Name:_____

Monster Mash

Part 1: Multigenerational Observations—Shnorfs

1. What is a trait?_____

   _____

2. Where do we get our traits from?_____

   _____

3. List three traits that you have:

   _____ _____ _____

Shnorfs

4. List traits that can vary between shnorfs:

   _____ _____ _____

   _____ _____ _____

5. Circle the traits in question 4 that are the same in the siblings (generation 2).

6. What patterns can you identify in this set of offspring (generation 2)?_____

   _____

   _____

   _____

   _____

7. A model is your understanding of how traits are inherited. What key points need to be included in a model of heredity?

    - There are _____ in a population of one species.
    - **Siblings** have traits that are _____ but they have more traits _____ with each other than with the general population.
    - In general, family members are not _____ to each other.

8. As a class we chose to look at the: Parent Offspring

9. What patterns do you notice about generation _____ of shnorfs compared to generation 2?

    _____

    _____

    _____

10. What additional key points need to be included in a model of heredity?

    - **Parents** have traits that are _____ from their offspring, but they have more traits _____ with each other than with the general population.

11. Use the information from questions 7 and 10 to create your initial model of heredity (a poster which explains how traits are inherited).

12. Based on your model, describe what you think another species of sibling monsters would look like._____

    _____

Part 2: Multigenerational Observations—Dromos

Dromos

13. List traits that can vary between dromos:

_____ _____ _____

_____ _____ _____

14. Does your prediction match with the dromo siblings? Yes No

15. What patterns can you identify about the offspring (generation 2) in family 1?_____

_____

16. What patterns can you identify about the offspring (generation 2) in family 2?_____

_____

17. What patterns can you identify between family 1 and family 2?_____

_____

_____

18. What do you think caused the families to look the way they do?_____

_____

19. What additional key points need to be included in a model of heredity?

- Some species produce offspring siblings that are _____

20. As a class we chose to look at the: Parent Offspring

21. What patterns do you notice about generation _____ of dromos compared to generation 2?

_____

_____

22. What was different about shnorfs and dromos? _____

_____

_____

23. What additional key points need to be included in a model of heredity?

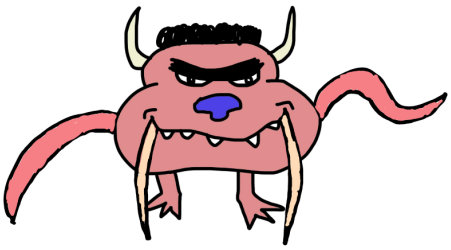
- Some species have parents that are _____.
- Traits can be inherited in _____.

24. Use the information from questions 19 and 23 to revise your model of heredity. On your model make sure to include what you predict a sibling of each the following shnorf would look like.

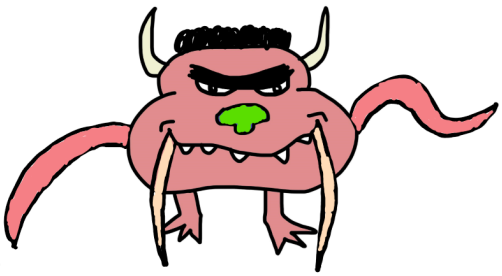
Part 3: Shnorf Genetics (the study of how traits are passed down)

25. Below are pictures of two shnorf siblings. Draw what you think their parents look like.

Sibling 1:



Sibling 2:



Parent 1:

Parent 2:

26. Were your predictions correct? Yes No

27. Where did sibling 1's nose color come from?_____

28. What does this mean about the parents' genes (genetic makeup) ? _____

_____

29. If nose color were determined by **one piece** of genetic information, would it be possible for two green-nosed parents to have a blue-nosed offspring? Yes No

30. Justify your answer to number 29. _____

_____

_____

31. Could nose color be determined by **two pieces** of genetic information? Why or why not?

_____

_____

_____

_____

32. We are exploring the trait of _____. The genetic information for traits are stored in _____. Within a _____, there are _____ pieces of information; these are called _____. _____ code for the different versions of a trait; for example, _____ and _____. Even though the _____ could be different in a _____, only one will be seen.

33. What does this mean about how genetic information is passed down?_____

_____

_____

34. What additional key points need to be included in a model of heredity?

- Genetic information is stored in _____ which contain _____ and determines_____.
- Not all alleles that are carried _____.
- Parents _____ to their offspring.

35. Use the information from question 34 to revise your model of heredity. In addition, make sure to include the following about the shnorf family consisting of two green-nosed parents, with blue-nosed AND green-nosed offspring:

- The alleles which are contained in each family member's genes. We will use _____ to represent the blue nose allele and _____ to represent the green nose allele.
- The possible allele combinations that the parents could pass down to their offspring.
- The fraction of offspring that are expected to show green noses, and the fraction of offspring that are expected to show blue noses.

Part 4: Predicting the Frequency of Traits - Shnorfs

36. Geneticists use _____ to calculate the fraction of siblings that will inherit a certain trait from their parents. Confirm that your model matches the fractions from this method.

_____

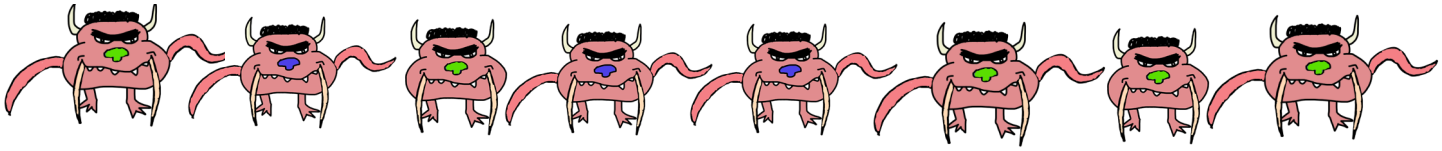
_____

_____

_____

_____

37. The following are eight siblings which are offspring from the parents we have been studying. Do these offspring match our predictions from question 35 and why?



	Green Nose	Blue Nose
Predicted Fraction (out of 8)		
Actual Fraction (out of 8)		

_____

_____

_____

_____

_____

38. When is our model the most accurate? _____

_____

39. The terms **dominant** and **recessive** are often used in discussing the inheritance of traits. What do you think these terms mean?_____

_____

_____

_____

40. What additional key points need to be included in a model of heredity?

- If the allele is dominant, _____

  _____

- If the allele is recessive, _____

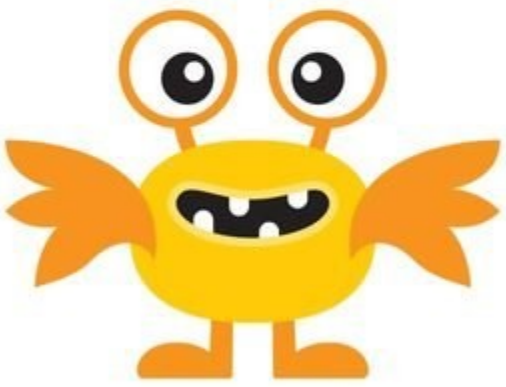
  _____

- Punnett squares give _____

  _____

  _____

41. Use the information from question 40 to revise your model of heredity. On your model, include a Punnett square to show the probability that two shnorf parents, one with tusks (allele "T") and one with no tusks (allele "N"), would have offspring with tusks. Having tusks is known to be a recessive trait.



Part 5: Predicting the Frequency of Traits — Dromos

42. Are all dromos identical? Yes No

43. What patterns did you notice about the dromo parent and their offspring that you saw?

_____

_____

44. What does this mean about dromo parents? _____

_____

45. How likely is this to happen?_____

46. If you have identical parents, does this mean you will have identical offspring? Yes No

47. Give an example to support your answer to question 46.

	Gene	**Expressed Trait**
Parent 1		
Parent 2		
Offspring		

48. How could a parent produce offspring that are identical to them? _____

_____

_____

49. What does this mean about dromos? _____

_____

To reproduce, shnorfs undergo **sexual reproduction**.

50. How many parents are needed for sexual reproduction?_____

    _____

51. When an offspring is produced though sexual reproduction, what does this mean about where the offspring's genetic makeup comes from? _____

    _____

    _____

52. What do you think asexual reproduction is, and how many parents are needed?_____

    _____

    _____

    _____

53. What additional key points need to be included in a model of heredity?

    - Some species produce offspring through _____, others produce offspring through _____.

54. Use the information from question 53 to revise your model of heredity. On your model, make sure to include a definition of sexual and asexual reproduction.

Part 6: Applying the Model

55. What patterns have you noticed in sets of human siblings?_____

_____

56. What patterns have you noticed between parents and their children?_____

_____

57. Use your model to make a claim about which type of reproduction humans undergo.

Humans undergo sexual reproduction asexual reproduction

because _____
evidence

_____

_____

_____

58. According to your model, what does this mean about a human child's genes?_____

_____

_____

59. In humans, the allele for freckles is known to be dominant. Use your model to calculate the probability that two parents without freckles will have a child with freckles.

	Gene	Expressed Trait
Parent 1		
Parent 2		
Child		

_____

_____

_____

_____

_____

Ploobs

60. What patterns did you notice in the ploob offspring born in December of 2013?_____

_____

_____

61. Use your model to make a claim about which type of reproduction ploobs undergo.

Ploobs undergo sexual reproduction asexual reproduction

because _____

_____

_____

_____

62. What patterns did you notice in the ploob offspring born in June of 2021?_____

_____

_____

63. Was your prediction in question 61 correct? Yes No

64. What evidence supports this?_____

_____

_____

65. How do you think ploobs reproduce?_____

_____

_____

66. What additional key points need to be included in a model of heredity?

- Some species _____

67. What do you think an advantage of sexual reproduction is?_____

_____

68. What do you think an advantage of asexual reproduction is?_____

_____

Part 7: Verifying the Model

69. Is your model of heredity consistent with scientific findings? Yes No

and is your model complete? Yes No

70. What are three interesting things that you learned from the article?

1. _____

_____

2. _____

_____

3. _____

_____

71. How is there diversity within populations that reproduce asexually?_____

_____

_____

72. What additional key points need to be included in a model of heredity?

- Asexual reproduction is common in _____.
- Sexual reproduction is common in _____.
- Plants often reproduce_____.
- A benefit of sexual reproduction is _____

  _____
- A benefit of asexual reproduction is_____

  _____

73. Use the information from question 66 and 72 to revise your model of heredity. Make sure that each group member describes a different type of asexual reproduction on a sticky note and places it on your model.