

Acids & Bases Quest

Complete this quest using the Challenge Levels 8 - 12, 4 - 16, and the Connected Levels in the Acids & Bases game.

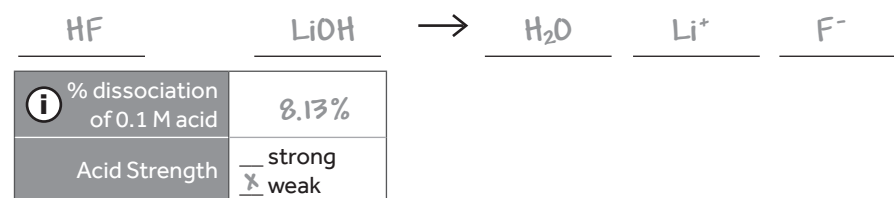
MISSION 1. GATHER YOUR INTEL

Use your Collisions gameplay experience to gather the following intel:

1. Label the molecule you used on the 'Acid Anchor (left).'
2. Label the molecule you used on the 'Base Anchor (right).'
3. Label each target.
4. Determine the % dissociation of the acid by tapping the **i** in the workspace and label the acid strength.

Sample Level

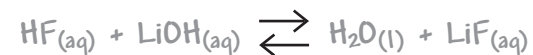
Acid Anchor Base Anchor Target 1 Target 2 Target 3



MISSION 2. EXPOSE THE DETAILS

Use your expertise to expose the following information.

Balanced Chemical Reaction



Reaction Analysis

What is the acid?	HF	Is this a neutralization reaction?	yes
What is the base?	LiOH	If yes, what salt is formed?	LiF

Acid Analysis

Base Analysis

Acid name	hydrofluoric acid	Base name	lithium hydroxide
Strong or weak acid	Weak	Conjugate acid	H ₂ O
Conjugate base	F ⁻	Color after red litmus paper test	Blue
Color after red litmus paper test	Red	Color after blue litmus paper test	Blue
Color after blue litmus paper test	Red		

K_a, pK_a, and pH

K _a	6.8 × 10 ⁻⁴	pH of acid at 0.1M	2	pH of base at 0.1M	13
pK _a	3.17	pOH of acid at 0.1M	12	pOH of base at 0.1M	1

Acids & Bases - Challenge Level 8

MISSION 1. GATHER YOUR INTEL

Use the information from the **1st segment** of Challenge 8.

SEGMENT 1 Acid Anchor	SEGMENT 1 Base Anchor	\rightarrow	SEGMENT 1 Target 1	SEGMENT 1 Target 2						
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15px; text-align: center;">i</td> <td style="font-size: 0.8em;">% dissociation of 0.1 M acid</td> <td style="width: 40px; border: 1px solid black;"></td> </tr> <tr> <td colspan="2">Acid Strength</td> <td style="border: 1px solid black;"> ___ strong ___ weak </td> </tr> </table>	i	% dissociation of 0.1 M acid		Acid Strength		___ strong ___ weak				
i	% dissociation of 0.1 M acid									
Acid Strength		___ strong ___ weak								

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	\rightarrow
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases - Challenge Level 9

MISSION 1. GATHER YOUR INTEL

Use the information from the **1st segment** of Challenge 9.

SEGMENT 1 Acid Anchor	SEGMENT 1 Base Anchor	\rightarrow	SEGMENT 1 Target 1	SEGMENT 1 Target 2	SEGMENT 1 Target 3
_____	_____		_____	_____	_____

i	% dissociation of 0.1 M acid	
Acid Strength	<input type="checkbox"/> strong <input type="checkbox"/> weak	

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	\rightarrow
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases - Challenge Level 10

MISSION 1. GATHER YOUR INTEL

Use the information from the **1st and 2nd segments** of Challenge 10.

SEGMENT 1 Acid Anchor	SEGMENT 1 Base Anchor	\rightarrow	SEGMENT 1 Target 2	SEGMENT 1 Target 3	SEGMENT 2 Target 1	SEGMENT 2 Target 2				
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #cccccc; padding: 2px;">i % dissociation of 0.1 M acid</td> <td style="width: 50px; height: 20px;"></td> </tr> <tr> <td style="background-color: #cccccc; padding: 2px;">Acid Strength</td> <td> ___ strong ___ weak </td> </tr> </table>	i % dissociation of 0.1 M acid		Acid Strength	___ strong ___ weak						
i % dissociation of 0.1 M acid										
Acid Strength	___ strong ___ weak									

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	\rightarrow
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH			
K _a		pH of acid at 0.1M	
pK _a		pOH of acid at 0.1M	pOH of base at 0.1M

Acids & Bases - Challenge Level 11

MISSION 1. GATHER YOUR INTEL

Use the information from the **3rd segment** of Challenge 11.

SEGMENT 3 Acid Anchor	SEGMENT 3 Base Anchor	→	SEGMENT 3 Target 1	SEGMENT 3 Target 2
_____	_____		_____	_____

i	% dissociation of 0.1 M acid	
	Acid Strength	<input type="checkbox"/> strong <input type="checkbox"/> weak

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	→
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases - Challenge Level 12

MISSION 1. GATHER YOUR INTEL

Use the information from the **3rd segment** of Challenge 12.

SEGMENT 3 Acid Anchor	SEGMENT 3 Base Anchor	\rightarrow	SEGMENT 3 Target 1	SEGMENT 3 Target 2
_____	_____		_____	_____

i	% dissociation of 0.1 M acid	
Acid Strength		<input type="checkbox"/> strong <input type="checkbox"/> weak

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	\rightarrow
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases - Challenge Level 14

MISSION 1. GATHER YOUR INTEL

Use the information from the **1st segment** of Challenge 14.

	SEGMENT 1 Acid Anchor		SEGMENT 1 Base Anchor	\rightarrow	SEGMENT 1 Conjugate Base	SEGMENT 1 Target 2	SEGMENT 1 Conjugate Acid
	_____		_____		_____	_____	_____

i	% dissociation of 0.1 M acid	
Acid Strength	<input type="checkbox"/> strong <input type="checkbox"/> weak	

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	\rightarrow
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases - Challenge Level 15

MISSION 1. GATHER YOUR INTEL

Use the information from the **1st segment** of Challenge 15.

SEGMENT 1 Acid Anchor	SEGMENT 1 Base Anchor	→	SEGMENT 1 Conjugate Base	SEGMENT 1 Target 2	SEGMENT 1 Conjugate Acid
_____	_____		_____	_____	_____

i	% dissociation of 0.1 M acid	
	Acid Strength	<input type="checkbox"/> strong <input type="checkbox"/> weak

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	→
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases - Challenge Level 16

MISSION 1. GATHER YOUR INTEL

Use the information from the **3rd segment** of Challenge 16.

SEGMENT 3 Acid Anchor	SEGMENT 3 Base Anchor	\rightarrow	SEGMENT 3 Conjugate Base	SEGMENT 3 Conjugate Acid
_____	_____		_____	_____

<div style="display: flex; align-items: center;"> <div style="background-color: #ccc; border: 1px solid #000; border-radius: 50%; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">i</div> <div style="font-size: 0.8em; padding: 2px;">% dissociation of 0.1 M acid</div> </div>	
Acid Strength	<input type="checkbox"/> strong <input type="checkbox"/> weak

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	\rightarrow
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases and Covalent Bonding - Connected Level 1

MISSION 1. GATHER YOUR INTEL

Acid Anchor	Base Anchor	\rightarrow	Target 1	Target 2	Target 3
_____	_____		_____	_____	_____

i	% dissociation of 0.1 M acid	
Acid Strength		<input type="checkbox"/> strong <input type="checkbox"/> weak

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	\rightarrow
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases and Covalent Bonding - Connected Level 2

MISSION 1. GATHER YOUR INTEL

Use the information from the **2nd segment**.

Acid Anchor	Base Anchor	\rightarrow	Target 1	Target 2
_____	_____		_____	_____

i	% dissociation of 0.1 M acid	
Acid Strength		<input type="checkbox"/> strong <input type="checkbox"/> weak

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	\rightarrow
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	

Acids & Bases and Covalent Bonding - Connected Level 3

MISSION 1. GATHER YOUR INTEL

Use the information from the **1st segment**.

Acid Anchor	Base Anchor	→	Target 1	Target 2	Target 3
_____	_____	→	_____	_____	_____

i	% dissociation of 0.1 M acid	
	Acid Strength	<input type="checkbox"/> strong <input type="checkbox"/> weak

MISSION 2. EXPOSE THE DETAILS

Balanced Chemical Reaction	→
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Reaction Analysis			
What is the acid?		Is this a neutralization reaction?	
What is the base?		If yes, what salt is formed?	

Acid Analysis		Base Analysis	
Acid name		Base name	
Strong or weak acid		Conjugate acid	
Conjugate base		Color after red litmus paper test	
Color after red litmus paper test		Color after blue litmus paper test	
Color after blue litmus paper test			

K _a , pK _a , and pH					
K _a		pH of acid at 0.1M		pH of base at 0.1M	
pK _a		pOH of acid at 0.1M		pOH of base at 0.1M	