

**MINISTRY OF EDUCATION**  
**SECONDARY ENGAGEMENT PROGRAMME**  
**GRADE 10**  
**CHEMISTRY**

**WEEK 11**

**WORKSHEET**

**Instructions:** The following questions require the use of a table that lists the pH ranges of common acid-base indicators.

1. Which statement correctly describes a solution with a pH value of 10?
  - a. It would turn litmus red.
  - b. It would turn methyl orange-red.
  - c. It would turn thymol blue yellow.
  - d. It would turn phenolphthalein pink.
2. Which of the following indicators would be most useful to distinguish between soda, which has a pH of 2, and a sample of acid rain, which has a pH of 5?
  - a. bromthymol blue
  - b. methyl orange
  - c. litmus
  - d. phenolphthalein
3. If a solution were to turn litmus blue, which of the following substances would most likely be present in this solution?
  - a. NaOH
  - b. H<sub>2</sub>O
  - c. HNO<sub>3</sub>
  - d. HCl
4. A lake has a pH of 3.0, where the rates of mortality for adult fish are steadily increasing over time. How would a sample of water from this lake affect bromothymol blue?
  - a. It would turn the indicator blue.
  - b. It would turn the indicator red.
  - c. It would turn the indicator yellow.

- d. It would turn the indicator pink.
5. What is the color of methyl orange for a sample of potassium hydroxide, KOH?
- a. It is red.
  - b. It is orange.
  - c. It is yellow.
  - d. It cannot be determined, based on the information given.
6. Phenolphthalein helps to provide the endpoint of titration with a reasonable amount of accuracy.
- a. True
  - b. False
7. Write an equation for the reaction of potassium metal with hydrochloric acid.

8. Write the color expected for each indicator (phenolphthalein, litmus dye) when immersed and indicate the pH range you would expect.

<b>Solution</b>	<b>Acid or Base</b>	<b>Phenolphthalein</b>	<b>Litmus</b>	<b>pH Range</b>
Ammonia				
Coffee				
Digestive juices				
Drain cleaner				
Human blood				
Laundry Detergent				
Lemon juice				
Milk				
Rain				
Saliva				
Shampoo				
Soda Pop				
Sour Candy				
Toothpaste				
Vinegar				
Vitamin C				

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**Worksheet –Answers**

**Instructions:** The following questions require the use of a table that lists the pH ranges of common acid-base indicators.

1. Which statement correctly describes a solution with a pH value of 10?
  - e. It would turn litmus red.
  - f. It would turn methyl orange-red.
  - g. It would turn thymol blue yellow.
  - h. It would turn phenolphthalein pink.**
  
2. Which of the following indicators would be most useful to distinguish between soda, which has a pH of 2, and a sample of acid rain, which has a pH of 5?
  - e. bromthymol blue
  - f. methyl orange**
  - g. litmus
  - h. phenolphthalein
  
3. If a solution were to turn litmus blue, which of the following substances would most likely be present in this solution?
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  - h. HCl

4. A lake has a pH of 3.0, where the rates of mortality for adult fish are steadily increasing over time. How would a sample of water from this lake affect bromothymol blue?
- e. It would turn the indicator blue.
  - f. It would turn the indicator red.
  - g. **It would turn the indicator yellow.**
  - h. It would turn the indicator pink.
5. What is the color of methyl orange for a sample of potassium hydroxide, KOH?
- e. It is red.
  - f. It is orange.
  - g. **It is yellow.**
  - h. It cannot be determined, based on the information given.
6. Phenolphthalein helps to provide the endpoint of titration with a reasonable amount of accuracy.
- c. **True**
  - d. False
7. Write an equation for the reaction of potassium metal with hydrochloric acid.
- $$2 \text{K} + 2 \text{HCl} \rightarrow 2 \text{KCl} + \text{H}_2$$

## INTERPRETING THE pH SCALE

Solution	Acid or Base	Phenolphthalein	Litmus	pH Range
Ammonia	Base	Pink	Blue	$> 7$
Coffee	Acid	Colorless	Red	$< 7$
Digestive juices	Acid	Colorless	Red	$< 7$
Drain cleaner	Base	Pink	Blue	$> 7$
Human blood	Base	Pink	Blue	$> 7$
Laundry Detergent	Base	Pink	Blue	$> 7$
Lemon juice	Acid	Colorless	Red	$< 7$
Milk	Acid	Colorless	Red	$< 7$
Rain	Acid	Colorless	Red	$< 7$
Saliva	Acid	Colorless	Red	$< 7$
Shampoo	Base	Pink	Blue	$> 7$
Soda Pop	Acid	Colorless	Red	$< 7$
Sour Candy	Acid	Colorless	Red	$< 7$
Toothpaste	Base	Pink	Blue	$> 7$
Vinegar	Acid	Colorless	Red	$< 7$
Vitamin C	Acid	Colorless	Red	$< 7$