BHAI PARMANAND VIDYA MANDIR

Holidays Homework 2025-26

Class IX

Theme: - "Technology and Sustainability: Improving Our Lives."

Dear Young Innovators,
Summer is a time to relax, reflect, and recharge—and also to explore! This year's holiday homework revolves around the theme: **"Technology and Sustainability: Improving Our Lives."** Discover how innovation can create a greener, better future through fun, creative activities. **Don't forget to revise what you've learned so far**—a little each day goes a long way. Stay curious, enjoy learning, and make the most of your break!Wishing you a joyful and enriching summer!

INSTRUCTIONS:

- Holidays Homework carries marks in Internal Assessment. Hence, submission of the work post vacation is compulsory for each and every student.
- Students can only seek guidance from their parents or elders. They are expected to complete all the tasks on their own.
- Creativity and originality of the work will be appreciated.
- The assigned tasks must be done in a very neat and presentable manner.
- Questions must be done in the given sequence.
- Students will be assessed for the handwriting, presentation, neatness, completion of all the given questions and indexing of the work.
- It is mandatory to do all the activities; however there may be internal choices.
- Use the material available at home.

SUBJECT ENRICHMENT ACTIVITY

THEME:Technology And Sustainability Improving Our Lives.
Technological advancement and innovation now play a crucial role in promoting sustainability and responding to urgent environmental challenges. By developing eco-friendly solutions, we can enhance the quality of life, preserve natural resources, and pave the way for a cleaner, more sustainable future.
Dear students
There are some activities based on the above theme to foster your creativity, enhance knowledge, refine your skills, enrich your learning experience and make the best use of your precious time.

ACTIVITY - 1 A: Green Talks: Conversation with Eco Heroes
Write a fictional **INTERVIEW** with a scientist/ an entrepreneur/ an environmental activist who has invented or promoted eco-friendly technology.
INSTRUCTIONS:

Create a Changemaker: You can choose a real person Like Elon Musk or Vandana Shiva or invent your own eco-hero who has created something that helps the environment like a solar car or clean water filter.
Write an Interview: Use a Question & Answer format where you as a journalist ask about their life, their invention, and what inspired them.

KEY PARAMETERS:

★ Content Relevance and Accuracy
★ Structure and Organization
★ Creativity and Originality
★ Language and Expression
★ Presentation and Neatness

MATERIAL REQUIRED:
Use **A-4 size ruled sheets** (any light color).
WORD LIMIT: Write in about 400–500 words.

OR

ACTIVITY - 1 B: EcoScripts: Stories of a Smarter Tomorrow
Write a **PLAY** based on **ANY ONE** of the following themes:

- Reboot Earth: The Clean Tech Mission
- Green Dreams, Digital Schemes
- Operation Oxygen

POINTS TO REMEMBER:

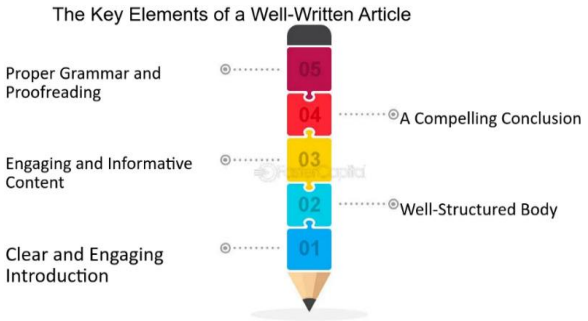
- Create **realistic and meaningful characters** (maximum 5).
- Set the **scene creatively**—it could be a school, a village, a lab, or even the future!
- Structure your play with a **clear beginning, middle, and end**.
- **Stick closely to the theme** of how technology can improve life while protecting the planet.
- Add **narrator's commentary** where necessary to move the story or explain events.
- Use **real-time dialogues** that are natural, expressive, and relevant to the topic.

MATERIAL REQUIRED:
Use **A-4 size ruled sheets** (any light color).
WORD LIMIT: Write in about 400–500 words.

ACTIVITY - 2: Podcast Reflection: Exploring Technology and Sustainability
Podcasts are a powerful learning tool that capture attention, boost focus, and aid memory retention while inspiring imagination and encouraging critical thinking through vivid mental imagery.
TASK: Listen to a podcast related to the theme "Technology and Sustainability: Improving Our Lives". This could include topics such as green innovations, renewable energy, smart cities, eco-friendly inventions, or sustainable lifestyle practices.

After listening, write an **ARTICLE** in 250–300 words on the topic - **"Sustainability in Practice: A Tech-Driven Awakening"**, sharing your thoughts on:

- Key insights or information you gained
- Ideas or facts that stood out to you
- How the podcast influenced or reinforced your understanding of sustainable living through technology.



MATERIAL REQUIRED:
Use **A-4 size ruled sheets** (any light color).

ACTIVITY - 3: Word Quest: The Flashcard Adventure

Developing a strong vocabulary is essential for clear communication. Using flashcards to learn and practice words improves retention, pronunciation, and boosts speaking confidence.

TASK: Prepare 10 flashcards, each presenting one vocabulary word related to the theme assigned to you according to your roll number.

Mindfulness and Mental Health (Roll No. 1-4)

- Technology and Innovation (Roll No.5-8)
- Leadership and Teamwork (Roll No.9-12)
- Travel and Exploration (Roll No.13-16)
- Digital Literacy and Media (Roll No.17-20)
- Social Justice and Equality (Roll No.21-24)
- Sports and Fitness (Roll No.25-28)
- Culture and Traditions (Roll No.29-32)
- Space and Astronomy (Roll No.33-36)
- Sustainable Lifestyle Practices (Roll No.37-40)
- Global Cultures and Diversity (Roll No.40 onwards)

Prepare flashcards with the following details:

- Front side: Write the vocabulary word clearly.
- Back side: Write the meaning, part of speech, one synonym, one antonym, and an example sentence using the word.

Practice pronouncing each word aloud and try using them in sentences.

MATERIAL REQUIRED:

Use index cards or small pieces of paper for your flashcards.

Kindly refer to the attachment for Practice Worksheet

https://docs.google.com/document/d/1E5DopkxVsoZt8WClPjhmVkGyxd4gtb86szKV3dcCmcc/edit?usp=sharing

Theme: Technology and Sustainability – Improving Our Lives

Objective:

To explore and compare how **India** and **[Assigned Country]** are using **technology to promote sustainability**, and how these efforts are improving everyday life. Each student is assigned a **unique country** to compare with India. Analyze the key areas using the parameters provided below.

Instructions:

Use the comparison framework given below to explore both countries.

Present your findings in a **creative and informative** format

Use **images, statistics, real-life examples, or case studies** to support your comparison.

Keep your work **original, well-organized, and neat**.
Use A4 sheets and arrange them in the punched folder.

Countries are assigned according to roll numbers. Students will compare India with the assigned country given below based on the parameters:

Roll no.	Countries	Roll no.	Countries
1	Germany	**21**	Ireland
2	Japan	**22**	Luxembourg
3	South Korea	**23**	Iceland
4	USA	**24**	Malta
5	Canada	**25**	Czech Republic
6	Australia	**26**	Slovakia
7	Sweden	**27**	Slovenia
8	Norway	**28**	Estonia
9	Finland	**29**	Latvia
10	Denmark	**30**	Lithuania
11	Netherlands	**31**	Poland
12	France	**32**	Hungary
13	United Kingdom	**33**	United Arab Emirates
14	New Zealand	**34**	Qatar
15	Singapore	**35**	Bahrain
16	Switzerland	**36**	Kuwait
17	Italy	**37**	Austria
18	Spain	**38**	Monaco
19	Portugal	**39**	Liechtenstein
20	Austria	**40**	Cyprus
21	Belgium	**41**	Costa Rica
		42	Finland
		43	Uruguay

PARAMETERS

Roots of Progress: Past Events Shaping the Present

- What was the awakening moment that led the country towards sustainability?
- Construct a timeline of progress from that point to the present day?
- What factors have supported or hindered this progress?

Leadership, Laws, and People Power

- What are the government's key policies related to sustainability and technology?
- How are citizens involved in environmental decision-making and awareness campaigns?
- How do government rules and policies shape the way technology is used for environmental protection?
- Has the country committed to any Global climate targets?

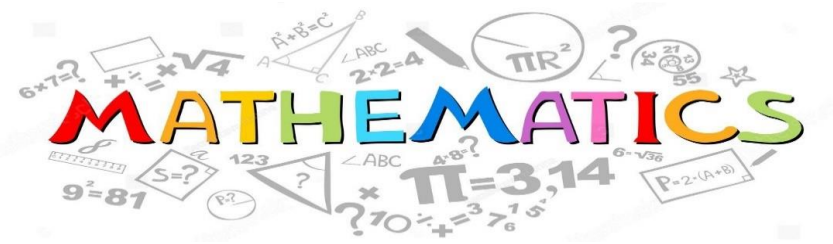
Land, Climate, and Natural Choices

- What geographical features influence the country's sustainability priorities (e.g., deserts, rivers, coastlines)?
- Which natural resources are available, and how are they used or preserved through technology?
- Are there any region-specific environmental challenges or solutions (e.g., flood control, afforestation, and solar potential)?

Green Growth and Smart Spending

- How is the country investing in eco-friendly or clean technologies?
- What role does technology play in creating green jobs or supporting the economy?
- Are there initiatives like subsidies, grants, or public-private partnerships in the green sector?
- How does economic development affect the country's ability to adopt sustainable practices?

- **Concluding Reflections**
- Have the environmental goals set by each country been achieved, partially achieved, or are they still in progress?
- What are the major obstacles still faced by both countries in achieving sustainability?
- What innovative or practical solutions could each country adopt to move forward? In what ways can India and the selected country collaborate—through exchange of knowledge or joint projects —to promote sustainability on a global scale?

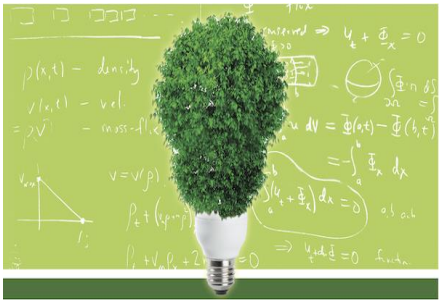


INSTRUCTIONS:

- Holidays Homework carries marks in assessment. Hence, submission of work post vacation is compulsory for all students.
- Parents are requested to only guide their children while doing the assignment.
- Originality of the work will be appreciated.
- The Holiday homework must be done in a very neat and presentable manner.
- The child will be assessed for ORIGINALITY , NEATNESS , ACCURACY AND PRESENTATION.
- You can include more than one sheet for a given Task.

THEME: TECHNOLOGY AND THE SUSTAINABILITY IMPROVING OUR LIVES

Technology and sustainability go hand in hand in shaping a better and brighter future. From harnessing solar energy to designing sustainable school campuses, and from smart agricultural practices to using mathematical models for prediction, today's innovations are paving the way for environmental balance and improved quality of life.

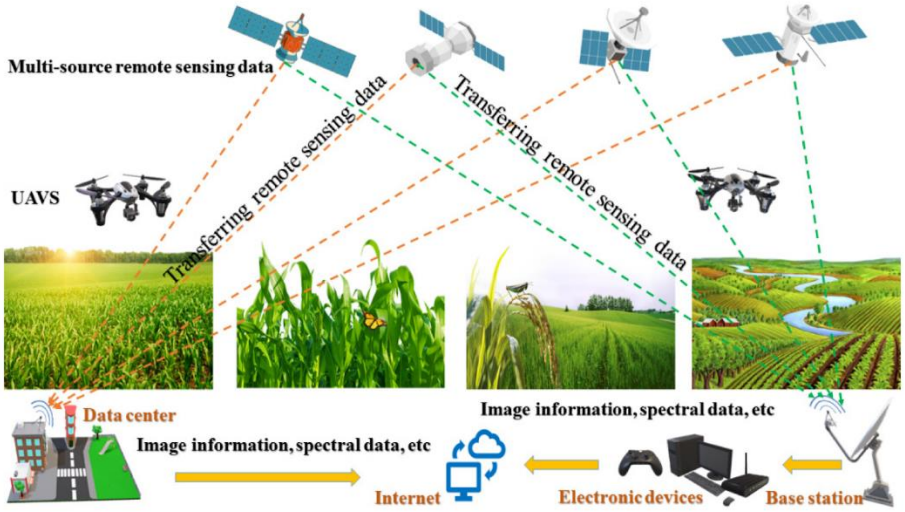


Mathematics, especially polynomials, provides a powerful tool to represent and analyze real-world problems. Polynomial functions can be used to model solar energy output, resource efficiency in eco-friendly campuses, and outcomes in sustainable agriculture. This integration of mathematics with technology and sustainability highlights the practical value of both disciplines in building a greener tomorrow.

WHERE TO DO : A4 SIZE RULED SHEET

TASK - 1 (Polynomial)

Case Study – Smart Agriculture and Polynomial Predictions



With the help of modern AI-based sensors, a village in Punjab transformed its farming practices. These smart farms use drones, temperature sensors, and soil moisture detectors to predict crop yield, optimize irrigation, and reduce fertilizer waste. Scientists model the predicted crop yield over weeks using polynomials. For example, the yield for a wheat crop is modeled by:
$P(x) = 2x^3 - 3x^2 + 5x - 4$, where x is the number of weeks after sowing and P(x) is the predicted crop yield in kg per square meter.
These models help farmers make better decisions on when to irrigate, how much fertilizer to use, and when to harvest, reducing both environmental impact and resource usage. Additionally, water usage patterns are modeled by a separate polynomial:
$R(x) = x^2 - 2x + 1$.

ANSWER THE FOLLOWING QUESTIONS BASED ON THE GIVEN INFORMATION

1. Find the value of P(x) when x = 2. Interpret what this value tells us about the wheat crop yield in week 2.
2. Factorize $P(x) = 2x^3 - 3x^2 + 5x - 4$ using a suitable method. What does each factor represent in the context of crop behavior?
3. If another crop's yield is given by $Q(x) = x^3 + x^2 - x - 1$, calculate and interpret P(x) + Q(x). Write a few points describing the benefits of multi-crop farming?
4. Check whether x = 1 is a zero of P(x). How would this affect planning if this week showed no yield growth?
5. State the degree and type of the polynomial P(x). Discuss the significance of higher-degree terms in modeling real-world nonlinear growth patterns.

TASK - 2(Number System)

Case Study – Solar Energy and Sustainable Campuses

In recent years, schools across India have taken serious steps toward becoming environmentally responsible by reducing their carbon footprint. One such initiative is the installation of solar panels. A school in Jaipur installed 25 solar panels, each producing 12.5kWh of energy per day. This project was part of a government-funded plan that supports educational institutions in adopting renewable energy solutions.
The total area covered by 25 panels is 900 m^2, and the school receives a 20% subsidy on the overall installation cost. The installation cost per square meter is ₹2,000. Over time, the school noticed a significant drop in their monthly electricity bill, averaging 10.5% savings.

This energy-saving plan is expected to offset 10,000 kg of CO_2 emissions annually, contributing to environmental sustainability.
To evaluate the success of this initiative, students were asked to explore the mathematical reasoning behind the installation using Number Systems concepts.

ANSWER THE FOLLOWING QUESTIONS BASED ON THE GIVEN INFORMATION

1. Express $\sqrt{18}$ in its simplest radical form and represent it on the number line.
2. If the school saves ₹1,050 monthly, find the decimal expansion of the saved amount when expressed as a fraction of the total cost (₹2,000).
3. Justify whether the cost of energy saved over a year can be considered a terminating or non-terminating decimal when expressed in ratio to the initial installation cost.
4. Find the cost of installing solar panels and the area of each panel.
5. Express **12.5$\overline{15}$** kWh in the form p/q, where p and q are integers, q≠ 0 and check whether it is a rational number.
6. Classify the following numbers as rational, irrational, or integers: **625** , 10.5%, -3, π.

Here is link to the worksheet : (worksheet to be done on an A4 sheet).

https://docs.google.com/document/d/17skww9GcfNHQzu3IHGcbYMZB9HdwGXxnhxvxttwStNI/edit?usp=sharing

आवश्यक निर्देश –

* ग्रीष्मावकाश कार्य एक नयी अभ्यास पुस्तिका में करें |
* कार्य करते समय वर्ण स्पष्टता व वर्तनी शुद्धता का ध्यान रखें |
* शब्दरूप व अव्यय शब्द कंठस्थ भी करें |

1. अभ्यास पुस्तिका में जितने भी स्थान पर अध्यापिका द्वारा प्रश्नचिह्न लगाया गया हैं वह सारा कार्य पूर्ण करें तथा जिस कार्य में त्रुटियां रेखांकित की गई हैं उनका स्वच्छता व स्पष्टता से सुधार कार्य करें |
2. नृपति,हरि,प्रभु,बिन्दु,पितृ,दातृ,नर व छात्र के शब्द रूप कारक व विभक्ति अनुसार स्पष्टतालिका बनाकर लिखें व किम् पुल्लिंग शब्द रूप से समन्वित करें |
3. भृत्या,सेविका,जननी,विधि,मातृ,भगिनी के शब्दरूप अभ्यास पुस्तिका में लिखकर किम् स्त्रीलिंग शब्द रूप से समन्वित करें |
4. पचास अव्यय शब्दों की अर्थ सहित तालिका बनाएं व वाक्यों में उन अव्यय शब्दों का प्रयोग करते हुए सरल संस्कृत वाक्य लिखें |
5. द्य,घ,छ,भ व म वर्ण से आरम्भ पांच-पांच शब्द स्पष्टता से अभ्यास पुस्तिका में लिखें |

सामान्य निर्देश -

- **मूल्यांकन हेतु ग्रीष्मकालीन गृहकार्य अनिवार्य है।**
- **क्रमानुसार सभी प्रश्नों के उत्तर शुद्ध वर्तनी में पूर्ण कीजिए ।**
- **प्रत्येक कार्य स्पष्ट व सुंदर लेख में पूर्ण कीजिए| मई माह तक करवाए गए सारे विषय दोहराएँ|**

नोट- (I) विषय संवर्धन गतिविधि व संलग्न कार्य पत्रिकाएँ व्याकरण पुस्तिका में करें |

(II) कला एकीकृत गतिविधि के अंतर्गत भी दो कार्य दिए गए हैं जिनमें से किसी एक कार्य करना अनिवार्य है |कार्य A4 साइज शीट में करें|

विषय संवर्धन गतिविधि

THEME : प्रौद्योगिकी और स्थिरता

विवरण- आज के समय में तकनीक केवल जीवन को आसान बनाने का साधन नहीं रही, बल्कि यह पृथ्वी को सुरक्षित और संसाधनों को संरक्षित रखने का एक मजबूत उपाय बन चुकी है। भारत में भी कई ऐसी परियोजनाएँ चल रही हैं, जो तकनीक का इस्तेमाल करते हुए पर्यावरण संरक्षण, ऊर्जा की बचत और संसाधनों के टिकाऊ उपयोग को बढ़ावा देती हैं।

कार्य-1 खोज कार्य (Research Work)

विषय: **भारत की सबसे प्रभावशाली टिकाऊ तकनीकी परियोजनाएँ कौन-सी हैं? संक्षिप्त जानकारी एकत्रित कीजिए|**

➤ **स्मार्ट सिटी मिशन के तहत आपके शहर में ग्रीन तकनीकें लागू की गई हैं। विषय पर जानकारी देते हुए अपने मित्र क120-150 शब्दों पत्र लिखिए |**

कार्य- 2 सौर ऊर्जा और पर्यावरण संरक्षण अनुच्छेद लेखन

➤ **सौर ऊर्जा और पर्यावरण संरक्षण** ' विषय पर जानकारी एकत्र कीजिए तथा संकेत बिन्दुओं की सहायता से १५०-२०० शब्दों में अनुच्छेद लिखिए|

- सौर ऊर्जा से तात्पर्य
- सौर ऊर्जा या पवन ऊर्जा कैसे काम करती है
- प्रमुख उपयोग: बिजली उत्पादन , सोलर हीटर, सोलर स्ट्रीट लाइट्स
- भारत में उपयोग
- सरकारी प्रयास व उसे उत्पन्न लाभ

कार्य- 3 संवाद लेखन

'रेन वाटर हार्वेस्टिंग भविष्य के लिए उपयोगी' विषय पर वार्तालाप करते हुए दो पड़ोसियों के मध्य हुए संवाद को १००-१५० शब्दों में लिखिए-

संवाद लेखन में निम्नलिखित बिंदुओं का प्रयोग अनिवार्य है|

- जल की कमी एक गंभीर समस्या
- वर्षा के जल को एकत्रित करना
- पर्यावरण संतुलन बनाए रखने में सहायक
- जल शक्ति अभियान', 'कैच द रेन' जैसे सरकारी अभियान

(कला एकीकृत गतिविधि)

क्रियाकलाप-1 वाद -विवाद

➤नीचे दिए गए विषय पर वाद-विवाद लेखन 200-250 शब्दों में तैयार कीजिए।

आर्टिफिशियल इंटेलिजेंस:पर्यावरण का रक्षक

नोट- अनुक्रमांक - 1-24 पक्ष

अनुक्रमांक - 25 से आगे सभी तक विपक्ष

अथवा

क्रियाकलाप-2 अनुमान और कल्पना

पाठ- एवरेस्ट मेरी शिखर यात्रा - यात्रा वृत्तांत

बचेंद्री पाल की 'एवरेस्ट शिखर' यात्रा एक ऐतिहासिक और प्रेरणादायक घटना है, और जिसमें उनको अनेक चुनौतियों का सामना करना पड़ा।

अनुमान लगाइए कि आप भी बचेंद्री पाल जी के साथ साहसिक पर्वतारोहण पर गए थे। यात्रा के दौरान आपने किन - किन चुनौतियों व अनुभूतियों का सामना किया। अपने अनुभव को २०० -२५० शब्दों में लिखिए।

संलग्न कार्य पत्रिकाएँ -- https://docs.google.com/document/d/1E6DFI4Y5L-qE492AHjAu_k6FGdGAgfwVgjA4wyjpJEs/edit?usp=sharing

(I) MODEL/EXPERIMENT BASED ACTIVITIES:

Roll no. 1 to 14 will make physics model

Roll no. 15 to 28 will prepare chemistry model/activity

Roll no. 28 onwards will make Biology model

Following are the Ideas for making the project

***Apart from these suggested ideas you may also choose some other topic or idea for preparing the model or showcasing the activities.

PHYSICS

1. Design working model of Electric Motor/ Electric Generator.
2. Tesla Coil: Build a small Tesla coil to demonstrate principles of electromagnetic induction, electrical resonance, and wireless energy transfer.
3. Magnetic Levitation Train: Build a small-scale magnetic levitation train using magnets and a conductive track to demonstrate principles of magnetic levitation and electromagnetic propulsion.
4. Hydraulic Lift: Build a miniature hydraulic lift using syringes and tubes to demonstrate Pascal's principle and hydraulic systems.
5. Electromagnet: Create an electromagnet by wrapping wire around a nail or bolt and connecting it to a battery. Use the electromagnet to pick up small metal objects.
6. Simple Telescope or Microscope: Construct a basic telescope or microscope using lenses to explore optics principles and magnification.
7. Water Level Indicator project

8. Bernoulli's Principle Demonstrator: Create a simple device that demonstrates Bernoulli's principle using airflow to lift objects.
9. Newton's Cradle: Conservation of momentum and energy works by using a series of swinging spheres.

BIOLOGY

1. Aquaponics System: This model integrates aquaculture (raising aquatic animals) with hydroponics (cultivating plants in water).
2. Biofuel Production Setup: A small-scale model demonstrating the process of producing biofuels from organic matter such as algae, agricultural waste, or even kitchen scraps.
3. Microbial Fuel Cell: A model showcasing how microbial organisms can generate electricity through metabolic processes.
4. Bioluminescent Organisms Display: A model featuring bioluminescent organisms such as glowing bacteria or genetically modified plants.
5. Hydroponic Vertical Farm: A working model showcasing a vertical farming system where plants are grown in stacked layers without soil, using nutrient-rich water solutions.
6. Biomimicry Demonstrations: Models showcasing how biological principles inspire technological innovations. For example, a model demonstrating how the structure of a lotus leaf inspires water-repellent surfaces, or how the flight of birds inspires drone design.
7. Water Purification Using Plant-Based Filters
8. Bioplastics from Natural Materials
9. Liquid Tree/Forest Model: This could involve using fluids such as water, resin, or other transparent substances to mimic the appearance of trees or a forest landscape.
10. Self Sustainable Ecosystems

CHEMISTRY

1. Effect of pH on Plant Growth
   Concept: Acidity/alkalinity and chemical impact on sustainability in agriculture.
2. Rusting and Corrosion Prevention
   Concept: Oxidation reactions.
3. Voltaic Cell: Constructing a simple battery to demonstrate the conversion of chemical energy into electrical energy.
4. Water Purification system
5. Crystal Growing Kit: Allowing students to grow crystals from various solutions, demonstrating crystal formation and structure.
6. Chemical Clock: Prepare solutions for the iodine clock reaction or the Briggs-Rauscher reaction. These reactions undergo a series of color changes over time, creating an intriguing "chemical clock" effect.
7. Invisible Ink: Prepare invisible ink using lemon juice or milk and demonstrate how it becomes visible when heated or exposed to certain chemicals (like iodine vapor).
8. Density Tower: Create a density tower by layering liquids of different densities, such as water, oil, and syrup. This demonstrates the concept of density and the principle that denser substances sink while less dense substances float.
9. Oobleck: Mix cornstarch and water to create a non-Newtonian fluid known as "oobleck." Show its unique properties, such as behaving like a solid under pressure but flowing like a liquid when released.
10. Cabbage Juice pH Indicator: Extract red cabbage juice and demonstrate how it can be used as a pH indicator. Show color changes as the pH of various substances (such as lemon juice, baking soda solution, and vinegar) is tested.

(II) Worksheet -Do the given worksheets separately for Physics, Chemistry & Biology on A4 size sheets. Link for Science Worksheet

HHW IX Science Worksheet
https://docs.google.com/document/d/15Mt2omjNVhynsL4A62sk7waBGz6BJfFlGirsxR8cgzA/edit?usp=drivesdk