Name_____ Date: _____

<u>The Mole Webquest</u>

Use the following website to answer this set of questions:

http://antoine.frostburg.edu/chem/senese/101/moles/faq/why-use-moles.shtml

1) A mole of anything is how many? (give the number):

2) Why is it that different amounts of things can still equal one mole? (think about the weight of a dozen elephants vs a dozen eggs)

3) Why do we want to use the concept of moles?

4) Once we know the number of moles we can convert to the number of:
_____ or _____ and vice versa.

5) How many grams of water are in one mole of water?

6) How many molecules of water are in one mole of water?

Use the following website to answer the next set of questions:
https://chemfiesta.wordpress.com/2015/02/06/mole-calculations-3/

7) Define molar mass.

8) What is the mass of one mole of oxygen?

9) Find the molar mass of NH_3NO_3. (Show your work)

Converting between grams, moles, and particles

10) Copy the chart:

11) If you are converting between particles and moles, use _____ as conversion factor.

12) If you are converting between moles and grams, you need to know the _____ of the compound.

13) You CAN NOT convert between _____ and _____ without first converting to _____.

14. Convert 97.4 grams of NaCl to moles. (show all work)

15. Convert 32.6 grams of H_2O to moles (not on computer do this one on your own)

16. Convert 77.2 grams of CH_4 to molecules. (Show all work)

17. Convert 22.7 grams of H_2O to molecules (not on computer do this one on your own)

18. What does the name mole actually come from?

Use the following website the answer the next set of questions:
https://www.thoughtco.com/convert-grams-to-moles-example-problem-609578
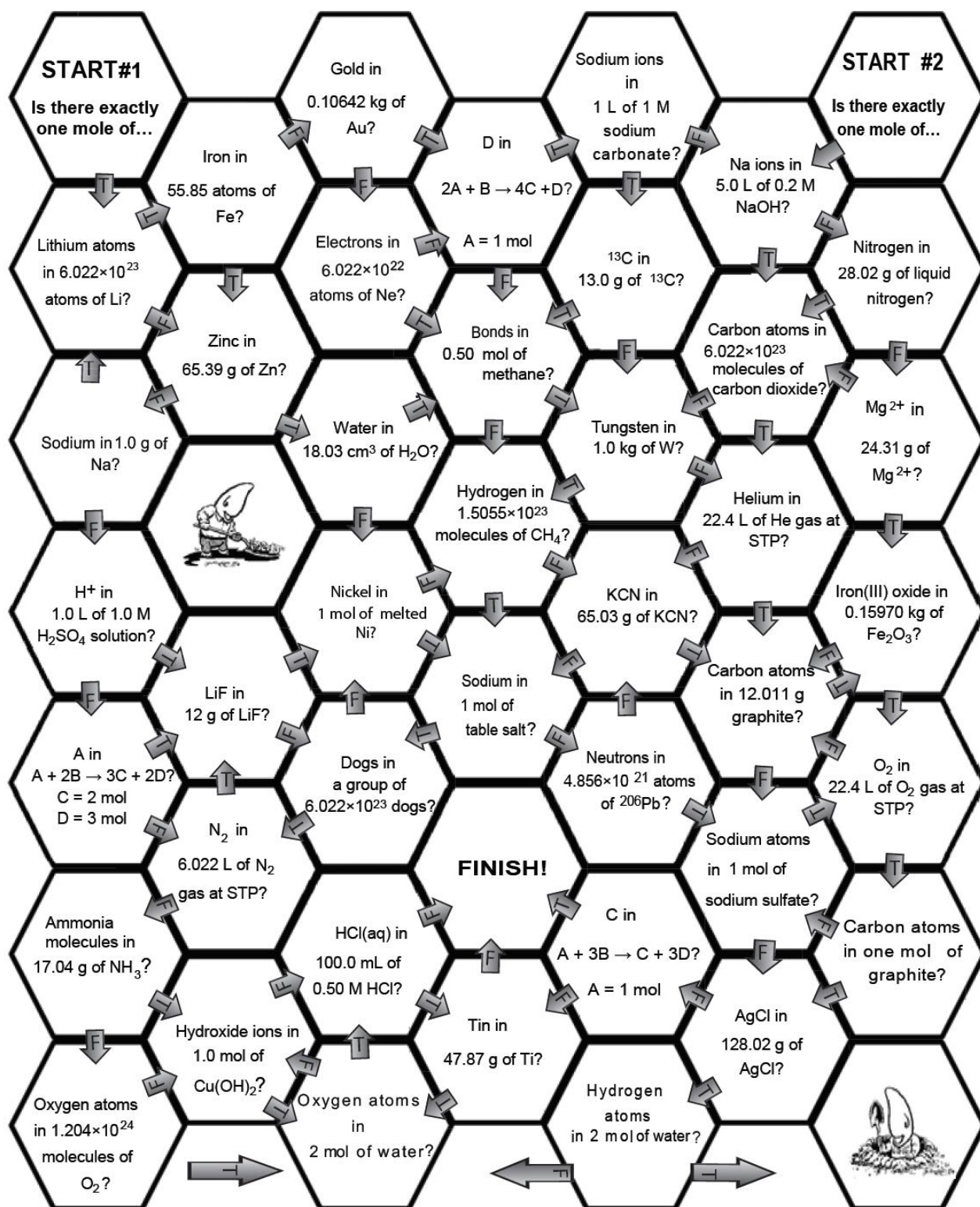
19. What is the molar mass of CO_2? Show your work.

20. Determine the number of moles of CO_2 in 454 grams of CO_2. Show your work.

21. Find the number of grams in 0.700 moles of H_2O_2. Show your work.

22. Determine the mass in grams of 3.60 mol of sulfuric acid. Show all your work.

Are you a mole expert? Use the puzzle below to test your knowledge. Begin at one of the two starting locations (Start 1 and 2) and work through the questions to reach the finish space. In each space there is a question that continues from the statement in the start box. If the content in the space equals one mole, follow the "T" for true arrow. If it does not equal one mole, follow the "F" for false arrow. Continue until you reach finish, then start for the other side! Record the path you took in the spaces provided.

START#1
Is there exactly one mole of…

Gold in 0.10642 kg of Au?

Sodium ions in 1 L of 1 M sodium carbonate?

START #2
Is there exactly one mole of…

Iron in 55.85 atoms of Fe?

D in 2A + B → 4C +D?

Na ions in 5.0 L of 0.2 M NaOH?

Lithium atoms in 6.022×10^{23} atoms of Li?

Electrons in 6.022×10^{22} atoms of Ne?

A = 1 mol

^{13}C in 13.0 g of ^{13}C?

Nitrogen in 28.02 g of liquid nitrogen?

Zinc in 65.39 g of Zn?

Bonds in 0.50 mol of methane?

Carbon atoms in 6.022×10^{23} molecules of carbon dioxide?

Mg^{2+} in 24.31 g of Mg^{2+}?

Sodium in 1.0 g of Na?

Water in 18.03 cm³ of H_2O?

Tungsten in 1.0 kg of W?

Hydrogen in 1.5055×10^{23} molecules of CH_4?

Helium in 22.4 L of He gas at STP?

H^+ in 1.0 L of 1.0 M H_2SO_4 solution?

Nickel in 1 mol of melted Ni?

KCN in 65.03 g of KCN?

Iron(III) oxide in 0.15970 kg of Fe_2O_3?

LiF in 12 g of LiF?

Sodium in 1 mol of table salt?

Carbon atoms in 12.011 g graphite?

A in A + 2B → 3C + 2D? C = 2 mol D = 3 mol

Dogs in a group of 6.022×10^{23} dogs?

Neutrons in 4.856×10^{21} atoms of ^{206}Pb?

O_2 in 22.4 L of O_2 gas at STP?

N_2 in 6.022 L of N_2 gas at STP?

FINISH!

Sodium atoms in 1 mol of sodium sulfate?

Ammonia molecules in 17.04 g of NH_3?

HCl(aq) in 100.0 mL of 0.50 M HCl?

C in A + 3B → C + 3D? A = 1 mol

Carbon atoms in one mol of graphite?

Hydroxide ions in 1.0 mol of $Cu(OH)_2$?

Tin in 47.87 g of Ti?

AgCl in 128.02 g of AgCl?

Oxygen atoms in 1.204×10^{24} molecules of O_2?

Oxygen atoms in 2 mol of water?

Hydrogen atoms in 2 mol of water?

Start 1 T __ __ __ __ __ __ __ __ __ __ __ __

Start 2 __ __ __ __ __ __ __ __ __ __ __