7th Grade Science Final Exam
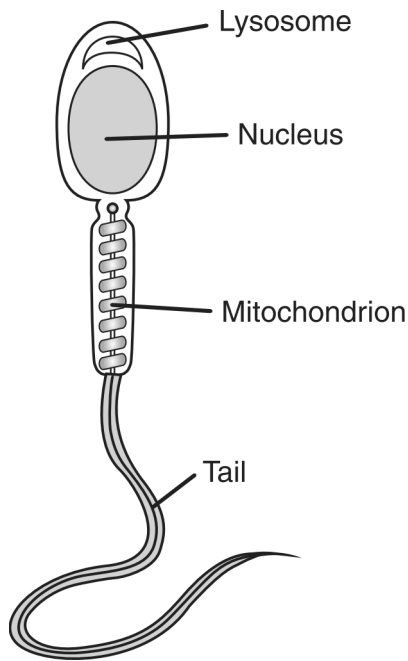
Name: _____   **Date:** _____

1. Why do eukaryotic cells require mitochondria?

    A. to break down cell debris for recycling

    B. to control division for cell reproduction

    C. to release stored energy for cell activities
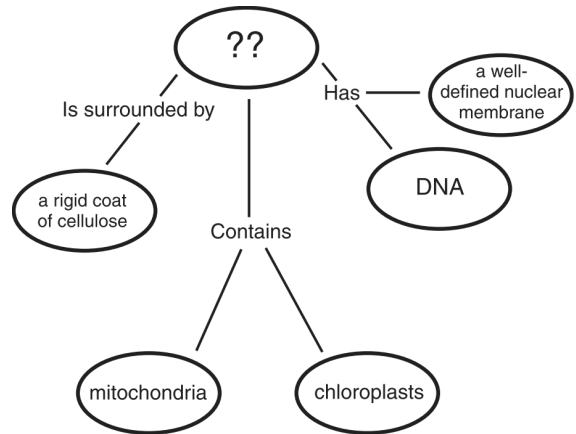
    D. to package materials inside cells for transport

2. The diagram below shows a male gamete.

    Which structure stores most of the genetic information?

    A. mitochondrion   B. lysosome

    C. nucleus   D. tail

3.

    Which of these *best* completes this concept map?

    A. an animal cell   B. a prokaryotic cell

   C. a virus   D. a plant cell

4. Eukaryotic cells are differentiated from prokaryotic cells because eukaryotic cells

    A. are much smaller.

    B. have permeable membranes.

    C. have a higher rate of reproduction.

    D. have nuclei.

5. Which statement about plant and animal cells is true?

A. Plant cells have a nucleus and a cell wall; animal cells do not have either of these structures.

B. Plant cells have a cell wall and chloroplasts; animal cells do not have either of these structures.

C. Plant cells have a cell wall and a cell membrane; animal cells have a cell wall but not a cell membrane.

D. Plant cells have chloroplasts and mitochondria; animal cells have chloroplasts but do not have mitochondria.

6. Which structure is responsible for allowing materials into and out of an animal cell?

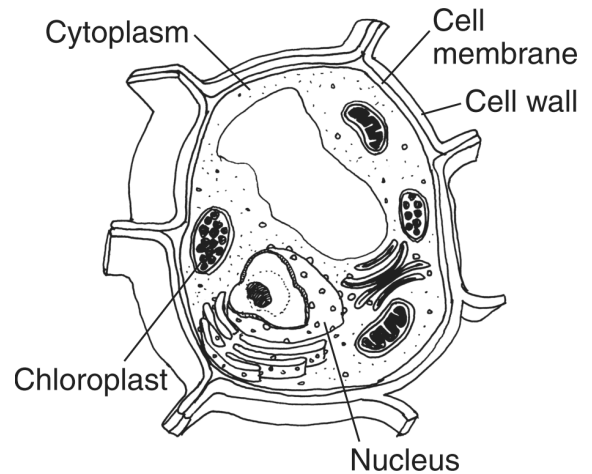A. Nucleus   B. Cell wall

C. Mitochondrion   D. Cell membrane

7. Use the pictures below to answer the following question.

Paramecium   Hydra   moss   lichen
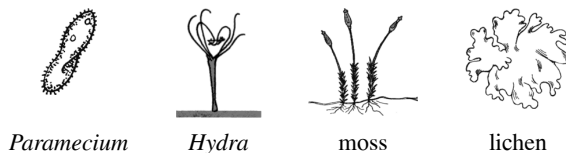
Which of the following is an example of a single-celled organism?

A. *Paramecium*   B. *Hydra*

C. moss   D. lichen

8. The diagram below shows a cell.

Where would this cell *most likely* be found?

A. bark   B. frog

C. leaf   D. mushroom

9. Which of the following best describes the purpose of the chromosomes in the nucleus of a cell?

A. to store the genetic instructions needed to specify traits

B. to release energy by breaking down food molecules

C. to transport nutrients into and out of the cell

D. to protect the cell from microorganisms

10. Which of the following structures is not present in animal cells?

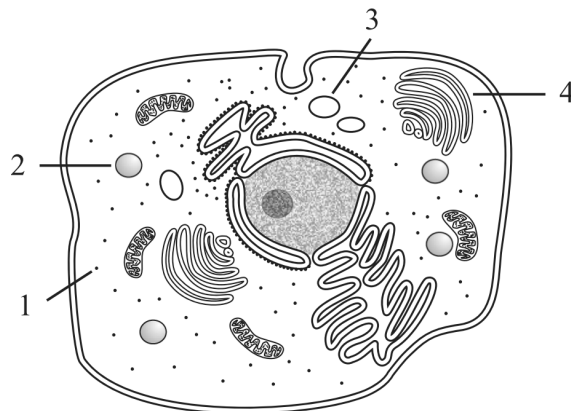   A. cell membrane   B. cell wall

   C. mitochondrion   D. nucleus

11. The illustration below represents two protists.

   Euglena   *Paramecium*
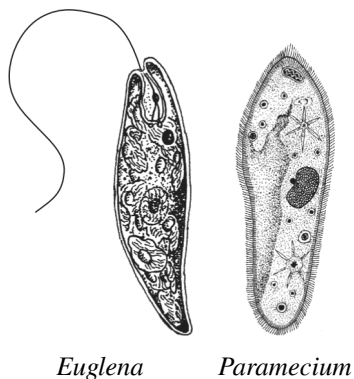
   What do these two organisms have in common?

   A. They are unicellular.

   B. They cause diseases.

   C. They live underground.

   D. They are photosynthetic.

12. The diagram below shows a cell with four of its parts numbered.

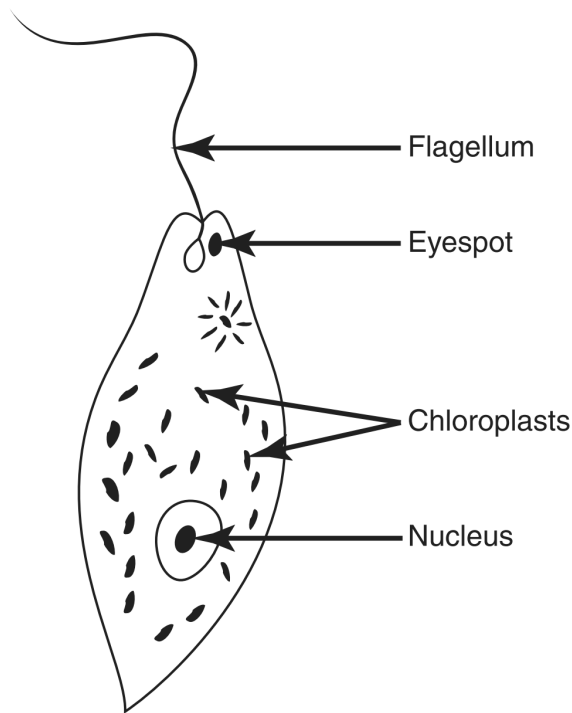   Which numbered part is a ribosome?

   A. 1   B. 2   C. 3   D. 4

13. Which cell structure contains molecules that direct cell activities?

   A. nucleus   B. ribosome

   C. mitochondrion   D. chloroplast

14. Organisms that have physical features common to both plants and animals are difficult to classify. The diagram below shows physical features of a *euglena*.
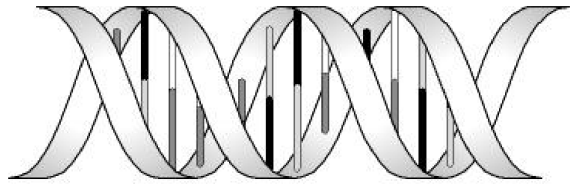

Which euglena feature caused some scientists to classify the *euglena* as a plant?

A. chloroplast   B. eyespot

C. flagellum   D. nucleus

15. In prokaryotic cells, the DNA is found—

A. floating in the cytoplasm.

B. attached to the ribosomes.

C. surrounded by the nuclear membrane.
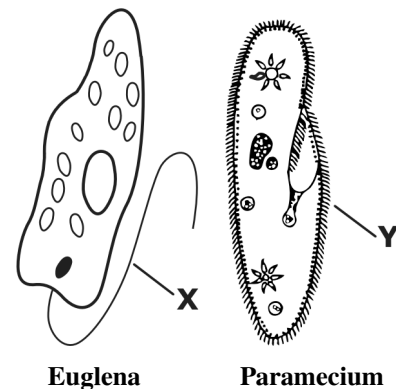
D. contained in the vacuole.

16.

The structure shown above is found in what part of a eukaryotic cell?

A. Cytoplasm

B. Nucleus

C. Golgi apparatus

D. Smooth endoplasmic reticulum

17. These diagrams represent a Euglena and a Paramecium.

Which function do structures **X** and **Y** have in common?

A. digestion   B. gathering food

C. movement   D. reproduction

18. Which sequence of DNA bases would pair with the ones shown in the partial strand below?

```
  1    2    3
ATG TGA CAG
```

A.
```
  1    2    3
ATG TGA CAG
```

B.
```
  1    2    3
TAC ACT GTC
```

C.
```
  1    2    3
GTA AGT GAC
```

D.
```
  1    2    3
CAT TCA CTG
```

19. One human disease is caused by a change in one codon in a gene from GAA to GUA. This disease is the result of

A. a mutation.   B. a meiosis error.

C. crossing-over.   D. polyploidy.

20. DNA contains the code for constructing which molecules?

A. proteins   B. fats

C. starches   D. sugars

21. Use this Punnett square to answer the question.

In horses, the gene for white hair (W) is dominant to the gene for non-white hair (w). A horse with genotype (WW) was crossed with a horse with genotype (ww), as shown in the Punnett square.

What fraction of the offspring should be expected to have white hair?

A. none   B. one-half

C. three-quarters   D. all

22. A rare genetic condition causes dwarfism and immunodeficiencies. Which of the following is the *most likely* cause of this condition?

A. a parasitic infection   B. a mutation in DNA

C. a bacterial disease   D. an excess of ATP

23. A partial Punnett square is shown below.

AA	AA
Aa	Aa

Which of the following statements describes the parental genotypes that would result in this Punnett square?

A. Both parents are heterozygous.

B. Both parents are homozygous dominant.

C. One parent is homozygous recessive and the other parent is heterozygous.

D. One parent is homozygous dominant and the other parent is heterozygous.

24. Female cattle that have white coats are crossed with male cattle that have red coats. Both male and female offspring have roan coats, which are coats with both red hairs and white hairs.

Which of the following *best* describes the genetics of coat color in the cattle?

A. The red and white alleles are sex-linked.

B. The red and white alleles are codominant.

C. The red allele is recessive to the white allele.

D. The red allele is dominant to the white allele.

25. In tomato plants, the tall vine allele (**T**) is dominant to the short vine allele (**t**). Two tomato plants are crossed. Among the offspring plants grown from seed, 45% have tall vines and 55% have short vines.

What are the *most likely* genotypes of the parent plants?

A. **TT** and **tt**   B. **Tt** and **TT**

C. **Tt** and **tt**   D. **tt** and **tt**

26. Garden pea plants can have yellow seeds or green seeds. In a pea plant that is heterozygous for seed color, the allele for yellow seeds masks the effects of the allele for green seeds.

Which of the following terms best describes the allele for yellow seeds?

A. codominant   B. dominant

C. recessive   D. sex-linked

27. Which of the following characteristics is a lion *least likely* to pass on to its offspring?

A. colors of its fur   B. length of its tail

C. scars on its leg   D. size of its body

28. In guinea pigs, the allele for black hair (**B**) is dominant to the allele for brown hair (**b**). Two black-haired guinea pigs are crossed. One of the guinea pigs is homozygous for black hair and one is heterozygous.

    What percentage of the offspring are expected to have black hair?

    A. 25%   B. 50%   C. 75%   D. 100%

29. A dog gives birth to five puppies. What percentage of its chromosomes does each puppy share with the mother?

    A. 25%   B. 50%   C. 75%   D. 100%

30. A scientist cloned a goat. Which of these is a true statement about the cloned goat?

    A. It has new genes and traits.

    B. It lacks the genes for reproduction.

    C. It has genes that are identical to the original goat.

    D. It looks the same as the original goat but has different genes.

31. Use the information and the Punnett square below to answer the question(s).

    In guinea pigs, the allele for black fur (B) is dominant. The allele for brown fur (b) is recessive. Two guinea pigs were crossed as shown in the Punnett square below.

	B	b
B	BB	Bb
B	BB	Bb

    Which of these describes the phenotypes of the parent guinea pigs?

    A. Both parents have black fur.

    B. Both parents have brown fur.

    C. One parent has black fur, and the other has brown fur.

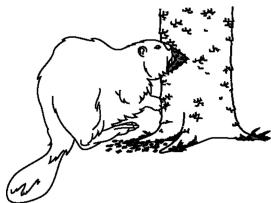32. What is the probability that an offspring from this cross would have brown fur?

    A. 50%   B. 25%   C. 0%
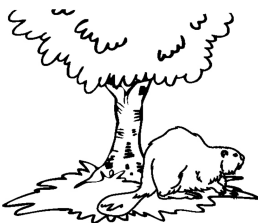
33.

Which trait will the offspring get from the parent beaver?

A.

Eating bark from a tree

B.

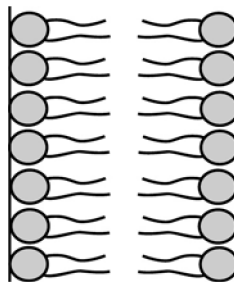Sitting under a tree

C.

Having a flat tail

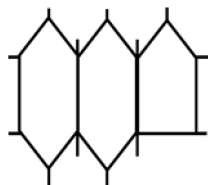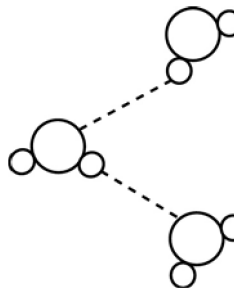34. Which of these models *best* represents a DNA molecule?
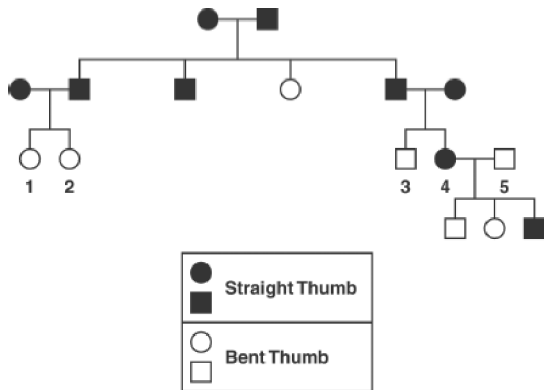
A.

B.

C.

D.

35. Which of the following would correctly represent the complementary strand of DNA to the DNA strand listed below?

| A T A G C C A T G |

A. U A U C G G U A C

B. A T A G C C A T C

C. T A T C G G T A C

D. G A T C A T T C A

36. In humans, the allele for straight thumbs (T) is dominant to the allele for bent thumbs (t). A pedigree showing the inheritance of thumb type is shown below.

What are the genotypes of individuals 4 and 5?

A. TT and TT   B. Tt and tt

C. tt and tt   D. TT and tt

37. Which trait do children *most likely* inherit from their parents?

A. shape of earlobes   B. musical ability

C. personality   D. language

38. Which deals with the transmission of inherited traits from one generation to another?

A. anatomy   B. genetics

C. ecology   D. forensics

39. A mother bird has four baby birds. Each baby bird has a pointed beak. What can *best* be concluded from this information?

A. One of the parent birds has a pointed beak.

B. Each of the baby birds is a different color.

C. The mother bird is larger than the father bird.

40. Two parents, one with blue eyes and one with brown eyes, have five (5) children. Some of the children have blue eyes and some have brown eyes, as shown in the diagram below.

Parents	Key
●—▢	● Female; blue eyes
● ● ▢ ■ ▢	○ Female; brown eyes
	■ Male; blue eyes
	▢ Male; brown eyes
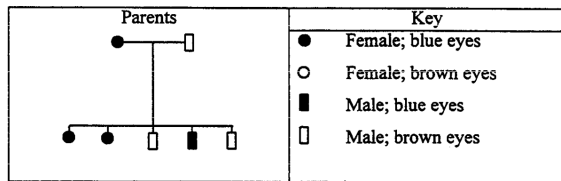
Why don't all the children have the same eye color?

A. Eye color is determined by one parent only.

B. Eye color is determined by the sex of the child.

C. Eye color is determined by a combination of both parents.

D. Eye color is completely random in humans.

41. The pedigree below shows the inheritance pattern of a recessive allele (z) that results in a genetic disease.
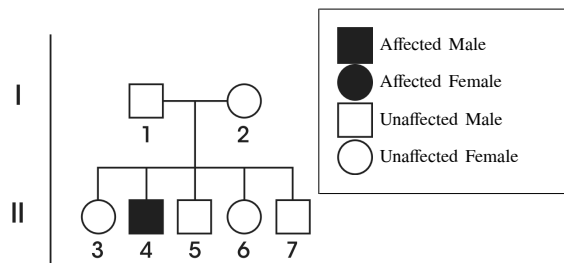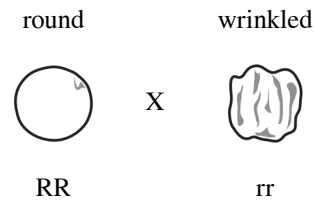

Based on the inheritance pattern, what are all the possible genotypes for individual 6?

A. Zz

B. ZZ and zz

C. ZZ and Zz

D. ZZ, Zz and zz

42. A pea plant with genes that are homozygous for round seeds is crossed with a pea plant that is homozygous for wrinkled seeds.

Genetic Cross of Two Pea Plants

round   wrinkled

RR   rr

Which statement correctly predicts the results of this genetic cross?

A. The offspring will have the genotype Rr.

B. The offspring will have the genotype RR.

C. Round seeds will be recessive to wrinkled seeds.

D. Wrinkled seeds will be observed in half of the offspring.

43. The table below shows the average summer temperature increases for regions in Canada.

Average Summer Temperature for Regions in Canada (1948–2004)

| Region in Canada	Temperature Increase (°C)
Atlantic coast	0.46
Pacific coast	0.67
northeastern forest	0.29
northwestern forest	0.57
southern mountains	0.71
northern mountains	0.86

Which trend can be correctly inferred from the data?

A. The mountain regions are warming more than the coasts.

B. The forest regions are warming more than the mountain regions.

C. The Atlantic coast is warming more than the Pacifi c coast.

D. The northeastern forest is warming more than the northwestern forest.

44. Meteorologists study weather. Which of the following should meteorologists know about?

A. types of fronts

B. types of fossils

C. types of circuits

D. types of adaptations

45. Use the information below to answer the following question(s).

The map below shows the weather conditions for some of the cities in Arizona.
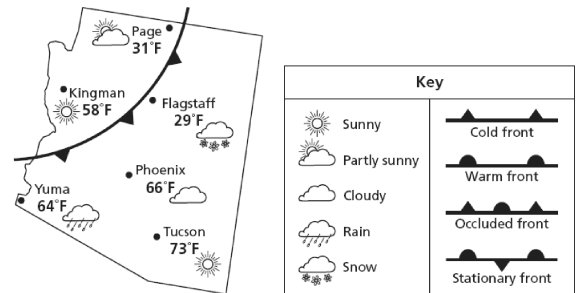
What type of front is moving through Arizona?

A. cold front   B. warm front

C. occluded front   D. stationary front

46. Which city has snow?

A. Flagstaff   B. Kingman

C. Page   D. Phoenix

47. The table below shows the temperature and precipitation (rain or snow) in four different cities on the same day.

	Atlanta	Boston	Chicago	Dallas
Lowest temperature	2° C	-10° C	-8° C	12° C
Highest temperature	16° C	-2° C	4° C	25° C
Precipitation (rain or snow)	0 cm	6 cm	0 cm	3 cm

In which city did it snow?

A. Atlanta   B. Boston

C. Chicago   D. Dallas

48. The picture below shows a place where air currents will form due to the uneven heating of Earth.
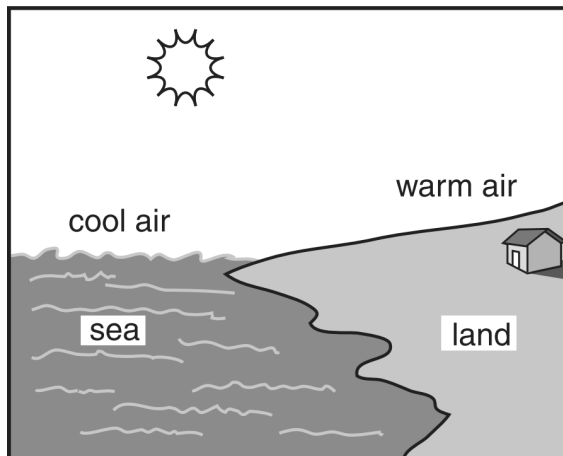
In which direction will air currents *most* likely move?

A. straight down over the land

B. from the land toward the sea

C. straight up above the sea

D. from the sea toward the land

49. Which of the following factors would *most* likely cause a hurricane to decrease in strength?

A. staying over a warm body of water for a long time

B. increasing the number of large clouds

C. moving over a continent
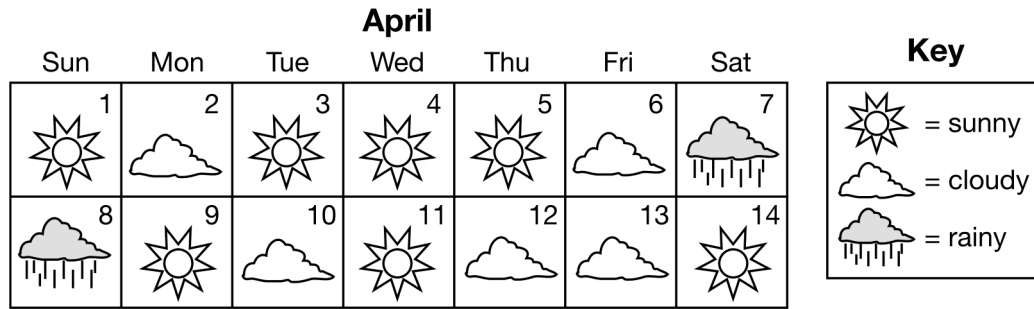
D. moving toward tropical waters

50. Use the weather map below to help you answer the following question .

Weather Map
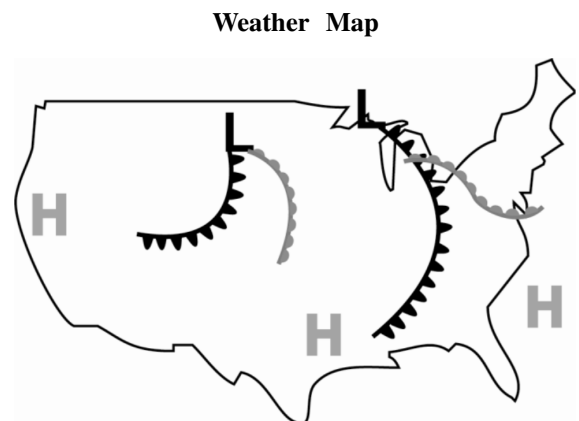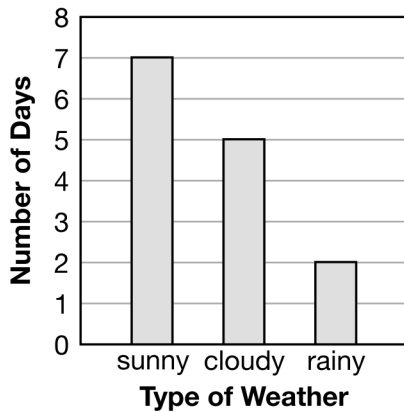

Which symbol on the map shows a cold front?

A. H

B. L

C.

D.

51. Use the calendar below to answer the question.

April

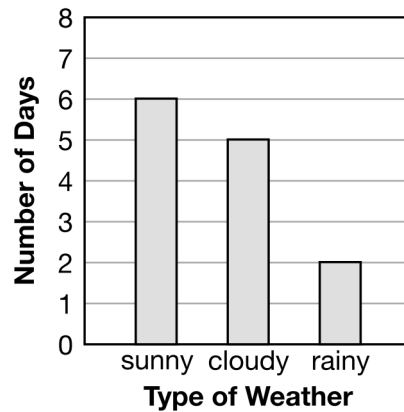| Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 ☀	2 ☁	3 ☀	4 ☀	5 ☀	6 ☁	7 🌧
8 🌧	9 ☀	10 ☁	11 ☀	12 ☁	13 ☁	14 ☀

Key

☀ = sunny
☁ = cloudy
🌧 = rainy

Students recorded daily weather conditions on a calendar for the first two weeks of April. Which graph best shows the weather conditions recorded by the students?
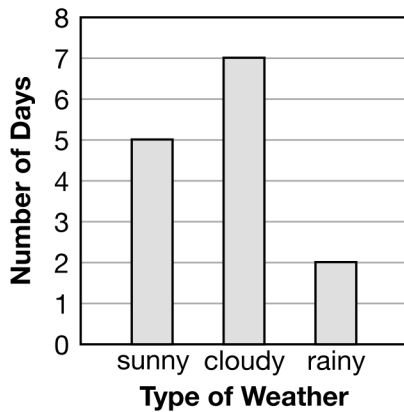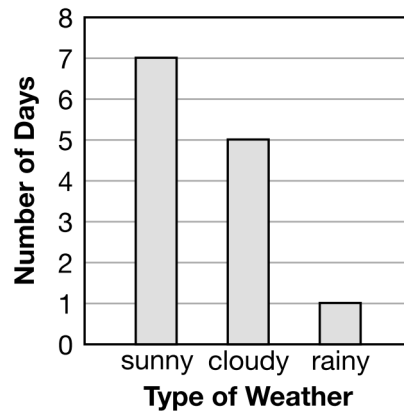
A.

April Weather (sunny 7, cloudy 5, rainy 2)

B.

April Weather (sunny 6, cloudy 5, rainy 2)

C.

April Weather (sunny 5, cloudy 7, rainy 2)

D.

**April Weather** (sunny 7, cloudy 5, rainy 1)

52. The table below shows the average monthly temperatures for Massachusetts over a 30-year period.

Month	Temperature
January	−1°C
February	0°C
March	3°C
April	?
May	15°C
June	20°C
July	23°C
August	22°C
September	18°C
October	13°C
November	7°C
December	1°C

The average temperature for April is missing. Which is the *best* estimate of the average temperature for April?

A. 1°C   B. 10°C   C. 16°C   D. 20°C

53. The picture below shows a weather instrument.
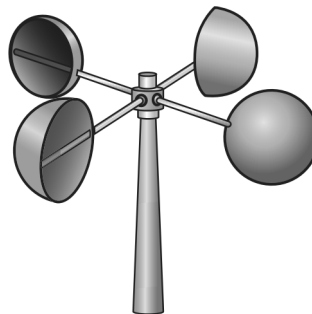

What is this weather instrument designed to measure?

A. air temperature   B. rainfall amount

C. snowfall amount   D. wind speed

54. What is the primary energy source that drives all weather events, including precipitation, hurricanes, and tornados?

A. the Sun   B. the Moon

C. Earth's gravity   D. Earth's rotation

55. A group of students in Baltimore, Maryland, determined the average high temperature for each month during the school year.

AVERAGE HIGH TEMPERATURES IN BALTIMORE, MD
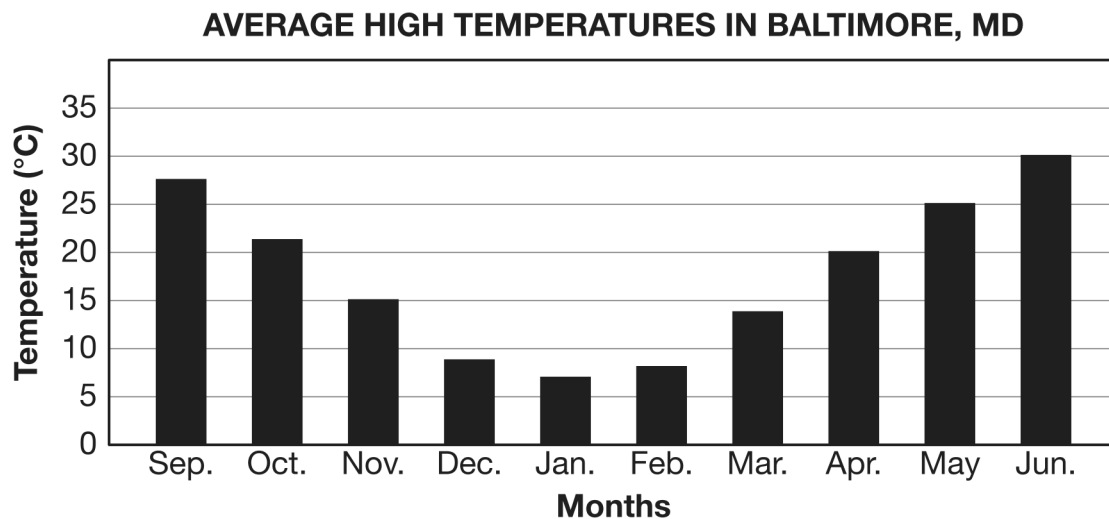
Which two months shown in the graph had the *lowest* average temperatures?

A. September and June

B. November and December

C. January and February

D. October and May

56. The table below shows some temperature and precipitation reports for Bangor, Maine.

Weather in Bangor, Maine

Date	Low Temperature (°C)	Precipitation (cm)
January 4	2	0.0
January 6	10	1.9
January 15	−7	12.7
January 30	−15	0.0

On which day did rain fall?

A. January 4   B. January 6

C. January 15   D. January 30

57. Students observe rain falling outside. Three hours later, the students observe snow falling. What *most likely* caused the rain to change to snow?

A. The air temperature became cooler.

B. The clouds became darker.

C. The wind became stronger.

D. The sunlight became stronger.

58. Where is *most* of Earth's water located?

    A. glaciers   B. lakes

    C. oceans   D. rivers

59. A diagram of the water cycle is shown below.
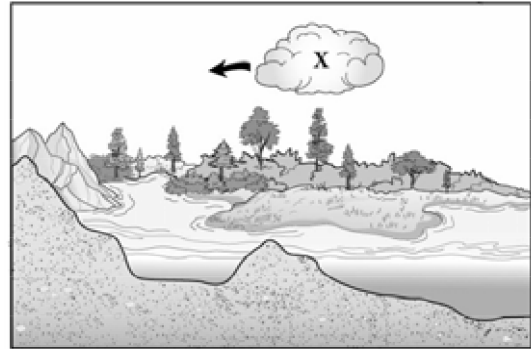
Which stage of the water cycle follows **X** in the diagram?

A.

B.

C.

D.