Use the following information to answer the next 14 questions.

Dr. Morgan studies mayflies in ponds and streams. When they are immature (juvenile), mayflies live in the water and eat algae; as flying adults they do not eat. Assume young trout (fish) eat only mayflies and carp (another fish) eat only algae. Black bears and eagles both eat trout and carp. Some people catch trout and eat them too.

1. The algae in this community are called producers because they ________.
   a) produce carbon dioxide in cellular respiration
   b) produce cells that are eaten by mayflies and carp
   c) are autotrophs
   d) produce molecules that are sources of energy for herbivores
   e) (b), (c) and (d) are true of producers in this system

2. Suppose that people in this community eat only fish. They could harvest the largest proportion of the energy fixed by the autotrophs if they eat ________.
   a) equal amounts of carp and trout
   b) only carp
   c) only trout
   d) carp on Monday, Wednesday and Friday and trout on other days of the week.
   e) trout on Monday, Wednesday and Friday and carp on other days of the week.

3. If lead (a heavy metal) leaches into the stream where this community lives and it is biomagnified, the highest concentrations of lead (for example, mg lead/gram of a particular organism) would be found in ________.
   a) algae
   b) mayflies
   c) carp
   d) trout
   e) eagles

4. The carbon which is a part of glucose in the cells of the mayflies entered the food chain as ______.
   a) carbon dioxide dissolved in water and taken up by algae
   b) carbon dioxide in trees in the surrounding forest
   c) rotting bear flesh that fed decomposer bacteria
   d) oxygen released in cellular respiration
   e) carp feces

5. Some of the oxygen that was used by adult mayflies was produced by ____.
   a) bears
   b) eagles
   c) algae
   d) carp
   e) trout

6. Which one or more of the following organisms in this community release carbon dioxide?
   a) trout
   b) mayflies
   c) decomposer bacteria
   d) algae
   e) all of these organisms release carbon dioxide
Use this material to answer the next 3 questions.
Dr. Morgan is studying the relationship between exposure to lead concentration in food and mental confusion in black bears. For 6 weeks she feeds one bear a diet containing 0 mg lead/gm bear body weight, one bear a diet containing 3 mg/gm, one bear a diet containing 5 mg/gm and one bear a diet containing 10 mg lead/gm. At the end of this period she assesses bear mental confusion by releasing each bear, one at a time, at the opening to a very large maze built by the local vocational-technical concrete construction class. At the end of the maze is a small pool of water in which 5 trout are swimming and the bear is permitted to eat as many of the fish as it likes. She records the length of time it takes each bear to make its way through the maze (time elapsed in maze) and eat one fish.

7. The control bear in this experiment receives ____ mg lead/gm body weight
   a) 0
   b) 1
   c) 3
   d) 5
   e) 10

8. If Dr. Morgan is not mentally confused herself by this experiment, she would correctly plot _______, which is the independent (manipulated) variable on the ___ axis; and _______, which is the dependent (response) variable on the ___ axis.
   a) time elapsed in the maze, Y; lead concentration, X
   b) lead concentration, X; fish swimming speed, Y
   c) time elapsed in the maze, Y diameter of bear skull, X
   d) lead concentration, X; time elapsed in the maze, Y
   e) time elapsed in the maze, Y; number of fish eaten, X

9. Suppose that lead exposure has been demonstrated to decrease the transmission rate of neural signals from neuron to neuron. Your task is to determine whether the decrease in transmission rate is caused by a defect in the synapse. Which of the following would you logically measure to determine whether a process in the synapse is affected directly?
   a) activity of the sodium-potassium pump
   b) activity of the sodium channels in the pre-synaptic neuron
   c) concentration of acetylcholine in axon bulb vesicles
   d) rate of closing of the potassium gates
   e) concentration of neurotransmitter in the synapse

Use the following information to answer the next 5 questions.
A catfish farm has been established close to one of Dr. Morgan's study streams. In the pond in which very high densities of catfish are raised by feeding them Whiskers Catfish Chow, dissolved nitrogen and phosphorus levels are now quite high. The water from this pond is moving through the ground water into a Morgan study stream in the adjacent state park.

10. You correctly predict which one or more of the following will occur within Dr. Morgan's study stream?
    a) biodiversity may decline
    b) blue-green algae (cyanobacteria) populations may increase
    c) anoxia may result
    d) (a), (b) and (c) may occur
    e) only (a) and (b) may occur
11. The mayflies in Dr. Morgan’s study stream die and none are found there for 10 years. Dr. Morgan is very surprised to find the immature mayflies in the study stream again at the end of that period. She correctly concludes that adult mayflies from other streams unaffected by the nitrogen and phosphorus increases in the ground water have laid their eggs in her study stream and that these young mayflies came from those eggs. She finds that the new mayflies in her stream are extraordinarily efficient at glycolysis. You correctly predict that to document this she should measure increased levels of pyruvate (a product of glycolysis) in the _______ of the mayfly cells.
   a) rough endoplasmic reticulum
   b) chloroplast
   c) nucleus
   d) ribosomes
   e) cytoplasm/cytosol

12. The mayflies, described in the previous question, that are very efficient at glycolysis probably arose as a result of _______ and survived in the study stream as a result of ________.
   a) a mutation, natural selection
   b) a mutation, adaptive radiation
   c) mitochondrial evolution, natural selection
   d) need for more ATP, mutation
   e) need for more ATP, adaptive radiation

13. If you (or Dr. Morgan) looked at cells of any mayfly, you would know that they are _____ because they contain ______.
   a) prokaryotic, ATP
   b) eukaryotic, nucleus
   c) eukaryotic, ribosomes
   d) prokaryotic, ribosomes
   e) eukaryotic, DNA

14. The trout in this system contain abnormally small amounts of fat. Assume that although they are poikilothersms, their metabolism is controlled by roughly the same endocrine secretions (hormones) that control metabolism in mammals. Which one or more of the following would you correctly predict may be causing abnormally small amounts of fat?
   a) decreased pituitary secretion
   b) decreased swimming frequency
   c) increased locomotor activity
   d) increased thyroxin secretion
   e) (c) and (d) may be responsible

Use this material to answer the next 7 questions.

At one of their many public appearances after the Survivor series, Jervis and Rich began talking about greenish-yellow marine algae they noticed washing up onto the beaches of “Survivor” island, where it quickly dried up and died. One of the noticeable features of this greenish-yellow alga was an assortment of hollow bladders filled with air. As an informed and interested biology 1114 student, you could have correctly answered several of Jervis’s questions about the adaptive value of these easily observed traits.

15. Which of the following is true about the algae?
   a) It will be able to make the most sugar at the ocean’s surface in full sunlight.
   b) It will be able to make the most sugar in ocean depths greater than 20 m, where light intensity is reduced.
   c) It will be able to make the same amount of sugar at all ocean depths.
   d) All metabolic processes, including photosynthesis will proceed faster in cold water compared to warm water.
   e) Greenish-yellow pigments reflect red light.
16. Which one or more of the following is(are) good hypothesis(es) to explain the existence of air bladders?
   a) The algae survives best if it dries up on beaches.
   b) The algae survives and reproduces best if it floats in the top few feet of the ocean.
   c) The algae uses air bladders to breathe.
   d) The energy harvested by algae floating on the ocean surface is greater than the energy harvested by algae that sinks.
   e) Both (b) and (d)

17. Jervis correctly predicts (and you confirm) that photosynthesis will be greatest when the algae is kept in which of the following conditions under lights of equal intensity?
   a) warm water under green light.
   b) cool water under green light.
   c) warm water under white light (sunlight).
   d) warm water under red light.
   e) cool water under red light.

18. If Rich and Jervis really had to survive on the island, their biological fitness would have been most fully demonstrated if they also ___________.
   a) made a lot of money
   b) became famous
   c) produced viable offspring
   d) rafted off the island and went home
   e) showed up as characters in a BIOL 1114 exam.

19. Rich observed gas bubbles on the surface of algae while he was snorkeling one day in the ocean. When he asks you what the gas bubbles are, you are quick to provide him with the correct information from the following list:
   a) oxygen generated during cellular respiration
   b) oxygen generated during glycolysis
   c) oxygen generated during photosynthesis
   d) carbon dioxide generated by the Calvin cycle
   e) carbon dioxide generated by Photosystem I

20. The molecules (chemicals) in the gas bubbles were ___________ formed by ___________.
   a) splitting water in the thylakoid
   b) pumping protons across mitochondrial membranes
   c) adding yeast
   d) making ATP
   e) replicating DNA

21. The reason(s) Rich needs a breathing apparatus such as a snorkel is to ___________.
   a) provide his cells with oxygen
   b) allow him to make ATP in cellular respiration
   c) help him eliminate carbon dioxide
   d) provide him with an electron acceptor for electron transport
   e) All these (a-d)
The White-Tailed Ptarmigan (a type of bird) has a distribution range that extends from Alaska to the Colorado Rockies. The ptarmigans eat only plants and are often preyed upon (eaten) by bobcats. Male ptarmigans are territorial and perform several different types of displays to attract a female to their territory. The male remains pair-bonded with the female until the eggs hatch (a period of 22 days) in order to defend the nest from predators. Once hatched the young can feed themselves and they stay with the female until all birds move to their winter grounds. In contrast to the ptarmigans, the female bobcat is the sole provider for her young. She nurses the kittens until they can eat solid food, which she then provides from her own kills. The kittens will eventually set out on their own once they have obtained some practice at making their own kills.

22. Which one of the animals in the above situation would you correctly predict as having a monogamous breeding system?
   a) ptarmigans
   b) bobcats

23. Which female provides the greater parental investment?
   a) ptarmigan
   b) bobcat

24. Which one of the following males has the greatest evolutionary fitness?
   a) a male ptarmigan that defends the largest territory in area, but does not attract a female
   b) a male ptarmigan that produces 4 eggs each with two females but does not provide protection for either nest; 1 offspring survives
   c) a male ptarmigan that produces and protects 4 eggs with one female; 3 offspring survive
   d) a male ptarmigan that does not defend a territory

25. The plants that the ptarmigans feed on obtain ATP for performing cellular tasks such as transcription and translation by using glucose obtained from the ______ and processing it in ______.
   a) light dependent reactions; the Calvin cycle
   b) Calvin cycle; the light dependent reactions
   c) soil; the Krebs cycle
   d) Calvin cycle; cellular respiration

26. During the day, you would correctly predict that these plants would mostly give off _____ and take up ______ from the atmosphere.
   a) CO₂; H₂O
   b) O₂; ATP
   c) O₂; CO₂
   d) H₂O; CO₂

27. At night you would correctly predict that these plants would give off ______ to the atmosphere and take in ______ from the atmosphere
   a) CO₂; H₂O
   b) O₂; ATP
   c) CO₂; O₂
   d) H₂O; CO₂
28. On a snowy day (in comparison with a warm sunny day) in the Rockies, which one or more of the following would you correctly predict to be true?
   a) The plants would have decreased movement of protons (H+) across the thylakoid membrane.
   b) The ptarmigan would have increased movement of protons (H+) across the inner membrane of the mitochondria.
   c) The plant would have decreased movement of protons (H+) across the inner membrane of the mitochondria.
   d) You would correctly expect all of the above to be true.
   e) You would correctly expect only (a) and (b) to be true.

29. In a lab experiment designed to determine the effect of temperature on the rate of O2 consumption in ptarmigans, you place birds in 5 different metabolic chambers held at 5 different temperatures. You would plot _______ on the X-axis and _______ on the Y-axis.
   a) time; O2 consumption
   b) temperature; O2 consumption
   c) O2 consumption; temperature
   d) O2 consumption; time
   e) weight of bird; O2 consumption

30. In the above experiment _______ is the independent (manipulated) variable and _______ is the dependent (response) variable.
   a) time; O2 consumption
   b) temperature; O2 consumption
   c) O2 consumption; temperature
   d) O2 consumption; time
   e) weight of bird; O2 consumption

31. The ptarmigan is white in the winter and brown in the summer. You would correctly hypothesize that the bird appears white to us because ________.
   a) its feathers absorb all wavelengths of light
   b) its feathers reflect all wavelengths of light
   c) its feathers reflect only blue wavelengths of light
   d) its feathers reflect only red wavelengths of light
   e) its feathers reflect only green wavelengths of light

32. You would correctly hypothesize that the seasonal change in color experienced by the ptarmigan is a result of which one or more of the following.
   a) random mutations in the DNA of an ancestral form of the ptarmigan
   b) natural selection for the added protection against predation that is provided by the camouflage
   c) smoke and mirrors
   d) All of the above
   e) Only (a) and (b)
Use this material to answer the next 7 questions.

On a recent visit to earth, Aliens left behind a plant called Exotica, previously found only on their planet Zorg. While nearly identical to Earth plants, the Exotica plant is different in that it can consume (extract nutrients from) mice and it produces a chemical distasteful (not eaten by) to herbivores. The Exotica plant and Earth plants grow at the same rate in heavily fertilized areas without mice but Earth plants do not grow as well as the Exotica plant in areas without fertilizer when mice are present.

33. Which one or more of the following correctly explains how the Exotica plant can out-compete Earth plants?
   a) The Exotica plant can obtain nitrogen and phosphorous from consuming mice.
   b) The Exotica plant uses cellular respiration to make ATP but Earth plants do not.
   c) The Exotica plant is avoided by herbivores.
   d) Only (a) and (c) are correct.

34. During their first several years on a small Earth island, the Exotica plant population growth rate increased each year but then later decreased each year. Which one or more of the following might correctly explain this observation?
   a) The population of mice on the island decreased during the later years.
   b) Nitrogen and phosphorous became limiting during the later years.
   c) Viral and bacterial infections of the Exotica plant increased during the later years.
   d) Herbivores capable of consuming the Exotica plant evolved during the later years.
   e) All of the above could correctly explain the observation.

35. To test the effect of mice on Exotica plant growth, a good control treatment would be ________.
   a) Exotica plants grown in the absence of mice
   b) Exotica plants grown in the presence of a single mouse
   c) Exotica plants grown in the presence of 10 mice
   d) Exotica plants grown in the absence of light
   e) Exotica plants grown in the absence of fertilizer

36. The planet Zorg has millions of Exotica plants but the Aliens left behind only 5 Exotica plants on Earth. The founding population of Exotica plants on earth has ________ genetic diversity compared to the Exotica plant population on Zorg.
   a) more
   b) less
   c) the same

37. If Exotica plants are red in color, then which of the following colors of light would be least beneficial to the growth of these plants?
   a) green
   b) blue
   c) red
   d) yellow
   e) All of these colors would be equally beneficial

38. The Exotica plant grows more quickly on the planet Zorg compared to growth on Earth. Which of the following best explains this observation?
   a) The average temperature on Zorg is approximately 5°C warmer than on Earth.
   b) The average temperature on Zorg is approximately 5°C cooler than on Earth.
   c) The population density of mice is greater on Earth.
   d) The planet Zorg has more Exotica diseases.
   e) The Earth receives more solar energy than the planet Zorg.
39. The *Stinky* gene is responsible for producing the distasteful chemical of the Exotica plant. A scientist isolates DNA containing the *Stinky* gene and inserts it into the genome of Earth plants. Which one or more of the following must occur for Earth plants to produce the distasteful chemical?
   a) Transcription of the *Stinky* DNA.
   b) Translation of the *Stinky* DNA.
   c) Transcription of the *Stinky* mRNA.
   d) All of the above must occur.
   e) None of the above must occur.

40. Which one of the following organelles does not contain DNA?
   a) Golgi complex
   b) mitochondria
   c) nucleus
   d) chloroplasts
   e) All of the above organelles contain DNA.

41. Which of the following is required for the secretion of hormones and neurotransmitters?
   a) Endocytosis
   b) Phagocytosis
   c) Exocytosis
   d) Osmosis
   e) None of the above are required.

42. Plants convert nitrogen-containing compounds, such as nitrate, into ___________.
   a) Glucose
   b) Amino acids and nucleotides
   c) Oxygen
   d) Carbon dioxide
   e) Water

Use this material to answer the next 3 questions.

Scientists in the Yukon Territory of Canada fenced plots of land which were 1 km² in area. The plots contain willow bushes, a favorite browse (food) for snowshoe hares. In one fenced plot they introduced a small population of snowshoe hares consisting of 7 females and 3 males. Each female hare produced 7 baby hares the first year. The first year 10 hares died, from predation, disease, or old age.

43. What was the growth rate, $r$, of the population at the end of the first year?
   a) 1 individuals/individual/year
   b) 39 individuals/individual/year
   c) 3.9 individuals/individual/year
   d) 390 individuals/individual/year
   e) 7 individuals/individual/year

44. What was $G$, the population growth increment of hares, within the fenced plot at the end of the first year?
   a) 1 individual
   b) 39 individuals
   c) 3.9 individuals
   d) 390 individuals
   e) 0.39 individuals

45. What was the density of the hare population in the fenced plot at the end of the first year?
   a) 29 hares/km²
   b) 10 hares/km²
   c) 49 hares/km²
   d) 100 hares/km²
   e) 39 hares/km²
46. Your B cells (lymphocytes) have ____________ on their surfaces that bind with ____________ on pathogens or other cells that do not belong to you.
   a) antigens; antigen receptors
   b) antibiotics; antigens
   c) antigen receptors; antibiotics
   d) antigen receptors; antigens
   e) antibiotic receptors; antibiotics

47. A man and his wife both have normal skin pigmentation. But both had one parent who was an albino. Albinism results from an autosomal recessive allele and results in complete lack of skin pigmentation. What is the probability that their first child will be an albino?
   a) 0%
   b) 25%
   c) 50%
   d) 75%
   e) 100%

48. The process of meiosis results in:
   a) the production of four identical cells.
   b) no change in chromosome number from parental cell.
   c) a doubling of the chromosome number in the daughter (progeny) cells.
   d) a reduction in chromosome number in the daughter (progeny) cells.

49. Proteins are composed of
   a) nucleotides
   b) amino acids
   c) ions
   d) organelles
   e) none of the above

50. A strand of DNA contains which one or more of the following?
   a) information for creating a complementary DNA strand
   b) amino acids
   c) information for the order of amino acids in a protein
   d) Both (a) and (b)
   e) Both (a) and (c)

51. Which of the following helps to maintain a favorable rate of nutrient and waste exchange with the environment?
   a) The number of chromosomes
   b) Cell division (mitosis) resulting in two smaller daughter cells
   c) Cell death
   d) Fertilization to create a zygote
   e) All of the above

52. Which one or more of the following requires cell growth and division?
   a) Tumor development (cancer)
   b) Development of an antibody response to infection
   c) Tissue repair
   d) Both (a) and (c)
   e) (a), (b), and (c)
53. Transcription occurs in the ______ of eukaryotic cells.
a) Golgi body  
b) cytoplasm  
c) rough endoplasmic reticulum  
d) nucleus  
e) secretory vesicles

54. Which of the following statements about DNA is false?
a) Most eukaryotic DNA is organized as chromosomes.  
b) Eukaryotic cells contain DNA in the nucleus and mitochondria.  
c) The DNA sequence of a gene can be determined.  
d) DNA binds to ribosomes during protein synthesis

55. Transcription of a gene results in a(n)_______ and translation results in a(n)_______.
a) DNA sequence, mRNA sequence  
b) mRNA sequence, DNA sequence  
c) mRNA sequence, protein  
d) amino acid, protein  
e) protein, DNA sequence

56. Which of the following is not a protein?
a) antibody  
b) enzyme  
c) peptide hormone (leptin)  
d) DNA  
e) leptin receptor (MC-4)
Dr. Al Geelover, an aquatic biologist, added nitrate (a form of nitrogen), phosphate (a form of phosphorus) to three tubes of water containing green algae (unicellular, eukaryotic, photosynthetic organisms) and cyanobacteria (unicellular, prokaryotic, photosynthetic organisms that can also fix atmospheric nitrogen). He placed two \textit{Bosmina} (a tiny, swimming, crab-like organism that eats algae and cyanobacteria) in each tube as well. He then filled them to the top so no air was present and sealed them so no gases can exit or enter. Each algal cell is ten times bigger than each cyanobacterial cell and absorbs ten times the light. He obtains the following results during daytime observations.

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<th>Tube 1</th>
<th>At beginning of experiment</th>
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<th>After 10 days</th>
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<td>cyanobacteria population size</td>
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<tr>
<td>Bosmina population</td>
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<td>2</td>
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</table>

57. Based on the data presented, which of the following hypotheses is best supported?
   a) algal population growth is limited (restricted) by the amount of dissolved oxygen present
   b) algal population growth is limited (restricted) by the amount of nitrogen present
   c) algal population growth is limited (restricted) by the amount of phosphorus present
   d) algal population growth is limited (restricted) by the amount of carbon dioxide present
   e) algal population growth is limited (restricted) by the amount of space present

58. Based on the data presented, which hypothesis correctly explains the changes in algal population size by day 5 in tube 3?
   a) Algae need nitrogen to build protein and there was none in other tubes.
   b) Algae use phosphorus to build sugar.
   c) Because energy is lost as heat in all chemical reactions, ATP is used up and its components are not recycled.
   d) Algae cannot undergo mitosis unless they have the phosphorus and nitrogen to build DNA.
59. Based on the data presented, what is the correct hypothesis to explain the changes in algal population size in tube 3 over the 10 days?
   a) Algae continue to grow exponentially (J-shaped) under all conditions
   b) Algae continue to grow exponentially (J-shaped) as phosphorus runs out but nitrogen remains
   c) Algae grow logistically (S-shaped) because they are photosynthetic
   d) Algae grow logistically (S-shaped) as they approach some carrying capacity based on nitrogen and or phosphorus levels
   e) The algal population decreased because of the increasing *Bosmina* population.

60. Besides the scientist, which of the following can add CO₂ to each tube?
   a) algae and cyanobacteria
   b) *Bosmina*
   c) algae and cyanobacteria and *Bosmina*
   d) cyanobacteria and *Bosmina*
   e) dissolved oxygen

61. If the algae and cyanobacteria are both the same elliptical shape (like a football), which would have a larger surface to volume (S/V) ratio?
   a) algae
   b) cyanobacterium
   c) they are the same

62. To which one or more places did the phosphorus go in tube 3 by day 10?
   a) It was in the remaining living algae
   b) It was in the *Bosmina*
   c) It was in the decomposing algae in the at the bottom of the tube (sediment)
   d) It was in the cyanobacteria
   e) It was in all of the above

Use this material to answer the next 2 questions.
We discussed two hypotheses, Good Genes (A characteristic that contributes to survival of the organism is directly related to a characteristic a potential mate can observe) and Handicap (A characteristic is a direct impediment to survival and a potential mate can identify those males with the greatest handicap).

63. The orange color of male darters (a small freshwater fish) is attractive to females and easily seen by aquatic and avian predators. Which hypothesis(es) is(are) more likely to be correct concerning the evolution of this characteristic?
   a) Good Genes
   b) Handicap
   c) Both are equally likely to be supported by the evidence.

64. In red-tailed hawks, which are at the top of the food web, healthy males that catch many mice are brightly colored. If females select mates based on the brightness of their feathers, which hypothesis(es) does this observation best support?
   a) Good Genes
   b) Handicap
   c) Both are equally likely to be supported by this evidence.

65. The Leptin protein is naturally synthesized in eukaryotic cells only. However, the Leptin protein could be synthesized in bacteria if they were genetically altered to contain the Leptin gene because __________.
   a) bacteria have organelles
   b) bacteria have a nucleus
   c) bacteria and eukaryotes use the same genetic code.
   d) bacteria are eukaryotes
   e) bacteria have mitochondria
While a geneticist is in the hospital recovering from a scooter accident, he receives as a gift from his nephew, a white mouse named Arbuckle that is quite overweight, even though neither of its parents is overweight. The geneticist elects to do some breeding experiments. He breeds Arbuckle with some normal white mice and finds that all their offspring (F1) are normal looking. If the mice from the F1 generation are bred among themselves, one out of every four of their offspring (F2) is overweight. He labels this new, overweight phenotype "Spheroid".

66. Upon examining Arbuckle's offspring, which one or more of the following hypothesis(es) best explain(s) the nature of the allele that results in the Spheroid phenotype?
   a) The spheroid allele is recessive.
   b) The spheroid allele is dominant.
   c) The spheroid allele is co-dominant.
   d) The spheroid allele is either dominant or co-dominant.
   e) None of the above.

67. The expected genotype(s) of Arbuckle's offspring (F1) from the cross with the normal mouse would be
   a) SS
   b) ss
   c) Ss
   d) SS, Ss, ss
   e) Ss or SS

68. Based on the table and our knowledge of how fat is regulated, which of the following hypotheses to explain Arbuckle's condition is best supported by the data?
   a) Spheroid mice fail to produce Leptin.
   b) Spheroid mice fail to produce Leptin receptors (MC-4).
   c) Spheroid mice have no appetite.
   d) Spheroid mice produce excess Leptin Receptors (MC-4).

69. The endocrinologist decides to test a hypothesis by injecting Thyroxin into a Spheroid mouse and measuring its oxygen consumption. The independent (manipulated) variable is
   a) mouse type
   b) amount (presence or absence) of Thyroxin in the injection
   c) amount of oxygen consumed
   d) mouse age
   e) body weight

70. Based on your knowledge of the action of Leptin and the observations of the mice above, you correctly predict which of the following as the most likely outcome of the endocrinologit's experiment?
   a) $O_2$ consumption would be equal in the experimental and control groups.
   b) $O_2$ consumption would increase in the experimental group.
   c) $O_2$ consumption would increase in the control group.
   d) $O_2$ consumption would decrease in the experimental and control groups.
   e) $O_2$ consumption would decrease in the experimental group.

<table>
<thead>
<tr>
<th></th>
<th>Spheroid mice</th>
<th>Normal mice</th>
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<tbody>
<tr>
<td>Leptin levels</td>
<td>22 µg/ml</td>
<td>2 µg/ml</td>
</tr>
<tr>
<td>Body Weight</td>
<td>23g</td>
<td>13g</td>
</tr>
<tr>
<td>Oxygen Consumption</td>
<td>3g/min</td>
<td>5g/min</td>
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<tr>
<td>Food Consumption</td>
<td>8g/day</td>
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