lesson plan 1

subject: science

class x

(bloom's levels and sub categories to be put,accordingly, the table to be filled)

topic- electricity

brief description- concept of charge, electric current, electric potential, ohm's law, resistivity and its application, joules heating

kpi definition:

kpi 01 – students face problems in solving mathematical calculations in numerical

kpi 02: students should be able to link there knowledge, understanding with its applications

kpi 03- students face problems in solving the conceptual based questions

objectives:

Specific objectives-

sp1 the students will be able to understand the basic concept of the chapter. which includes electric current , electric potential, concept of q=ne

sp2 the students should be able to do the proper book reading and can understand points to remember part of the chapter so that they can apply their own skills to solve mcq and assertion and reasoning type question (new pattern of questions) at the end of the chapter.

sp 4 the students can be able to solve the numerical based questions related to the resistivity , joules heating effect, electric power etc.

sp 5 the students will be able to understand the practical use of general circuits using various electronic components (for example cell or a battery, resistance, rheostat etc) and to make them understand about various concepts of ohm's law , resistance in series and parallel and its combination numerical.

sp6 the students can be able to understand the graph pattern of ohm's law and their related numerical

sp7 the students can be able to understand the concept related to resistivity and its related concept that when length, area of cross section as well as resistance change and to make them understand why resistivity of the material depends on nature of the material used

sp8 the students can be able learn the concepts of connection done in series and parallel combination of resistance and practical use of resistance.

Behavioral objectives

to enable the students
to-
B1 make the own small circuits and to understand why parallel combination is used in domestic electric circuit
B2 to develop the critical thinking of the students and to develop the scientific attitude.
B3 find problem in understanding the language of questions and time management
B4 students find problem in writing any solution in proper language
B5 demonstration: students should be able to demonstrate the activity of resistance connected in series and parallel and explain thatwhy parallel connections are used in domestic electric circuits
B6 application: students should apply their understanding to solve problems related electricity such as calculating power by using different formulas, concepts of applications of joules heating effect of electric current, concept of calculating electricity bills(consumption).
B7 construction: they might be asked to construct simple electronic circuits and to make them aware about soldier machine.

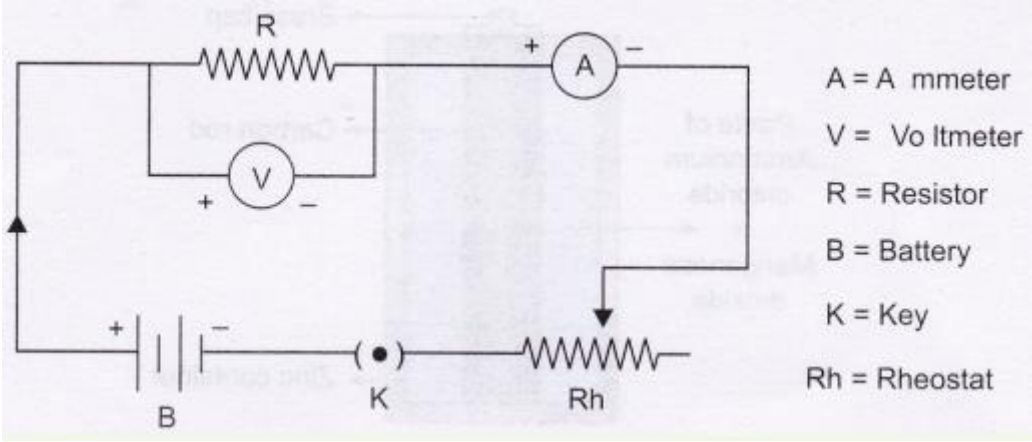
process /activities

activities can be based on the discussion method followed by demonstration method of that particular content

activity 1: to verify ohm's law

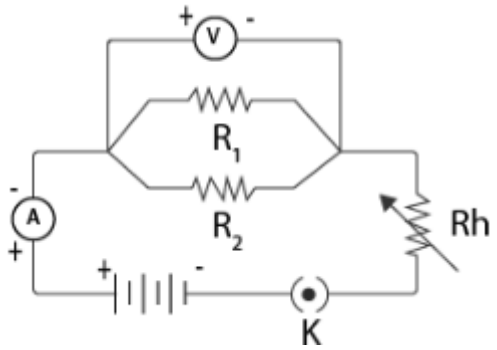
explanation: in this activity the students learn about the basic concepts of ammeter, voltmeter, rheostat, resistance, cell/battery and its related connections and to make them understand about the circuit diagram of ohm's law.

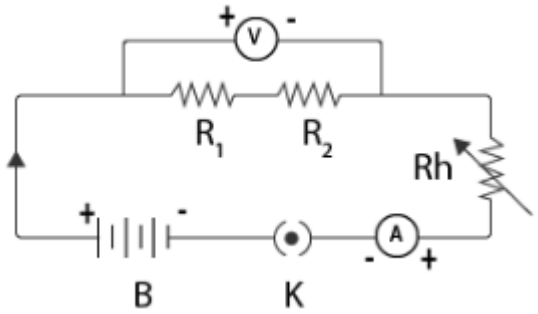
students learn about the concept of least count of ammeter and voltmeter and then would be able to read the values accurately



activity 2: to find and verify the values of resistance connected in series and parallel.

explanation: in this activity the students learn the concept of doing connections connected in series and parallel with voltmeter. and the same can be verified / calculated by taking the reading of voltmeter and ammeter.





assessment:

A1 worksheet of related topic should be given to the students and worksheet test should be conducted for improvement

A2 students can also be assessed on the basis of activities they are performing in lab.

A3 oral assessments: conduct oral quizzes or discussions to gauge their ability to explain concepts verbally. encourage studentsto ask questions and engage in discussions about real-world applications.

A4 projects and presentations: assign projects related to practical applications of the electricity, such as to verify ohms law, whyammeter is connected in series and voltmeter in parallel, presentation of cell or battery etc. require students to present their readings and explain their projects to the class.

A5 : Evaluate students based on their active participation in class discussions and their ability tocomplete homework assignments related to the topic

expected learning outcome–

1. students will be able to get the complete understanding of the chapter.
2. students will be able to solve different typology of questions.
3. students can be able to understand use of kwh in finding electric bill consumption
4. students can understand the meaning of 5-star rating of electrical appliances.
5. students get aware about the concept of how potential difference and current are related to each other in voltage regulators of electric fans
6. they can be able to understand the concept of number of electrons present in one coulomb of charge.
7. understand the concept of resistance connection done in series and parallel and combination of resistance in series and parallel.
8. Students understand the concept of ohm's law along with its graph.
9. Students understand the reasoning questions such as why tungsten is used as the filament in electric bulb and why LED bulbs are more efficient.

	placement of objectives, instructional activities and assessment **topic: Electricity**					
	knowledge	**understanding**	**application**	**analysis**	**synthesis**	**evaluation**
objectives	sp1,	sp2/sp3	sp4-sp5			
activities	b1/b5	b3/b4	b2/b6/b7			

assessment				a1 / a2		A3– A5

Review of the Lesson plan
(to be done when the Lesson gets over)

Problems faced –

1. syllabus planned is not completed in time due to unplanned holidays, due to preparation of CNMUN and teacher's day practice classes remains suspended for a week.
2. worksheet question not solved by every student which is given to students 10 to 12 days before the exam.
3. lab conduction works not done in time due to unplanned holidays
4. students faced problems in solving complete numerical (finding solution) of resistivity, unit conversion related to the topic etc.
5. students not be able to solve properly typical questions of circuit diagrams of resistance in series and parallel. which includes the questions to find the value of unknown resistance (extra questions)
6. students face problem in solving numerical based MCQ
7. students commit mistake in solving a different pattern of application-based questions on electric power consumption. for example

(Half yearly exam 2023 question based on Power)

a household uses the following electric appliances:
(i) one refrigerator of rating 500 w for 24 h per day,
(ii) two electric fans of rating 70 w each for 6 h per day,
(iii) six electric tube light of rating 20 w each for 7 h per day.
(iv) one electric toaster of 1200 w used for 10 min per day for 15 days
calculate the electricity bill of the household for the month of June if the cost per unit of electric energy is rs. 5.

Success- about 67%of the students understand the topic better and also have ability to express it properly

Failure- about 33 % of students not be able to solve correctly a particular set of questions in examination such as questions related to power

Real Learning Outcomes. the real learning outcome is totally based on the coordination among students and teacher. how a particular topic can be explained and expressed by teacher and how students grasp up the knowledge of that particular topic.

1. students understand the concept of q=ne i.e. how to find the number of electrons in one coulomb of charge

2. students corelate the topic with daily life example such as use of electric potential in electric sockets, and understand the concept of volt and also electric current in ampere
3. students should be able to understand the power rating of electrical appliances based on the calculations of electric power consumption.
4. students should know about the concept of joules heating effect of electric current and understand its related questions such as why tungsten is used as the filament of electric current. why led bulb produces less heat.
5. students will be able to understand the concept of series and parallel combination of resistance (they better understand why electric connections is preferred to be done in parallel instead of series combination.
6. concept based MCQ of the above related topic is solved by students properly

Student's response/ participation: (i) due to less efforts of students, the model presentation is not done by every student.
(ii) Students actively understand, how to take the reading of ammeter and voltmeter in ohm's law experiment and also understood the series and parallel connections of resistance

Teacher's learning: teachers should try to explain every topic with proper demonstration which makes understanding of the particular in better way. A teacher has to add few additional questions based on the topics so that extra knowledge related to the topic can also be given. Teachers have to thoroughly go through the sample papers assigned by CBSE board for current as well as previous years and frame new pattern of questions for better practice.

if required teachers have to take extra classes to cover the topics in details for better understanding of the topic

to incorporate in term 2-

lesson plan 2

subject : science
class: x

(bloom's levels and sub categories to be put,accordingly, the table to be filled)

topic- magnetic effect of electric current

brief description- . magnetic effects of current: magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; force on current carrying conductor, fleming's left hand rule,
direct current. alternating current: frequency of ac. advantage of ac over dc. domestic electric circuits.

kpi definition :

kpi 01: students face problems in understanding the conceptual questions, hot's questions

kpi 02 : students face problems in solving numerical portion/ mathematical calculations

kpi 03 : students face problems in solving mcq based questions of chapter magnetic effect of electric current

kpi 04: students face problem to understand the concept of mass and weight.

objectives:

i- specific objectives-

sp 1 to give more practice to students in form of different pattern of questions.

sp 2 proper book reading and points to remember part is to be prepared for preparation of assertion and reasoning typequestions.
sp 3 to discuss about the practical example related to topic so that students can be able to solve case based study. this willhelp to connect the subject with daily life examples.
sp 4 solving simple problems and experiments related to magnetic effects of current to reinforce their understanding.
sp5 understanding the relationship between electricity and magnetism.
sp 6 learning about the right-hand rule to determine the direction of magnetic fields around a current-carrying wire.
sp 7 understand the concept of alternating and direct current with graph

ii -behavioural objectives

to enable the students to-
b1 to develop interest in framing their own practical examples
b2 to understand the basic difference between a.c. and d.c.
b3 to find problem in understanding the language of questions and time management
b4 observation: students should be able to observe and identify the magnetic field produced by a current-carrying conductor usingmagnetic field lines or iron filings.

b5 demonstration: they should be able to demonstrate how the direction of the magnetic field around a wire can be determinedusing the right-hand rule.

b6 application: students should apply their understanding to solve problems related to the magnetic effect of current, such ascalculating the magnetic field strength or direction in different scenarios.

b7 construction: they might be asked to construct simple electromagnets and understand how the number of turns and current affecttheir strength.

b8 comparison: students should be able to compare and contrast the magnetic properties of different materials, such asferromagnetic, paramagnetic, and diamagnetic substances.

assessment:

a1 - worksheet of related topic should be given to the students

a2 - written examinations:

(a) multiple-choice questions to test basic concepts like the right-hand rule.
(b) short-answer questions to assess understanding of magnetic field direction in different scenarios.
(c) problem-solving questions that require students to calculate magnetic field strength or determine the effect of changingvariables in electromagnets.
(d) practical experiments:

conduct experiments where students must set up and observe the magnetic field around a current-carrying wire or coil.ask them

to record observations and draw conclusions from the experiments.

(e) oral assessments: conduct oral quizzes or discussions to gauge their ability to explain concepts verbally.encourage

students to ask questions and engage in discussions about real-world applications.

(f) projects and presentations: assign projects related to practical applications of the magnetic effect of current, such as building simple electromagnets or researching how magnets are used in everyday devices. require students to present theirfindings and explain their projects to the class.
(g) peer assessment: encourage peer evaluations where students assess and provide feedback on each other's presentationsor project work.
(h) class participation and homework: evaluate students based on their active participation in class discussions and their abilityto complete homework assignments related to the topic

digital content to be used: (if applicable) to explain

the topic properly in a visualized manner.

expected learning outcome–

students will be able to:

1. to get the complete understanding of the chapter.
2. solve different typology of questions
3. can connect the subject with their daily life examples
4. understanding concepts: students should grasp the fundamental concepts, such as how an electric current produces magnetic field and the right-hand rule for determining magnetic field direction.

5. application skills: they should be able to apply their knowledge to real-world scenarios, such as understanding how electricmotors work or how electromagnets are used in devices like doorbells.

6. problem solving: students should develop problem-solving skills related to magnetic fields, such as calculating the strengthof a magnetic field or predicting the behavior of magnets in different situations.

7. experimental skills: proficiency in conducting experiments to observe and measure magnetic fields and using equipment suchas compasses and iron filings.

8. critical thinking: encouraging critical thinking by asking questions like, "what happens to the magnetic field when the currentdirection changes?" or "how can we increase the strength of an electromagnet?"

9. scientific inquiry: fostering curiosity and inquiry by prompting students to ask questions and explore magnetic phenomena intheir environment.

10. communication: developing the ability to communicate their understanding of magnetic effects clearly and effectively throughwritten and oral presentations.

11. safety awareness: instilling a sense of safety when working with electricity and magnets, emphasizing precautions and proper handling.

12. connection to future studies: recognizing the relevance of electromagnetism and its importance in advanced physics and engineering courses.

	placement of objectives, instructional activities and assessment **topic: magnetic effect of electric current**					
	knowledge	**understanding**	**application**	**analysis**	**synthesis**	**evaluation**
objectives	sp1,	sp2/sp3	sp4-sp7			
activities	b1/b5	b3/b4	b2/b6/b7/b8			
assessment				a1 / a2		

<u>review of the lesson plan</u>
(to be done when the lesson gets over)

problem faced

1. few students face problem in applying right hand thumb rule in finding the direction of magnetic field
2. students face problem in applying flemmings left hand rule in finding the direction of force

success:- about 70 % of students understand the topic better

failure:- about 30 % of the students face problem in applying thumb rule and flemmings rule in conceptual questions

real learning outcomes: the students understand the topic properly and can be able to understand theory part of magnetic effect of electric current which include

#1 the concept of orestered experiment which shows that the every current carrying conductor has an effect of magnetic field around it which can be shown by placing the magnetic compass near the current carrying conductor

#2 the direction of magnetic field can be find it out by using right hand thumb rule for straight conductor circular conductor and solenoid.

in this part the students face problem in finding the direction of magnetic field due to current carrying lonmg solenoid

#3 they understand the concept of temperory and permenant magnet and the concept of ferromagnetic material which is used to make an electromagnet

#4 they understand the concept on what factors does the force on a charge and current carrying conductor depends on. as mentioned above, about 15 % of the students find problem in finding the direction of force in current carrying conductor

#5 students also understand the concept of a.c. and d.c. with their related graphs. they also taught about the concept of root mean suare value of a.c., concept of overloading and short circuiting

#6 they properly understand the concept of why a.c. is more dangerous than d.c. and what are the advantages of a.c. over d.c.

students response/ participation:

due to less efforts of students, the model presentation is not done by every student. those students who remain absent in classes and have attendance less than 75% , those students participation is very less in class / group activities. those students who remain absent for long time face problem in understanding the topics properly.

teacher's learning: teachers should try to explain every topic with proper demonstration which makes understanding better

a teacher should coordinate with parallel teachers for better delivery content.