Bio.10-Q2W3-Qs.Bank-Classification

Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

Linnaeus used similarities in <u>structure</u> to determine relationships among organisms.
2. *Streptococcus*, a type of bacteria that causes strep throat, is classified in the Kingdom Protista.
3. When organisms are classified within the same group, it can be assumed that they have a common <u>phylogeny</u>.
4. In a fan diagram, the closer a species is to the outer band, the <u>earlier</u> it appeared in geologic time.
5. A <u>dichotomous key</u> is a step-by-step way to identify an organism using a series of paired descriptions.
6. In the name of the white oak, *Quercus alba*, *Quercus* is the <u>species</u> name.
7. A phylum is related to a class as a family is related to <u>an order</u>.
8. Organisms that are similar in structure and form and successfully reproduce among themselves belong to the same <u>family</u>.
9. The greater the number of taxa two organisms have in common, the <u>more closely</u> related they are.
10. In Aristotle's system of classification, animals were classified on the basis of their <u>size and structure</u>.

Multiple Choice

Identify the choice that best completes the statement or answers the question.

 11.	The evolutionary history of a species is its		
	a. biodiversity	c.	extinction
	b. phylogeny	d.	taxonomy
 12.	A system for naming species in which two word	is a	re used to name an organism is
	a. binomial nomenclature	c.	cladistics
	b. dichotomous keying	d.	fan diagramming
 13.	The placing of information or objects into group	ps b	ased on certain similarities is
	a. biochemical analysis	c.	phylogeny
	b. classification	d.	speciation
 14.	A heterotrophic eukaryote associated with the d	eco	mposition of dead organisms is a(n)
	a. bacterium	c.	fungus
	b. herbivore	d.	protist
 15.	A group of related classes of plants is a		
	a. database	c.	division
	b. kingdom	d.	taxon
 16.	The science of grouping and naming organisms	is _	·

 17.	 a. classification b. phylogeny The method used to construct a hypothetical et a. biochemistry b. cladiation 	c. d. volut c.	nomenclature taxonomy tionary tree is DNA sequencing statistical analysis
 18.	Biologists use to create a cla a. derived traits	u. dogi c.	cam. discretionary
	b. behavioral	d.	pedigrees
 19.	Organisms that do not have a nucleus bounded	by	a membrane are
	a. multicellular.	с. d	protists.
 20.	 b. eukaryotes. Fungi obtain food by a. photosynthesis. b. chemosynthesis. c. endocytosis. d. absorbing nutrients from organic materials 	u.	prokaryotes.
 21.	Animals area. autotrophs.b. heterotrophs.	c. d.	prokaryotes. stationary.

Completion

Complete each statement.

22. The language used for scientific names is ______ because it does not change.

23. Aristotle classified animals according to their ______ and _____.

24. Aristotle classified plants into three groups based on ______ and _____

25. Scientists used a system of ______ to help understand the relationships between organisms.

Matching

Match each item with the correct statement below.

- a.phylume.familyb.orderf.bacteriac.protistg.class
- d. kingdom h. genus
- _____ 26. group of related families
- _____ 27. group of related classes
- _____ 28. group of related species
- _____ 29. group of related genera
- _____ 30. eukaryote lacking complex organ systems
- _____ 31. group of related orders
- _____ 32. microscopic, single-celled prokaryotes
- _____ 33. group of related phyla

Match each item with the correct statement below.

a. Aristotle

d. classification

b. Linnaeus

e. taxonomy

c. genus

- f. binomial nomenclature
- _____ 34. Grouping objects or information based on similarities
- _____ 35. Naming system that gives each organism a two-word name
- _____ 36. Developed the first system of classification
- _____ 37. Branch of biology that groups and names organisms
- _____ 38. Designed a system of classifying organisms based on their physical and structural similarities
- _____ 39. Consists of a group of similar species

Short Answer

40. Classify each of the items in Figure 17-1 as a bacterium, protist, or fungus.





- 41. Aristotle classified animals according to where they lived. Classify objects in your classroom in the same way.
- 42. If you observed green material on the surface of a pond, how could you determine whether it belonged to Kingdom Protista or Kingdom Eubacteria?
- 43. If you observed green, cellular, threadlike structures on a dead leaf, to what kingdom might this organism belong?
- 44. If you observed gray, threadlike structures on the surface of a leaf, how could you determine whether they were spiderwebs or fungi?
- 45. Make a list of the taxonomic categories in order from the largest category to the smallest category. Also include groups below the level of species.
- 46. On what basis can members of one kingdom be distinguished from those of another kingdom?
- 47. What are three advantages of using scientific names for organisms?
- 48. What was one shortcoming of Aristotle's classification system?
- 49. In what way are bacteria and many protists alike?
- 50. In what way are fungi and plants alike?
- 51. In what way are protists and fungi alike?

Organism	House cat	Red fox	Dog	Wolf	Gopher	Fly
Kingdom	Animalia	Animalia	Animalia	Animalia	Animalia	Animalia

Phylum	Chordata	Chordata	Chordata	Chordata	Chordata	Arthropoda
Class	Mammalia	Mammalia	Mammalia	Mammalia	Mammalia	Insecta
Order	Carnivora	Carnivora	Carnivora	Carnivora	Rodentia	Diptera
Family	Felidae	Canidae	Canidae	Canidae	Geomyidae	Muscidae
Genus	Felis	Vulpes	Canis	Canis	Thomomys	Musca
Species	F. domesticus	V. fulva	C. familiaris	C. lupus	T. bottae	M. domestica

Table	17-2
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- 52. How does Table 17-2 indicate that a dog is more closely related to a red fox than a house cat?
- 53. At what level does the relationship between gophers and house cats diverge? Refer to Table 17-2.
- 54. From Table 17-2, which two animals are most closely related? Explain.
- 55. What is the complete classification of *Vulpes velox*? Use Table 17-2.
- 56. What kind of animal is *Vulpes velox*? How do you know? Use Table 17-2.

When a sample solution of DNA is heated to about 80°C, the DNA "melts," separating into single strands of nucleotide bases. If the sample is cooled slightly and incubated, matching sequences begin to reassociate. The solution can then be filtered to allow the single strands to pass through.

One technique for comparing DNA of different species involves the labeling of single strands of DNA with radioactive iodine and using the labeled DNA to form hybrid DNA. In this procedure, a small amount of labeled, single-stranded DNA from one organism is mixed with a large amount of unlabeled, single-stranded DNA from another organism, and the mixture is incubated over time. A percentage of the strands form hybrid DNA consisting of one labeled and one unlabeled strand (see Figure 17-2A).

The more closely related the organisms, the greater the number of matched sequences there will be along these strands (see Figure 17-2B). Hybrid DNA with a high proportion of matched sequences melts at higher temperatures than that with a low proportion of matched sequences.



Figure 17-2

- 57. Referring to Figure 17-2, what control could you devise?
- 58. What would be the independent and dependent variables in your experiment? See Figure 17-2.
- 59. How could you use the hybrid DNA technique to test your hypothesis? Refer to Figure 17-2.
- 60. What is one hypothesis you could form about the relationship among bird groups A, B, and C of Figure 17-2, based on the given information?
- 61. A solution containing Hybrid A in Figure 17-2 is heated at stages of 2.5 degrees from 55°C to 95°C and filtered at each stage to let single strands of DNA pass through. The radioactivity of the filtered material is measured at each stage. Would you expect to find higher radioactivity levels at 60°C or 85°C? Why?
- 62. Which hybrid DNA in Figure 17-2 would melt at a lower temperature when heated?
- 63. Which hybrid DNA in Figure 17-2 was formed by DNA from two closely related organisms?

Problem

	~						
67	Complete the t	table of the	abaractoristics	of the civ	kingdome i	n Toblo 17-1	
04.				of the six	KIII2UUIIIS I		
					0		

Character- istic	Eubacteria	Archae- bacteria	Protista	Fungi	Plantae	Animalia
cell type		prokary- otic				
body form					multi- cellular	
method of obtaining food	absorption, photosyn- thesis, or chemosyn- thesis					
presence of complex organ systems				no		

Table 17-1

Essay



Figure R17-1

- 65. What five probable ancestors of the modern bird (robin) are shown on the cladogram above?
- 66. In the figure above, which dinosaur is probably the most recent common ancestor of *Velociraptor* and *Archaeopteryx*?
- 67. In the figure above, which traits shown on the cladogram are shared by Archaeopteryx and modern birds?

Bio.10-Q2W3-Qs.Bank-Classification Answer Section

MODIFIED TRUE/FALSE

1.	ANS: OBJ:	T 17-1	NAT:	C3 C5 G3	PTS:	1	DIF:	В
2.	ANS:	F, Eubacteria						
	PTS:	1	DIF:	В	OBJ:	17-6	NAT:	C3 C5
3.	ANS:	Т			PTS:	1	DIF:	В
	OBJ:	17-3	NAT:	C3 C5 G3				
4.	ANS:	F, later						
	PTS:	1	DIF:	В	OBJ:	17-4	NAT:	C3 C5
5.	ANS:	Т			PTS:	1	DIF:	В
	OBJ:	17-1	NAT:	C3 C5 G3				
6.	ANS:	F, genus						
	PTS:	1	DIF:	В	OBJ:	17-2	NAT:	C3 C5 G3
7.	ANS:	F, a genus						
	PTS:	1	DIF:	В	OBJ:	17-3	NAT:	C3 C5 G3
8.	ANS:	F, species						
	PTS:	1	DIF:	В	OBJ:	17-3	NAT:	C3 C5 G3
9.	ANS:	Т			PTS:	1	DIF:	В
	OBJ:	17-4	NAT:	C3 C5				
10.	ANS:	F, habitat and	physica	l differences				
	PTS:	1	DIF:	В	OBJ:	17-1	NAT:	C3 C5 G3
MULTIPL	E CHO	DICE						
11.	ANS:	B	PTS:	1	DIF:	В	OBJ:	17-1
	NAT:	C3 C5 G3				_		
12.	ANS:	A	PTS:	1	DIF:	В	OBJ:	17-2
	NAT:	C3 C5 G3						
13.	ANS:	В	PTS:	1	DIF:	В	OBJ:	17-1
	NAT:	C3 C5 G3						
14.	ANS:	С	PTS:	1	DIF:	В	OBJ:	17-6
	NAT:	C3 C5						
15.	ANS:	С	PTS:	1	DIF:	В	OBJ:	17-3
	NAT:	C3 C5 G3						
16.	ANS:	D	PTS:	1	DIF:	В	OBJ:	17-1
	NAT:	C3 C5 G3						
17.	ANS:	В	PTS:	1	DIF:	В	OBJ:	17-4

		NAT:	C3 C5						
1	18.	ANS:	Α	PTS:	1	DIF:	В	OBJ:	17-5
		NAT:	C3 C5						
1	19.	ANS:	D	PTS:	1				
	20.	ANS:	D	PTS:	1				
2	21.	ANS:	В	PTS:	1				
COMP	LEI	ΓΙΟΝ							
2	22.	ANS:	Latin						
					_				
		PTS:	1	DIF:	В	OBJ:	17-1	NAT:	C3 C5 G3
2	23.	ANS:	habitat, physic	al diffe	erences				
		DTC .	1	DIE	P	OBI	17 1	ΝΛΤ·	$C_{3} C_{5} C_{3}$
~	7/	LIP.	iza structura	DII'.	Б	ODJ.	1/-1	INAL.	05 05 05
2	24.	ли.	size, structure						
		PTS:	1	DIF:	В	OBJ:	17-1	NAT:	C3 C5 G3
2	25.	ANS:	classification						1 1
		PTS:	1	DIF:	В	OBJ:	17-1	NAT:	C3 C5 G3
матс	HIN	IG							
2	26.	ANS:	В	PTS:	1	DIF:	В	OBJ:	17-3
		NAT:	C3 C5 G3						
2	27.	ANS:	A	PTS:	1	DIF:	В	OBJ:	17-3
	•	NAT:	C3 C5 G3	DEG		D.IE	5	0.5.4	
4	28.	ANS:	H	PTS:	1	DIF:	В	OBJ:	17-3
~	20	NAT:	C3 C3 G3	DTC.	1	DIE.	D	ODI.	17.2
2	29.	ANS: NAT·	E	P15:	1	DIF:	D	ODJ:	17-5
	30	ANS.	C C	PTS ·	1	DIF	B	OBI	17-3
		NAT:	C3 C5 G3	110.	1	DII.	D	010.	17.5
	31.	ANS:	G	PTS:	1	DIF:	В	OBJ:	17-3
		NAT:	C3 C5 G3						
	32.	ANS:	F	PTS:	1	DIF:	В	OBJ:	17-3
		NAT:	C3 C5 G3						
	33.	ANS:	D	PTS:	1	DIF:	В	OBJ:	17-3
		NAT:	C3 C5 G3						
-	2 /I	ANC.	D	DTC.	1				
)4. 25	ANG.	Г F	LIS: DLC	1				
	35. 36	ANS.	Δ	FIS. PTC.	1				
	30.	ANS.	F	113. РТς.	1				
	38	ANS.	B	PTS.	1				
-		·			-				

39. ANS: C PTS: 1

SHORT ANSWER

40.	ANS: protist, bacterium, fu	ingus				
41.	PTS: 1 ANS:	DIF:	В	OBJ:	17-6	NAT: C3 C5
	On the floor: chairs, models. On the coun papers, pens, pencils	tables, s ters: fla , books	stools, trash car sks, test-tube ra , wire baskets, o	ns, gum acks wit distilled	wrappers. On th test tubes, pl water bottles,	the ceiling: lights, spiderwebs, suspended ants, animals in cages, aquarium, piles of book bags, beakers
42	PTS: 1	DIF:	А	OBJ:	17-1	NAT: C3 C5 G3
42.	Protists have organiz	ed nucl	ei while bacteri	a do no	t.	
43.	PTS: 1 ANS: Protista	DIF:	А	OBJ:	17-6	NAT: C3 C5
4.4	PTS: 1	DIF:	А	OBJ:	17-6	NAT: C3 C5
44.	ANS: Microscopically, fun	igi woul	d be cellular w	hile spi	derwebs would	l not.
45	PTS: 1	DIF:	А	OBJ:	17-6	NAT: C3 C5
ч.).	kingdom, phylum or	divisio	n, class, order,	family,	genus, species,	, subspecies, varieties, forms, cultivars
46	PTS: 1 ANS [.]	DIF:	А	OBJ:	17-3	NAT: C3 C5 G3
	Differences in cellula	ar chara	cteristics and n	nethods	of obtaining fo	ood are used to distinguish kingdoms.
47.	PTS: 1 ANS:	DIF:	А	OBJ:	17-6	NAT: C3 C5
	Answers may vary. I names avoids confus how organisms are re	Latin sc sion whe elated a	ientific names a ere there is mor nd classified.	are reco e than c	gnized by scier one common na	ntists all over the world. The use of scientific ame for an organism. Scientific names reflect
18	PTS: 1	DIF:	А	OBJ:	17-2	NAT: C3 C5 G3
-0.	Answers may state the nor did it show nature	hat Aris al relati	totle's system d onships among	idn't ac organis	count for anim	als that live in two kinds of environments,
49.	PTS: 1 ANS: They are unicellular	DIF:	А	OBJ:	17-1	NAT: C3 C5 G3
	PTS· 1	DIE	в	OBI-	17-6	NAT: C3 C5
50.	ANS:	μη,		UD J.	1/0	

	They both remain in	one pla	ce for their life	history	<i>.</i>	
51.	PTS: 1 ANS: Members can be eith	DIF:	B Allular or multi	OBJ:	17-6	NAT: C3 C5
	Weinbers can be en			ciiuiai.		
52.	PTS: 1 ANS:	DIF:	В	OBJ:	17-6	NAT: C3 C5
	A dog, a red fox, and family, whereas dog	1 a cat s s and ca	hare the same k ts are not.	tingdom	n, phylum, class	s, and order. Dogs and foxes are in the same
53	PTS: 1	DIF:	А	OBJ:	17-4	NAT: C3 C5
55.	Gophers and house c	ats sha	e the same king	gdom, p	hylum, and cla	ass; they begin to diverge at the order level.
54	PTS: 1	DIF:	А	OBJ:	17-4	NAT: C3 C5
54.	The dog and the wol classification in com	f are mo mon, di	ost closely relat ffering only at	ed beca the spec	use they have t cies level.	the greatest number of levels of
55	PTS: 1	DIF:	А	OBJ:	17-4	NAT: C3 C5
55.	kingdom: Animalia; species: V. velox	phylum	: Chordata; cla	ss: Mar	nmalia; order: (Carnivora; family: Canidae; genus: Vulpes;
56	PTS: 1 ANS [:]	DIF:	А	OBJ:	17-4	NAT: C3 C5
20.	Vulpes velox is a spe	cies of	fox because it i	s of the	same genus as	the red fox, Vulpes fulva.
	PTS: 1	DIF:	А	OBJ:	17-4	NAT: C3 C5
57.	ANS: The control would b in the same group.	e mixin	g labeled DNA	from o	rganisms in gro	oup A with unlabeled DNA from organisms
5 0	PTS: 1	DIF:	А	OBJ:	17-4	NAT: C3 C5
58.	ANS: Answers may vary, o DNA from organism would be the proport	dependi is in gro tion of r	ng on the hypot up A with unla natched sequen	hesis. T beled D ces in t	The independen DNA from organ he hybrid.	nt variable would be the mixing of labeled nisms in group C. The dependent variable
50	PTS: 1	DIF:	А	OBJ:	17-4	NAT: C3 C5
39.	Mix labeled, single-s organisms in group (measuring levels of a	stranded C to form radioact	l DNA from org m hybrid DNA. ivity in the filtr	ganisms Then c ate as th	s in group A wi letermine the p he hybrid DNA	ith unlabeled, single-stranded DNA from proportion of matched sequences by A is heated in stages.
60	PTS: 1	DIF:	А	OBJ:	17-4	NAT: C3 C5
00.	Answers may vary. ' should be classified	The orgatogether	anisms in group :	A are	more closely re	elated to the organisms in group C and

PTS: 1	DIF: A	OBJ: 17-4	NAT: C3 C5
--------	--------	-----------	--------------

61. ANS:

The radioactivity levels would be higher at 85°C. Because Hybrid A has a high proportion of matched sequences, it has a higher melting temperature; thus, single strands containing radioactive iodine would not be present at lower temperatures.

62.	PTS: 1 ANS: Hybrid B	DIF: A	OBJ: 17-4	NAT: C3 C5
63.	PTS: 1 ANS: Hybrid A	DIF: A	OBJ: 17-4	NAT: C3 C5
	PTS: 1	DIF: A	OBJ: 17-4	NAT: C3 C5

PROBLEM

64. ANS:

Character- istic	Eubacteria	Archae- bacteria	Protista	Fungi	Plantae	Animalia
cell type	prokaryotic	prokary- otic	eukaryotic	eukaryotic	eukaryotic	eukaryotic
body form	most uni- cellular	unicellular	uni- or multi- cellular	most multi- cellular	multi- cellular	multi- cellular
method of obtaining food	absorption, photosyn- thesis, or chemosyn- thesis	chemo- synthesis	absorption, ingestion, or photo- synthesis	absorption	photo- synthesis	ingestion
presence of complex organ systems	no	no	no	no	yes	yes

Table 17-1

PTS: 1 DIF: A OBJ: 17-6 NAT: C3 C5	7-6 NAT: C3 C5		DIF:	1	PTS:
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ESSAY

65. ANS:

theropods, Allosaurus, Sinornis, Velociraptor, and Archaeopteryx

PTS: 1

66. ANS: Sinornis

PTS: 1

67. ANS:

light bones, three-toed foot, wishbone, down feathers, and feathers with shafts, veins, and barbs

PTS: 1