**MIDTERM EXAM REVIEW: NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_--**

**Nature of Science**

Repetition replication experiment graduated cylinder problem hypothesis theory law balance evidence conclusion Ruler thermometer biologist chemist

1. A procedure with controlled conditions and test and outcome variables \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. An experiment includes many trials to improve accuracy. This is called\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. The first step in a scientific investigation is to define a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which type of scientist would study organisms?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. A well supported and widely accepted explanation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Scientific Laws and Theories are both based on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. How do scientific ideas change? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. After a scientist has collected data they make a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. The piece of equipment used to measure the length of a pencil
10. The piece of equipment used to measure a change in temperature
11. The piece of equipment used to measure volume

You are conducting an experiment to measure how far a rubber band stretches as you add weight to it.

1. What is the independent variable\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the dependent variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. In the space at the right, sketch how you would make the line graph for the data. Label the independent and dependent variables (be sure to label and give it a title and a key)

You collect the following data: draw the type of graph you would use to display your data. Don’t forget labels

|  |  |  |  |
| --- | --- | --- | --- |
| **Plant** | **Week1** | **Week2** | **Week3** |
| **A (sun)** | **20** | **26** | **33** |
| **B(no sun)** | **20** | **21** | **25** |

**Ecology**

Abiotic biotic parasitism commensalism mutualism light fire

Introduced species predator prey limiting factor ecologist carnivore omnivore herbivore producer food web population ecosystem community

1. A group of individuals of the same species living in an area
2. Leaves on trees are an example of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ factor
3. Nonliving parts of an ecosystem \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Someone who studies the interactions of organisms with their environment \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. An organism that eats both plants and other organisms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. The level of a food pyramid that has the most available energy \_\_\_\_\_\_\_\_\_
7. An organism that can make it’s own food\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. A factor that keeps the population from growing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. A limiting factor in a prairie ecosystem\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. A limiting factor in a rainforest ecosystem \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. Mistletoe grows on other plants and draws out nutrients and water – harming the plant. What is it’s role in this relationship?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. The plover bird gets food by picking it off the back of crocodiles. What kind of symbiotic relationship is this?
13. An organism (like the Burmese Python in the everglades that was brought to an area by humans \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. List the levels of organization in an ecosystem from ***largest to smallest***

Use the food chain to answer the following questions

1. Which organism is the source of energy for the snake? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How many organisms in the food chain are consumers?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which organism is the producer? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Cell Division and reproduction**

Reproduction Interphase prophase metaphase anaphase telophase cytokinesis half 2-times 1 2 3 4 mitosis meiosis egg sperm budding

vegetative reproduction sexual asexual

1. The purpose of cell division in single celled organisms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. If you look at a cell under a microscope and can’t see the chromosomes – just a tangled ball of string, what phase of mitosis is it most likely in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. During which stage of mitosis would you first see chromosomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. You see a cell with 2 nuclei. Which phase of mitosis is it most likely in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Draw it
5. List the stages of the cell cycle in order \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. List the stages of mitosis in order \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_
7. Name the 2 types of sex cells \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. Skin cells are formed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. Sex cells are formed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. A sex cell has \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the number of chromosomes as a body cell.
11. How many cell divisions are in meiosis \_\_\_\_\_\_\_
12. How many cells are formed in meiosis \_\_\_\_\_\_\_\_
13. When a new plant is formed from the stem or root from a parent plant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. In \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reproduction the new organisms receives half of its chromosomes from each of its parents and is not genetically identical
15. The name of the female sex cell \_\_\_\_\_\_\_\_\_\_\_\_ Male \_\_\_\_\_\_\_\_\_\_\_\_\_
16. In the space below: Draw a model of a DNA molecule. Include it’s shape in your illustration
17. In the space below draw a Hydra budding in order to undergo asexual reproduction

Heredity and Genetics

TT Tt tt alleles genotype phenotype

offspring dominant recessive probability

1. Which symbols above show 2 dominant alleles \_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which symbols shows one dominant and one recessive \_\_\_\_\_\_\_\_\_\_\_\_
3. The 2 different forms of a gene are called \_\_\_\_\_\_\_\_\_\_\_
4. An organisms genetic makeup is its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. An organisms physical appearance is its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. A pea plant with round seeds is crossed with a pea plant with wrinkled seeds. All the new plants have round seeds. The wrinkled trait is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ trait.
7. What do the letters TT mean to geneticists? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. What do the letters tt mean to geneticists?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. What do the letters Tt mean to geneticists?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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|  |  |
|  |  |

1. The likelihood that an event will occur is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Complete a Punnet Square for parents BB x Bb – where B=black and b = white.
2. Give the ratio for the offspring in the diagram \_\_\_\_\_\_ :\_\_\_\_\_\_\_\_
3. What are the phenotypes? \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What is a pedigree used for?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. In a pedigree chart, which shape represents a male \_\_\_\_\_\_\_\_\_\_ female \_\_\_\_\_\_\_\_\_
6. How are generations shown in a pedigree chart?
7. What does each box in a punnett square represent \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. The chromosomes for a male = \_\_\_\_\_\_\_\_\_\_\_ female = \_\_\_\_\_\_\_\_\_\_\_\_

**DNA And biotechnology**

Franklin Watson Crick adenine guanine cytosine thymine nucleotide twisted ladder biotechnology artificial selection cloning genetic engineering vegetative reproduction selective breeding Chargoff

1. Draw and describe the shape of the DNA molecule \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Name the 4 nitrogen bases and how they pair \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which scientist used xray techniques to determine the structure of DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which scientists determined the structure of the DNA moledule \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Which scientist determined that the amount of A always = T and G = C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. What molecule is made up of a sugar, phosphate, and nitrogen base \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. A-C-T-G-T-G draw the complementary DNA strand\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. The use and application of living things and biological processes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. Choosing the best seeds for tomato plants over many generations \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. Breeding dogs for its size and temperament \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. 2 identical mice can be produced by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. A scientist transfers a fragment of genetic material from one organism to another of a different speicies \_\_\_\_\_\_\_\_\_\_
13. Name some risks of GMO plants \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Evolution**

Extinct common ancestor natural selection evolution artificial selection variation adaptation Overproduction

1. Differences among members of the same species \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. A species that no longer has any living members \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. 2 organisms that look very similar in early developmental stages may have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. The gradual change in a species over time \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. A trait that helps an organism survive and reproduce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Individuals better adapted to their environment are more likely to survive and reproduce \_\_\_\_\_\_\_\_\_\_\_\_\_
7. When a species creates more offspring than can survive. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_