

What Americans know about science

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Credit: Petr Kratochvil/Public Domain

There are substantial differences among Americans when it comes to knowledge and understanding of science and scientific processes. People's level of science knowledge varies by education, race, ethnicity and gender, according to a new study released today by Pew Research Center.

Americans' knowledge of specific facts connected with [life sciences](#) and earth and other physical sciences ranges:

- About eight-in-ten (79%) correctly identify that antibiotic resistance is a major concern related to the overuse of antibiotics.
- A similar share (76%) know an incubation period is the time during which someone has an infection but is not showing symptoms.
- The most challenging question in the set asks for the main components of antacids that help relieve an overly acidic stomach; 39% correctly answer bases.

The representative survey of 4,464 adults finds that on the 11 multiple-choice questions asked by Pew Research Center, Americans give more correct than incorrect answers. The mean number of [correct answers](#) is 6.7, while the median is 7. About four-in-ten (39%) Americans get between 9 and 11 correct answers, classified as having high [science](#) knowledge on the 11-item scale or index. About one-third (32%) are classified as having medium science knowledge (five to eight correct answers) and roughly three-in-ten (29%) are in the low science knowledge group (zero to four correct answers).

"In an era of easy access to a wide array of information, along with sometimes-intense debate over what information is true and false, this survey takes stock of the degree to which the public shares a common understanding of science facts and processes," said Cary Funk, director of science and society research at Pew Research Center.

The data show that there are wide educational differences on science knowledge.

Americans with more education score highest on science knowledge. These large differences are consistent with past Center surveys on science knowledge and with analysis of the factual science knowledge index in the National Science Board's Science and Engineering Indicators.

- Americans with a postgraduate degree get about four more questions correct, on average, than those with a high school degree or less education (9.1 vs. 5 out of 11).
- About seven-in-ten (71%) Americans with a postgraduate degree are classified as high in science knowledge, answering at least 9 of 11 items correctly. By contrast, about two-in-ten (19%) of those with a high school degree or less perform as well on the scale.
- On each of the 11 questions, those with a postgraduate degree are at least 27 percentage points more likely to choose the correct answer than those with a high school degree or less.

In addition to educational differences, there are substantial differences in levels of science knowledge by race and ethnicity.

Whites are more likely than Hispanics or blacks to score higher on the index.

- Whites get an average of 7.6 out of 11 correct, while Hispanics average 5.1 correct answers and blacks 3.7 correct answers.
- Roughly half of whites (48%) are classified as having high science knowledge on the scale, answering at least 9 items correct, compared with 23% of Hispanics and 9% of blacks.
- Differences by race and ethnicity on science knowledge could be tied to several factors, such as educational attainment and access to science information. However, differences between the racial and ethnic groups on science knowledge hold even after controlling for education levels in a regression model.

Men score higher than women on the science knowledge scale, but the differences vary across questions.

The survey also finds that men generally score higher than women on the

scale.

- On average, men answer 7.4 questions correctly, while women average 6.0.
- About half of men (49%) score high on the scale compared with 30% of women.
- However, gender differences are not consistent across questions. For example, men and women are about equally likely to identify that antibiotic resistance is a major concern related to overuse of these drugs (80% and 77%, respectively). But, more men (66%) than women (46%) recognize that inserting a gene into a plant is an example of genetic engineering.

Republicans and Democrats hold similar levels of science knowledge.

Republicans and Democrats have similar levels of understanding about science, in contrast with the wide differences by education and racial and ethnic group.

- Republicans and independents who lean to the Republican Party average seven correct answers, while Democrats and independents who lean to the Democratic Party average 6.6 correct.
- Those at the ends of the political spectrum—liberal Democrats and conservative Republicans—score higher than those in the middle, however. On average, liberal Democrats get 7.8 correct answers and conservative Republicans score 7.4. In comparison, moderate and liberal Republicans get an average of 6.5 correct answers and moderate and conservative Democrats get an average of 5.6.

Two-thirds of Americans see the [scientific method](#) as an iterative process.

People's understanding of scientific processes and the way scientific [knowledge](#) accumulates may help them navigate ongoing debates over science connected with issues such as climate change, childhood vaccines and genetically modified foods. The survey includes two questions designed to tap understanding of scientific processes.

- Six-in-ten Americans (60%) identify adding a control group as the best of four options to test whether an ear infection medication is effective.
- 52% correctly identify a reason for a computer slowing down as a scientific hypothesis.
- One question, not included as part of the scale, asked survey respondents about their view of the scientific method. Two-thirds of Americans (67%) say the scientific method "produces findings that are meant to be continually tested and updated over time," 15% say the method produces unchanging core principles and truths, and 17% say they are not sure.

These are among the findings from the new report, which is based on a nationally representative survey conducted Jan. 7 to 21, 2019, among 4,464 adults 18 years of age or older who live in all 50 U.S. states and the District of Columbia. The margin of sampling error is plus or minus 1.9 percentage points.

The findings will be available at

<https://www.pewresearch.org/science/2019/03/28/what-americans-know-about-science/>.

A quiz with the 11 questions will be available at

<https://www.pewresearch.org/science/quiz/science-knowledge-quiz>.

Provided by Pew Research Center

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