



Sainik School Bhubaneswar

Autumn Vacation Task

Class-X

Subject-Physics

1. The refractive index of glass relative to air is 1.5. If the speed of light in air is 3×10^8 m/s, calculate the speed of light in glass.
2. A concave mirror produces a real image three times larger than the object placed 18 cm in front of it. Find the focal length of the mirror.
3. Two resistors of 3Ω and 6Ω are connected in parallel to a 12 V battery. Find:
 - (a) Equivalent resistance
 - (b) Total current drawn from the battery
 - (c) Current through each resistor
4. Explain the following:
 - (a) Why is the filament of an electric bulb made of tungsten?
 - (b) Why are conductors like copper used for electrical transmission?
5. Draw a ray diagram to show the formation of an image by a concave mirror when the object is placed between its pole (P) and focus (F). Write the nature, position, and relative size of the image formed.
6. A 100 W bulb is used for 5 hours daily and a 60 W fan is used for 10 hours daily. Calculate the total energy consumed in kWh in 30 days.
7. An object 5 cm in length is placed at a distance of 20 cm in front of a convex lens of focal length 15 cm.
8. Draw a ray diagram and find the position, nature, and size of the image.
9. A wire of resistance 20Ω is bent in the form of a closed square. What is the resistance between two diagonally opposite corners of the square?
10. Why do the headlights of vehicles use a concave reflector behind the bulb? Explain with diagram.
11. Two students perform an experiment with two resistors connected in series and in parallel. They measure the current in both cases. Which arrangement will give higher current for the same voltage? Justify mathematically.
12. **Solve any three sets of PYQ (Physics) of CBSE (Uploaded in website)**

Project/Assignment Work (Any one)

- Prepare a **project** on *Applications of Reflection of Light in Daily Life* (periscopes, headlights, solar cooker, etc.).
- Write a brief **report** on the topic: *Role of Electricity in Modern Defence Equipment*.

BIOLOGY

1. What is Geotropism? Draw a labelled diagram of a potted plant showing positive geotropism and negative geotropism. (from the Textbook)
2. Ravi saw a snake and instantly jumped back. He then slowly moved away from the snake. What is the difference between the two actions of instantly jumping and walking away?
3. Name the two components of peripheral nervous system.
4. Pertaining to endocrine system, what will you interpret if;
 - (a) You observe swollen neck in people living in hills.
 - (b) Over secretion of growth hormone takes place during childhood.
 - (c) Facial hairs develop in boys aged 13.
5. Differentiate between binary fission in Amoeba and binary fission in Leishmania.
6. List in tabular form two differences between binary fission and multiple fission.
7. Draw the labelled diagram of pollen tube formation in a flower from the textbook.
8. Veins have thin-walled and have valves. Justify your answer.
9. Describe in brief how urine is produced in human body.
10. Patients whose gall bladder is removed are recommended to eat less oily food. Why?
11. Prepare a poster on any one of the following topics for your internal assessment. {A4 size Chart paper}

OZONE LAYER/ GLOBAL WARMING/ ACID RAIN/ GANGA ACTION PLAN/
CHIPKO ANDOLAN/ CONSERVATION OF WILD LIFE

MATHEMATICS

1. In triangle ABC, right angled at B, If $\tan A = \frac{4}{3}$, then find the value of $\cos C$.
2. In $\triangle OPQ$, right-angled at P, $OP = 7$ cm and $OQ - PQ = 1$ cm, then find the values of $\sin Q$.
3. In $\triangle PQR$, right-angled at Q, $PR + QR = 25$ cm and $PQ = 5$ cm, then find the value of $\sin P$.
4. If $4\tan \theta = 3$ then find the value of $(\cos^2 \theta - \sin^2 \theta)$.
5. If $3\cot \theta = 2$, then find the value of $\frac{4\sin\theta - 3\cos\theta}{2\sin\theta + 6\cos\theta}$.
6. If $7\tan \theta = 4$, then find the value of $\frac{7\sin\theta - 3\cos\theta}{7\sin\theta + 3\cos\theta}$.
7. The value of $2(\sin^2 45^\circ + \cot^2 30^\circ) - 6(\cos^2 45^\circ - \tan^2 30^\circ)$ is
8. The value of $2(\sin^4 30^\circ + \cos^4 60^\circ) - (\tan^2 60^\circ + \cot^2 45^\circ) + 3\operatorname{cosec}^2 60^\circ$ is
9. If $\tan^2 45^\circ - \cos^2 30^\circ = x \sin 45^\circ \cdot \cos 45^\circ$, then $x = ?$
10. If $\tan(A - B) = 1/\sqrt{3}$ and $\tan(A + B) = \sqrt{3}$, then find the value of A and B.
11. $(1 + \tan \theta + \sec \theta)(1 + \cot \theta - \operatorname{cosec} \theta) = ?$
12. $(\sec A + \tan A)(1 - \sin A) = ?$
13. If $A + B = 90^\circ$, $\cot B = 3/4$ then $\tan A$ is equal to;
14. The points $(-1, -2), (1, 0), (-1, 2), (-3, 0)$ forms a quadrilateral. Find the type of quadrilateral it forms.
15. If the distance between the points $A(2, -2)$ and $B(-1, x)$ is equal to 5, then find the value of x .
16. If $O(P/3, 4)$ is the midpoint of the line segment joining the points $P(-6, 5)$ and $Q(-2, 3)$. The value of p is:
17. Find the point which divides the line segment of points $P(-1, 7)$ and $(4, -3)$ in the ratio of 2:3.
18. Find the ratio in which the line segment joining the points $P(-3, 10)$ and $Q(6, -8)$ is divided by $O(-1, 6)$.
19. The coordinates of a point P, where PQ is the diameter of a circle whose centre is $(2, -3)$ and Q is $(1, 4)$ is:
20. Find the area of a rhombus if its vertices are $(3, 0), (4, 5), (-1, 4)$ and $(-2, -1)$ taken in order.
21. The distance of the point $P(-6, 8)$ from the origin is
22. The distance between the points $(0, 5)$ and $(-5, 0)$ is
23. Find the perimeter of a triangle whose vertices are $(0, 4), (0, 0)$ and $(3, 0)$.
24. If the points $A(1, 2), O(0, 0)$ and $C(a, b)$ are collinear, then find the value of a & b .
25. Find the ratio in which the line $3x + y - 9 = 0$ divides the line joining the points $(1, 3)$ and $(2, 7)$ internally.
26. If $\sec \theta + \tan \theta = p$, then find the value of $\operatorname{cosec} \theta$
27. If $2 \operatorname{cosec}^2 30^\circ + Y \sin^2 60^\circ - \frac{3}{4} \tan^2 30^\circ = 10$, find value of Y
28. If $\tan A + \cot A = 2$, then find the value of $\tan^2 A + \cot^2 A$.
29. Find the value of $(\sin 30^\circ + \cos 30^\circ) - (\sin 60^\circ + \cos 60^\circ)$
30. If $\sin \theta - \cos \theta = 0$, find the value of θ
31. $\triangle ABC$ is right angled at C, and $AC = \sqrt{3} BC$, prove that $\angle ABC = 60^\circ$
32. If $2 \sin 3x = \sqrt{3}$, then find the value of x
33. If $\sin A + \sin^2 A = 1$ then find $\cos^2 A + \cos^4 A$
34. If $\tan(A - B) = \frac{1}{\sqrt{3}}$ and $\tan(A + B) = \sqrt{3}$, find the value of A and B
35. If m^{th} term of an AP is $\frac{1}{n}$ and n^{th} term is $\frac{1}{m}$. Show that $(mn)^{\text{th}}$ term of this AP is 1.
36. The sum of the first 9 terms of an AP is 171 and the sum of its first 24 terms is 996. Find the first term and the common difference.
37. For what value of n , are the n^{th} terms of two APs: 63, 65, 67, ... and 3, 10, 17, ... equal?
38. If the sum of the first 14 terms of an AP is 1050 and its first term is 10, find the 20th term.
39. In an AP, ratio of 4th term and 9th term is 1:3, find the ratio of 12th and 5th term.
40. The 14th term of an A.P. is twice its 8th term. If the 6th term is -8, then find the sum of its first 20 terms.
41. Determine graphically the vertices of the triangle, the equations of whose sides are given below: $2y - x = 8$; $5y - x = 14$; $y - 2x = 1$
42. Draw the graph of the equations $x = 3, x = 5$ and $2x - y - 4 = 0$. Also find the area of the quadrilateral formed by the lines and the X-axis.
43. For each of the following system of equations determine the values of k for which the given system has no solution $3x - 4y + 7 = 0, kx + 3y - 5 = 0$.

44. For what value of k , will the following system of equations have infinitely many solutions: $2x + 3y = 4$, $(k+2)x + 6y = 3k+2$
45. Determine the values of a and b for which the following system of linear equations have infinite solutions: $2x - (a-4)y = 2b+1$; $4x - (a-1)y = 5b-1$
46. Solve the following quadratic equations $9x^2 - 9(a+b)x + [2a^2+5ab+2b^2] = 0$
47. A motor boat whose speed is 24 km/hr in still water takes 1 hour more to go 32 km upstream than to return downstream to the same spot. Find the speed of the stream.
48. One fourth of a herd of camel was seen in the forest. Twice the square root of the herd had gone to the mountains and the remaining 15 camels were seen on the bank of the river. Find the total number of camels.
49. A takes 6 days less than the time taken by B to finish a piece of work. If both A and B together can finish it in 4 days, find the time taken by B to finish the work?
50. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $(x^2 + x) + k = 0$ has equal roots, then find the value of k .

CASE STUDY BASED QUESTIONS.

CASE STUDY-1:

A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while $\frac{1}{4}$ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

(Type of Question)	(Marks given for correct answer)	(Marks deducted for wrong answer)
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True/False	1	0.25
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1. If answer to all questions he attempted by guessing were wrong, then how many questions did he answer correctly?
2. How many questions did he guess?
3. If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got?
4. If answer to all questions he attempted by guessing were wrong, then how many questions answered correctly to score 95 marks?

CASE STUDY 2:

India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information, answer the following questions:

1. Find the production during first year.
2. Find the production during 8th year.
3. Find the production during first 3 years.
4. In which year, the production is Rs 29,200.
5. Find the difference of the production during 7th year and 4th year.

CASE STUDY 3:

A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919. The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

1. What is the angle of elevation if they are standing at a distance of 42m away from the monument?
2. They want to see the tower at an angle of 60. So, they want to know the distance where they should stand and hence find the distance.
3. If the altitude of the Sun is at 60, then the height of the vertical tower that will cast a shadow of length 20 m is
4. The ratio of the length of a rod and its shadow is 1:1. The angle of elevation of the Sun is
5. The angle formed by the line of sight with the horizontal when the object viewed is below the horizontal level is

GEOGRAPHY AND ECONOMICS

- 1) Define globalisation in simple words.
- 2) Name any two factors that have accelerated globalisation.
- 3) Give one example of a multinational company (MNC) operating in India.
- 4) What is meant by foreign direct investment (FDI)?
- 5) Differentiate between local markets and global markets.
- 6) Distinguish between conventional and non-conventional sources of energy.
- 7) State the environmental effect of mining.
- 8) Why is conservation of minerals necessary? Give two reasons
- 9) Describe the distribution of iron ore in India.
- 10) Which mineral is called “the backbone of modern industry” and why?
- 11) Describe the mode of occurrence of minerals.

History & Political Science (Civics)

Purpose: *Revision + Self-Study for Uncovered Chapters*

✓ Instructions:

- All answers to be written neatly in a notebook or on A4 sheets.
- Wherever possible, add timelines, charts, tables, or maps.
- Use NCERT textbooks, class notes, or reliable sources (e.g., ePathshala, Diksha app, or school library books).
- Chapters not yet taught are marked clearly — read and complete the tasks to build your board revision material.
- Focus on clarity, understanding, and original thinking.

CIVICS

1. Create a table comparing the power-sharing arrangements in Belgium and Sri Lanka.

Use headings like: Ethnic Groups, Nature of Conflict, Solution, Result

2. Why is power sharing essential in a diverse society like India? Give any 2 real-life school or family examples of power sharing.

3. Make short notes on the following:

- Two features of Indian federalism
- Differences between Union List, State List, and Concurrent List

4. Suggest two ways in which giving more power to local governments can improve democracy. Support your answers with local examples.

5. Create a chart of any 3 national and 3 state parties. For each party, mention:

- Symbol
- State of influence
- One major objective or ideology

6. Why do we need political parties in a democracy? (5 points)

7. List any two challenges faced by political parties in India and suggest one solution.

8. List and explain briefly 4 key outcomes of democracy (refer to NCERT).

9. "Democracies are not always economically efficient, but they are people-friendly."
Do you agree? Explain in 60–70 words with an example

10. Write a paragraph (100 words) on the topic:

"If I had the power to improve democracy in India, I would..."

Mention at least 3 specific reforms or ideas.

HISTORY

Chapter: The Rise of Nationalism in Europe

Qn. 1. Make a concept map of events that led to the unification of:

; -Germany, Italy, Greece

Qn. 2. How did cultural movements (like language, folklore, poetry) help in developing nationalism? Explain with one example.

✓ Chapter 2: Nationalism in India

Create a timeline (1915–1930) including at least 6 key events of the freedom struggle.

Label movements like:

- Non-Cooperation
- Khilafat
- Civil Disobedience
- Simon Commission

Write a short note on “How Gandhiji used local issues to build a national movement.”

- 🌐 Globalisation in the 19th century vs 20th century
Include points like: trade, migration, economy, and technology.

- 📖 Chapter 4: Print Culture and the Modern World. (not taught)

Write short notes (40–50 words each) on:

- How did the print revolution influence the French Revolution?
- Role of print in the spread of nationalism in India
- Role of women and workers in print culture

Q: Imagine you are a newspaper publisher in colonial India. What kind of topics would you print to promote national awareness?

List 3 article titles you would write and explain why.

 Map Activity (History)

On a physical map of India, label the following locations:

1. Champaran
2. Ahmedabad
3. Dandi
4. Amritsar
5. Nagpur

Submit as a photo or attach in notebook.

English

Writing Skills

1. **Letter to the Editor (120–150 words)**

You are Rohan/Riya of 22, Park Lane, Bhopal. Write a letter to the Editor of *The Times of India* expressing your concern about the increasing problem of plastic pollution in your city and suggesting solutions.

2. **Formal Letter – Application**

You are Amit/Amita, a student of Class X, Sunrise Public School. Write a letter to your Principal requesting permission to organize a “Book Donation Drive” in your school to help underprivileged children.

3. **Analytical Paragraph (Pie Chart)**

The following pie chart shows how students of Class 10 spend their leisure time:

Watching TV – 30%
Playing Outdoor Games – 25%
Reading Books – 20%
Using Social Media – 15%
Listening to Music – 10%

Write a paragraph in 100–120 words analyzing the data.

4. **Analytical Paragraph (Table/Chart)**

The following table shows the average rainfall (in mm) in your city across four months:

Month	June	July	August	September
Rainfall (mm)	120	310	280	150

Write a paragraph in 100–120 words interpreting the data and its effect on daily life.

Grammar

5. **Error Correction**

The following passage has errors. Correct them and underline the corrected words.

The students was preparing for the exam. Each of them have brought their notebooks.

The teacher say that success depend on regular practice.

6. The following passage has errors. Correct them and rewrite the passage. Underline the corrected words.

The boys was playing in the ground when the teacher come. They has not seen him approaching.

7. The following passage has an error in each line. Identify and correct it.

A hungry fox was looking for food.

Suddenly he see a bunch of grapes.

He jump high but cannot reach them.

Finally he say, "These grapes are sour."

8. Reported Speech

Rewrite the following in reported speech:

- a) He said, "I am going to Delhi tomorrow."
- b) She said to me, "Do you like music?"
- c) The teacher said, "Work hard and you will succeed."
- d) Mother said, "Don't waste your time."

Literature (First Flight & Footprints Without Feet)

Answer the following in about 100 words each:

- 9.
- a) How does Anne's diary give us insight into the challenges of adolescence?
 - b) What qualities of Anne make her writing timeless and relatable even today?
 - d) What qualities of Ausable help him outsmart Max without violence?
 - e) What is the irony in the title "A Question of Trust"?
 - f) What moral lesson does the story of Griffin convey about unchecked ambition?

VACATION TASK

CLASS-X

HINDI

1. अरिहंत अथवा ओसवाल से 5 सैंपल पेपर्स बनाएँ।
2. सपनों के से दिन कहानी को पढ़कर संक्षेप में लिखें।
3. अब कहाँ दूसरों के दुख से दुखी होने वाले कहानी से 25 MCQ बनाएँ।
4. स्वरचित लेख लिखें।(For school magazine)
5. मराठी भाषा के कहानीकार की कोई एक कहानी हिंदी में लिखें।
6. पंजाब की कला और संस्कृति पर एक PPT बनाएँ।

AUTUMN VACATION TASK
SAINIK SCHOOL, BHUBANESWAR
CLASS – X A
SUBJECT – ODIA

1) ନିମ୍ନ ବିଷୟ ଗୁଡ଼ିକର ପ୍ରଶ୍ନୋତ୍ତର ଲେଖ ।

- କ) ବନ୍ଦେ ଉତ୍କଳ ଜନନୀ
- ଖ) ଭୀମଙ୍କ ସିଂହନାଦ ରତ୍ନ
- ଗ) ରାଘବଙ୍କ ଲଙ୍କା ଯାତ୍ରାବୃତ୍ତ
- ଘ) ସର୍ବସତ୍ତା ମାଟି
- ଙ) କାନ୍ତକବି ଲକ୍ଷ୍ମୀକାନ୍ତ ମହାପାତ୍ର
- ଚ) ଜଳଭୂମି
- ଛ) କାଠ
- ଜ) ଫଲ୍‌ଗୁ

2) ନିଜ ମନରୁ 50ଟି ଶବ୍ଦ ଲେଖି ତାହାର ବିପରୀତ ଶବ୍ଦ ଲେଖ ।

3) ନିଜ ମନରୁ 20 ଟି ସରଳ ବାକ୍ୟ ଲେଖି ସେହି ବାକ୍ୟ କୁ ଯୌଗିକ ଓ ଜଟିଳ ବାକ୍ୟରେ ପରିଣତ କର ।

4) ଯେ କୌଣସି 10ଟି ବିଷୟରେ ପ୍ରବନ୍ଧ ଲେଖ ।

ଜାତୀୟ ସମ୍ପର୍କରେ ସାହିତ୍ୟର ଭୂମିକା, ସାମାଜିକ କୁସଂସ୍କାର ଓ ଅନ୍ଧବିଶ୍ୱାସ , ଛାତ୍ର ଓ ସମାଜ ସେବା , ଅରଣ୍ୟ ସଂପଦର ସୁରକ୍ଷା , ଏକ ବିଂଶ ଶତାବ୍ଦୀରେ ଭାରତ ବର୍ଷ , ଭାରତ ରେ ସାଧାରଣ ନିର୍ବାଚନ , ଓଡ଼ିଶାରେ ବନ୍ୟା ସମସ୍ୟା ଓ ତାର ପ୍ରତିକାର , ଛାତ୍ର ଜୀବନରେ ପର୍ଯ୍ୟଟନର ଭୂମିକା , ନାରୀ ଶିକ୍ଷା ଓ ସମାଜର ପ୍ରଗତି , ବିଜ୍ଞାନର ସବୁପ୍ରୟୋଗ , ଭାରତର ବୈଦେଶିକ ନୀତି , ଛାତ୍ର ଓ ରାଜନୀତି ।

INFORMATION TECHNOLOGY

Part A – Short Answer Questions

1. Explain the role of ICT in education and healthcare.
2. What is the difference between system software and application software? Give examples.
3. What is computer maintenance? Why is it important?
4. List any five preventive measures to keep a computer system healthy.
5. Write the steps to defragment a hard drive in Windows. What is Linux Operating System? How is it different from Windows?
6. Write any four advantages of using Linux.
7. What is the difference between Open Source Software and Proprietary Software?
8. What is What-If Analysis in spreadsheets? Give two real-life examples where it can be used.
9. Differentiate between Goal Seek and Scenario Manager

Part B – Long Answer Questions

1. “ICT has made communication faster and more effective.” Justify this statement with examples.
2. Describe any four ICT tools used in business organizations.
3. Explain the importance of data security and list three ways to keep data safe online.
4. What are the advantages and disadvantages of social networking sites in ICT?
5. Write the steps to use Goal Seek in LibreOffice Calc/MS Excel.
6. How is Scenario Manager useful for business decision-making?
7. Why is dust cleaning important in hardware maintenance? What precautions should be taken while cleaning?
8. Explain the role of firewalls and antivirus software in system protection.
9. A school’s computer lab has 20 systems. Suggest 5 measures to keep all systems in good working condition.
10. A user notices that their system is very slow. List the steps you would follow to diagnose and fix the problem.

Part C – Activities / Practical Work

Perform the following in Linux (or simulate in a terminal environment):

1. Create a folder named Class X. Inside it, create three subfolders: Docs, Images, and Projects.
2. Create an empty text file named notes.txt inside Docs.
3. Write the text “*Linux is powerful*” into notes.txt using a command.
4. Copy notes.txt into the Projects folder.
5. Rename notes.txt (in Projects) to linux_notes.txt.
6. Delete the file from the Docs folder.
7. Display the list of files in all three folders.

Perform the following in Goal Seek (Spreadsheet)

- A student needs 40% marks to pass.
- He scored **35 out of 100 in Maths**.
- Use **Goal Seek** to find how many more marks he should get to reach exactly **40%**.

Perform the following in Scenario Manager (Spreadsheet) :

Monthly Income = ₹30,000

Expense Head Current (₹)

Rent	8,000
Food	5,000
Transport	2,000
Others	3,000

- Create **three scenarios** using Scenario Manager:
 1. **Best Case** – reduce all expenses by 10%
 2. **Worst Case** – increase all expenses by 10%
 3. **Normal Case** – no change
- Observe how the **Savings = Income – Expenses** changes in each scenario.

Part D – Activities / Project Work

1. Prepare a “ICT in Daily Life”.
Sections includes as follows:
 - a. Introduction
 - b. Objectives of ICT Skills
 - c. Key areas Covered
 - i. Communication Skills Using ICT
 - ii. Cyber Safety and Security
 - iii. Digital Documentation and Tools
 - iv. ICT Applications in Daily Life
 - v. **Employability Skills through ICT**
 - vi. Benefits of Learning ICT Skills
 - d. Conclusion:
2. Make a poster on **Cyber Safety Rules** using any digital tool.

Practical and Project Report File (for Submission)

Each student should maintain a Project and Practical File with:

- Cover Page (with project title, student details)
- Certificate (signed by teacher)
- Acknowledgment
- Index
- Project Work (with screenshots if needed)
- Conclusion

SAINIK SCHOOL BHUBANESWAR

CLASS X (CHEMISTRY)

AUTUMN VACATION TASK FOR 2025

1. You have a piece of iron and a piece of copper. How would you identify which is more reactive?
2. A metal X reacts vigorously with cold water to form hydroxide and hydrogen gas. Predict the metal.
3. Suggest a method to prevent iron from rusting.
4. Why is aluminium oxide used as a protective coating for aluminium?
5. Explain how the reactivity of metals determines their uses in industries and daily life.
6. Why are carbon compounds used as fuels? Give two reasons.
7. Differentiate between saturated and unsaturated hydrocarbons with examples.
8. How is soap made from fats? Write the reaction involved in this process .
9. Write a note on “Allotropes of carbon” with examples.
10. Distinguish between ethanol and ethanoic acid.
11. Differentiate between ionic and covalent compounds on the basis of:
Physical state
Solubility
Conductivity
Melting and boiling points
12. A metal ‘X’ reacts with dilute hydrochloric acid to produce a gas which burns with a pop sound. Identify metal ‘X’.