

How Does the U.S. Stack Up?

Americans believe it is important that the United States lead the world in science and technology and, according to a [national survey](#)¹ conducted in late 2010, a majority of people believe that the quality of our science and research is ahead of most other countries. But, how does the U.S. stack up in the global innovation race? The good news is that based on most indicators, America leads the world in science, technology and innovation. The bad news, though, is that we aren't maintaining our edge. Other nations are nipping at our heels. Consider the following²:

- China is now second in the world in its publication of biomedical research articles, having recently surpassed Japan, the United Kingdom, Germany, Italy, France, Canada and Spain.
- In 2009, 51 percent of United States patents were awarded to non-U.S. companies.
- The World Economic Forum ranks the U.S. 48th in quality of mathematics and science education.
- United States consumers spend significantly more on potato chips than the government devotes to energy R&D.
- Federal funding of research in the physical sciences as a fraction of GDP fell by 54 percent in the 25 years after 1970. The decline in engineering funding was 51 percent.
- In the 2009 rankings of the Information Technology and Innovation Foundation the U.S. was in sixth place in global innovation-based competitiveness, but ranked 40th in the rate of change over the past decade.
- By 2008, public spending in the United States on energy R&D had declined to less than half of what it was three decades ago in real purchasing power.
- China has now replaced the U.S. as the world's number one high-technology exporter.
- In less than 15 years, China has moved from 14th place to second place in published research articles (behind the United States).
- In a survey of global firms planning to build new R&D facilities, 77 percent say they will build in China or India.

¹ Heartland Monitor [Poll](#) November 29 – December 1, 2010

² Except where noted, factoids are from [Rising Above the Gathering Storm, Revisited](#). September 2010.

- The United States ranks 27th among developed nations in the proportion of college students receiving undergraduate degrees in science or engineering.
- The total annual federal investment in research and mathematics, the physical sciences and engineering is now equal to the increase in health care costs in the U.S. every nine weeks.
- For the next 5-7 years, the United States, due to budget limitations, will only be able to send astronauts to the Space Station by purchasing rides on Russian rockets.
- The U.S. is [home](#) to only two of the ten largest solar photovoltaic producers in the world, two of the top ten wind turbine producers and one of the top ten advanced battery manufacturers. Only one-sixth of the world's top renewable energy manufacturers are based in the United States.³
- Between 1996 and 1999, 157 new drugs were approved in the United States. In a corresponding period ten years later, the number dropped to 74.
- All of the National Academies Gathering Storm committee's recommendations (to improve science and math education and invest in basic scientific research) could have been fully implemented with the sum America spends on cigarettes each year – with \$60 billion left over.
- In January 2010, China's BGI genome sequencing research center made the biggest purchase of genome sequencing equipment ever.
- In May, 2010, a supercomputer produced in China was ranked as the world's second-fastest.

³ [Memo](#) to the President from the Economic Recovery Advisory Board, June 17, 2009