

Name: \_\_\_\_\_

Collisions Username: \_\_\_\_\_

Class: \_\_\_\_\_

## Ions Quest

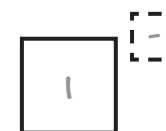
Now that you have completed the Ions Challenges, you are ready to conduct this Ions Quest.

### MISSION 1. GATHER YOUR INTEL

Use your Collisions gameplay experience to gather the following intel:

1. Label the correct element symbol in the large square.
2. Write the ion charge in the smaller, dashed box.
3. List the # of protons in the ion.
4. List the # of electrons in the ion.
5. Check if energy was used or released.

Sample Target



# of Protons: 53

# of Electrons: 54

Energy was:

Used  Released

### MISSION 2. EXPOSE THE DETAILS

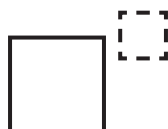
Use your expertise to expose the following information for each target ion.

Sample Target	
Common Ion Name	Iodide ion
Type of Ion (Cation or Anion)	Anion
Lost or Gained Electrons?	Gained Electrons
Formation Reaction	$I + e^- \rightarrow I^-$
Endothermic or Exothermic?	Exothermic
The ionic radii is (> or <) than the parent's atomic radii.	$I^- > I$
What noble gas is isoelectronic with this ion?	Xenon

# Ions - Challenge Level 1

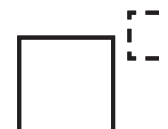
## MISSION 1. GATHER YOUR INTEL

Target 1



# of Protons: \_\_\_\_  
# of Electrons: \_\_\_\_  
Energy was:  
\_\_\_Used \_\_\_Released

Target 2



# of Protons: \_\_\_\_  
# of Electrons: \_\_\_\_  
Energy was:  
\_\_\_Used \_\_\_Released

## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2
Common Ion Name		
Type of Ion (Cation or Anion)		
Lost or Gained Electrons?		
Formation Reaction		
Endothermic or Exothermic?		
The ionic radii is (> or <) than the parent's atomic radii.		
What noble gas is isoelectronic with this ion?		

# Ions - Challenge Level 2

## MISSION 1. GATHER YOUR INTEL

Target 1



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 2



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 3



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

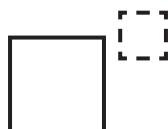
## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2	Target 3
Common Ion Name			
Type of Ion (Cation or Anion)			
Lost or Gained Electrons?			
Formation Reaction			
Endothermic or Exothermic?			
The ionic radii is (> or <) than the parent's atomic radii.			
What noble gas is isoelectronic with this ion?			

# Ions - Challenge Level 3

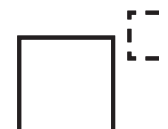
## MISSION 1. GATHER YOUR INTEL

Target 1



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 2



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

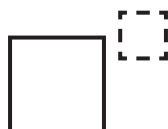
## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2
Common Ion Name		
Type of Ion (Cation or Anion)		
Lost or Gained Electrons?		
Formation Reaction		
Endothermic or Exothermic?		
The ionic radii is (> or <) than the parent's atomic radii.		
What noble gas is isoelectronic with this ion?		

# Ions - Challenge Level 4

## MISSION 1. GATHER YOUR INTEL

Target 1



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 2



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2
Common Ion Name		
Type of Ion (Cation or Anion)		
Lost or Gained Electrons?		
Formation Reaction		
Endothermic or Exothermic?		
The ionic radii is (> or <) than the parent's atomic radii.		
What noble gas is isoelectronic with this ion?		

# Ions - Challenge Level 5

## MISSION 1. GATHER YOUR INTEL

Target 1



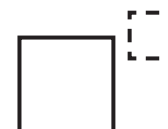
# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 2



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 3



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2	Target 3
Common Ion Name			
Type of Ion (Cation or Anion)			
Lost or Gained Electrons?			
Formation Reaction			
Endothermic or Exothermic?			
The ionic radii is (> or <) than the parent's atomic radii.			
What noble gas is isoelectronic with this ion?			

# Ions - Challenge Level 6

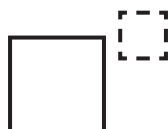
## MISSION 1. GATHER YOUR INTEL

Target 1



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_Used \_\_\_Released

Target 2



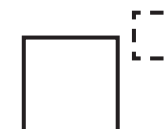
# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_Used \_\_\_Released

Target 3



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_Used \_\_\_Released

Target 4



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_Used \_\_\_Released

## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2	Target 3	Target 4
Common Ion Name				
Type of Ion (Cation or Anion)				
Lost or Gained Electrons?				
Formation Reaction				
Endothermic or Exothermic?				
The ionic radii is (> or <) than the parent's atomic radii.				
What noble gas is isoelectronic with this ion?				

# Ions - Challenge Level 7

## MISSION 1. GATHER YOUR INTEL

Target 1



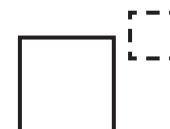
# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 2



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 3



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2	Target 3
Common Ion Name			
Type of Ion (Cation or Anion)			
Lost or Gained Electrons?			
Formation Reaction			
Endothermic or Exothermic?			
The ionic radii is (> or <) than the parent's atomic radii.			
What noble gas is isoelectronic with this ion?			



# Ions to Atoms - Connected Level 1

## MISSION 1. GATHER YOUR INTEL

Target 1



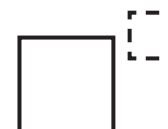
# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 2



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

Target 3



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_ Used \_\_\_ Released

## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2	Target 3
Common Ion Name			
Type of Ion (Cation or Anion)			
Lost or Gained Electrons?			
Formation Reaction			
Endothermic or Exothermic?			
The ionic radii is (> or <) than the parent's atomic radii.			
What noble gas is isoelectronic with this ion?			

# Ions to Atoms - Connected Level 2

## MISSION 1. GATHER YOUR INTEL

Target 1



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_Used \_\_\_Released

Target 2



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_Used \_\_\_Released

Target 3



# of Protons: \_\_\_\_  
 # of Electrons: \_\_\_\_  
 Energy was:  
 \_\_\_Used \_\_\_Released

## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2	Target 3
Common Ion Name			
Type of Ion (Cation or Anion)			
Lost or Gained Electrons?			
Formation Reaction			
Endothermic or Exothermic?			
The ionic radii is (> or <) than the parent's atomic radii.			
What noble gas is isoelectronic with this ion?			

# Ions to Atoms - Connected Level 3

## MISSION 1. GATHER YOUR INTEL

Target 1



# of Protons: \_\_\_\_

# of Electrons: \_\_\_\_

Energy was:

\_\_\_Used \_\_\_Released

Target 2



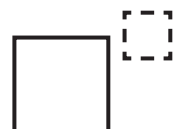
# of Protons: \_\_\_\_

# of Electrons: \_\_\_\_

Energy was:

\_\_\_Used \_\_\_Released

Target 3



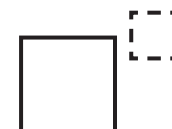
# of Protons: \_\_\_\_

# of Electrons: \_\_\_\_

Energy was:

\_\_\_Used \_\_\_Released

Target 4



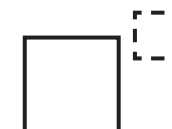
# of Protons: \_\_\_\_

# of Electrons: \_\_\_\_

Energy was:

\_\_\_Used \_\_\_Released

Target 5



# of Protons: \_\_\_\_

# of Electrons: \_\_\_\_

Energy was:

\_\_\_Used \_\_\_Released

## MISSION 2. EXPOSE THE DETAILS

	Target 1	Target 2	Target 3	Target 4	Target 5
Common Ion Name					
Type of Ion (Cation or Anion)					
Lost/Gained Electrons?					
Formation Reaction					
Endothermic or Exothermic?					
The ionic radii is (> or <) than the parent's atomic radii?					
What noble gas is isoelectronic with this ion?					