

### 03.04 Biology Notebook: Mutations

#### **Page 1: A Message with an Error**

Errors in DNA can occur when DNA is \_\_\_\_\_ or \_\_\_\_\_.

**Key Terms:** Jot down terms and definitions that are new to you. You will see them used in the lesson.

#### **Page 2: What are Mutations?**

How can DNA change or be damaged?

What is a mutation?

Are all mutations detrimental to the organism?

Mutations can be separated into what two basic categories?

- 1.
- 2.

What are chromosomal mutations?

Describe the four main types of chromosomal mutations in the table below.

Type of Mutation	Description
Deletion	
Duplication	
Inversion	
Translocation	

#### **Page 3: Gene Mutations**

What is a gene mutation or point mutation?

When do gene mutations usually occur?

What happens when point mutations occur in a gamete (sperm or egg cell)?

What is a base-pair substitution?

What are base-pair insertions and deletions?

**Page 4: Genetic Variation**

Fill-in the blank with the correct answer.

Without mutations, organisms could not evolve. Inherited mutations are an important source  
\_\_\_\_\_ within a species.

What are germ line mutations?

When would an offspring not exhibit an inherited mutation?

How can cells control gene expression?

Do all body cells express the same genes?

**Page 5: Helpful and Harmful Mutations**

Identify the advantages and disadvantages of mutation in the table below.

Advantages	Disadvantages

What is a neutral mutation?

Briefly describe the six examples of mutations:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

What is a mutagen? Provide an example.

How do mutagens produce mutations?

### **Page 6: Cancer and Mutations**

What is cancer?

What is a tumor?

What is the difference between benign tumor and malignant tumor?

What happens when cancer cells spread?

Many cancer cells have a defect in the p53 gene. What is the function of this gene?

Why is radiation an effective treatment for cancer?

### **Practice question:**

Without mutations, there would not be \_\_\_\_.

- A. identical offspring
- B. increase in populations
- C. genetic diversity
- D. increase in DNA