



सी डैक
CDAC



AMRITA
VISHWA VIDYAPEETHAM
UNIVERSITY

OLABS: SCHOOL LABS ONLINE

Ms. Suman Ninoriya
Ms. Priyanka Monde
C-DAC Mumbai



About OLabs

Project Title

Online Labs (OLabs) for school experiments

Participating Organizations

C-DAC Mumbai & Amrita Vishwa Vidyapeetham

Target Audience

CBSE schools, students & teachers

Physics, Chemistry,
Biology,
Mathematics &

Classes Covered

Class IX, X, XI, XII

Duration of Project

2010 onwards

OLabs – Background

- ***School education in India faces many challenges***
 - lack of infrastructure including labs.
 - shortage of trained teachers.
 - *students come out with little practical knowledge of the concepts they learn.*
- ***Laboratory a key component of science subjects.***
 - *Activities for other subjects*

Why OLABs?

- **Problems with Physical Labs**
 - Limited Infrastructure
 - No/minimal lab session
 - Limited lab access
 - Safety constraints and fragile equipments.
- **Others**
 - Inadequate 'higher order thinking skills'
 - Assessment of experiments difficult
 - Lack of quality teachers

Online Labs (OLabs) for school lab experiments

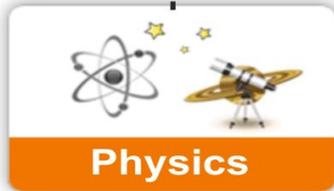
- Not meant to replace physical labs!
 - But augment and amplify them.
- Virtual labs address deficiencies of physical labs.
 - Infinite repetitions at no cost.
- It provides the ease and convenience of conducting experiments over the internet.
- Aimed to bridge the constraints of geographical distances and time.

Technology can expand the boundaries of a physical Lab

- Events occurring in large or small time windows can be simulated –
 - Demonstrating lifecycle of Mosquito.
- Invisible objects can be ‘made visible’
 - Sensing magnetic field intensity.
- Things impossible to perform in real labs
 - behaviour of simple pendulum in atmosphere of Jupiter, etc.
- Offers tremendous scope for open-paced learning, to account for varying learner profiles

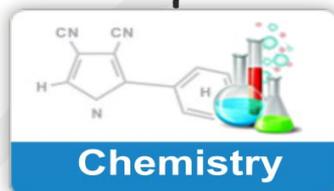
Olabs: What we have now

Experiment/Lab Details



Physics

54



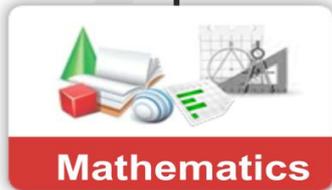
Chemistry

46



Biology

36



Mathematics

25



English

12

Total Experiments :

173

Classes:

- IX
- X
- XI
- XII

- हिंदी
- English
- മലയാളം
- मराठी

Salient Features

interactive simulations
with real world
behaviour.

Students can Explore,
Conduct and Repeat at
their own pace.

Includes features such as
recording observations,
plotting graphs,
calculations, etc which
enhance the overall
learning experience.

Experiments/activities
aligned to CBSE
curriculum.

Available for free
web-based access on
<http://www.olabs.edu.in/>.

Offline version (Live DVD
& Windows installer) are
available on request.

Contents of a Lab

Each experiment as sections covering following:

- **Theory** – conceptual background of the experiment, concepts, related laws, proofs, principles, etc.
- **Procedure** - detailed steps for conducting the experiment in the online & actual lab environment.
- **Animation** - for teacher's demonstration of the experiment in the class or in the laboratory.
- **Simulation** - a simulated laboratory environment with necessary apparatus to conduct the experiment online.
- **Viva Voce** – Questions on related lab for self-assessment

Bell Jar Experiment



Theory



Procedure



Animation



Simulator



Viva Voce



Resources

Snippets from Review Report by NCERT

Chemistry:

1. All 46 resources in different section are completely acceptable to be included as e-content on different portal operated by NCERT.

2. We are also looking forward to for sim of 9th (3 experiments) and 12th (12 experiments), which is relevant and created to support experiential learning for students.

Biology:

1. Among 36 contents in different section , all resources are completely acceptable to be included as e-content on different portal operated by NCERT.

2. It is suggested that important vocabulary should be included wherever it is applicable. Also, new terms should be incorporated and mentioned in separate section from each experiment.

Mathematics

Among 25 resources in different section are acceptable to be included as e-content on different portal operated by NCERT.

2. We are also seeking such material for senior secondary mathematics.

It is to increase the number of resources in each section so that there are more problems for practice.

English:

1. The content developed can be supported with more examples

2. Some more activities in simulations can be incorporated for practice by students.

3. All the e-content is satisfactory to be included in various portals maintained by NCERT

1. Among 42 contents in different section , 41 resources are completely acceptable to be included as e-content on different portal operated by NCERT.

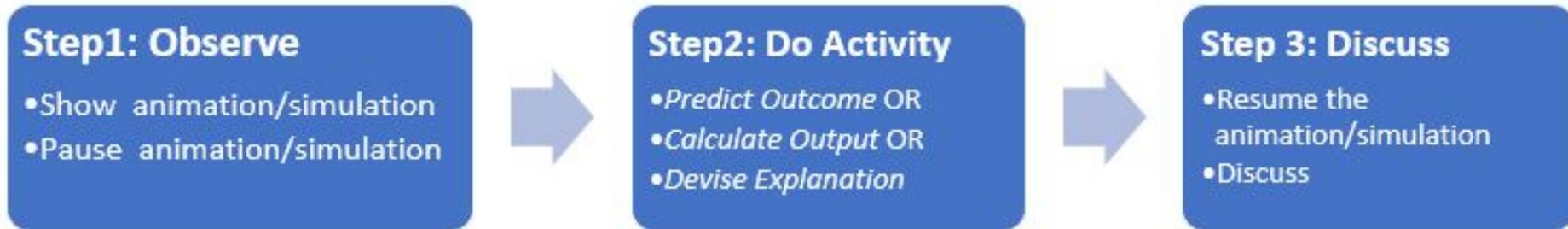
2. One you tube link written as cross-check (either for link or video) is showing error . If provided alternative or correct (playable link) then it can also be included as e-content. If this video is not available for mass then it can be excluded.

Effective usage of OLabs in your school – suggestions for teachers

- **Minimally, use it for demonstration in class**
 - To prepare students for the physical lab
 - To reflect on the activities performed in the lab
- Can get more by ensuring students are actively involved in the activity.
 - Active learning strategies can be interleaved with usual lecture
 - As Homework – Give inquiry-based activities
- Encourage self-evaluation using “Viva-Voce” section of each lab.

Proposed Active Learning Strategy for OLabs

- Recommended time: 5-15 min



- *Predict Outcome* - Ask students to make prediction: “What will happen if ...”
- *Calculate Output* - Ask students to calculate next step or output.
- *Devise explanation* - Ask students to devise reason for process

Choose activity based on pedagogical purpose and learning objective of the Lab

Using OLabs: Scenario

- **Teachers (In the classroom/Lab)**

- Explain labs before performing the practical/lab session
- Explain a procedure
- Demonstrate a phenomenon
- Set expectation about a lab
- Can frame review questions with the lab as the backdrop (after Lab Session)

Creative teachers and students can come up with many more innovative uses!

Usage OLabs

- **Students**

- Familiarize with the Lab before physical lab session
- Try variations available in the lab
- Do revision
- Use Lab to reinforce the concepts, answer question they may have, etc.

Olabs: training and online usage

Overall training Figures



	CBSE	State Board	Total
Teachers trained	35349	4997	40346
Schools trained	9404	1654	11058

Registered users on Olabs Portal 



Important Links

- OLabs website – www.olabs.edu.in
- OLabs FB page - <https://www.facebook.com/onlinelabs/>
- OLabs Email – support@olabs.co.in / etu@cdac.in
- Download Offline version:
<http://www.olabs.edu.in/?pg=topMenu&id=289>
- Are you using OLabs? Let us know
<http://www.olabs.edu.in/?pg=topMenu&id=288>



ENDORSEMENTS, AWARDS

E-mail: director@cbseacademic.in
Website: www.cbseacademic.in

Tel: 011-23212603
23211576
Tele Fax: 011-23234324



केन्द्रीय माध्यमिक शिक्षा बोर्ड

(मानव संसाधन विकास मंत्रालय, भारत सरकार, के अधीन एक स्वायत्त संगठन)

शिक्षा सदन, 17, इन्सटिट्यूशनल क्षेत्र, राउज एवेन्यु, दिल्ली-110002.

CENTRAL BOARD OF SECONDARY EDUCATION

(An Autonomous Organization under the Union Ministry of Human Resource Development, Govt. of India)
"Shiksha Sadan", 17, Institutional Area, Rouse Avenue, Delhi-110002



CBSE/ACAD/DIR(ART&I)/2013

Dated: 16th February, 2013
Circular No. Acad-15/2013

All the Heads of Institution
Affiliated to CBSE

Subject: Roll out of Online Labs in CBSE affiliated schools across the country

Dear Principal,

Online Labs for School Experiments (OLabs) is a novel e-Learning project developed by CDAC, Mumbai and Amrita University, Kerala and based on the concept of virtual learning environment.

CBSE recommends OLabs to all the schools affiliated to the Board. For Kendriya Vidyalayas the roll out may be via ERNET, which provides network connectivity to all the Kendriya Vidyalayas. This is also to inform that OLabs is a facility which is available free of cost at www.olabs.co.in to all the schools affiliated to the Board.

Regards,

Vineet Joshi
(Chairman)

CBSE Circular & Endorsement – Feb 2013

CBSE Circular 2016

E-mail: directoracad.cbse@nic.in
Website: www.cbseacademic.in

Tel: 011-23212603
Telefax: 01123234324



केन्द्रीय माध्यमिक शिक्षा बोर्ड

(मानव संसाधन विकास मंत्रालय, भारत सरकार, के अधीन एक स्वायत्त संगठन)

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CBSE/ACAD/JD(SS)/2016

07.04.2016

Circular No. Acad.11/2016

All Heads of Institutions Affiliated to CBSE

Subject: Training of Teachers on Managing Online Lab Resources

Dear Principal

Online Labs (OLabs) for School Environment is a virtual online e-Learning initiative jointly developed by CDAC, Mumbai and Amrita University, Kollam with funding support from the Department of Electronics and Information Technology, Government of India. It has been developed to supplement the traditional physical labs and bridge the constraints of time and geographical distances. Olabs is a free resource for all schools (teachers and students) in India and is accessible free of cost on the website www.olabs.edu.in. For schools with absence or limited access internet facilities, a DVD version is also available on demand.

CBSE Circular 2020



केन्द्रीय माध्यमिक शिक्षा बोर्ड
(मानव संसाधन विकास मंत्रालय, भारत सरकार के अधीन एक स्वायत्त संगठन)
CENTRAL BOARD OF SECONDARY EDUCATION
(An Autonomous Organisation under the Ministry of Human Resource Development, Govt. of India)



CBSE/ Dir (Acad)/2020

September 2, 2020
Circular No.: Acad- 65/2020

All the Heads of Institutions affiliated to CBSE

Subject: Conduct of the practical work during the lockdown

CBSE has advised schools to follow the Alternative Calendar developed by NCERT to continue education during the lockdown through alternative modes to achieve learning outcomes. Schools have reportedly started using these calendars and other prescribed pedagogical techniques such as experiential and joyful learning, integration of Arts and Sports and project based learning etc. It is also learnt that in addition to alternative calendar and guidelines given on the conduct of online classes (Pragyata), most of the schools have started using online virtual platforms for providing an experience of practical lab activities to the extent possible during this period.

In addition to measures being taken by schools regarding conduct of practical work, it is informed that a platform titled **OLabs** has been developed jointly by the Ministry of Electronics and Telecommunications, Government of India, CDAC, and Amrita University to facilitate a virtual experience of **CBSE syllabus aligned experiments for classes 9 to 12**. The **OLabs** are hosted at www.olabs.edu.in, and the access to it is free for schools on registration. This platform provides class wise experiments with detailed theory and procedure. Students can see animations and use simulation to have an experience as close to real experiments as possible. Students can also assess themselves and provide feedback.

Schools may also keep developing their own resources and explore other appropriate online platforms available in the public domain and use them only after establishing their effectiveness in attaining the desired learning outcomes.

Dr. Joseph Emmanuel
Director (Academics)

KVS & NVS circulars/emails



केन्द्रीय विद्यालय संगठन (मुख्या०)
शहीदजीत सिंह मार्ग, १८ संस्थागत क्षेत्र,
नई दिल्ली - ११० ०१६
KENDRIYA VIDYALAYA SANGATHAN (Hqrs.)
18, INSTITUTIONAL AREA, SJS MARG
NEW DELHI - 110 016
Ph. 26858570 Fax - 26514179

E-mail/Speed Post

Dated: -06-2016.

F. 110350-50/2016 / KVS (HQ) Acad/

The Dy. Commissioner / Director
Kendriya Vidyalaya Sangathan
All Regional Offices & All ZIETs.

Subject: Training of Kendriya Vidyalaya teachers on Managing Resources – regarding.

Ref.: 1. CBSE Circular No. Acad.11/2016 dated 07-04-2016
2. CDACM (K)/Rollout/MS/75 dated 18-05-2016

Madam / Sir,

Please refer to the above cited letters (copy enclosed) regarding teachers on Managing Online Lab Resources.

In this context, you are requested to communicate the CBSE circulars to Principals of all KV's under your jurisdiction encouraging them to depute teachers to benefit from the Olabs training programme.

You are also requested to contact Dr. M. Sasikumar, Associate Director for Development of Advanced Computing to schedule workshops to incorporate the content of the workshops planned at the regional / ZIET level. Please inform this to the concerned authorities. You may also inform the benefits of the workshops alongwith comments, if any, for kind perusal of the competent authority.

Copy to:

1. Dr. M. Sasikumar, Associate Director, Centre For Development of Advanced Computing, Gulmohar Cross Road No.9, Juhu, Mumbai-400 021.
2. PS to Commissioner, KVS (HQ).
3. PS to Addl. Commissioner (Acad.) KVS (HQ).
4. Guard File.

Joint Commissioner

F.No.12-11/2016-NVS(Acad)

Dated:- 24/04/2017

To

The Deputy Commissioner
Navodaya Vidyalaya Samiti
All Regional Offices(Except Hyderabad Region)

Sub:- Conduct of Online Lab Teacher training workshop for JNV Teachers under Digital India Programme-OLABS-reg.

Sir/Madam,

The Online Labs for School Experiments (O Labs) is a novel e-learning project developed by Amrita University in collaboration with CDAC Mumbai under a research grant from the Department of Information Technology, Government of India. It has been developed to supplement the traditional physical labs and bridge the constraints of time and geographical distances. O Labs is a free resource for all schools in India and is accessible free of cost on its website. O Labs content has been developed for Class IX and X in Physics, Biology, Chemistry, Mathematics and English and is aligned with CBSE syllabus.

For further information regarding fixing venues and dates of the training workshops, you are requested to please contact Dr. Prema Nedungadi, Director, AmritaCREATE, Amrita University, Mob.-9995911222, email is: prema@amrita.edu and Co-ordinator, O Labs Team at amritaolabs@gmail.com and Shri Pantina Chandrashekar at pantinashekar87@gmail.com. Contact No.09940653418.

After conduct of the said training, a report in this regard may be forwarded to this office. Your co-operation in this regard is highly solicited.

This issues with the approval of competent authority.

Yours faithfully,

(N.Uma Maheswara Rao)
Assistant Commissioner (Acad)

Launch of O Labs



OLabs was launched during Good Governance week celebrations on Dec 28, 2015 by Honourable minister of IT Shri Ravi Shankar Prasad



A PEEP INTO OLABS

OLabs Homepage



ONLINE LABS

Funded by MeitY

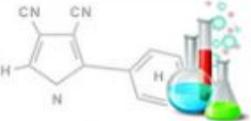
Ministry of Electronics and Information Technology



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PHYSICS



CHEMISTRY



BIOLOGY



MATHS



ENGLISH

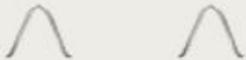
OLabs - Physics

Equivalent Resistance of Resistors(Series)

SAVE FULLSCREEN EXIT

Arrangement of Resistors:

Single



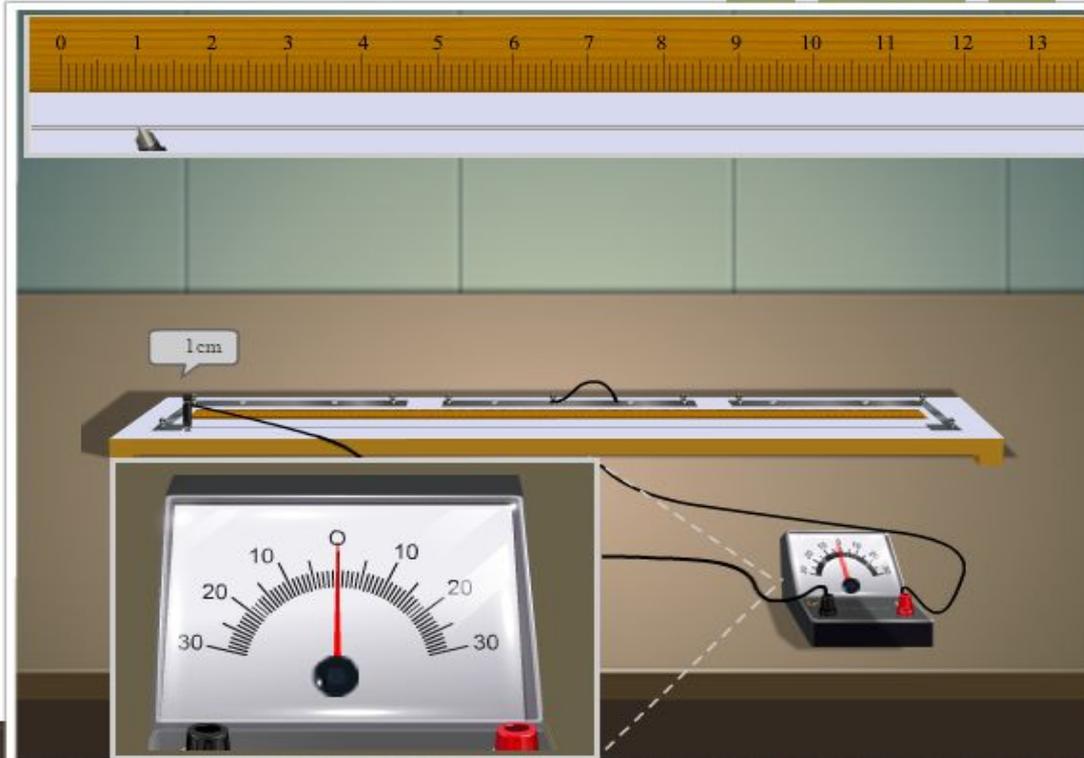
Start Experiment

Insert Key

Jockey Position(cm): 0.01



Reset



OLabs - Chemistry

Chemical Reactions

HELP

FULLSCREEN

EXIT

Select the reaction:



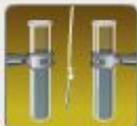
Burning of magnesium in air



Sublimation of dry ice



Na_2SO_4 (aq)
with BaCl_2 (aq)



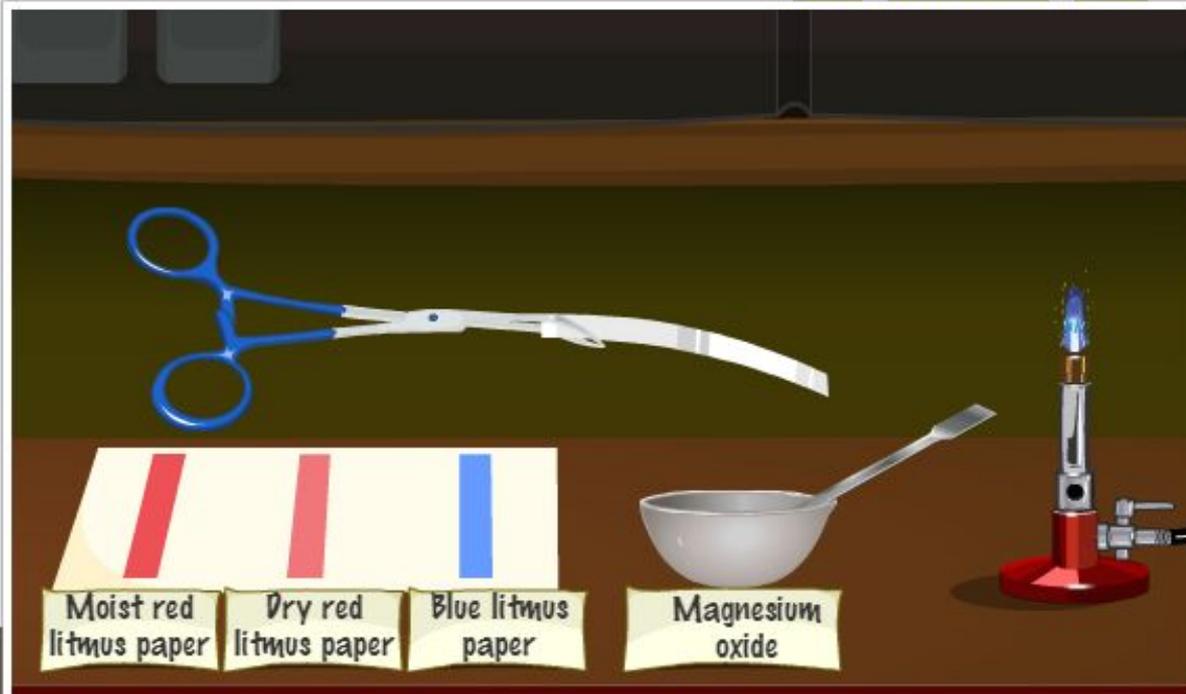
Iron nail with CuSO_4 (aq)



Heating of CuSO_4



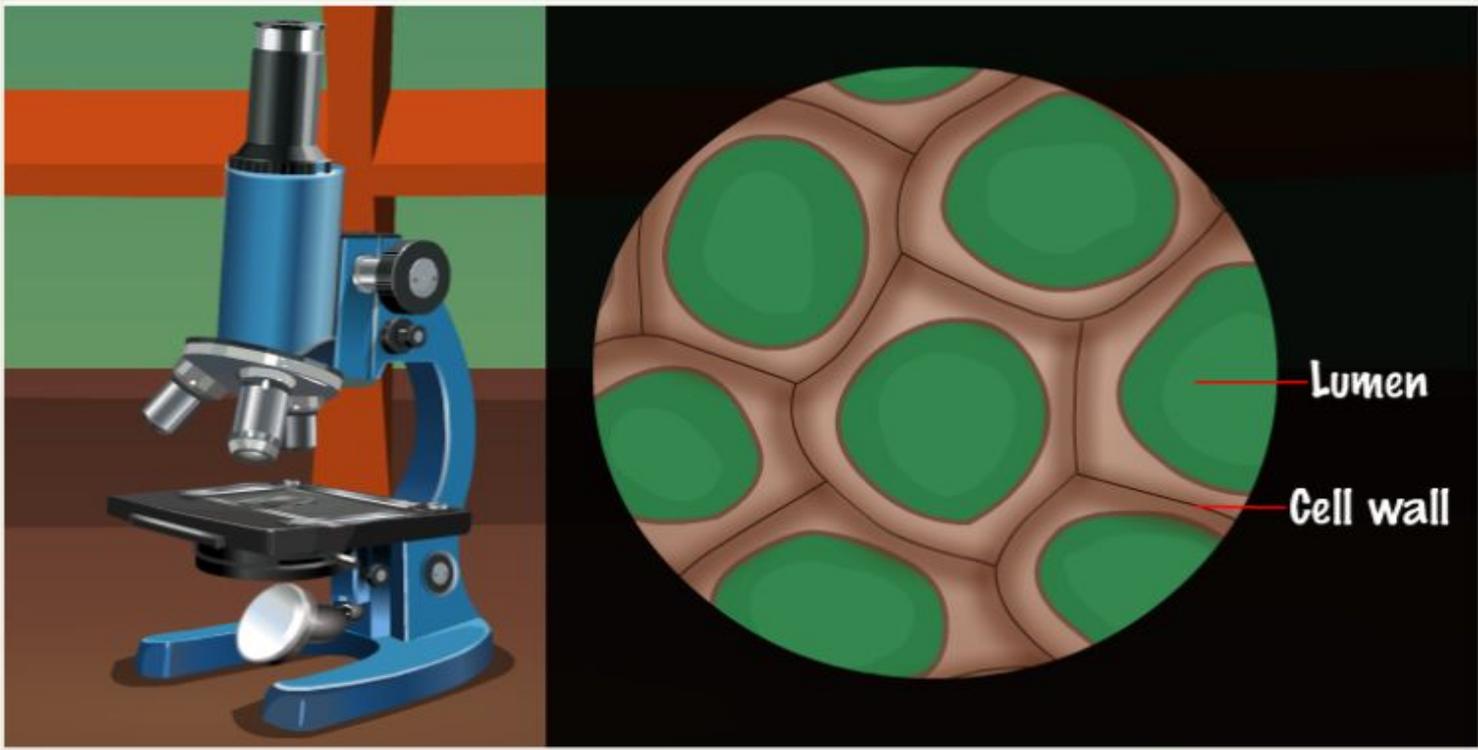
Melting of ice



OLabs - Biology

Plant and Animal Tissues

HOME FULL SCREEN SAVE



Lumen

Cell wall

These cells are long, narrow and have hard and extremely thick secondary walls due to uniform distribution of lignin.

<< || >> 🔊

Developed by CDAC Mumbai & Amrita University
Under research grant from department of IT



OLabs - Mathematics

 Theory Procedure Animation Simulator Self Evaluation Reference Feedback

Instructions

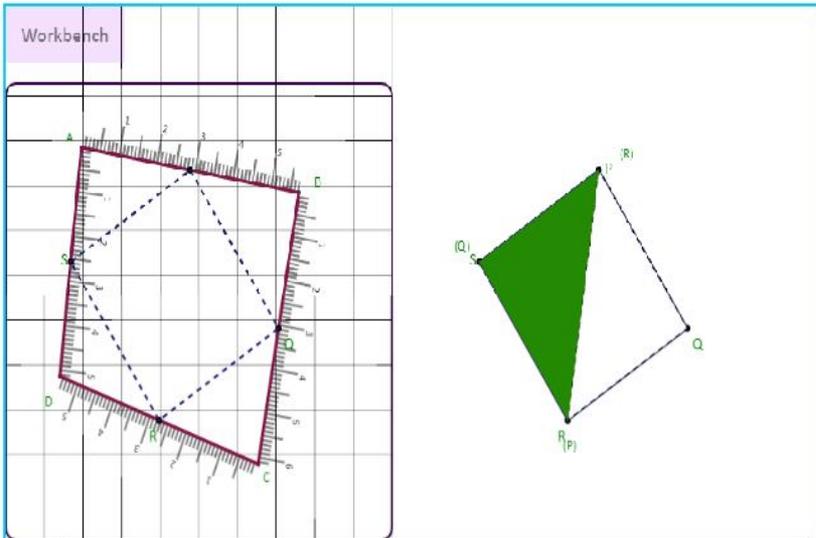
- Activity completed successfully.
- Please see the inference below.

Tools



- Show scale AB
- Show scale BC
- Show scale CD
- Show scale DA

The quadrilateral formed by the midpoints of a quadrilateral.



Conclusion :

- $\triangle PQR$ covers $\triangle PSR$ exactly.
- Thus $SP=QR$ and $RS=PQ$ therefore,
- Quadrilateral $PQRS$ is a parallelogram (by definition).

Restart

OLabs - English

Tense Conversion

[Instructions](#) [Theory](#) [Hints](#)

Select tense
Simple Present Tense change to Future Perfect Tense

Sentence in Simple Present Tense
Sarah catches a ball.

Sentence in Future Perfect Tense

Sarah [] [] caught a ball .

Feedback			
Items	Result	Description	Remedy
Main Verb	✓	'main verb' is correct.	---
Helping Verb	✗	'helping verb' is missing.	Drag 'helping verb' from word repository and drop it in the proper blank box.

Word Repository

were will have caught was is be been has had are being going to catches catch catching am

[Submit](#) [Next](#) [Show Answer](#)

OLabs in Regional

Languages

ఘన సాంద్రత యొక్క సంకల్పం

వారము
 విధానము
 సందానం
 వీడియో
 సిమ్ములేటర్
 విచారణ
 వనరులు

pH - నిర్ధారణ

స్వీచ్‌పై పంచకానికీ క్లిక్ చేయండి

కారకాలు మరియు ఫలితం

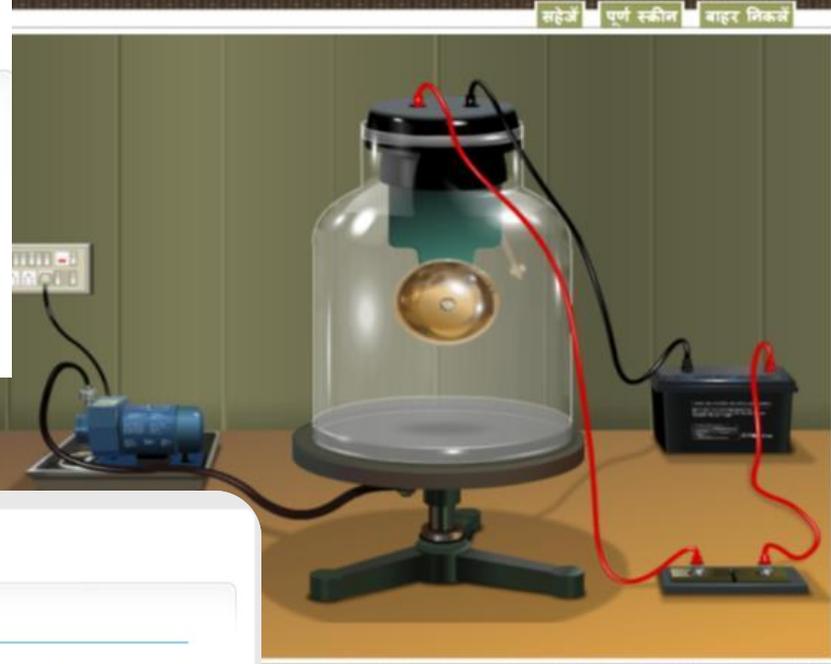
ఏ వనూనా మేత్రమం వర్తనా నోక్స్ ఫలితాన్ని ప్రారంభించండి

1 2 3 4 5 6 7 8 9 10 11 12 13 14

ఎసిడిక్ న్యూట్రల్ బేసిక్

లెమన్ జాస్ టోమాటో జాస్
 ఆరెంజ్ జాస్ సైనాపిల్ జాస్
 గ్రీన్ జాస్ యెల్లో జాస్

ఒక వస్తువు కలిగి ఉన్న సస్థలం మొత్తం. లీటర్ల సంఖ్య. సాంద్రత తమ



भौतिक विज्ञान

కक्षा 9

<p>బేర జార ప్రయోగం</p>	<p>టోస్ కి ఘనత్వ కే నిర్ధారణ</p>	<p>ఒక తీర్చిదిద్దిన పతలం పై ఒక లవణి కే భ్రమోక స్థానాంతరం చేయడం కే నియం ఆవశ్యక బల</p>	<p>టో వసంత్ శీఘ్రం కే ఉపయోగం నియం కే నియం కే నియం నియం నియం</p>
<p>రేతం పై ఒక టోస్ లోకే ఘనం ద్వారా ద్రావణం నియం</p>	<p>ఆర్కిమిడిజ్ సిద్ధాంతం కే నియం</p>	<p>ఘనం కే పారావర్తనం కే నియం</p>	<p>స్ట్రూటం కే ద్వారా నియం</p>

त्रिभुज के मध्य बिंदु प्रमेय

निर्देश:

1. मध्यबिंदु P, Q, R निर्दिष्ट करने से.
2. ऊपरी कदम, PQ, QR के मध्य बिंदु मिलाने.
3. मध्य बिंदु P को Q से मिलाने.
4. मध्य बिंदु Q को R से मिलाने.
5. साइज लीनर के लिए समतल दो बिंदुओं पर विचार करें.

बिंदु P निर्दिष्ट ✓
 बिंदु Q निर्दिष्ट ✓
 बिंदु R निर्दिष्ट ✓
 सभी अंक निर्दिष्ट ✓

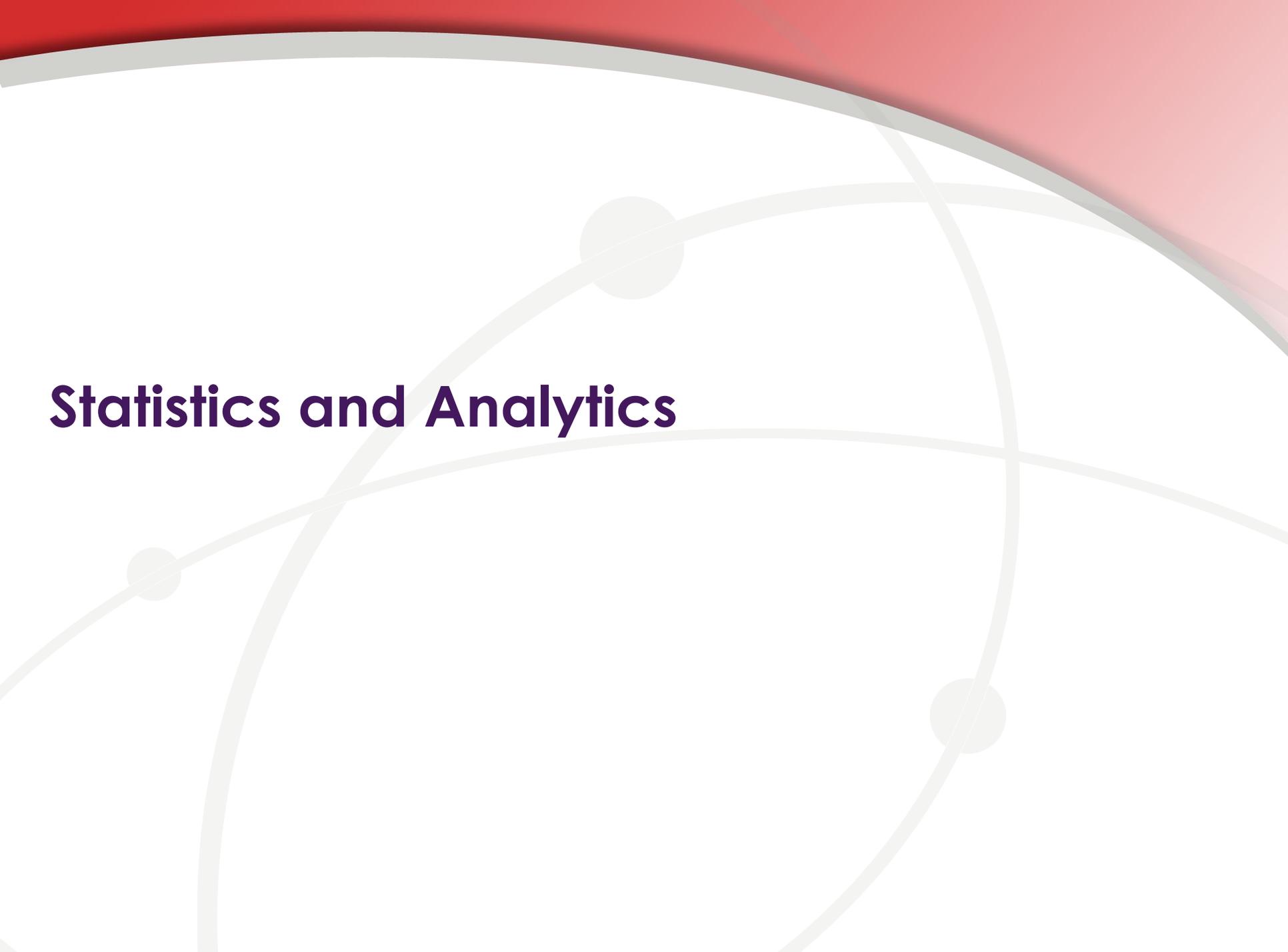
त्रिभुज के मध्य बिंदु

दो समानांतरों को मिलाने से:

4.8 से. 5.8 से. 5.8 से.

OLabs on Mobile device

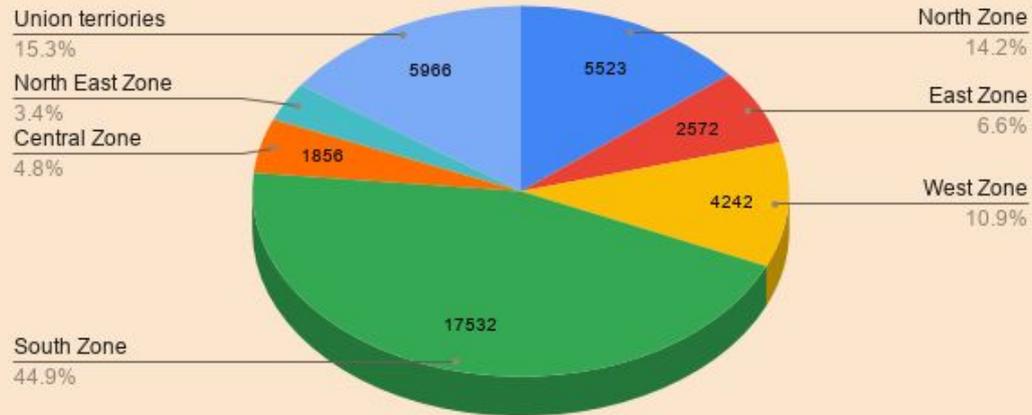


The background features a white space with a red gradient at the top right. Several light gray curved lines and three light gray circular dots are scattered across the page, creating a modern, abstract design.

Statistics and Analytics

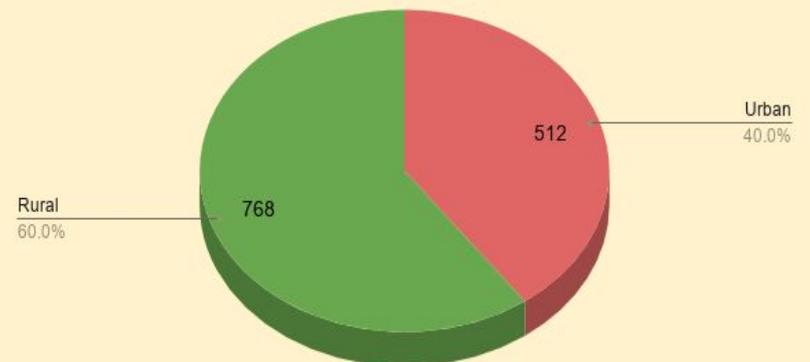
Insights of Training

Zone-wise training status

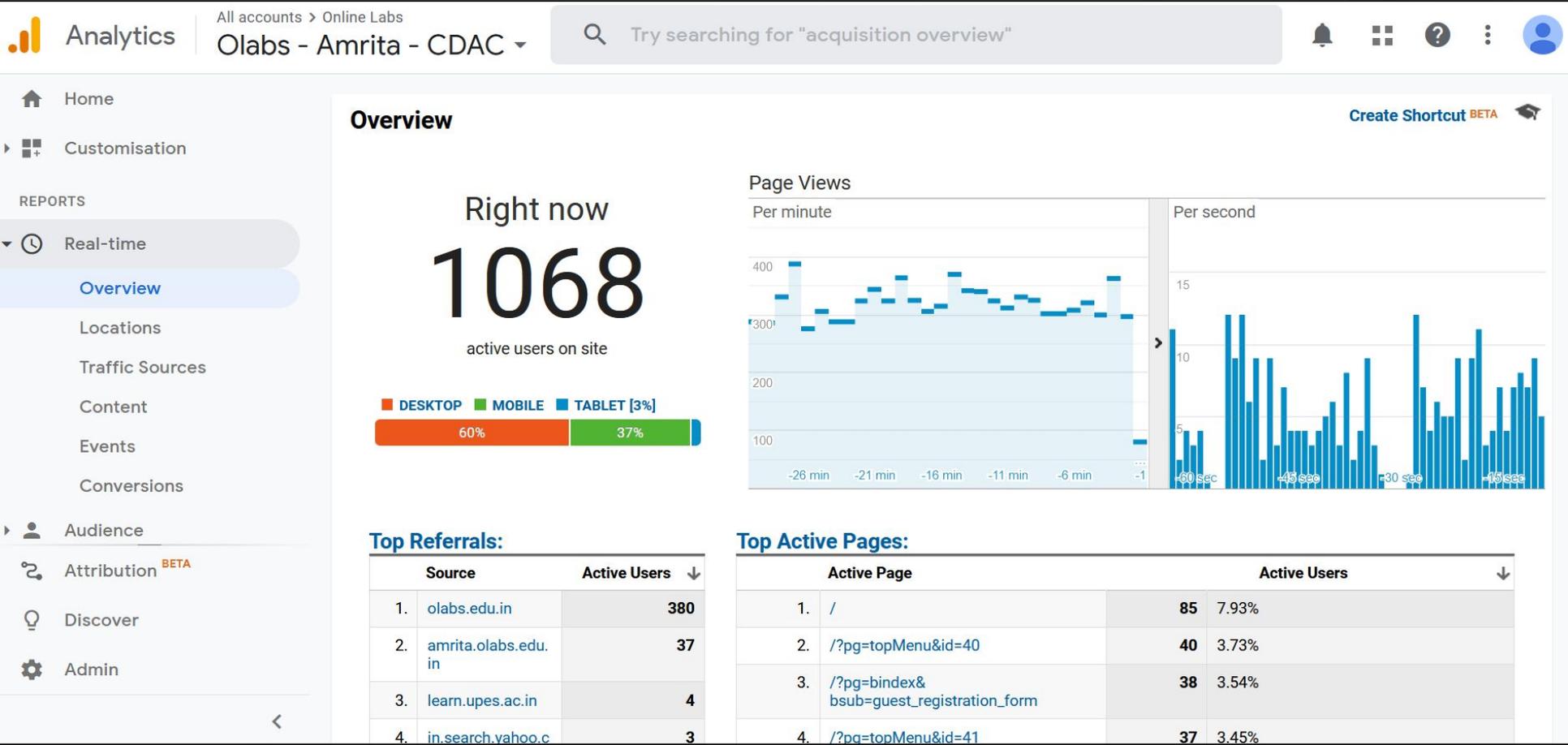


Total number of training conducted in the North East Region is : 52

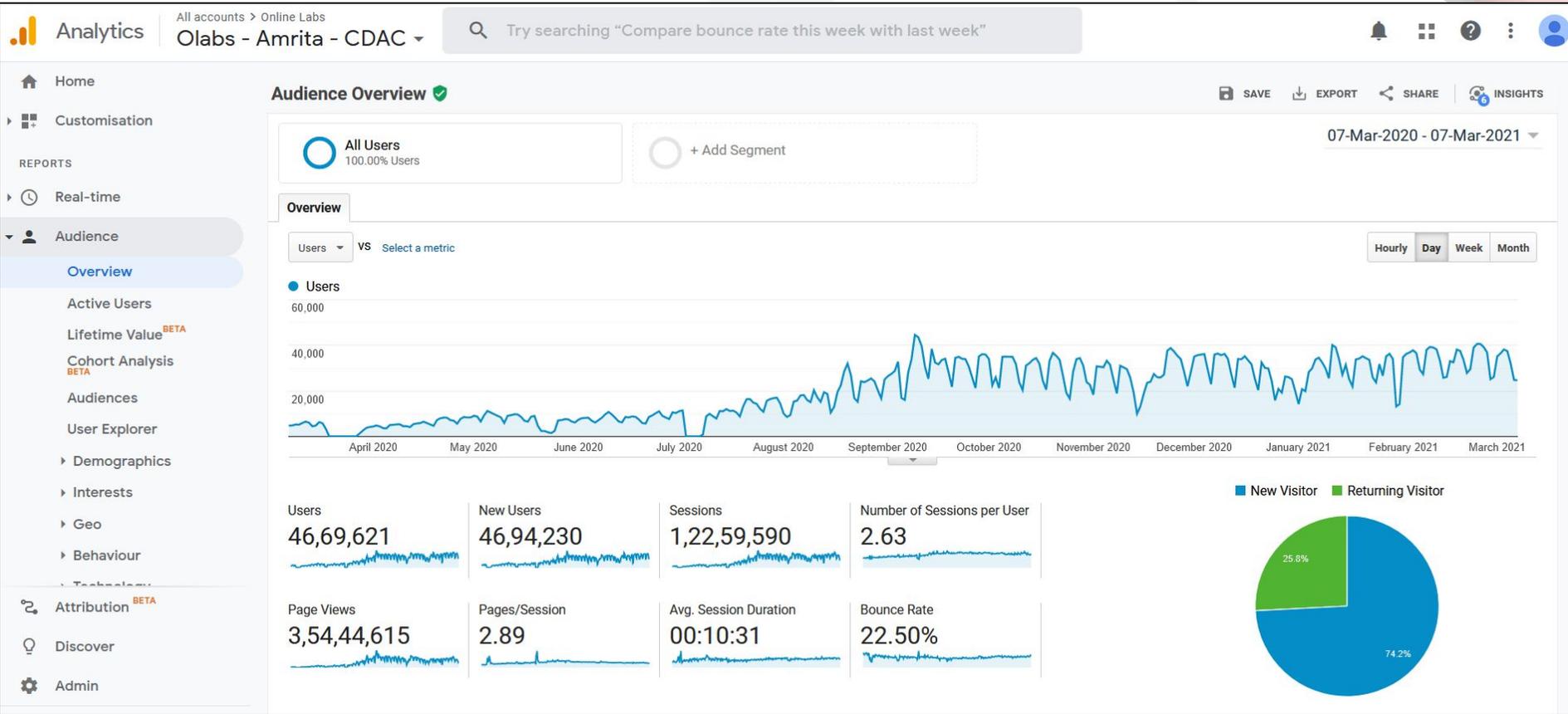
Status of Urban and Rural training in NE regions



Active users and pages



Audience Overview





BIOLOGY ACTIVITIES IN OLABS

Biology Labs – Class IX

Class 9



Onion and Cheek Cells



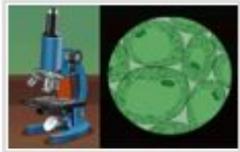
Detection of adulterant in Dal



Adaptation in Animals



Imbibition by Raisins



Plant and Animal Tissues



Detection of Starch in Food Samples



Life Cycle of a Mosquito



Monocot and Dicot Plants



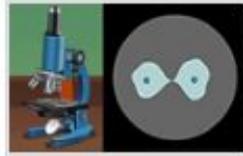
Characteristics of Plants

Biology Labs – Class X

Class 10



Importance of Light in Photosynthesis



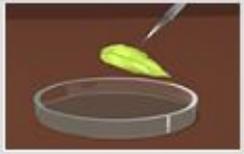
Asexual Reproduction in Amoeba and Yeast



Embryo of Dicot Seeds



Role of Carbon Dioxide During Respiration



Demonstration of Stomata on a Leaf Peel



Homology and Analogy

Biology Labs – Class XI

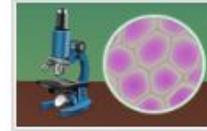
Class 11



Study of Osmosis



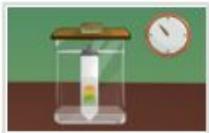
Rate of Transpiration



Study of Plasmolysis



Study of distribution of stomata



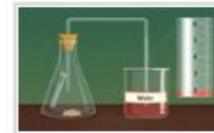
Paper Chromatography



Characteristics of Flowers



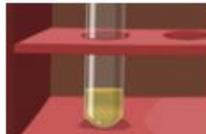
Characteristics of Dicot and Monocot Stem and Root



Rate of Respiration



Detection of Sugar in Urine



Detection of Urea in Urine



Detection of Albumin in Urine



Detection of Bile salts in Urine



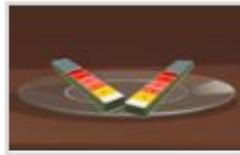
Detection of Carbohydrates, Proteins and Fats

Biology Labs – Class XII

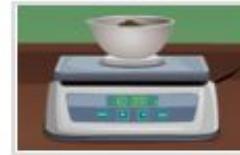
Class 12



Study of Pollen Germination



Studies on Turbidity, pH and Microbial Presence in Water



Study of Physical Properties of Soil



Study of pollutants in Air



Study of plant population density by quadrat method



Study of plant population frequency by quadrat method



Study Mitosis in Onion Root Tip



Action of Salivary Amylase on Starch

Conclusion

- We are happy to bring this platform you to add value to the school education, in significant ways.
- We are working on to bring you better and more labs.
- Do share your feedback and suggestions; we certainly appreciate that.
- We do hope you will consider adopting it for your students and inform the students accordingly.

Thank you
for
your time

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