

USP UNIQUE STUDY POINT

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Class VII Science — Chapter 2 — Curiosity NCERT 2026-27 Exploring Substances: Acidic, Basic and Neutral

◆ Story-Based Situational Questions · Doodle Worksheet · Total Marks: 20 ◆

Name: _____

Class / Sec: _____

Date: _____

Marks: _____ / 20

Instructions: Read each story carefully and answer the questions. For MCQs, circle the correct option. Write answers in the lines provided. Do not taste or touch unknown substances!

1 Riya's Kitchen

Indicators & Litmus

>> Riya loves helping her mother cook. One Sunday morning, she squeezed lemons for lemonade, picked a tomato from their garden, and used vinegar to make a pickle. Her younger brother Rohan dipped a blue litmus paper strip into each of these liquids out of curiosity. To his surprise, the strip turned red each time! Later, Riya added a few drops of lemon juice to the turmeric paste on her finger — nothing changed. But when she accidentally rubbed some soap on the turmeric paste, it turned reddish-brown. Rohan was very confused!

QUESTIONS BASED ON THIS STORY

Q1. Why did the blue litmus paper turn red when dipped in lemon juice, tomato juice and vinegar? (1 mark)

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Q2. What does the turmeric experiment tell us about lemon juice and soap solution respectively? (1 mark MCQ)

(a) Both are basic

(b) Both are acidic

(c) Lemon = acidic; soap = basic

(d) Lemon = basic; soap = neutral

Q3. Name two other kitchen substances that would give the same result as lemon juice on blue litmus. (1 mark)

* USP Trick: Turmeric = only detects BASE (reddish-brown). Litmus = detects BOTH. "Turmeric finds the BASE, Litmus names BOTH!"

2 Grandma's Garden

Natural Indicators

>> Kavya's grandmother had a beautiful hydrangea plant. One year Kavya noticed that when Grandma added wood ash to the soil near the plant, the blue flowers slowly turned pink over the following months. In science class, Kavya also learnt that red rose petals and purple cabbage can work like litmus paper. She prepared a rose-petal indicator at home and tested baking soda and lemon juice. She also noticed that onion stored near baking soda in a closed container lost its strong smell overnight.

QUESTIONS BASED ON THIS STORY

Q4. Why did hydrangea flowers change from blue to pink after Grandma added wood ash to the soil? (1 mark)

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Q5. What colour would red rose extract turn when Kavya adds baking soda solution to it? (1 mark MCQ)

- (a) Red (b) Green
(c) Yellow (d) No change

Q6. What is an olfactory indicator? Why did the onion near baking soda lose its smell? (2 marks)

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* USP Trick: Rose turns RED for acid, GREEN for base. "Red = acRid, gReen = gReat base!"

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3 Science Fair Magic

Secret Writing & Indicators

>> At the National Science Day fair, Class 7 students set up a magical stall. Meena had written "YOU ARE A SCIENTIST!" on white paper using soap solution — the paper looked completely blank. When Arjun sprayed turmeric solution on the paper, the words appeared in reddish-brown colour! In another activity, Priya dipped filter paper in red hibiscus extract and dried it. She then placed drops of vinegar, baking soda solution, and salt water on separate pieces of this indicator paper.

QUESTIONS BASED ON THIS STORY

Q7. Explain why the writing appeared reddish-brown when turmeric solution was sprayed on the soap-written paper. (2 marks)

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Q8. What would Priya observe on the hibiscus indicator paper for vinegar, baking soda, and salt water? (1 mark MCQ)

- (a) All three show colour change (b) Only baking soda changes colour
(c) Vinegar and baking soda change; salt water does not (d) Only vinegar changes colour

Q9. If Meena had used lemon juice instead of soap to write on the paper, would turmeric spray still make the words visible? Give reason. (1 mark)

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* USP Trick: Turmeric is a "BASE detector only." Stays yellow for acid and neutral. Reddish-brown = BASE is present!

4 The Ant Bite Picnic

Neutralisation in Daily Life

>> Ashwin and Keerthi went for a picnic near a mango orchard. While playing, Keerthi stepped on an anthill and was bitten by several red ants. Her skin turned red and she felt a burning, stinging sensation. Luckily, Ashwin had a small box of baking soda in the picnic bag. He mixed it with a little water and gently applied it on the bitten area — within minutes Keerthi felt much better! Ashwin's uncle, a farmer nearby, mentioned that he also adds lime to his fields when soil tests show high acidity, and adds compost when the soil is basic.

QUESTIONS BASED ON THIS STORY

Q10. Which acid does a red ant inject when it bites? Why did applying baking soda relieve the pain? (2 marks)

Q11. Write the general chemical equation for neutralisation. (1 mark)

Q12. What would the farmer add if his soil was found to be basic? (1 mark MCQ)

- (a) More lime (chuna) (b) Baking soda solution
(c) Compost / organic matter (d) Salt water

* USP Trick: Neutralisation: Enemies meet (acid + base), make Salt + Water, release Heat! "ABSWH = Acid + Base = Salt + Water + Heat"

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5 The Factory and the Lake

Industrial Waste & Acid-Base

>> Eurbir's village is located near an industrial area. He noticed that the fish in the nearby lake were dying day by day. His science teacher Ms Parveen tested the lake water and found that factory waste was making it highly acidic. She also visited a nearby factory whose waste, when tested with red litmus paper, turned it blue. Both factories were polluting the lake — one with acid, one with base. Ms Parveen explained that both types of waste needed treatment before being released into the lake to protect aquatic life.

QUESTIONS BASED ON THIS STORY

Q13. How can Ms Parveen confirm that the first factory's waste is acidic? Name the indicator she should use. (1 mark)

Q14. The second factory's waste turned red litmus paper blue. What does this confirm? (1 mark MCQ)

- (a) It is acidic (b) It is basic
(c) It is neutral (d) Cannot be determined

Q15. Suggest one method to treat the acidic waste before it enters the lake. Name the type of reaction involved. (1 mark)

Q16. Ms Parveen later tested the lake water and it did not change the colour of either red or blue litmus paper. What can you conclude? (1 mark)

* USP Trick: Acid attacks Blue, Base attacks Red. Neutral attacks NONE! "Blue-Red = Acid-Base. No change = Neutral."

Class VII Science — Chapter 2**Answer Key — Story-Based Situational Questions**

♦ For Teacher's Reference Only - Session 2026-27 ♦

ANSWER KEY — Story 1: Riya's Kitchen

- Q1. Lemon juice, tomato juice and vinegar are all acidic substances. All acids turn blue litmus paper to red. This is the identifying property of acids.
- Q2. (c) — Turmeric does NOT change colour with acidic/neutral substances (lemon juice stays yellow), but turns reddish-brown with basic substances. Soap solution is basic. So lemon juice = acidic, soap = basic.
- Q3. Any two from: amla juice, tamarind water, curd, vinegar. All are acidic in nature and turn blue litmus red.

ANSWER KEY — Story 2: Grandma's Garden

- Q4. Wood ash is basic in nature. Adding it made the soil basic. Hydrangea gives blue flowers in acidic soil and pink/red flowers in basic soil. So when the soil became basic, the flowers turned pink.
- Q5. (b) Green — Red rose extract gives red colour in acid and green colour in base. Baking soda is basic in nature.
- Q6. Olfactory indicators are substances whose smell (odour) changes in acidic or basic medium. Onion is an olfactory indicator. Its smell disappears when a basic substance (baking soda) is near it, because the basic medium destroys the smell-producing compounds in onion.

ANSWER KEY — Story 3: Science Fair Magic

- Q7. Soap solution is basic in nature. Turmeric is a natural indicator that turns reddish-brown in the presence of a base. Wherever soap was written on the paper, the turmeric spray reacted with the basic soap and produced reddish-brown colour, making the hidden words visible.
- Q8. (c) — Vinegar (acid) changes hibiscus colour; baking soda (base) also changes colour. Salt water is neutral and does NOT change the colour of the hibiscus indicator paper.
- Q9. No, the words would NOT be visible. Turmeric paper remains unchanged when acidic substances are applied. Lemon juice is acidic — it would not change the yellow colour of turmeric. Only basic substances cause the reddish-brown reaction.

ANSWER KEY — Story 4: The Ant Bite Picnic

- Q10. Red ants inject formic acid when they bite. Baking soda is a base. When applied, it neutralises the formic acid (neutralisation reaction), which relieves the burning and stinging pain.
- Q11. Acid + Base → Salt + Water + Heat

Q12. (c) Compost / organic matter – If the soil is basic, adding organic matter (manure/compost) is the remedy. Organic matter releases acids on decomposition, which neutralise the excess base in the soil.

ANSWER KEY — Story 5: The Factory and the Lake

Q13. Ms Parveen should use blue litmus paper. If it turns red, the waste is acidic. She could also use red rose extract (turns red) or turmeric paper (no colour change with acid confirms it is not basic).

Q14. (b) Basic – Turning red litmus paper blue is the characteristic property of all basic substances.

Q15. Add a suitable base (such as lime – calcium hydroxide) to the acidic waste before releasing it into the lake. This will neutralise the acid. The type of reaction is neutralisation: Acid + Base → Salt + Water + Heat.

Q16. The lake water is neutral in nature – neither acidic nor basic. It does not affect either red or blue litmus paper, which is the characteristic of a neutral substance.