

1. The nucleus of a eukaryotic cell is correctly described by which structure / function pairing?
- A multi-folded inner membrane / energy production
  - B phospholipid bilayer membrane / protein synthesis
  - C single porous membrane / sugar storage
  - D double membrane / DNA replication

2. Using the key provided, drawing III can be identified as which bird?



(90. cm)  
I



(69. cm)  
II



(50. cm)  
III



(31. cm)  
IV



(20. cm)  
V



(7.5 cm)  
VI

**Taxonomic Key to North American Birds**

1.a. Larger than 40. cm .....	2
1.b. Not larger than 40. cm .....	4
2.a. Hooked beak .....	3
2.b. Beak not hooked .....	<i>Phasianus colchicus</i>
3.a. Feathers over eyes that look like ear .....	<i>Bubo virginianus</i>
3.b. No Feathers that look like ears .....	<i>Haliaeetus leucocephalus</i>
4.a. Head one solid color of feathers .....	5
4.b. Head not solid color of feathers .....	<i>Colinus virginianus</i>
5.a. Bill flat .....	<i>Anas platyrhynchos</i>
5.b. Bill pointed .....	<i>Archilochus colubris</i>

- A *Bubo virginianus*
- B *Haliaeetus leucocephalus*
- C *Colinus virginianus*
- D *Anas platyrhynchos*

3. Which group of four components are found in prokaryotic cells?

- A ribosomes, nucleus, cilia, cell wall
- B ribosomes, DNA strand, flagella, cell wall
- C chloroplast, DNA strand, cilia, vacuole
- D chloroplasts, nucleus, flagella, vacuole

4. Which of the cells characterized in the chart below is a prokaryotic cell?

	Ribosome	Cell Wall	Chloroplast	Nuclear Membrane	Plasma Membrane
Cell A	✓	✓	✓	✓	✓
Cell B	✓			✓	✓
Cell C	✓	✓			✓
Cell D	✓	✓		✓	✓

- A Cell A
- B Cell B
- C Cell C
- D Cell D

5. An organism is eukaryotic, multicellular, heterotrophic, and has a cell wall. To which kingdom does it belong?

- A Animal
- B Fungi
- C Plant
- D Protist

6. The organism *Ursus maritimus* is a member of which genus?

- A *Ursus*
- B *maritimus*
- C Animalia
- D Mammalia

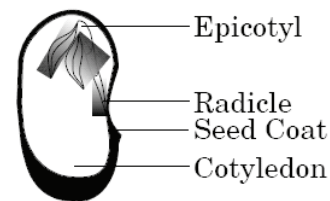
7. In order to maintain good health, a person's normal glucose level must remain within a given range. Which two systems control the blood glucose level?

- A endocrine and skeletal
- B endocrine and digestive
- C circulatory and lymphatic
- D digestive and lymphatic

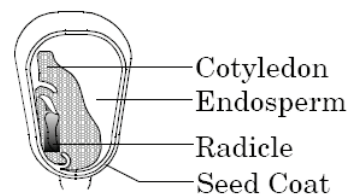
8. The structure of the digestive tube in the grasshopper and earthworm consists of many folds. The folds affect the efficiency of food absorption by which of the following functions?

- A increasing surface area
- B reducing transpiration
- C increasing hormone secretion
- D reducing storage of sugar

9. How would the seeds in Figure 1 and Figure 2 be classified?



**Figure 1**



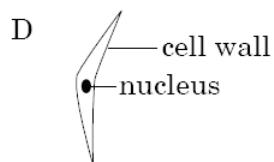
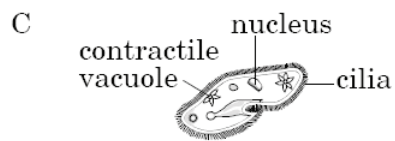
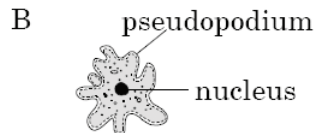
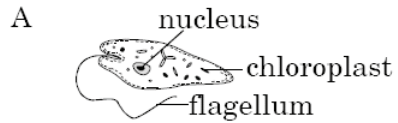
**Figure 2**

- A ferns
- B mosses
- C angiosperms
- D gymnosperms

10. The fertilized eggs of most mammals follow a similar pattern of early development. Which sequence is the typical pattern, beginning with the earliest stage?
- A fetus→embryo→zygote
  - B fetus→zygote→embryo
  - C zygote→fetus→embryo
  - D zygote→embryo→fetus
11. How is the folded structure of the villi in the small intestine related to the function of villi?
- A It decreases blood flow.
  - B It provides protection.
  - C It increases absorption.
  - D It provides support.
12. What is the adaptive value of distinctive light patterns in male and female fireflies during courtship?
- A recognizing a species
  - B illuminating a food source
  - C finding a habitat
  - D scaring off predators
13. Identical twins grew up under different conditions. Twin A grew up in a rural area with low pollution. Twin B grew up in a heavily populated city. Twin B developed a severe respiratory condition at age 28. Which could be a correct assumption about the interaction between genes and the environment in this case?
- A Twin A lacks the genetic potential for the respiratory disease and so cannot develop the condition.
  - B Twin A has a dominant trait that gives resistance to lung diseases.
  - C Twin A has the genetic potential for the disease but has not been exposed to influential environmental conditions.
  - D Twin A has a recessive trait that gives resistance to environmental conditions.
14. Many factors can affect human fetal development. Which would have the **most damaging** effect on fetal development?
- A increasing food intake
  - B decreasing exercise
  - C smoking cigarettes
  - D increasing exercise

15. Which would **most likely** be caused by environmental conditions?
- A lung cancer
  - B hemophilia
  - C cystic fibrosis
  - D sickle cell anemia
16. Which describes an internal factor that influences the growth and development of an organism?
- A In certain bacteria, brick-red colonies form at 25°C and cream-colored colonies form at 30°C.
  - B In some species of sheep, testosterone causes rams to have much heavier and more coiled horns than ewes.
  - C In one pair of identical twins, significant differences in body weight are observed.
  - D In certain areas, evergreens show reduced size due to air pollution.
17. Which statement about animal behavior is **most accurate**?
- A Innate behaviors can be changed as a result of individual experiences.
  - B Innate behaviors are generally complex and require time to perfect.
  - C A complex nervous system is necessary for learned behavior.
  - D Learned behaviors are acquired as a result of individual experience.

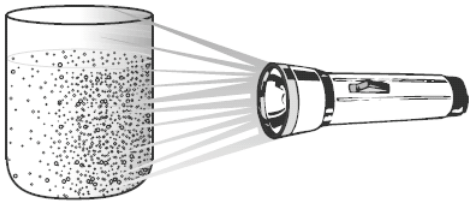
18. Which these organisms will **most likely** show a positive phototactic response?



19. Bacteria living in nodules on the roots of legumes have the ability to fix atmospheric nitrogen into a water-soluble form that plants can use. The bacteria absorb sugar from the plants' roots. Which describes the relationship between the bacteria and the legume plants?

- A commensalism  
B mutualism  
C parasitism  
D predation

20. *Euglena* are one-celled organisms containing chlorophyll. A culture of *Euglena* is placed into a beaker in a dark room with a flashlight shining on one side, as shown in the diagram. The *Euglena* gather on one side of the beaker.



What can be inferred about *Euglena* from this experiment?

- A *Euglena* show a positive response to light.
- B *Euglena* show a positive response to darkness.
- C *Euglena* show a negative response to light.
- D *Euglena* do not react to light.
21. Which is an advantage of social grouping?
- A increased competition for limited resources
- B increased chance of detection by predators
- C increased protection from predators
- D increased risk of minor infections

22. Estivation is a period of inactivity for animals experiencing conditions of extreme heat. Estivation serves the same function as which activity practiced by animals in cold environmental conditions?

- A camouflage
- B hibernation
- C migration
- D mimicry

### End of Goal 4 Sample Items

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