

# The Mechanical Universe

## THE MILLIKAN EXPERIMENT 15min



Read the following questions before the video begins. Answer them while the video is in progress. To complete this assignment successfully, you must listen carefully to the narration. Do not get distracted by the visual effects. Unless the instructor tells you otherwise, do not ask others for answers or copy answers from other people's sheets since doing so is cheating.

1. The scientist: Robert A. Millikan.

2. Millikan imagined measuring the charge on a single water droplet rather than an entire cloud.

3. The problem: water evaporates. Millikan therefore decided to use oil instead of water.

4. To create a mist of oil, Harvey Fletcher suggested using a(n)  
A. turkey baster  
B. atomizer  
C. aerosol spray can  
D. miniature garden hose nozzle

5. Which forces act on the falling drop?

A. Drag  
B. Friction  
C. Normal  
D. Tension  
E. Weight

6. Millikan established that every charge was a whole number multiple of a(n)

elementary charge.

7. Millikan looked for error in the apparatus

A. mostly when the observations didn't agree with the results he expected to get.  
B. continually.  
C. at random intervals.  
D. very rarely.

8. What prevents someone from making a discovery that isn't true?

A. The Golden Rule  
B. Threats of imprisonment  
C. Public ridicule  
D. The test of repeatability

9. Passion and prejudice

A. are the crowning achievements of science  
B. play no role in science  
C. are never very far from the scientific process  
D. are homonyms

10. The repeatability of scientific experiments

A. is a central tenet of a scientist's faith.  
B. impedes scientific progress as researchers repeat the same experiments over and over.

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1. At the turn of the 20th century, J. J. Thompson showed that cathode rays (electrons) are parts of atoms.

2. If it were possible to make measurements on the droplets, the charge of a(n) single electron could be detected.

3. In 1907 at ?, it all began to fall into place.

A. Purdue

B. Harvard

C. The University of Michigan

D. Caltech

E. Berkeley

F. The University of Chicago

4. To create a mist of oil, Harvey Fletcher suggested using a(n)

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5. Which forces act on the falling drop?

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E. Normal

6. Millikan's forte was precision; the ability to detect and eliminate error.

7. When Millikan got a result he didn't like, he

A. was obliged to record and use it; all data must be used for a study to be valid.

B. selectively neglected to record it.

C. threw it out.

D. examined the apparatus, found error, then threw it out.

8. Every discovery is made in an experiment designed to produce the results that the scientist expects to find.

9. Passion and prejudice

A. are never very far from the scientific process

B. are homonyms

C. are the crowning achievements of science

D. play no role in science

10. The repeatability of scientific experiments

A. impedes scientific progress as researchers repeat the same experiments over and over.

B. is a central tenet of a scientist's faith.