



Name: _____

Collisions Username: _____

Class: _____

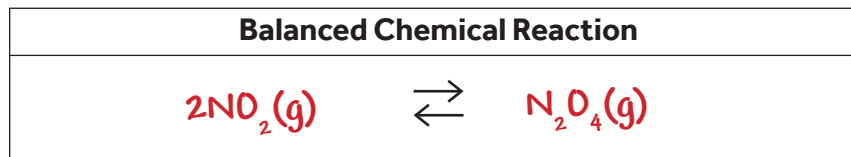
Equilibrium Quest

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.



Target 1

SHIFT
RIGHT + [NO₂]

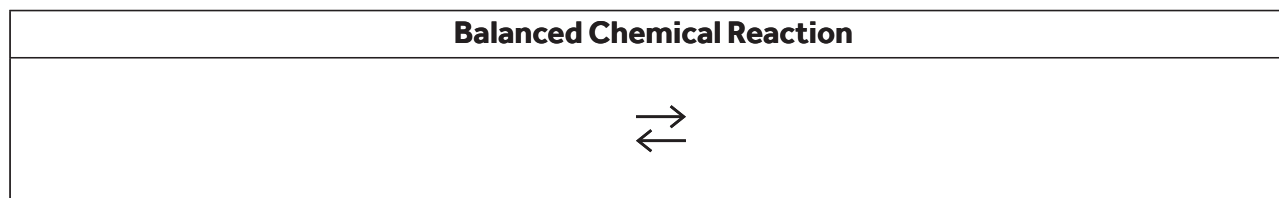
MISSION 2. EXPOSE THE DETAILS

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

Reaction		
What is the K_c expression?	$\frac{[\text{N}_2\text{O}_4]}{[\text{NO}_2]^2}$	
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?	- [N₂O₄]	
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



Target 1

SHIFT
RIGHT _____

Target 2

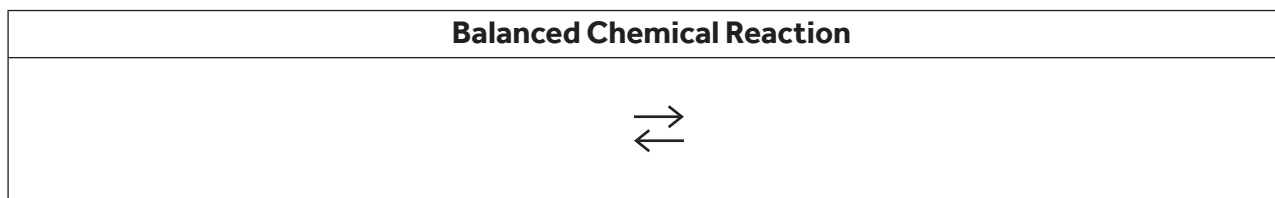
SHIFT
LEFT _____

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



Target 1

SHIFT
RIGHT _____

Target 2

SHIFT
LEFT _____

Target 3

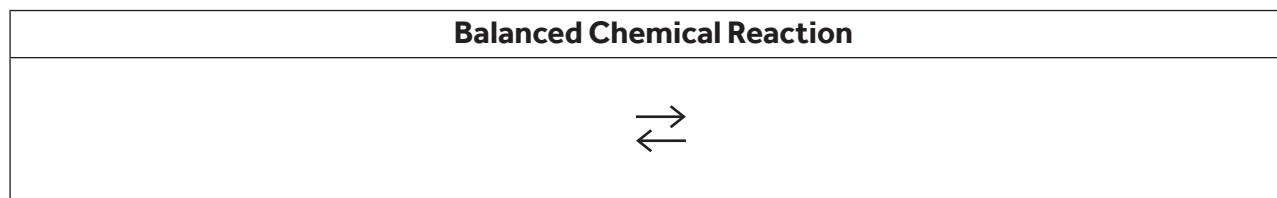
SHIFT
LEFT _____

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



Target 1

SHIFT
RIGHT _____

Target 2

SHIFT
LEFT _____

Target 3

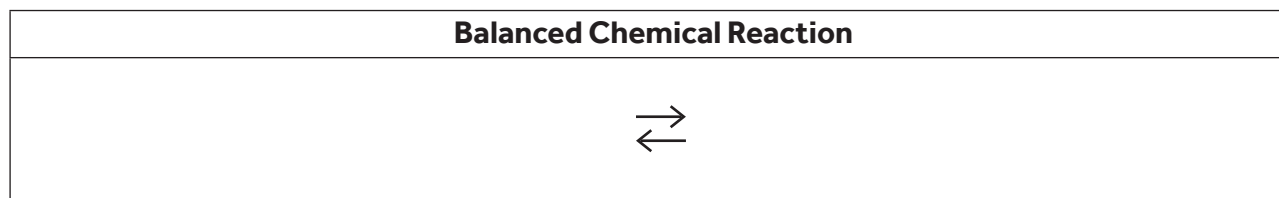
SHIFT
LEFT _____

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



Target 1

Target 2

SHIFT
RIGHT _____

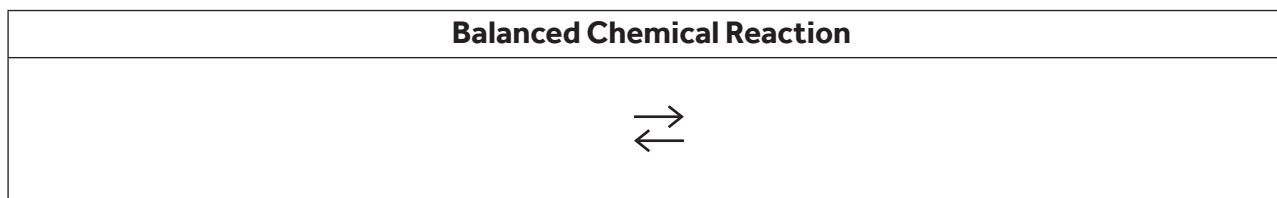
SHIFT
LEFT _____

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



Target 1

SHIFT
RIGHT _____

Target 2

SHIFT
LEFT _____

Target 3

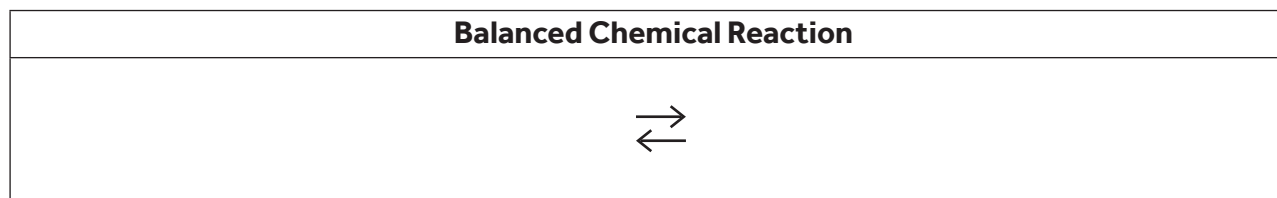
SHIFT
LEFT _____

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



Target 1

SHIFT
LEFT _____

Target 2

SHIFT
LEFT _____

Target 3

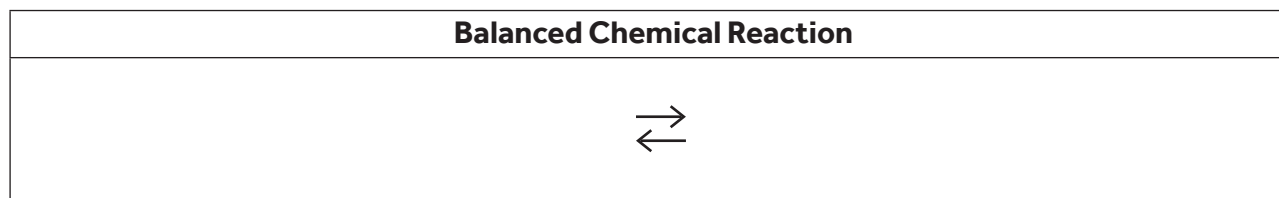
SHIFT
LEFT _____

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



Target 1

SHIFT
RIGHT _____

Target 2

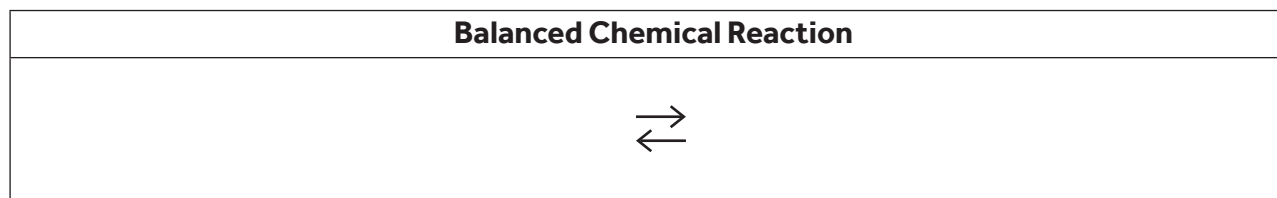
SHIFT
LEFT _____

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



Target 1

SHIFT
RIGHT _____

Target 2

SHIFT
LEFT _____

Target 3

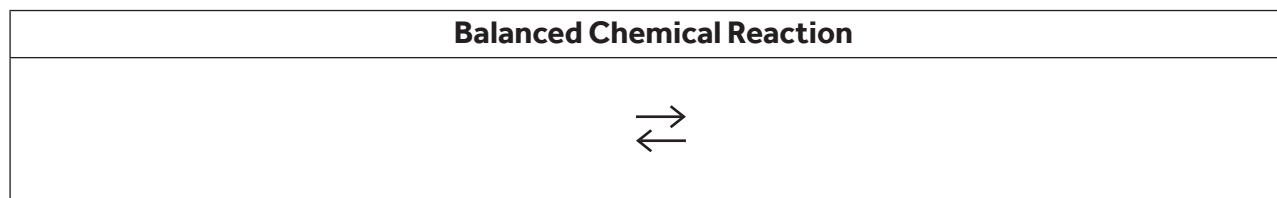
SHIFT
LEFT _____

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



Target 1

DECREASE
H₂ at Eq _____

Target 2

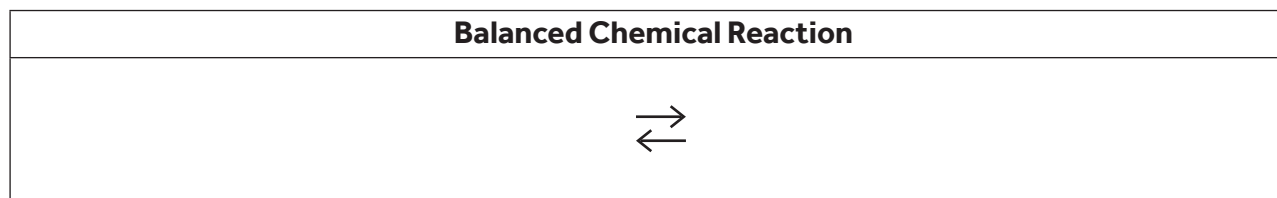
DECREASE
HCl at Eq _____

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



Target 1

DECREASE
H₃O⁺ at Eq _____

Target 2

DECREASE
HBr at Eq _____

Target 3

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
\rightleftharpoons

Target 1

DECREASE
PRESSURE at Eq _____

Target 2

DECREASE
PRESSURE at Eq _____

Target 3

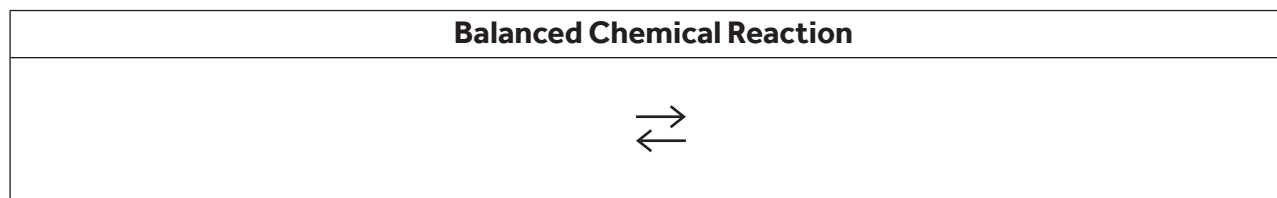
DECREASE
PRESSURE at Eq _____

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



Target 1

INCREASE
N₂ at Eq _____

Target 2

INCREASE
NH₃ at Eq _____

Target 3

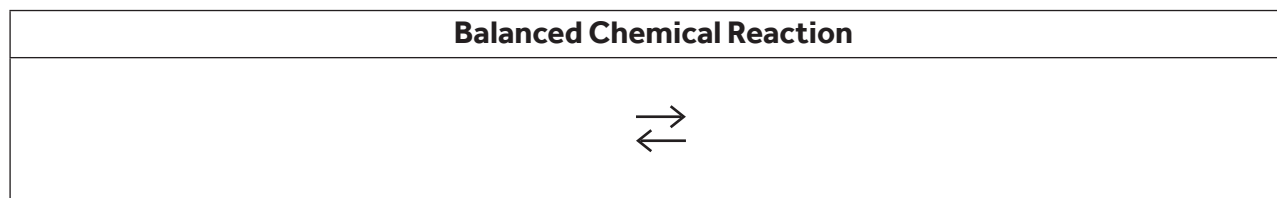
INCREASE
H₂ at Eq _____

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



Target 1

INCREASE
N₂ at Eq _____

Target 2

INCREASE
NH₃ at Eq _____

Target 3

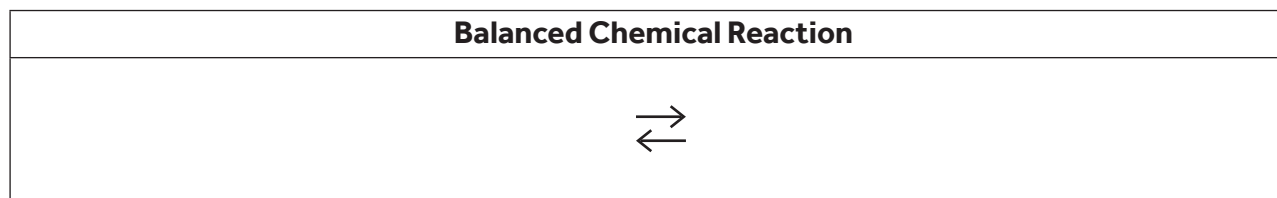
DECREASE
H₂ at Eq _____

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



Target 1

INCREASE
PRESSURE at Eq _____

Target 2

DECREASE
CO at Eq _____

Target 3

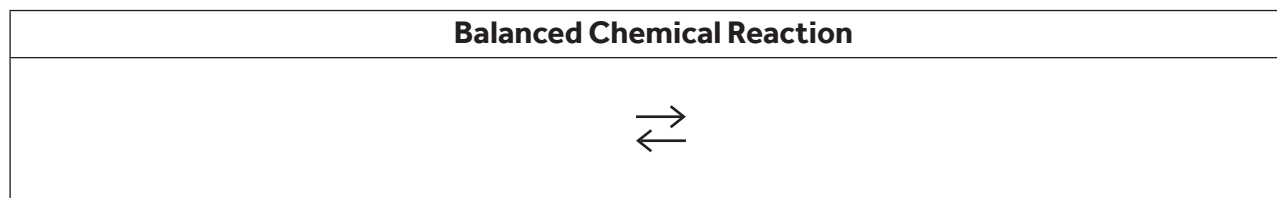
DECREASE
CO₂ at Eq _____

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



Target 1

INCREASE
PRESSURE at Eq _____

Target 2

DECREASE
SO₃ at Eq _____

Target 3

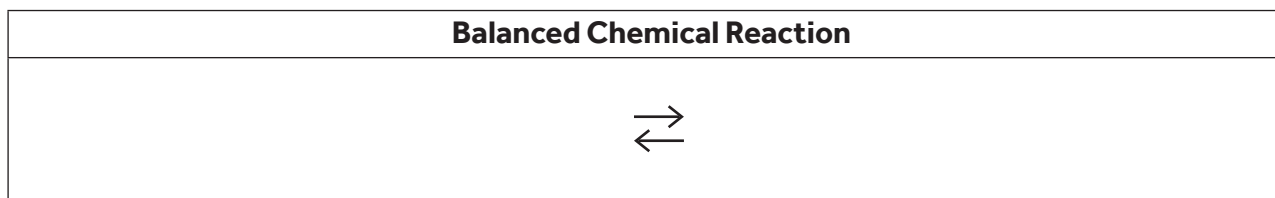
DECREASE
SO₂ at Eq _____

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



Target 1

INCREASE
PRESSURE at Eq _____

Target 2

DECREASE
CO at Eq _____

Target 3

DECREASE
CO₂ 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
\rightleftharpoons

Target 1

INCREASE
CO at Eq _____

Target 2

INCREASE
H₂ at Eq _____

Target 3

DECREASE
CO₂ 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		