPA), and the Department of Health and Human Services' Food and Drug Administration (FDA)

Monoculture!

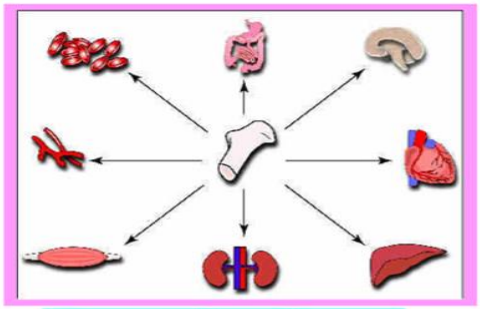
What does the opposition say?

The public has concern's that GMO's can impact human health; that there's a potential damage to the environment; a negative impact on traditional farming practice; excessive corporate dominance; and the 'unnaturalness' of the technology.

Part 6 Lesson 4 and 5 Issues in Bioethics Stem Cells and Cloning

Stem cells: Cells that have the remarkable potential to develop into many different cell types in the body.
What are the three types of stem cells?

Embryonic Stem Cells



Adult Stem Cells

Cord Blood

What are some of the arguments for both sides of the stem cell debate.

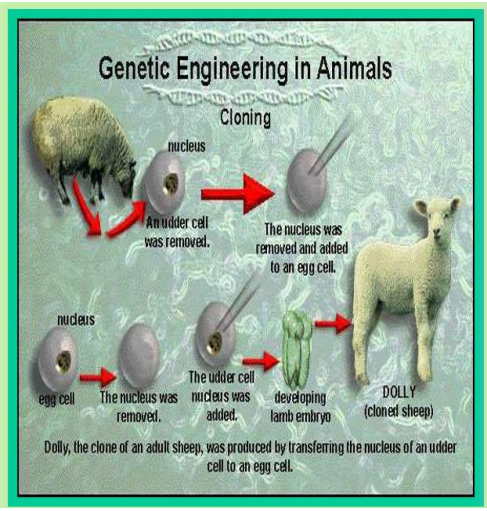
Pro-choice position: Pro-choice beliefs are based on the assumption that a fertilized ovum is not a human being; it is rather potential for human life.

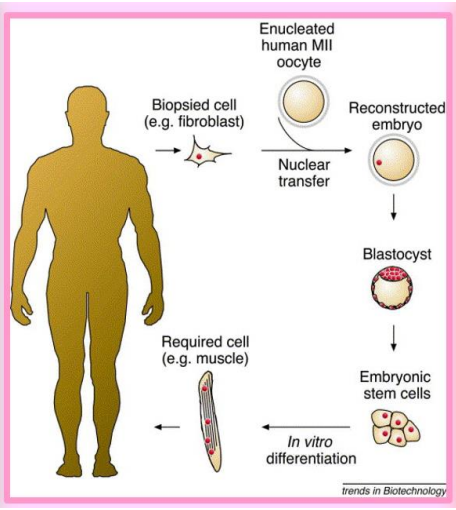
The Pro-Life Group Believe: The use of embryonic stem cells for research involves the destruction of blastocysts formed from laboratory-fertilized human eggs.

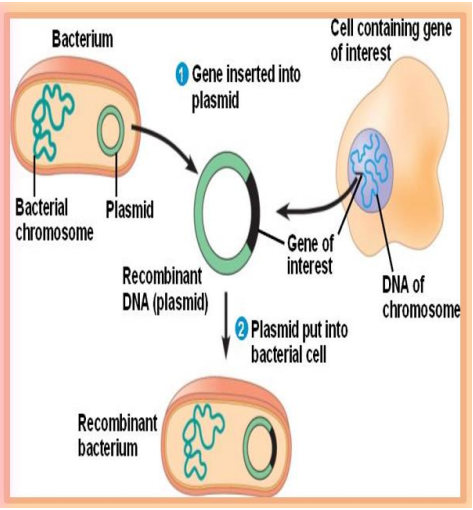
Cloning: A method of reproduction used to copy a cell or an individual (producing a clone) from their DNA.

Name each type of Cloning below?

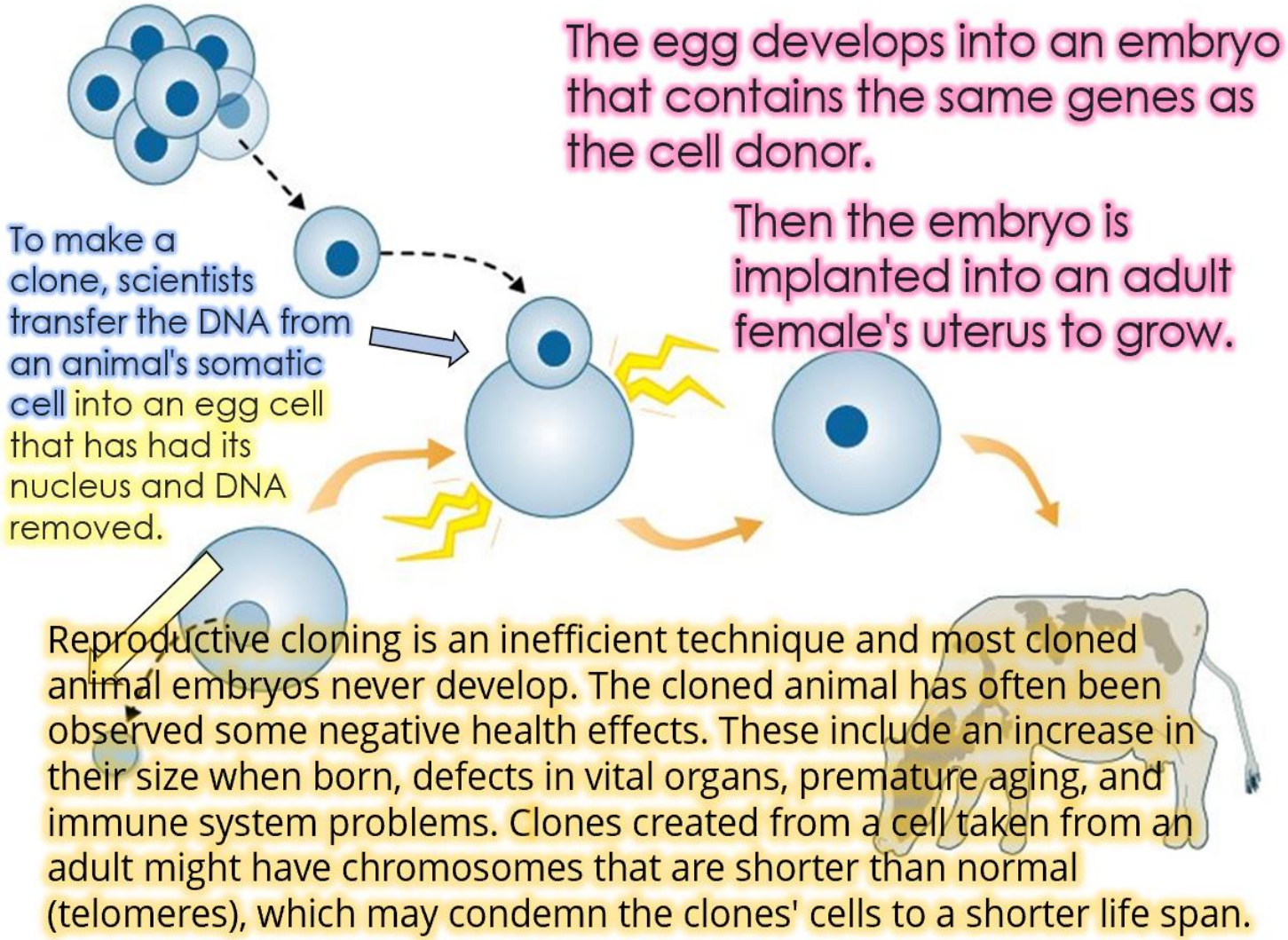
Reproductive cloning, which creates copies of whole animals.	Therapeutic cloning, which creates embryonic stem cells.	Gene cloning, which creates copies of genes or segments of DNA.







Describe reproductive cloning below and some of the ethics associated with it.



Reproductive cloning is an inefficient technique and most cloned animal embryos never develop. The cloned animal has often been observed some negative health effects. These include an increase in their size when born, defects in vital organs, premature aging, and immune system problems. Clones created from a cell taken from an adult might have chromosomes that are shorter than normal (telomeres), which may condemn the clones' cells to a shorter life span.

The Last Topics will be about Designer Babies and Artificial Life. What are these two topics? What are some of the concerns / benefits?

Designer Babies

Positives Perhaps	Negatives Perhaps
-Reduces risk of genetic diseases	-Termination of embryos

-Reduces risk of inherited medical conditions -Better understanding of genetics -Increased life span -Can give a child genes that the parents do not carry -Prevent next generation of family from getting characteristics/diseases -Better chance the child will succeed in life?	-Could create a gap in society -Possibility of damage to the gene pool -Baby has no choice in the matter -Genes often have more than one use -Geneticists might make errors -Loss of Individuality -Other children in family could be affected by parent's decision -Only the rich can afford it

Synthetic Life?

Creation of synthetic life could benefit humanity. – Agriculture / Food Production – Medicine – Energy (Biomass) – Many More	Concerns? Institutions and their accountability? Biological Weapons? Exotic Life spreading accidentally?

GATTACA

This worksheet is worth a class investigation grade and should be completed upon the conclusion of the film. Please put the same amount of effort into this assignment as Antoine/Gerome put into following his dream.

What were some of the negative impacts that faced Vincent (Gerome) (Ethan Hawke) because of his DNA/and being considered an Invalid? Vincent was placed into a new subclass called the invalids. They could not get an education, career, or be equal with the genetically "valid", those who have a superior and lab altered DNA sequence. How was DNA used to discriminate in the movie? DNA was used to profile people and determine the advancement in their careers / status in their society	Describe his work ethic. Make sure to list specific examples from the movie? How hard must he work to overcome the problems facing him? He had to learn Astronomy, train, and then pull-off trying to be a valid in an in-valid world. He used urine pouches, blood caches, and rubbed the skin off of his body each day. He had to get up early, stay late, and work harder than his "valid" peers How does his work ethic compare to your own? Answers will vary but he worked hard to achieve his dream
What were some ways that DNA was collected? DNA was collected by blood, saliva, urine, skin cells, hair follicles. What does GATTACA stand for? **G**uanine **A**denine **T**hymine **T**hymine **A**denine **C**ytosine **A**denine	What do you feel was the message in the movie GATTACA? It's just a neat glimpse into the not so distant future of DNA advancement. There is no gene for the human spirit

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