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# NOTE-TAKING GUIDE: Unit 10, SEGMENT D

Name:

Date:

## Main Ideas, Key Points, Questions:

***After watching the video segment, write down key points, main ideas and big questions.***

## Objective(s):

- ***To use models to construct an explanation of Le Chatelier's principle and its usefulness.***
- ***To stress chemical systems to determine their equilibrium point.***

## Notes:

***During the video segment, use words, phrases or drawings to take notes.***

## Summary:

***After watching the video segment, write at least three sentences explaining what you learned.***
*You can ask yourself: "If I was going to explain this to someone else, what would I say?"*

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## QUESTIONS TO CONSIDER:
## Unit 10, SEGMENT D

Name:

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**After watching the video and performing any associated labs and/or experiments, you should be able to answer the following:**

***If you had difficulty writing down three examples of equilibrium in your daily life as instructed in Unit 10C, watch the Unit 10D video to find examples you can use. You may write them in this section.***

1. Le Chatelier's Principle states that when equilibrium is stressed, the system adjusts to reestablish equilibrium. List three ways in which chemical equilibrium can be stressed.

2. Which one of these three ways is the only one that can cause the equilibrium constant of the reaction to change?

3. Use the Haber process again as an example. $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

   Imagine we're all chemists in a manufacturing plant, responsible for producing the maximum amount of ammonia. Our reaction has reached equilibrium and the amount of ammonia made is less than what we want. What can we do to disturb the equilibrium and produce more ammonia ($NH_3$)?

4. Draw a model of a see-saw with reactants and products showing the equation system at equilibrium.

5. Then draw the see-saw diagram again to show the reaction disturbed to produce more ammonia.

6. What is one way to reduce pressure on the reaction system?

7. Make a prediction: How would the reaction system respond if you removed products from the container as they are made? How would that disturb the equilibrium?

***You will now watch a demonstration of Le Chatelier's Principle in a glass of tea in the 10D video segment.***

A simplified version of this reaction is represented by this equation:

Tea (colorless) $\rightleftharpoons$ Tea + $H^+$ (brown)

8. Why will dissolving more tea in the solution make the tea change color? In what direction does the reaction shift?

9. What will happen to the solution color if more product ($H^+$) is added? In what direction does the reaction shift?

10. What will happen to the solution color if baking soda is added?

11. What will happen to the solution color if the reaction system has heat added to the reactant? Why?

***You will now observe the dinitrogen tetroxide smog experiment in the next video (10E) or begin work on planning an alternate Le Chatelier's Principle lab found in the Chemistry Matters Toolkit.***