

Name \_\_\_\_\_

Date \_\_\_\_\_

## Genetics

1. What type of plant did Gregor Mendel experiment with?

- A. Beans
- B. Peas
- C. Corn
- D. Pumpkins

2. When crossing a pure-breeding tall plant (TT) with a short plant (tt), what percent of the offspring will be tall?

- A. 100%
- B. 75%
- C. 50%
- D. 25%
- E. 0%



3. When crossing two heterozygous tall plants (Tt), what percent of the offspring will be tall?

- A. 100%
- B. 75%
- C. 50%
- D. 25%
- E. 0%

4. What percent of the offspring of problem #3 will be exactly like the parent plants (Tt)?

- A. 100%
- B. 75%
- C. 50%
- D. 25%
- E. 0%

5. What percent of the offspring from problem #3 will be short?

- A. 100%
- B. 75%
- C. 50%
- D. 25%
- E. 0%

6. What was Gregor Mendel's occupation?

- A. Doctor
- B. Monk
- C. King
- D. Chemist
- E. Monkey

7. True or False - mutations are always harmful.

- A. True
- B. False

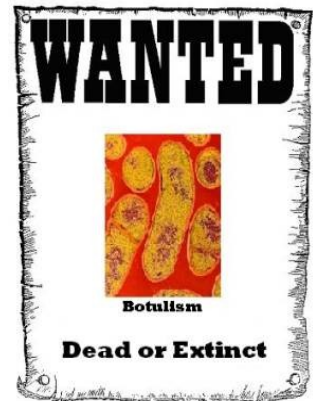


8. The plants that Mendel worked with used flowers and seeds to reproduce. This often involves the transfer of genetic material. ALSO, these plants can be broken off and replanted to make them reproduce without any exchange of DNA. What kind of reproduction can these plants have?

- A. Both sexual and asexual
- B. Asexual
- C. Sexual
- D. Other
- E. They don't reproduce

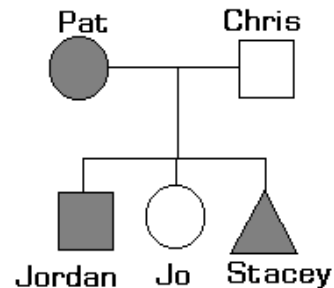
9. *Clostridium botulinum* is a type of bacteria that causes botulism. Like all bacteria, it can reproduce by dividing. What type of reproduction is that?

- A. Both sexual and asexual
- B. Asexual
- C. Sexual
- D. Other
- E. They don't reproduce



10. On the following chart, which person is a male with green hair? (Shaded shapes have green hair)

- A. Pat
- B. Chris
- C. Jordan
- D. Jo
- E. Stacey



11. How do birds reproduce?

- A. Both sexual and asexual
- B. Asexual
- C. Sexual
- D. Other
- E. They don't reproduce

12. What is one human cell which has gone through meiosis?

- A. toe
- B. hair
- C. skin
- D. sperm
- E. blood

13. Most cells in your body reproduce by mitosis. What is mitosis?

- A. Infection of the feet
- B. Sexual cell division
- C. Asexual cell division
- D. A type of halitosis
- E. None of these are true

14. Is meiosis sexual or asexual?

- A. sexual
- B. asexual

PUT THE STEPS OF MITOSIS IN ORDER

Of all the steps of mitosis, which happens...

- 15. First
- 16. Second
- 17. Third
- 18. Fourth
- 19. Last

- A. anaphase
- B. interphase
- C. metaphase
- D. prophase
- E. telophase

MATCH THE DESCRIPTION TO THE PHASE

- 20. In which phase do chromosomes bunch up into Xs?
- 21. In which phase are chromosomes far apart?
- 22. In which phase are chromosomes in the middle?
- 23. In which phase are chromosomes all spread out?
- 24. In which phase do chromosomes first split up?

- A. anaphase
- B. interphase
- C. metaphase
- D. prophase
- E. telophase

25. In MITOSIS, one cell splits into how many cells?

- A. Two
- B. Three
- C. Four
- D. Forty

26. In MEIOSIS, one cell splits into how many cells

- A. Two
- B. Three
- C. Four
- D. Forty

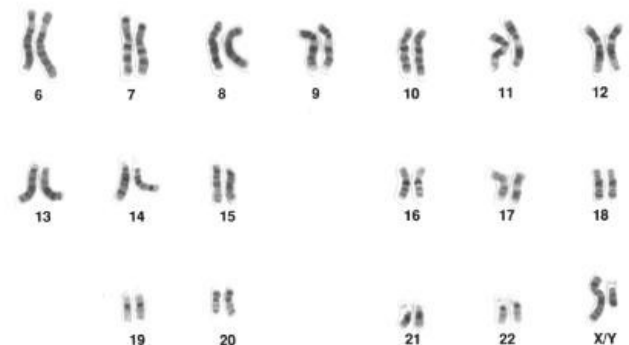
27. Women have XX sex chromosomes. Men have XY. What are the odds their first child will be male?

- A. 100%
- B. 75 %
- C. 50 %
- D. 25 %
- E. 0 %



28. Where are the chromosomes located in the cell?

- A. The membrane
- B. The mitochondria
- C. The nucleus
- D. The nucleolus



29. True or false: all organisms have the same number of genes and chromosomes.

- A. True
- B. False

30. How many PAIR of chromosomes does a normal (non-sex) human cell have?

- A. 10 pair
- B. 23 pair
- C. 30 pair
- D. 46 pair
- E. None of the above

31. If a cell starts out with six chromosomes at the beginning of MEIOSIS, how many chromosomes will each sperm or egg have at the end of meiosis?

- A. 2
- B. 3
- C. 4
- D. 6
- E. 12

32. Chromosomes are made of coiled up DNA. Why does the DNA coil up?

- A. It just looks better
- B. To keep from tangling and breaking while dividing
- C. To make studying genetics easier for scientists
- D. They don't really. Scientists made that up.

33. In DNA, there are four nitrogenous bases abbreviated GAT and C. A is always paired with T. What is the opposite of GATTACA?

- A. TGCCTAG
- B. CTAATGT
- C. CGAAGTG
- D. ACATTAG

34. Variety and the ability to adapt are advantages of what?

- A. Sexual reproduction
- B. Asexual reproduction
- C. Both sexual and asexual reproduction
- D. Neither sexual or asexual reproduction

35. Quick reproduction and exact copies are advantages of what?

- A. Sexual reproduction
- B. Asexual reproduction
- C. Both sexual and asexual reproduction
- D. Neither sexual or asexual reproduction

36. Slow reproduction and offspring that differ from the parents are disadvantages of what?

- A. Sexual reproduction
- B. Asexual reproduction
- C. Both sexual and asexual reproduction
- D. Neither sexual or asexual reproduction



37. If the original is bad, the duplicates are bad. Also, some cells suffer from a lack of genetic variety, so if one is in danger, they all are. What type of reproduction is most likely to have these problems?

- A. Sexual reproduction
- B. Asexual reproduction
- C. Both sexual and asexual reproduction
- D. Neither sexual or asexual reproduction

38. Dwarfism is DOMINANT. Let's suppose one parent is a dwarf (Dd) and the other has normal height. What percentage of the children will be dwarves?

- A. 100%
- B. 75%
- C. 50%
- D. 25%
- E. 0%



39. Why is meiosis important?

- A. It allows skin cells to reproduce
- B. It divides the chromosomes in half for reproduction
- C. It doubles the amount of chromosomes in the nucleolus
- D. It allows fish to have split tails

Plant Genotype:

**Tt SS yy PW**

T codes for height

S codes for texture

Y is pea color

PW is flower color

Tall is dominant over short. Smooth is dominant over rough.

Yellow is dominant over green. Purple and White are co-dominant.

40. What is the phenotype of the plant?

- A. Tall, with smooth yellow peas and purple flowers
- B. Tall, with smooth green peas and purple flowers
- C. Tt SS yy PW
- D. Medium height with smooth yellow peas and pink flowers
- E. Medium height with smooth green peas and purple flowers

41. What is the genotype of the plant?

- A. Tall, with smooth yellow peas and purple flowers
- B. Tall, with smooth green peas and purple flowers
- C. Tt SS yy PW
- D. Medium height with smooth yellow peas and pink flowers
- E. Medium height with smooth green peas and purple flowers

42. For what trait is the plant heterozygous?

- A. Height
- B. Pea color
- C. Pea texture
- D. Both height and flower color
- E. None of these

43. For what trait is the plant homozygous recessive?

- A. Height
- B. Pea color
- C. Pea texture
- D. Both height and flower color
- E. None of these

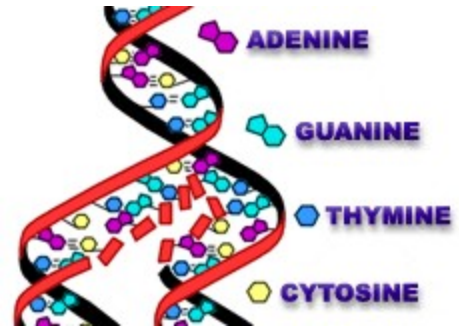
#### REVIEW

44. Which of the following would you use to measure METRIC LENGTH?

- A. Meter
- B. Liter
- C. Gram
- D. Celsius
- E. Mile

45. How many kilograms in 34,000 grams?

- A. 34,000,000
- B. 3,400,000
- C. 3400
- D. 34
- E. 3.4



46. What part of the cell is responsible for making energy (power)?

- A. the ribosome
- B. the mitochondria
- C. the endoplasmic reticulum (ER)
- D. the nucleus
- E. the membrane

47. Which part of the cell is the "highway" of the cell?

- A. the ribosome
- B. the mitochondria
- C. the ER
- D. the nucleus
- E. the membrane

48. In which substance are the molecules moving fastest?

- A. Solid
- B. Liquid
- C. Gas
- D. Jello

49. What will happen when you drop a carrot into salt water? (Hint: osmosis – remember blood cells)

- A. It will swell up with water
- B. It will shrivel as water leaves
- C. It will turn brown quickly
- D. The peel of the carrot will fall off

50. What is required for something to be alive?

- A. It must metabolize (consume and/or produce)
- B. It must reproduce
- C. It must be made of one or more cells
- D. All of the above
- E. Only two of the above

1. Create a Punnet square for a cross between a heterozygous tall plant (Tt) and a short plant (tt).

2. Create a Punnet square for a cross between two heterozygous brown-eyed individuals (Bb).

1.


2.


3. Draw and label the steps of mitosis
