

## Elemental “March of Madness” Tournament

Name \_\_\_\_\_

Period \_\_\_\_\_

In this activity, your favorite elements from the periodic table will battle it out in a 64-element single elimination tournament to determine which element can claim bragging rights as the toughest of them all. Each round in this tournament will feature a different contest pitting elemental pairs against each other. You will have to use your vast knowledge of chemistry, a periodic table, and other available resources to predict who the winner will be and advance that element to the next round. If you know your stuff, you will correctly predict who will win each contest and which element will be the grand champion of our tournament.

*Simply read the description of the contests for each round below and write an explanation of how you will determine the winner in the box provided. Then look at the tournament draw on the following page and write in the winning element on the winner's blank for each round until you have the whole tournament results filled in. A correct prediction of the whole tournament will earn you 21 CLC points!*

### Contest Descriptions:

#### ➤ **Round 1: Getting Through**

- In this first round, both elements are placed inside of a room with a closed door. The door slowly begins to open. At first the opening is too small for either atom to get through. The door continues to open very, very slowly until one of the atoms is able to make it out of the room. This is the element that “gets through” to the next round. (2 pts for all correct)

Explain how you will determine who the winners will be in this round: (2 pts)

#### ➤ **Round 2: A Positive Attitude**

- For each element, subtract the number of valence electrons from the principal quantum number of its valence electron(s). The element resulting in the most positive answer will advance to the next round. (*Remember: -1 is more positive than -2*) (2 pts for all correct)

#### ➤ **Round 3: The Electron Extractor**

- For this round, both elements will be subjected to a device that attaches to a valence electron of each element. The device then pulls on the electron with increasing force until the atom finally loses its hold on the electron and it is pulled away from the atom. The element that holds onto its electron the longest will be declared the winner and move on to the next bracket. (2 pts for all correct)

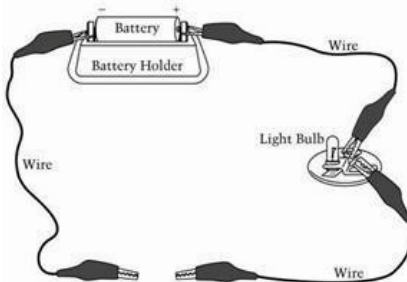
Explain how you will determine who the winners will be in this round: (2 pts)

- **Round 4: Last Element Standing** *Hint: If you have completed the first 3 rounds correctly, all participants in the fourth round should appear somewhere on your Activity Series paper.*
- In this round, each element will be placed in a beaker filled with aqueous cadmium chloride. The element that remains intact without reacting advances to the semi-finals. (2 pts for all correct)
  - **HINT:** *If both react with cadmium chloride, then you have made a mistake in an earlier round. For each pair, there should be one that does react and one that does not react.*

Explain how you will determine who the winners will be in this round: (2 pts)

➤ **Semi-Finals: It's Electric**

- In this battle, each element is attached to the two alligator clip leads of electrical wire as pictured below. When the power source is turned on, the element whose light bulb glows the brightest will advance to the finals. (2 pts for all correct)



➤ **The Grand Finale**

- 6.5 grams of each element is placed in a container holding 0.46 Liters of oxygen at STP. Each element is heated thoroughly so that it reacts with the oxygen, producing a reddish-colored powder. *(Keep in mind most metals have several possible oxidation states – be sure to research to verify that you have the correct oxidation state of your oxide that is reddish)*
- The element that produces 6.0 grams of the reddish compound without using up all of the oxygen is the winner of our tournament. (**Hint:** if you have an element in the finals that does not combine with oxygen to make a reddish oxide, then you have made a mistake in an earlier round)

*Show all of your work below (5pts for work and correct answer)*

