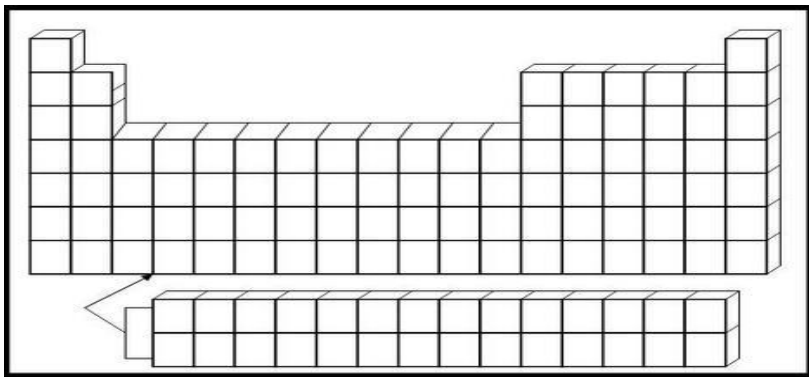


# CHAPTER 5 TEST: THE PERIODIC TABLE



name \_\_\_\_\_

HPS \_\_\_\_\_

# \_\_\_\_\_

date: \_\_\_\_\_

## **MULTIPLE CHOICE**

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

- \_\_\_\_\_ 1. The order of elements in the periodic table is based on  
a. the number of protons in the nucleus.  
b. the electric charge of the nucleus.  
c. the number of neutrons in the nucleus.  
d. atomic mass.
- \_\_\_\_\_ 2. Atoms of elements that are in the same group have the same number of  
a. protons. c. valence electrons.  
b. neutrons. d. protons and neutrons.
- \_\_\_\_\_ 3. Which of the following elements is an alkali metal?  
a. calcium c. mercury  
b. magnesium d. sodium
- \_\_\_\_\_ 4. Semiconductors are elements that  
a. have large atomic masses but small atomic numbers.  
b. do not form compounds.  
c. can conduct heat and electricity under certain conditions.  
d. are extremely hard.
- \_\_\_\_\_ 5. Carbon and other nonmetals are found in which area of the periodic table?  
a. on the left-most side  
b. on the right side  
c. in the middle column of the periodic table  
d. in the bottom rows
- \_\_\_\_\_ 6. In Mendeleev's periodic table, elements in each column had similar  
a. atomic masses. c. atomic numbers  
b. properties. d. symbols.
- \_\_\_\_\_ 7. Magnesium (Mg) is located to the right of sodium (Na) because Mg has  
a. fewer protons. c. no protons.  
b. no neutrons. d. more protons.
- \_\_\_\_\_ 8. As you move from left to right across the periodic table, elements  
a. become less metallic. c. have a lower atomic weight.  
b. have a lower atomic number. d. become more metallic.
- \_\_\_\_\_ 9. How was Mendeleev's periodic table arranged?  
a. by increasing atomic mass c. by increasing atomic number  
b. by decreasing atomic mass d. by decreasing atomic number

\_\_\_\_\_ 10. When did Mendeleev create a new row in his periodic table?

- a. when the first atomic mass was doubled
- b. when chemical properties were repeated
- c. when there were 10 elements in the row
- d. when the next element was a nonmetal

\_\_\_\_\_ 11. Mendeleev left gaps in his periodic table because

- a. the table was too small.
- b. protons belonged there.
- c. the table was too full.
- d. no known elements fit there.

\_\_\_\_\_ 12. Each column of the periodic table is

- a. an element.
- b. a group.
- c. an isotope.
- d. a period.

\_\_\_\_\_ 13. Atoms that gain or lose electrons are called

- a. metals.
- b. nonmetals.
- c. ions.
- d. isotopes.

\_\_\_\_\_ 14. Group 17 elements form

- a. +1 ion
- b. -1 ion
- c. +7 ion
- d. -7 ion

\_\_\_\_\_ 15. The three main groups of elements are metals, nonmetals, and

- a. inert gases.
- b. alkali metals.
- c. radioactive isotopes.
- d. semiconductors.

\_\_\_\_\_ 16. Most elements are

- a. metals.
- b. nonmetals.
- c. metalloids.
- d. semiconductors.

\_\_\_\_\_ 17. Most nonmetals are

- a. brittle.
- b. good conductors.
- c. metalloids.
- d. shiny.

\_\_\_\_\_ 18. Elements in an element family have similar

- a. atomic symbols.
- b. atomic sizes.
- c. atomic weights.
- d. chemical properties.

\_\_\_\_\_ 19. How do you know that potassium, an alkali metal, is highly reactive?

- a. It conducts heat.
- b. It conducts electricity.
- c. It is a soft and shiny metal.
- d. It has one valence electron.

\_\_\_\_\_ 20. The order of elements in the modern periodic table is based on an element's

- a. atomic number.
- b. name.
- c. chemical symbol.
- d. atomic mass.

\_\_\_\_\_ 21. Ionization refers to the process of

- a. changing from one period to another.
- b. losing or gaining protons.
- c. turning lithium into fluorine.
- d. losing or gaining electrons.

\_\_\_\_\_ 22. Elements that share properties of both metals and nonmetals are called

- a. ions.
- b. periods.
- c. semiconductors.
- d. valences.

- \_\_\_\_\_ 23. Which statement about the alkali metals is correct?  
a. They are located in the left-most column of the periodic table.  
b. They are extremely nonreactive.  
c. They are usually gases.  
d. They form negative ions with a 1- charge.
- \_\_\_\_\_ 24. Which statement about noble gases is correct?  
a. They form compounds with very bright colors.  
b. They exist as single atoms rather than as molecules.  
c. They are highly reactive with both metals and nonmetals.  
d. They are extremely rare in nature.
- \_\_\_\_\_ 25. Which element is a semiconductor?  
a. carbon  
b. silicon  
c. sodium  
d. uranium
- \_\_\_\_\_ 26. Metals tend to be  
a. gases.  
b. good conductors of heat.  
c. dull.  
d. brittle.
- \_\_\_\_\_ 27. Different isotopes of the same element have different  
a. atomic numbers  
b. numbers of protons  
c. numbers of neutrons  
d. numbers of electrons

## **Matching**

*Match each item with the correct statement below.*

- |                          |                        |
|--------------------------|------------------------|
| a. halogens              | d. semiconductors      |
| b. alkaline-earth metals | e. alkali metals       |
| c. transition metals     | f. noble (inert) gases |

- \_\_\_\_\_ 28. Elements that have properties of both metals and nonmetals; located near the stair step line
- \_\_\_\_\_ 29. Reactive elements of Group 17 that are poor conductors
- \_\_\_\_\_ 30. Highly reactive elements that belong to Group 1
- \_\_\_\_\_ 31. Very stable due to the fact that they have a full outermost energy level
- \_\_\_\_\_ 32. Elements that belong to Groups 3-12 and are somewhat reactive
- \_\_\_\_\_ 33. Group 2 elements that have two valence electrons

## **Essay**

34. Why might a jewelry designer prefer to work with a metal rather than a nonmetal? Explain your answer.
35. Draw a Lewis Dot Diagram for oxygen.



## OGT QUESTIONS

- \_\_\_\_\_1. The noble gas neon is used for filling neon signs. Like other noble elements, it has a full octet (complete outer energy level) of electrons, which makes the gas
- freeze at room temperature.
  - react with other gases in the air.
  - unlikely to combine with other elements.
  - solidify at standard pressure and temperature.
- \_\_\_\_\_2. Which of these elements would most likely be a shiny, gray-colored solid at room temperature, conduct electricity, and dent when hit with a hammer?
- aluminum
  - argon
  - chlorine
  - sulfur
- \_\_\_\_\_3. Which statement correctly describes protons and neutrons?
- They have the same mass and the same electrical charge.
  - They have the same mass but different electrical charges.
  - They have different masses but the same electrical charge.
  - They have different masses and different electrical charges.
- \_\_\_\_\_4. Different isotopes of the same element have different
- atomic numbers.
  - numbers of neutrons.
  - numbers of protons.
  - numbers of electrons
- \_\_\_\_\_5. The Periodic Table of the Elements can be used by scientists
- to find out the main uses of each element.
  - to predict how atoms of different elements will combine.
  - to identify all of an element's physical and chemical properties.
  - to determine the differences between ionic and covalent bonding.

Use the table below to answer questions 6 - 8.

**Data Table**

<b>Substance</b>	<b>Number of Protons</b>	<b>Number of Electrons</b>
lithium	3	2
fluorine	9	10
potassium	19	19
sulfur	16	18

- \_\_\_\_\_6. Which substance is electrically neutral?
- lithium
  - fluorine
  - potassium
  - sulfur
- \_\_\_\_\_7. Which substance has an overall  $1^+$  charge?
- lithium
  - fluorine
  - potassium
  - sulfur
- \_\_\_\_\_8. Which substance has an overall charge of  $1^-$ ?
- lithium
  - fluorine
  - potassium
  - sulfur

6	Atomic number
C	Symbol
Carbon	Name
12,0107	Average Atomic Mass

**Partial Periodic Table of the Elements**

IA 1	IIA 2	IIIA 13	IVA 14	VA 15	VIA 16	VIIA 17	VIIIA 18
1 H Hydrogen 1.00794	2 He Helium 4.0026	5 B Boron 10.811	6 C Carbon 12.0107	7 N Nitrogen 14.0067	8 O Oxygen 15.9994	9 F Fluorine 18.9984	10 Ne Neon 20.1797
3 Li Lithium 6.941	4 Be Beryllium 9.0122	13 Al Aluminum 26.98154	14 Si Silicon 28.0855	15 P Phosphorus 30.9738	16 S Sulfur 32.065	17 Cl Chlorine 35.4527	18 Ar Argon 39.948
11 Na Sodium 22.9898	12 Mg Magnesium 24.3050						
19 K Potassium 39.0983	20 Ca Calcium 40.078						

- \_\_\_\_\_ 9. Based on the Table, which of these elements probably has physical and chemical properties most similar to boron (B)?
- magnesium (Mg)
  - aluminum (Al)
  - neon (Ne)
  - chlorine (Cl)
- \_\_\_\_\_ 10. Which is a property of the noble gases in group 18?
- malleability
  - brittleness
  - high electrical conductivity
  - unlikely to react with other elements
- \_\_\_\_\_ 11. Which of the following groups on the Periodic Table is likely to form positively charged ions?
- group 1
  - group 13
  - group 17
  - group 18

\_\_\_\_\_12. Which element does the shell model represent?

- A. 

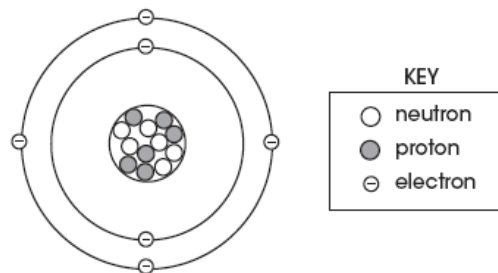
6 C
Carbon
12.0107
- B. 

9 F
Fluorine
18.9984
- C. 

12 Mg
Magnesium
24.3050
- D. 

11 Na
Sodium
22.9898

### Shell Model



Use the partial periodic table to answer questions 13-15.

6 C	Atomic number
C	Symbol
Carbon	Name
12.0107	Average Atomic Mass

**Partial Periodic Table of the Elements**

IA 1	IIA 2	IIIA 13	IVA 14	VA 15	VIA 16	VIIA 17	VIIIA 18
1 H Hydrogen 1.00794	4 Be Beryllium 9.0122	5 B Boron 10.811	6 C Carbon 12.0107	7 N Nitrogen 14.0067	8 O Oxygen 15.9994	9 F Fluorine 18.9984	2 He Helium 4.0026
2 3 Li Lithium 6.941	11 Na Sodium 22.9898	10 Ne Neon 20.1797	13 Al Aluminum 26.98154	14 Si Silicon 28.0855	15 P Phosphorus 30.9738	16 S Sulfur 32.065	17 Cl Chlorine 35.4527
3 12 Mg Magnesium 24.3050	19 K Potassium 39.0983	18 Ar Argon 39.948	16 O Oxygen 15.9994	17 Cl Chlorine 35.4527	18 Ar Argon 39.948	19 K Potassium 39.0983	20 Ca Calcium 40.078
4 20 Ca Calcium 40.078	[Empty grid for elements 21-36]						[Empty grid for elements 37-54]

\_\_\_\_\_13. A neutral atom of oxygen has

- A. 16 electrons
- B. 8 electrons
- C. 16 protons
- D. 16 neutrons

\_\_\_\_\_14. Would you normally expect neon (Ne) to form compounds?

- A. Yes, but neon is a rare gas and difficult to obtain
- B. No, neon needs six electrons to fill its outermost level.
- C. Yes, neon needs six valence electrons to fill its outermost energy level.
- D. No, neon has eight electrons in its outermost level and is stable.

\_\_\_\_\_15. Which pair of elements would most likely have a similar arrangement of outer electrons and have similar chemical behaviors?

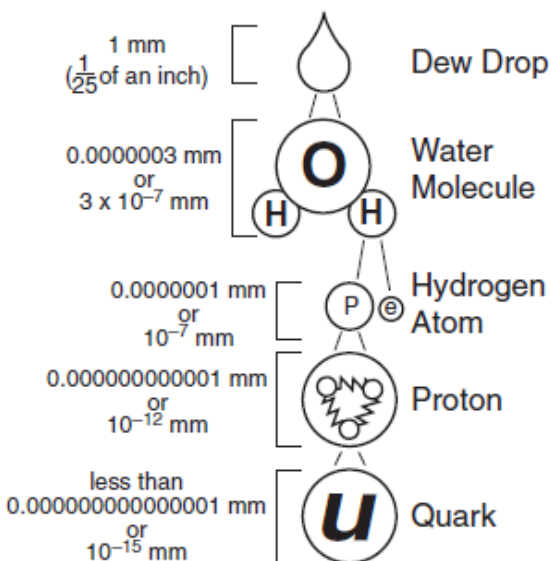
- A. boron and aluminum
- B. helium and fluorine
- C. carbon and nitrogen
- D. chlorine and oxygen

\_\_\_\_\_16. The noble gas neon is used for filling neon signs. Like other noble elements, it has a full octet (complete outer energy level) of electron, which makes the gas

- A. freeze at room temperatures
- B. react with other gases in the air
- C. unlikely to combine with other elements
- D. solidify at standard pressure and temperature

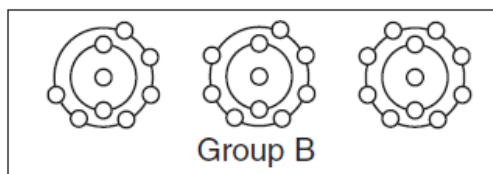
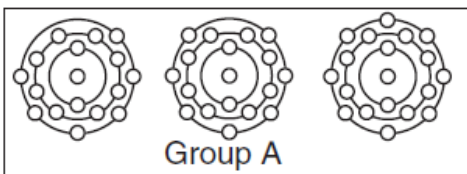
\_\_\_\_\_17. Scientists currently use radioactive isotopes in various fields. Some radioactive isotopes are used to \_\_\_\_\_.

- A. power lasers
- B. develop new antibiotics
- C. clone organisms
- D. date ancient bones



\_\_\_\_\_18. Based on the information provided above, which of the statements is **not** true?

- A. Molecules are made up of atoms.
- B. Protons are smaller than quarks.
- C. Atoms are larger than protons.
- D. Protons are made up of quarks.



\_\_\_\_\_19. The atoms in Group A are different from the atoms in Group B because only the atoms in Group A have \_\_\_\_\_

- A. their outer energy levels filled with electrons
- B. three energy levels of electrons
- C. electron configurations typical of metals
- D. electron arrangements typical of nonmetals

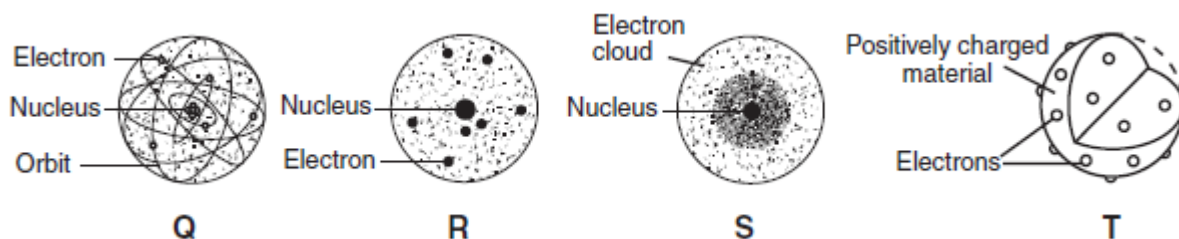


### Characteristics of Some Solids

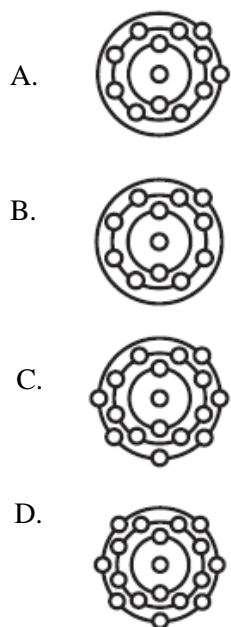
Solid	Atomic Number	Atomic Mass	Color
Rubidium	37	85.5	White
Cesium	55	132.9	Silvery-white
Tantalum	73	180.9	Gray
Thorium	90	232.0	Silvery-white

- \_\_\_\_\_20. According to the chart above, which solid has an atomic mass greater than 200?
- rubidium
  - cesium
  - tantalum
  - thorium

- \_\_\_\_\_21. These pictures show different models of the atom proposed by scientists. Which of these is the correct order, from oldest to most recent?



- T, R, Q, S
  - T, S, R, Q
  - S, R, T, Q
  - R, S, T, Q
- \_\_\_\_\_22. Alkali metals belong to a group of elements whose atoms have only one electron in their outer energy level. According to this definition, which of these is an atom of an alkali metal?



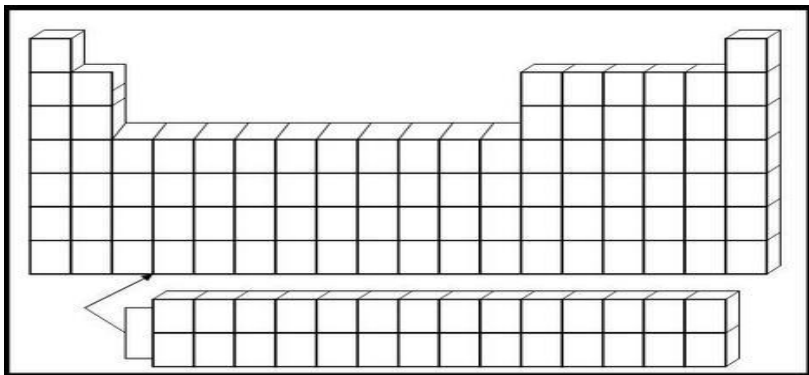
## **MORE MULTIPLE CHOICE**

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

- \_\_\_\_\_ 1. What is Mendeleev is known for?  
A. creating today's atomic model  
B. discovering protons  
C. publishing the first periodic table  
D. discovering Mendeleevium
- \_\_\_\_\_ 2. Each column of the periodic table is  
A. an element.  
B. a group.  
C. an isotope.  
D. a period.
- \_\_\_\_\_ 3. Each row of the periodic table is  
A. an element.  
B. a group.  
C. an isotope.  
D. a period.
- \_\_\_\_\_ 4. The periodic law states that elements that have similar properties appear  
A. to the left of each other  
B. to the right of each other  
C. at every tenth element  
D. at regular intervals
- \_\_\_\_\_ 5. Elements within the same group in the periodic table have similar properties because they have the same number of  
A. protons.  
B. neutrons.  
C. ions.  
D. valence electrons.
- \_\_\_\_\_ 6. As you move down the same column of the periodic table, elements have  
A. fewer protons  
B. a lower atomic number  
C. more energy levels  
D. a different group number
- \_\_\_\_\_ 7. Elements that have one valence electron tend to  
A. be highly reactive  
B. form ions  
C. become charged  
D. all of the above
- \_\_\_\_\_ 8. Which is not a family of the periodic table?  
A. alkaline-earth metals  
B. anions  
C. halogens  
D. noble gases
- \_\_\_\_\_ 9. Atoms that gain or lose electrons are called  
A. metals.  
B. nonmetals.  
C. ions.  
D. isotopes.
- \_\_\_\_\_ 10. Elements that belong to the same group have the same number of  
A. valence electrons  
B. neutral electrons  
C. inner electrons  
D. total electrons
- \_\_\_\_\_ 11. Elements in an element family have similar  
A. atomic symbols.  
B. atomic sizes.  
C. atomic weights.  
D. chemical properties.
- \_\_\_\_\_ 12. Group 17 elements form  
A. anions.  
B. cations.  
C. metals.  
D. semiconductors.

- \_\_\_\_\_13. The three main groups of elements are metals, nonmetals, and  
A. inert gases. C. radioactive isotopes.  
B. alkali metals. D. semiconductors.
- \_\_\_\_\_14. Most elements are  
A. metals. C. metalloids.  
B. nonmetals. D. semiconductors.
- \_\_\_\_\_15. What is the location of elements in the periodic table related to?  
A. color C. atomic weight  
B. number of neutrons D. electron arrangement
- \_\_\_\_\_16. Most nonmetals are  
A. brittle. C. metalloids.  
B. good conductors. D. shiny.
- \_\_\_\_\_17. Which element is a semiconductor?  
A. carbon C. sodium  
B. silicon D. uranium
- \_\_\_\_\_18. Metals tend to be  
A. gases.  
B. good conductors of heat.  
C. dull.  
D. brittle.
- \_\_\_\_\_19. Alkali metals are extremely reactive because they  
A. have very small atomic masses.  
B. are not solid at room temperature.  
C. have one valence electron that is easily removed to form a positive ion.  
D. have two valence electrons that form compounds with calcium and magnesium.
- \_\_\_\_\_20. Most halogens form compounds by  
A. gaining an electron to form a negative ion.  
B. losing an electron to form a positive ion.  
C. losing protons.  
D. joining with both calcium and carbon.
- \_\_\_\_\_21. Silicon, a semiconductor, is often found in  
A. air. C. steel.  
B. computers. D. wood.
- \_\_\_\_\_22. When can semiconductors conduct heat and electricity?  
A. under all conditions C. under some conditions  
B. under almost all conditions D. under no conditions
- \_\_\_\_\_23. An atom of which of the following elements is likely to form a negatively charged ion?  
A. potassium, K C. barium, Ba  
B. selenium, Se D. sodium, Na

# CHAPTER 5 TEST: THE PERIODIC TABLE



name \_\_\_\_\_  
HPS \_\_\_\_\_  
# \_\_\_\_\_  
date: \_\_\_\_\_

## ANSWER SHEET

- |           |           |           |
|-----------|-----------|-----------|
| _____ 1.  | _____ 12. | _____ 23. |
| _____ 2.  | _____ 13. | _____ 24. |
| _____ 3.  | _____ 14. | _____ 25. |
| _____ 4.  | _____ 15. | _____ 26. |
| _____ 5.  | _____ 16. | _____ 27. |
| _____ 6.  | _____ 17. | _____ 28. |
| _____ 7.  | _____ 18. | _____ 29. |
| _____ 8.  | _____ 19. | _____ 30. |
| _____ 9.  | _____ 20. | _____ 31. |
| _____ 10. | _____ 21. | _____ 32. |
| _____ 11. | _____ 22. | _____ 33. |

### Essay

34. Why might a jewelry designer prefer to work with a metal rather than a nonmetal? Explain your answer.
35. Draw a Lewis Dot Diagram for oxygen.

# OGT

\_\_\_\_\_ 1.

\_\_\_\_\_ 2.

\_\_\_\_\_ 3.

\_\_\_\_\_ 4.

\_\_\_\_\_ 5.

\_\_\_\_\_ 6.

\_\_\_\_\_ 7.

\_\_\_\_\_ 8.

\_\_\_\_\_ 9.

\_\_\_\_\_ 10.

\_\_\_\_\_ 11.

\_\_\_\_\_ 12.

\_\_\_\_\_ 13.

\_\_\_\_\_ 14.

\_\_\_\_\_ 15.

\_\_\_\_\_ 16.

\_\_\_\_\_ 17.

\_\_\_\_\_ 18.

\_\_\_\_\_ 19.

# MORE MULTIPLE CHOICE

\_\_\_\_\_ 1.

\_\_\_\_\_ 2.

\_\_\_\_\_ 3.

\_\_\_\_\_ 4.

\_\_\_\_\_ 5.

\_\_\_\_\_ 6.

\_\_\_\_\_ 7.

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\_\_\_\_\_ 20.

\_\_\_\_\_ 21.

\_\_\_\_\_ 22.

\_\_\_\_\_ 23.