Snowman Genetics

Genotypes and Phenotypes

B – 3 body segments	S – neck scarf
b – 2 body segments	s – neck tie
H – black top hat	L – twig arms with branches
h – soft stocking hat	l – twig arms without branches
E – long carrot nose	O – eyes & smile made of coal
e – short carrot nose	o – eyes & smile made of buttons

The genotype for the parent is: Bb Hh Ee Ss Ll Oo

Directions:

1. Answer Questions 1 – 3 on the student guide.
2. Lay your chromosomes FACE DOWN on your desk.
3. Match up your chromosomes by SIZE (homologous pairs)
4. Do MEIOSIS to make gametes with your chromosomes
5. Use INDEPENDET ASSORTMENT to separate your chromosomes (one of each kind of chromosome).
6. Find a partner and each of you choose one set of chromosomes to make a snowbaby.
7. Answer questions 4 – 7 on the student guide.
8. Use the chromosomes you did not use the first time to make a second snow baby.
9. Answer questions 8 – 11 on the student guide.
10. Complete the rest of the student guide

NAME: _____

SNOWMAN GENETICS

1. The parent snowperson is _____ for all of its alleles

2. What is its phenotype?

3. Draw your parent snowperson on the family tree page.

4. What is the genotype for snowbaby #1?

5. Draw snowbaby #1 on the family tree page.

6. Does this baby have the same genotype as its parents?

7. Does this baby have the same phenotype as its parents?

8. What is the genotype for snowbaby #2?

9. Draw snowbaby #2 on the family tree page.

10. Does this baby have the same genotype as its parents?

11. Does this baby have the same phenotype as its parents?

12. What law did Gregor Mendel come up with that helps explain why brothers and sisters are not identical even though they comes from the same parents?

13. A snowman with the genotype Hh is _____ for hat genes.

14. A snowman with the genotype SS is _____ for _____ genes.

15. A snowman with the genotype aa is _____ for _____ genes.

Make some snowman crosses:

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

17. Genotype of offspring: _____

18. Phenotype of offspring: _____

19. Could these parents ever have a stocking cap snowbaby? _____ Why? _____
_____

20. This cross is a monohybrid/dihybrid cross. (circle one).

21. Cross a PURE STOCKING CAP MOM with a HETEROZYGOUS TOP HAT DAD

22. What is the probability the offspring will:

    a. Top Hats: ____ out of 4 or _____%

    b. Have stocking caps: _____ out of 4 or _____%

    c. Be heterozygous: _____ out of 4 or _____%

    d. Be homozygous: _____ out of 4 or _____%

23. Make a cross between two snowpeople that are heterozygous for nose genes.

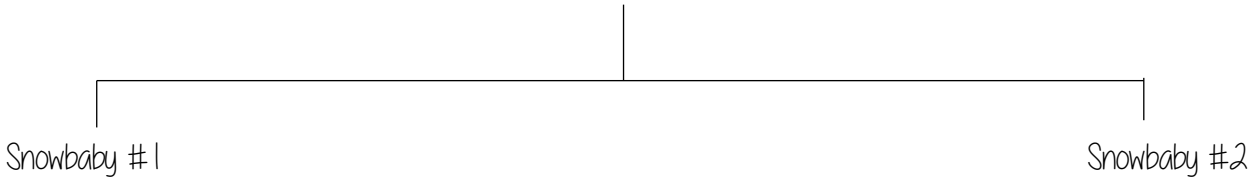
Probability	Genotype	Phenotype
a. _____ out of 4 or ____ % will be	_____	_____
b. _____ out of 4 or ____ % will be	_____	_____
c. _____ out of 4 or ____ % will be	_____	_____

NAME: _____

SNOWPEOPLE FAMILY TREE

Parent Snowperson

Bb Hh Ee Ss Ll Oa x Bb Hh Ee Ss Ll Oa



B 3 body segments	b 2 body segments

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S Neck scarf	s neck tie

L Twig arms with branches	l twig arms without branches

A Eyes & smile made of coal	a eyes & smilemade of buttons