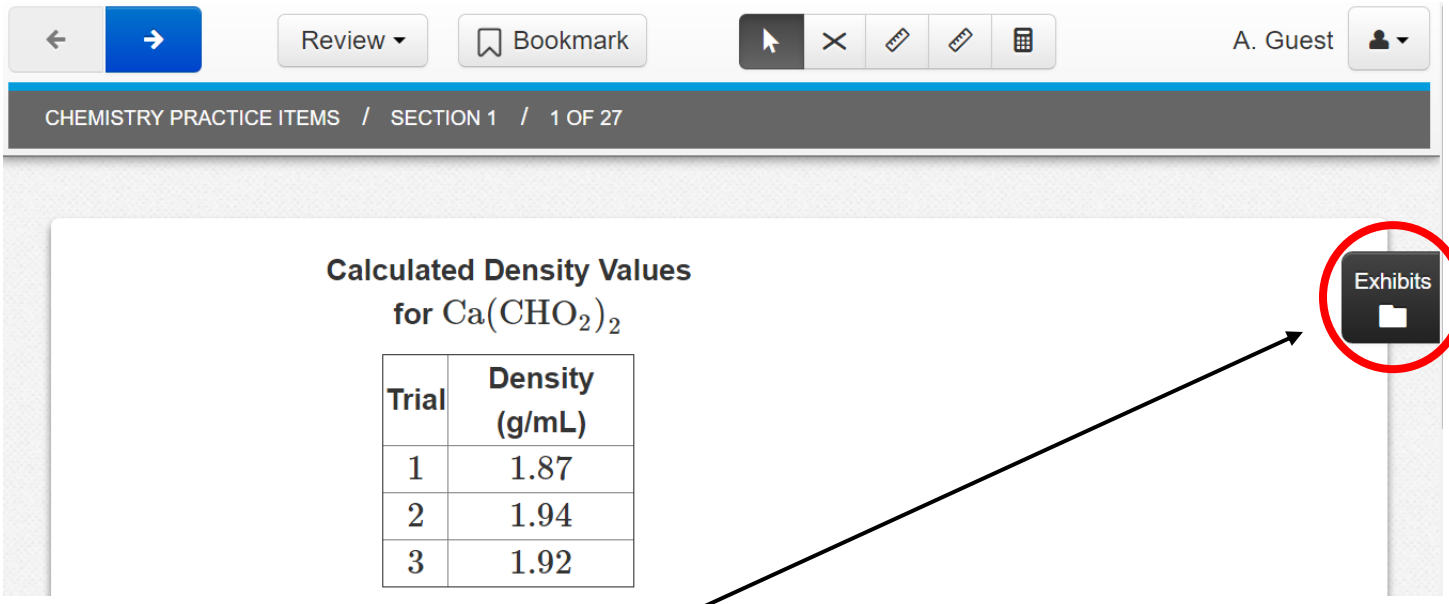
Technology Enhanced Questions

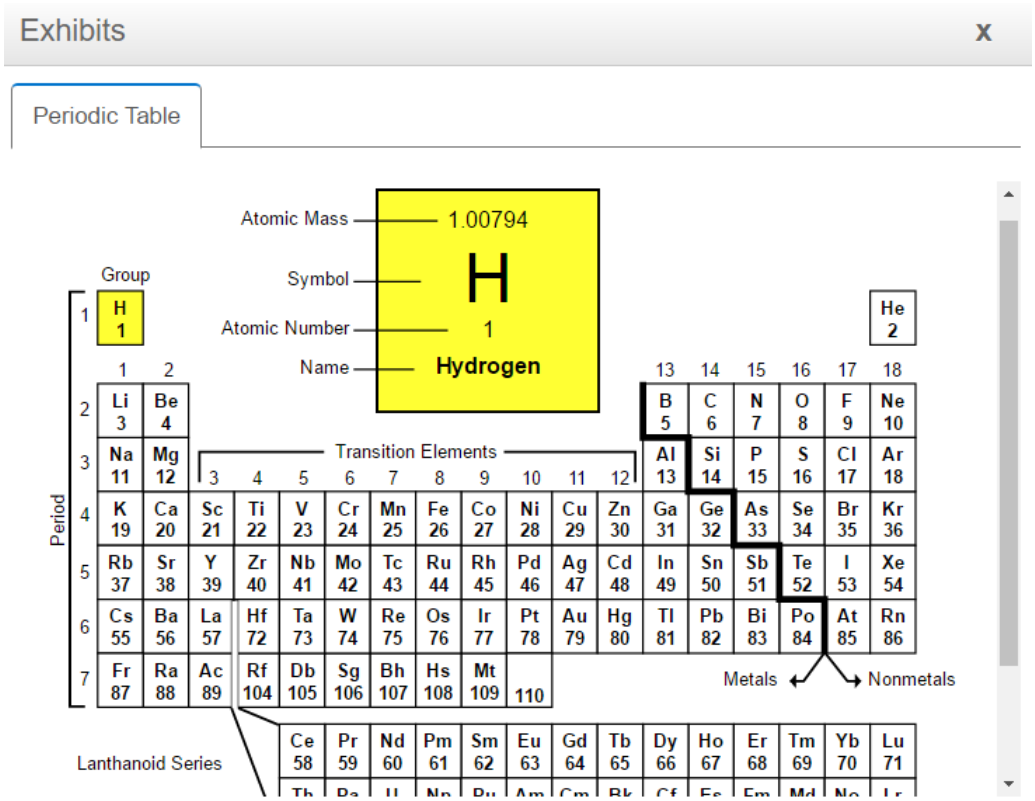
Directions: On your school issued laptop/Chromebook, log into TestNav. Do not sign into TestNav. Click on *SOL Practice Items*. Select *Science*. Select Chemistry. Click *Start*. Check the *I agree* box. Click *Continue*. Click *Start*.

Toolbar



Click  **to Access the Periodic Table**

***Note you must click on the element symbol to see its information.**



1. **Directions: Type your answer in the box.**

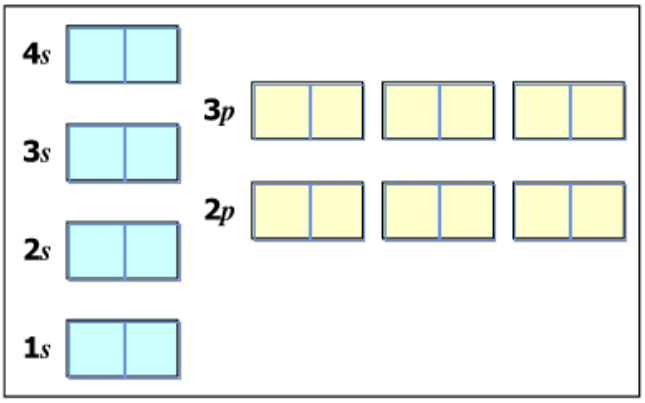
Calculate the atomic mass of the theoretical element using the data in the table. Your answer must be rounded to the nearest tenth.

Isotope Data for a Theoretical Element

Naturally Occurring Isotope	Mass Number	Relative Abundance
1	10	92%
2	11	6.5%
3	13	1.5%

2. **Directions: Drag each electron spin arrow to the appropriate box. You must place all spins in the correct order. Each arrow may be used more than one time.**

Write the orbital notation for silicon (Si) at the ground state.



3. **Directions: Drag a superscripts to the correct box. Each superscript may be used more than one time. Some boxes may be empty.**

Complete the electron configuration for argon (Ar) at the ground state.

$1s^{\square}\ 2s^{\square}\ 2p^{\square}\ 3s^{\square}\ 3p^{\square}\ 4s^{\square}$

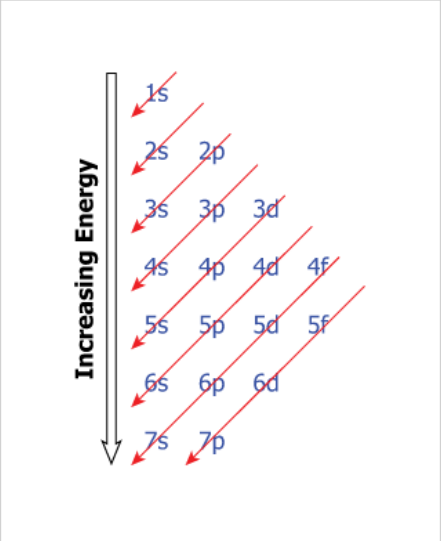
1 2 3 4 5 6 7 8 9

4. **Directions: Type your answer in the box. Use "+" or "−" for the electrical charge.**

What is the oxidation number of a fluoride ion?

5. **Directions: Type your answer in the box.**

How many electrons are needed to completely fill the orbitals from 1s to 4p? Your answer must be a whole number.



Electrons

6. What is the electron configuration of scandium (Sc) in $Sc(NO_3)_3$?

- A. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$
- B. $1s^2 2s^2 2p^6 3s^2 3p^6$
- C. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
- D. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3$

7. **Directions: Select the correct answer.**

Select the column in which all elements exist as diatomic molecules at room temperature.

6 **C**	7 **N**	8 **O**	9 **F**	10 **Ne**
14 **Si**	15 **P**	16 **S**	17 **Cl**	18 **Ar**
32 **Ge**	33 **As**	34 **Se**	35 **Br**	36 **Kr**
50 **Sn**	51 **Sb**	52 **Te**	53 **I**	54 **Xe**

8. **Directions: Drag the correct answers to the box.**

What is the name of the compound PbO_2 according to IUPAC rules?

The chemical name is [ ] [ ] .

dilead	oxide	tetralead	oxygen	lead(II)	dioxide	lead(IV)	tetraoxide

9. **Directions: Drag a coefficient to each box. Each box must have a coefficient. Each coefficient may be used more than one time.**

Use the lowest possible coefficients to balance this chemical equation.

$$\square\ Al + \square\ Fe_2O_3 \longrightarrow \square\ Al_2O_3 + \square\ Fe$$

1	2	3	4	5	6	7	8	9

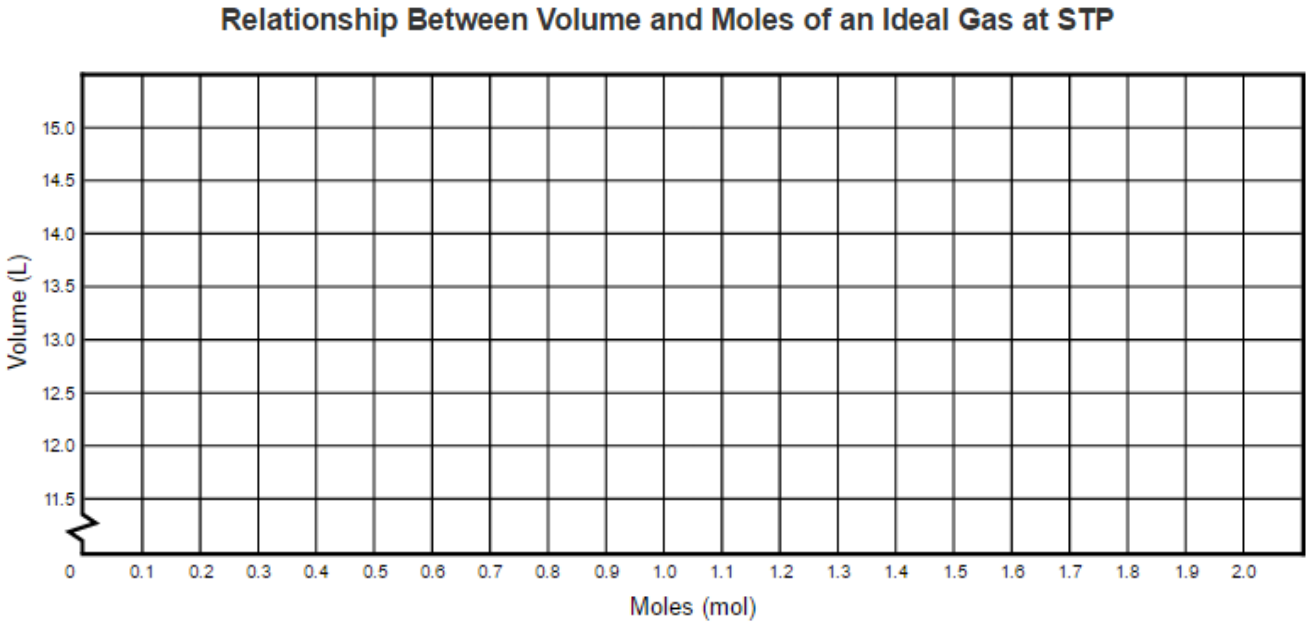
10. **Directions: Select all the correct answers.**

A change in which of these could affect the chemical equilibrium of a closed system?

Concentration	Pressure	Catalyst	Volume	Temperature

Directions: Plot a point on the grid. Line segments will connect the points.

11. **Plot two points to form a line from the data set that correctly shows the relationship between volume and moles of an ideal gas at STP.**



Data Set A

Volume (L)	Approximate Moles (mol)
12	1.1
15	1.3

Data Set B

Volume (L)	Approximate Moles (mol)
12	1.9
15	1.5

Data Set C

Volume (L)	Approximate Moles (mol)
12	0.5
15	0.7

12. Properties of CH_2Cl_2

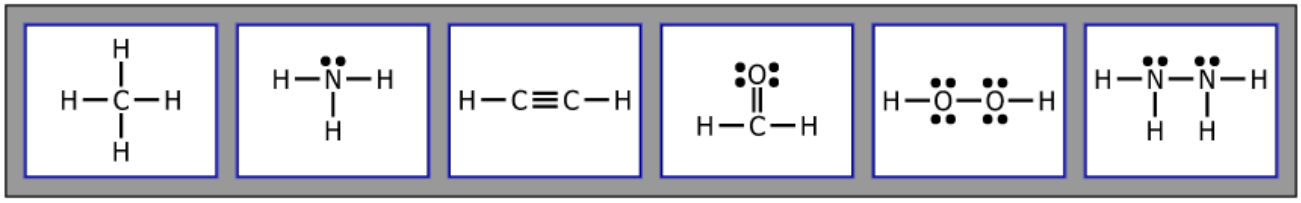
Heat of Fusion	Heat of Vaporization
$4.60\ \frac{kJ}{mol}$	$28.06\ \frac{kJ}{mol}$

Applying 7.80 kJ of heat melts what mass of solid CH_2Cl_2 at its melting point?

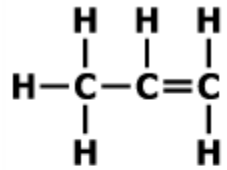
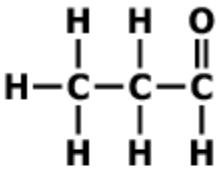
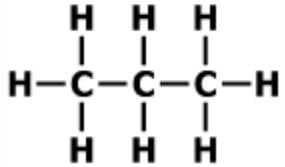
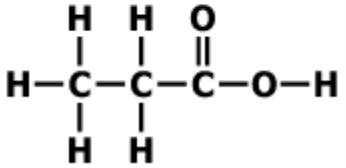
- A. 23.6 g
- B. 50.1 g
- C. 144 g
- D. 306 g

13. **Directions: Select all the correct answers.**

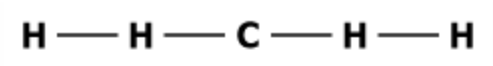
Which of these are organic compounds?

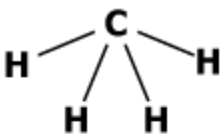


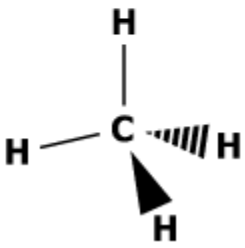
14. Which formula represents a molecule with fully saturated carbon (C) atoms?

- A. 
- B. 
- C. 
- D. 

15. Which geometric structure most accurately illustrates the shape of a molecule of CH_4?

A. 

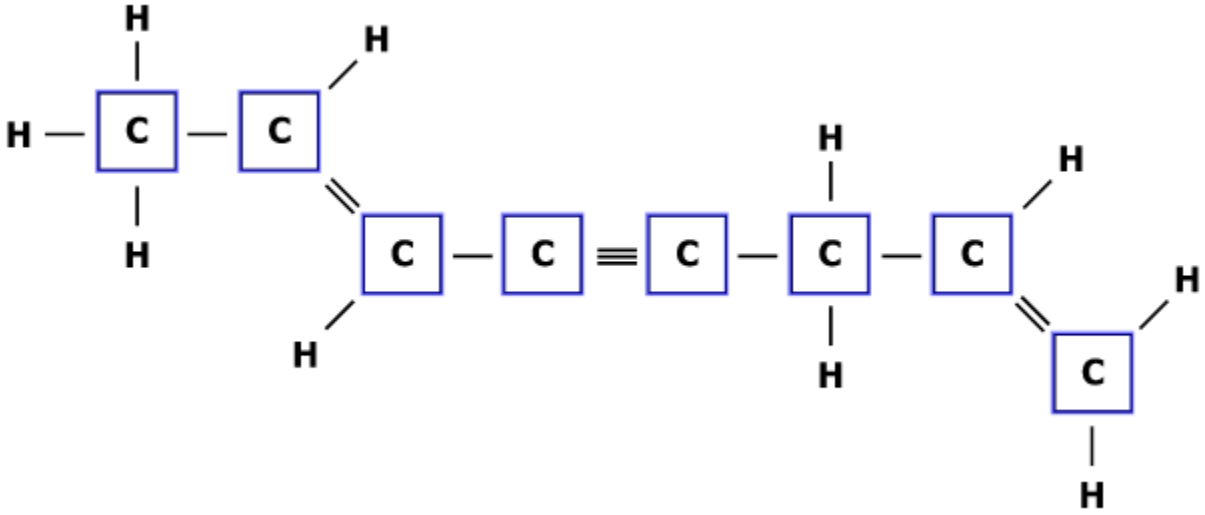
B. 

C. 

D. 

16. **Directions: Select the correct answers.**

Select three of the carbon (C) atoms that make this theoretical molecule unsaturated.



17. **Directions: Select all the correct answers.**

Which of these polymers are naturally occurring?

Nylon	Protein	Polyester	Teflon	DNA

18. Which statement describes how plastics differ from nucleic acids?

- A. Plastics are synthetic polymers, but nucleic acids are natural polymers.
- B. Plastics are formed from repeated subunits, but nucleic acids are not.
- C. Plastics are formed from organic compounds, but nucleic acids are not.
- D. Plastics are polymers, but nucleic acids are monomers.