Snowman (Snowpeople) GENETICS

NAME _____

The GENOTYPE for your parent Snowperson is: Bb Tt Ll Aa Hh Ee

1. This parent is _____ for all of its alleles.
homozygous heterozygous

2. What is its PHENOTYPE ?

_____

3. Draw (build) a picture of what your parent Snowperson looks like.

4. LAY your parent chromosomes FACE DOWN on your desk.
- **MATCH up your chromosomes BY SIZE (homologous pairs)**
- **Do MEIOSIS TO MAKE GAMETES WITH YOUR CHROMOSOMES.**
- **Use INDEPENDENT ASSORTMENT to separate chromosomes (one of each kind of chromosome) to make gametes**
- **Choose one set of chromosomes to make a snowbaby with your neighbor.**

5. WRITE DOWN the GENOTYPE for your baby. _____

6. Use the code to DRAW (build) A PICTURE OF WHAT THIS SNOWBABY WILL LOOK LIKE.

7. Does this baby have the same GENOTYPE as its parents? YES NO

8. Does this baby have the same PHENOTYPE as its parents? YES NO

9. USE THE CHROMOSOMES YOU DIDN'T USE THE FIRST TIME TO MAKE A SNOWBABY BROTHER.

10. SNOWBABY BROTHER GENOTYPE _____

11. DRAW A PICTURE (build) OF WHAT THE 2nd SNOWBABY LOOKS LIKE.

12. Does the new snowbaby have the same genotype as the snowparents? YES NO

13. Does the new snowbaby look exactly like the 1st snowbaby? YES NO

14. Name Mendel's TWO LAWS that explain why brothers and sisters are not identical even though they come from the same parents?

LAW OF _____

LAW OF _____

15. When 2 alleles BLEND to show an INTERMEDIATE PHENOTYPE (like crossing red and white flowered plants and producing PINK flowered offspring) the gene is said to be INCOMPLETELY DOMINANT.

16. If a trait shows INCOMPLETE DOMINANCE which genotype must an organism have to show the intermediate blended phenotype?
A. PURE DOMINANT B. PURE RECESSIVE C. HETEROZYGOUS D. HOMOZYGOUS RECESSIVE

17. Which trait in SNOWPEOPLE appears to blend and show INCOMPLETE DOMINANCE? _____

18. When neither of two alleles is dominant over the other, they don't blend but BOTH APPEAR TOGETHER AT THE SAME TIME (like A and B blood type alleles). The gene is said to be CODOMINANT.

19. Which trait in SNOWPEOPLE appears to be CODOMINANT? _____

20. Why do you think so? _____

21. A Snowperson with the genotype T t is _____ for hat genes.
homozygous heterozygous

22. A Snowperson with the genotype L L is _____ for snow color genes.
homozygous heterozygous

23. A Snowperson with the genotype e e is _____ for the nose genes.
pure hybrid

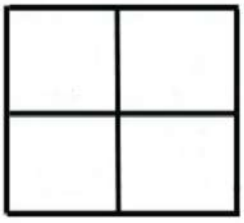
24. A Snowperson with the genotype A a is _____ for face (eyes & mouth) genes.
pure hybrid

25. What has to be true about the Snowperson parents that show a DOMINANT allele for a trait, but have a snowbaby that shows the RECESSIVE trait?

A. both parents are HOMOZYGOUS for the trait
B. both parents are HETEROZYGOUS for the trait
C. both parents are PURE for the trait
D. IMPOSSIBLE; Dominant looking parents can't have a recessive looking offspring

<u>MAKE SOME SNOWPEOPLE CROSSES:</u>
Top Hat (T) is dominant over stocking cap (t)

26. Cross a HOMOZYGOUS TOP HAT MOM with a STOCKING CAP DAD



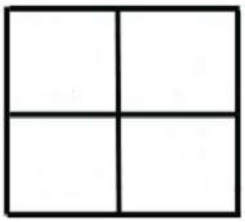
27. GENOTYPE of offspring = _____

28. PHENOTYPE of offspring = _____

29. Could these parents ever have a stocking cap snowbaby? YES N

30. This cross is a _____ cross.
MONOHYBRID DIHYBRID

MAKE A CROSS BETWEEN



31. Cross a PURE STOCKING CAP MOM with a HYBRID TOP HAT DAD

What is the probability the offspring will:

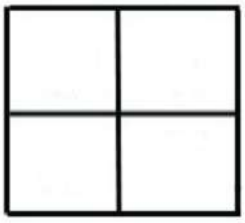
32. Top hats: _____ out of 4 OR _____%

33. Have stocking caps: _____ out of 4 OR _____%

34. Be hybrids: _____ out of 4 OR _____%

35. Be homozygous: _____ out of 4 OR _____%

36. MAKE A CROSS BETWEEN TWO SNOWPEOPLE THAT ARE HETEROZYGOUS FOR NOSE GENES.



PROBABILITY	GENOTYPE	PHENOTYPE
____ out of 4 OR _____ % will be	_____	_____
____ out of 4 OR _____ % will be	_____	_____
____ out of 4 OR _____ % will be	_____	_____

SNOWPEOPLE HAVE THE SAME A, B, O BLOOD TYPE ALLELES AS HUMANS.

37. Tell two different GENOTYPES a Snowperson could have if it had TYPE A blood. _____ _____

38. If one of your SNOWPEOPLE WITH AB TYPE blood was injured and needed a blood transfusion, tell all the possible blood types that could act as donors. _____ _____ _____

39. Which blood type is considered to be the "universal donor"? _____

40. A cross between two parent Snowpeople that are HETEROZYGOUS for TWO TRAITS is called a _____ cross.

MONOHYBRID DIHYBRID

EXTRA CREDIT

<u>MAKE THE FOLLOWING CROSS</u>: T t B b X T t B b

41. What are the possible GAMETES this Snowperson can produce?

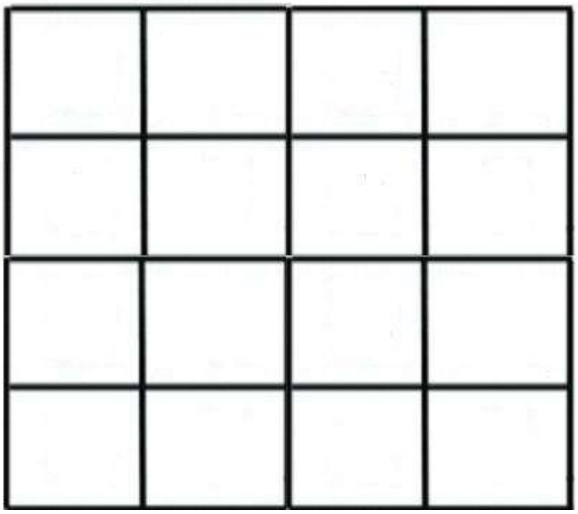
T t B b

_____ _____ _____ _____

42. What phenotypic ratio would you expect to see in the offspring?

3:1 1:2:1 2:2 9:3:3:1 4:4:4:4

43. USE A PUNNETT SQUARE TO SHOW THE POSSIBLE OFFSPRING OF THIS CROSS:



44. What is the probability that an offspring will have 3 BODY SEGMENTS and a TOP HAT?

45. What is the probability that an offspring will have 2 BODY SEGMENTS and a TOP HAT?

46. What is the probability that an offspring will have 3 BODY SEGMENTS and a STOCKING CAP?

47. What is the probability that an offspring will have 2 BODY SEGMENTS and a STOCKING CAP?

Snowman (Snowpeople) GENETICS

NAME _____

Parent Snowperson	x	Parent Snowperson
Bb Tt Ll Aa Hh Ee		Bb Tt Ll Aa Hh Ee