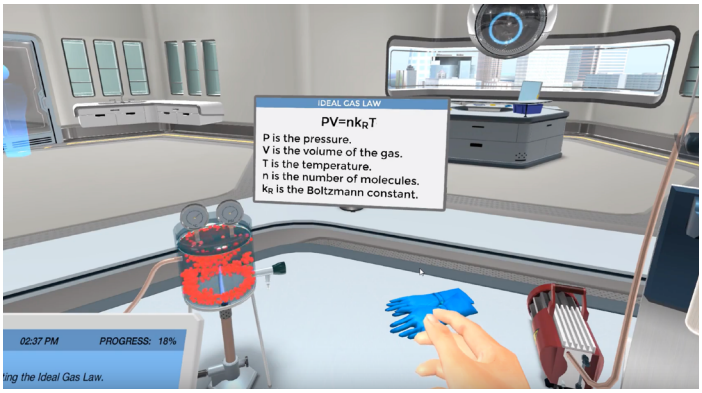
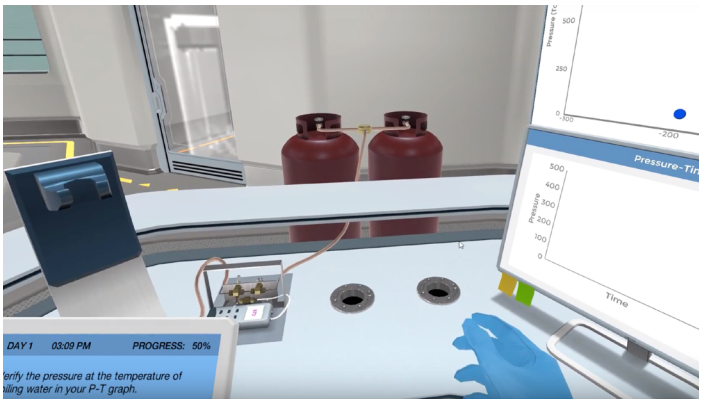
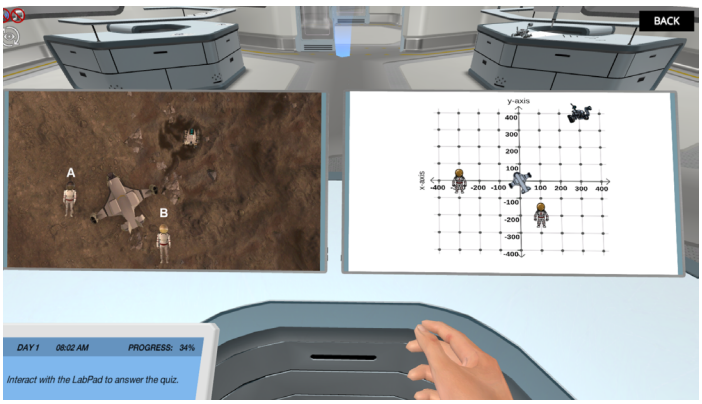
Introducing Labster Lab Simulations for Physics







Labster, a world-leading provider of virtual lab simulations, is launching two chemistry packages in Spring 2019.

The simulations are designed to let students learn by doing in a virtual laboratory, solving real-case problems, for example, the acidic contamination of a lake. Quiz questions test the students' knowledge, supporting an inquiry-based and deep-learning approach. In addition to concepts, the students will train lab skills such as solution preparation, acid-base titration and calorimetry, in a safe virtual environment where they can safely make mistakes, and learn at their own pace.

The most basic simulations are ideal as a self-study activity since the students will review essential chemistry concepts that will prepare them to better understand the new knowledge. The more advanced simulations are designed to support the course syllabus, reinforcing concepts and giving the students an innovative tool to deepen their learning.

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University Physics Package

The Labster University Physics Package is a set of virtual lab simulations focused on the core physics concepts. The package has been designed in alignment to university courses, and is a combination of basic and advanced simulations.

Includes 6 simulations:

- Ideal Gas Law
- Law of Universal Gravitation: Use Gravity to orbit the moon
- Light and Polarization
- Springs and Masses
- Vectors and Scalars
- Materials Science with Neutrons

Ready to learn more?

Bring the world of science into the classroom and enable students to bring learning home. No need for additional hardware or lab equipment; access these Biology, Chemistry, and Physics labs on Chromebooks or any other laptops, and spark creativity in students with this innovative and interactive way to explore science.

To learn more about how you can incorporate Labster virtual labs in your teaching, visit www.labster.com.

See the research at **https://blog.labster.com/students-learn-twice-as-much-with-labster**
and more at **https://www.labster.com/research**.

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Reimagine Education Awards 2019:
Virtual/Augmented Reality—Gold Award
Life Sciences & Medicine—Gold Award

Reimagine Education Awards 2016:
Overall Winner
ICT Tools for Teaching and Learning—Gold Award

Learning objectives covered in Labster's University Physics simulations

Ideal Gas Law

- Define the relationship between pressure, volume and temperature in gases using gas thermometry
- Explain the physical concepts of temperature and absolute zero
- Define and apply the Ideal Gas Law

Law of Universal Gravitation

- Understand the difference between weight and mass.
- Measure gravitational acceleration near the Earth's surface.
- Describe the mechanism for circular orbits.
- Describe the distance dependence of g.
- Distinguish between bound and unbound trajectories

Light and Polarization

- Define the wave/particle duality of light
- Use the electromagnetic spectrum to classify waves based on their wavelength and frequency
- Apply the law of reflection and refraction to predict how light interacts with interfaces
- Show the principles of linear polarization
- Use polarizing filters to adjust light intensity

Springs and Masses

- Describe the motion of a mass oscillating on a vertical spring
- Determine the equilibrium position of a vertical oscillator
- Explain the basic properties of Simple Harmonic Motion
- Apply Hooke's law to a spring-mass system
- Determine the magnitude and epicenter of an earthquake from a seismogram

Vectors and Scalars

- Describe the difference between vector and scalar quantities
- Identify the magnitude and direction of a vector
- Determine the product of two vectors
- Define the components of a vector
- Express the components of a vector in the polar coordinate system

Materials Science with Neutrons

- Distinguish the basic components of a rechargeable Li-ion battery
- Recognize in which cases neutrons as a probe might be preferred over x-rays in materials science
- Understand how and why neutrons are produced, moderated in wavelength, transported and detected in a large-scale materials research facility
- Understand neutron transmission imaging and its advantages in materials science
- Distinguish various forms of neutron interaction with a sample and the related neutron cross-sections
- Relate atomic lattice distance in a powder sample to neutron scattering angle via Bragg's law
- Explain how slow molecular movement in a sample can be measured by quasi-elastic neutron scattering

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