

Name: _____

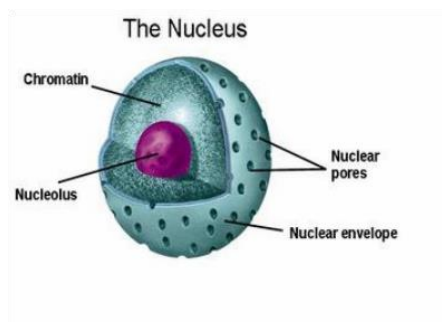
Biology 10 Learning Guide

INSTRUCTIONS

Complete the following notes and questions as you work through the related lessons. You are required to have this package completed BEFORE you write your unit test. Do your best and ask questions about anything that you don't understand BEFORE you write the unit test.

1.1 - Reintroducing the Cell

1. Watch the video which reviews cell structures and functions that you learned in Science 8.

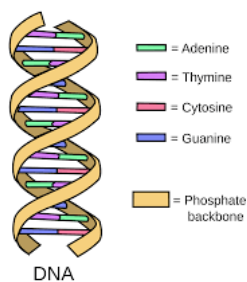


1.2 - The Nucleus and DNA

1. Compare the terms '**prokaryotic**' and '**eukaryotic**'. Are the cells that make up your body prokaryotic or eukaryotic?

2. Watch the video's '*Learn Biology: Cells-The Nucleus*' and '*Nucleus*' and answer the following questions:
 - What is stored in the nucleus?

- Why is the nucleus considered the **control center** of the cell?
- Where are ribosomes made?
- Describe how chromosomes are formed from DNA.
- Describe the membrane surrounding the nucleus.
- Why is the nuclear membrane porous?
- Do all living organisms contain the same number of chromosomes?

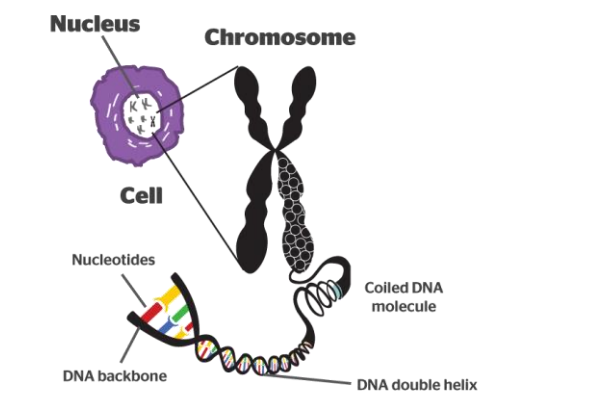


3. DNA is described as a '**double helix**'. What is this referring to?

4. Try the 10 questions practice quiz to test your knowledge and understanding of the nucleus. Redo the quiz until you get all 10 questions correct. Good luck!

5. Try the virtual DNA extraction lab. If you want to experiment and do an actual DNA extraction see the project section of this unit. The DNA extractions can be done in your kitchen!

1.3 - Genes and Chromosomes



Answer the following questions using the text and video links provided.

1. _____ are sections of _____ that code for the production of _____.

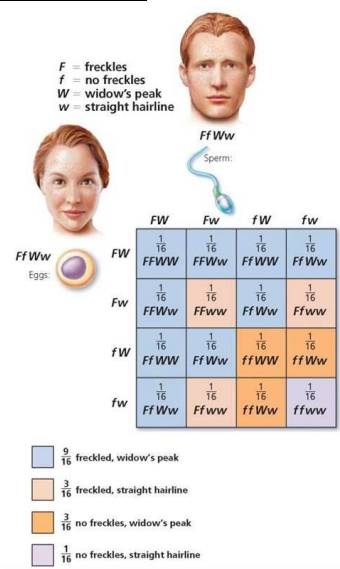
Proteins determine the _____ in humans. DNA is compacted into structures called _____.

2. What is significant about organisms that share the same number of chromosomes?

3. Why is DNA considered 'the blue print' for living things?

4. What is the difference between '**inherited traits**' and traits '**shaped by the environment**'. Give an example for each.

1.4 - Mendelian Genetics and Inherited Traits



1. What is the advantage of selective breeding?
2. Mendel's conclusions from his genetic research in the 1800's uses the term '**units**' or '**factors**'. What was he describing?
3. Watch the Amoeba Sisters video explaining a '**monohybrid cross**' and complete the accompanying worksheet. Include the worksheet with your completed learning guide.
4. Watch the Amoeba Sisters video explaining a '**dihybrid cross**' and complete the accompanying worksheet. Include the worksheet with your completed learning guide.



5. Use a Punnett Square to show the probability of 2 heterozygous Black Bears producing a Kermode Bear. Include the phenotype and genotype ratio and percentage of the offspring.

Genotype Ratio: _____
 Genotype Percentage: _____
 Phenotype Percentage: _____
 Phenotype Ratio: _____

6. Use a Punnett Square to determine the probable offspring by crossing a heterozygous Black Bear with a Kermode Bear.

Genotype Ratio: _____
 Genotype Percentage: _____
 Phenotype Percentage: _____
 Phenotype Ratio: _____

7. Use a Punnett Square to determine the probable offspring by crossing homozygous Black Bear with a Kermode Bear.

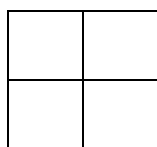
Genotype Ratio: _____
 Genotype Percentage: _____
 Phenotype Percentage: _____
 Phenotype Ratio: _____

8. Complete the Punnett Square practice questions. There is a key provided for you to check your work and your understanding of Mendelian Genetics.

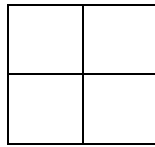


9. Answer the following questions using the '**Pedigree of the Royal Family**' and the inheritance of the **sex-linked trait**, Hemophilia.

- Which of Victoria's sons had hemophilia?
- How many of Queen Victoria's grandchildren had hemophilia:
- Do any females have hemophilia?
- Draw a Punnett Square to show Queen Victoria and her husband Albert. Queen Victoria's genotype will be XX^H and Albert will be XY . X^H indicates the female sex chromosome carrying the gene for hemophilia.



- Imagine that one of the daughters of Alexandra who married the Tsar of Russia, had hemophilia. Can you determine whether the Tsar had hemophilia? Why or why not?
- Draw a pedigree using the following information. (Hint: Draw a Punnett square for the parents!):
 - a. A man with hemophilia married a woman without it.
 - b. They had 2 daughters and 2 sons
 - c. The first daughter had a son with hemophilia.



1.5 - Genetic Mutations and Inheritance



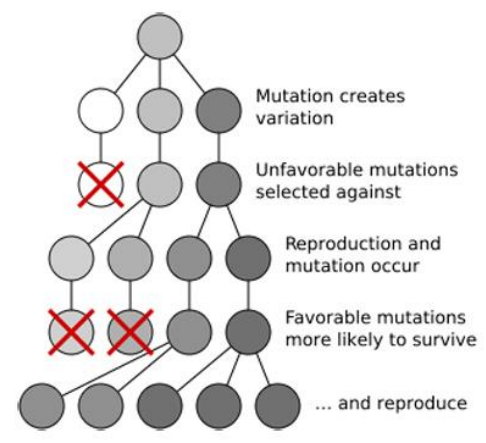
1. Define '**mutation**' and compare a '**gene mutation**' to a '**chromosomal mutation**'.
2. Do you think 'curly wings' on a fly would be a **positive**, **negative** or **neutral** mutation? Explain your answer.
3. Describe how an 'ebony' colored body could be considered a positive mutation for a fly.

4. What is your position on testing for genetic disorders? Should life insurance companies be allowed to request genetic testing to determine the rate to charge individuals? Explain your answer.

5. Should couples wanting to start a family undergo genetic testing to minimize risk to their offspring? Explain your answer.

6. Try the **'mutations – guided practice quiz'**. Redo the quiz until you get the 5 questions correct.

1.6 - Genetic Mutations and Adaptability of Organisms



1. Explain 'natural selection' in your own words.

2. What role does the environment play in natural selection?

3. What is the source of genetic variation?

4. Read the '**Case Study on the Cheeta**' and answer the following questions. You can check your answers using the links provided.

- Why is genetic diversity important?
- What is the likely cause for the Cheeta losing genetic diversity?
- What are some examples of genetic diversity in humans?

5. Define '**genetically modified organism**' or '**GMO**'.

6. Define '**recombinant DNA**'.

7. How would you prepare for a debate on the pros and cons of genetically modified organisms?