Name: _____

Collisions Username: _____

Class: _____

Equilibrium Quest

Complete this quest using the Challenge Levels 5-21.

MISSION 1. GATHER YOUR INTEL

Use your Collisions gameplay experience to gather the following intel from specific Equilibrium levels:

1. Record the reaction.
2. List the disturbance that successfully completed each target.

Balanced Chemical Reaction
$2NO_2(g) \rightleftarrows N_2O_4(g)$

Target 1

SHIFT RIGHT + $[NO_2]$

MISSION 2. EXPOSE THE DETAILS

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

Reaction		
What is the K_c expression?		$\frac{[N_2O_4]}{[NO_2]^2}$
At Eq, is the reaction more reactant or product heavy?		product
$K_c > 1$ or $K_c < 1$		$K_c > 1$
		Target 1
What is another way to reach this target?		$-[N_2O_4]$
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants	decrease
	Concentration of products	increase
	Temperature	increase
	Pressure	decrease

Equilibrium - Challenge Level 5

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1

SHIFT
RIGHT _____

Target 2

SHIFT
LEFT _____

MISSION 2. EXPOSE THE DETAILS

Reaction			
What is the K_c expression?			
At Eq, is the reaction more reactant or product heavy?			
$K_c>1$ or $K_c<1$			
		Target 1	Target 2
What is another way to reach this target?			
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants		
	Concentration of products		
	Temperature		
	Pressure		

Equilibrium - Challenge Level 6

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
SHIFT RIGHT _____	SHIFT LEFT _____	SHIFT LEFT _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
K_c>1 or K_c<1				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 7

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
SHIFT RIGHT _____	SHIFT LEFT _____	SHIFT LEFT _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
$K_c>1$ or $K_c<1$				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 8

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1

SHIFT
RIGHT _____

Target 2

SHIFT
LEFT _____

MISSION 2. EXPOSE THE DETAILS

Reaction			
What is the K_c expression?			
At Eq, is the reaction more reactant or product heavy?			
$K_c > 1$ or $K_c < 1$			
		Target 1	Target 2
What is another way to reach this target?			
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants		
	Concentration of products		
	Temperature		
	Pressure		

Equilibrium - Challenge Level 9

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
SHIFT RIGHT _____	SHIFT LEFT _____	SHIFT LEFT _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
K_c>1 or K_c<1				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 10

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
SHIFT LEFT _____	SHIFT LEFT _____	SHIFT LEFT _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
K_c>1 or K_c<1				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 11

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1

SHIFT
RIGHT _____

Target 2

SHIFT
LEFT _____

MISSION 2. EXPOSE THE DETAILS

Reaction			
What is the K_c expression?			
At Eq, is the reaction more reactant or product heavy?			
$K_c > 1$ or $K_c < 1$			
		Target 1	Target 2
What is another way to reach this target?			
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants		
	Concentration of products		
	Temperature		
	Pressure		

Equilibrium - Challenge Level 12

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
SHIFT RIGHT _____	SHIFT LEFT _____	SHIFT LEFT _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
K_c>1 or K_c<1				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 13

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1

DECREASE
H_2 at Eq _____

Target 2

DECREASE
HCl at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction			
What is the K_c expression?			
At Eq, is the reaction more reactant or product heavy?			
K_c>1 or K_c<1			
		Target 1	Target 2
What is another way to reach this target?			
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants		
	Concentration of products		
	Temperature		
	Pressure		

Equilibrium - Challenge Level 14

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
INCREASE H_3O^+ at Eq _____	DECREASE HBr at Eq _____	DECREASE Br^- at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
$K_c>1$ or $K_c<1$				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 15

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
DECREASE PRESSURE at Eq _____	DECREASE PRESSURE at Eq _____	DECREASE PRESSURE at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
K_c>1 or K_c<1				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 16

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1

INCREASE
Pressure at Eq _____

Target 2

INCREASE
H_2 at Eq _____

Target 3

INCREASE
CH_4 at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
$K_c>1$ or $K_c<1$				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 17

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
INCREASE N_2 at Eq _____	INCREASE NH_3 at Eq _____	DECREASE H_2 at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
$K_c>1$ or $K_c<1$				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 18

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
INCREASE PRESSURE at Eq _____	DECREASE CO at Eq _____	DECREASE CO_2 at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
K_c>1 or K_c<1				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 19

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
INCREASE PRESSURE at Eq _____	DECREASE SO_3 at Eq _____	DECREASE SO_2 at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
$K_c>1$ or $K_c<1$				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 20

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
INCREASE PRESSURE at Eq _____	DECREASE O_2 at Eq _____	DECREASE NO_2 at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
$K_c>1$ or $K_c<1$				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			

Equilibrium - Challenge Level 21

MISSION 1. GATHER YOUR INTEL

Balanced Chemical Reaction


Target 1	Target 2	Target 3
INCREASE CO at Eq _____	INCREASE H_2O at Eq _____	DECREASE CO_2 at Eq _____

MISSION 2. EXPOSE THE DETAILS

Reaction				
What is the K_c expression?				
At Eq, is the reaction more reactant or product heavy?				
$K_c>1$ or $K_c<1$				
		Target 1	Target 2	Target 3
What is another way to reach this target?				
Determine if these **increase, decrease, or remain the same** after the disturbance.	Concentration of reactants			
	Concentration of products			
	Temperature			
	Pressure			