

101+ AMAZING Science Project Ideas: COMPUTER SCIENCE



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- Gives you a brief survey
- Recommends projects that are best for you

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How Many Letters?

Can you remember all of your ABC's? Computers need to "remember" letters too. Every time we use a computer to write a story, the computer needs to "remember" the letters in the story by saving them to the computer's memory as a file. In this experiment find out how much memory it takes for the computer to "remember" a series of letters.

[Difficulty](#) = 1

Font and File Size

What is your favorite font? Is it Chalkboard, Comic Sans, Futura, or Curlz? Whatever your favorite font is, you can test it out with this fun experiment.

[Difficulty](#) = 1

Getting More Out of Less : Google Hits and Search Terms

"Google" is the name of the most often used search engine on the Internet. "Googol" is the mathematical term for a 1 followed by 100 zeros. It's a very large number! Want to know how to get less than a googol hits on Google? Do this experiment to test different search terms and find out.

[Difficulty](#) = 2

Wild About Wildcards

Everybody's favorite card in UNO is the wildcard, why? Because you can use it to play on anything! The same concept is behind using a wildcard when searching for something with your computer. Do this experiment to find out if using wildcards to conduct a search can help you get better results.

[Difficulty](#) = 2

CD Burning: Take it to the Edge

Did you know that you can tell how much information is on a CD-R without even using a computer? Find out how in this "reflective" experiment.

[Difficulty](#) = 3

Image File Types and Size

There are so many different ways to save an image file it can be mind boggling! If you want to know whether to save your favorite photo as a jpeg, bmp, gif, or tiff then try this simple experiment.

[Difficulty](#) = 3

The Point of a Parabola: Focusing Signals for a Better Wireless Network

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Here's a project with practical applications for homes with a wireless network. This project shows you how to build and test parabolic reflectors for the transmitters on your network. You may be able to increase the range of your transmitter to cover a location you would like to use but couldn't reach previously. You may also be able to find ways to make your network more secure, by reducing signals transmitted beyond your property.

[Difficulty](#) = 4

[How Fast is Your Computer?](#)

Computer technology continues to develop at a rapid pace. A new home computer is noticeably faster than a machine from five years ago, and dramatically faster than a machine from ten years ago. Exactly *how* much faster? This project will show you one way of measuring.

[Difficulty](#) = 4

[Image Compression vs. Image Quality: Finding the Best Tradeoff](#)

In this project you'll learn about how digital image files are encoded, and how digital images can be compressed so that the files take up less storage space and can be transmitted more quickly. You will also measure the quality of compressed and uncompressed images, which will give you important insights into the tradeoffs between file size and image quality.

[Difficulty](#) = 5

[Forms and Functions: Writing a Simple Calculator Program with JavaScript](#)

This is a good first-time programming project. You'll learn how to use JavaScript to create a basic calculator program that you can run in your Web browser.

[Difficulty](#) = 5

[Follow the Bouncing Ball: A Web Animation Project](#)

This project is a fun way to try your hand at programming. You'll learn how to create some simple animations, and you'll perform tests and make measurements to help you create more realistic-looking animations. All you need to get started is a Web browser and a text editor (like Notepad).

[Difficulty](#) = 5 – 6

[ABC's of Programming: Writing a Simple 'Alphabetizer' with JavaScript](#)

This is a good first-time programming project. You'll learn how to use JavaScript to create a simple program to alphabetize lists of words. You'll be able to run your program in your Web browser.

[Difficulty](#) = 5 – 6

[Paragraph Stats: Writing a JavaScript Program to 'Measure' Text](#)

This is a more challenging first-time programming project. You'll learn how to use JavaScript to create a simple program to analyze one or more paragraphs of text. Your program will count sentences, words and letters, and report the resulting statistics. You'll be able to run your program in your Web browser.

[Difficulty](#) = 5 – 6

[Artificial Intelligence: Teaching the Computer to Play Tic-Tac-Toe](#)

This is a more challenging JavaScript project: can you write a program that can play Tic-Tac-Toe? You'll have to figure out a way to translate the game strategy into a computer algorithm. The project will show you how to create a working Tic-Tac-Toe board on a webpage. Your challenge will be to show the computer how to play. Just think: you'll be creating artificial intelligence!

[Difficulty](#) = 6 – 8

[Program to Check a Sudoku Solution](#)

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Sudoku puzzles have become extremely popular over the past couple of years. You can find books of puzzles for beginners to experts, and many newspapers print Sudoku puzzles daily. This project challenges you to write a computer program to check if your Sudoku solution is correct.

[Difficulty](#) = 6 – 10

[Bits, Bytes, and Bases: Write a JavaScript Binary/Decimal/Hexadecimal Converter](#)

This is a challenging first computer science project. You'll learn the basics of how digital devices can represent numbers using only 0's and 1's, and you'll write a JavaScript program to convert numbers between binary, decimal and hexadecimal notation.

[Difficulty](#) = 6 – 7

[Computer Sleuth: Identification by Text Analysis](#)

Here's a project where you can try your hand at being a detective with your computer. In this project you'll write a program to do some basic analysis of features of written text (for example, counting the length of each word in the text, or the number of words in each sentence). Then you'll see if you can use the information from your text analysis program to find measurements that can distinguish one author from another. After analyzing known samples of several authors' writings, can your method match up unidentified writing samples with their correct authors?

[Difficulty](#) = 7 – 10

[Programming NANORGs in a Virtual World](#)

Imagine yourself as a software engineer, a decade and a half from now. You are called upon to help solve the world energy crisis by programming nano-organisms (NANORGs) to extract energy from industrial sludge. Your program must be small enough to fit in the NANORGs' tiny processors, yet at the same time meet several challenges. First and foremost, your NANORGs need to navigate on their own, extract energy from the sludge, and find collection points to deliver the harvested energy. Second, you must figure out how to deal with the fraction of the sludge that is radioactive. This sludge damages random locations in your NANORGs' processor memory when consumed. Third, your program must also fend off attacks by malicious nano-drones that are also present in the virtual world. The drones consume energy from the sludge, but never deliver it to the collection points. They will attempt to copy their program to your NANORGs, turning them into useless drones. If you're up for a real programming challenge, this is the project for you! (This project was adapted from Symantec's 2006 University Programming Contest.)

[Difficulty](#) = 8 – 10

[Tangent Circles and Triangles](#)

Here is a project that combines Computer Science and Mathematics. The two circles are tangent to one another at point *A*. Their diameters are parallel. Prove that points *A*, *D* and *F* are co-linear. You'll also learn how to create an interactive diagram to illustrate your proof, using an applet that runs in your Web browser. If you like solving problems and thinking logically, you'll like this project.

[Difficulty](#) = 8

[Circles, Tangent Lines and Triangles](#)

Here is a project that combines Computer Science and Mathematics. The semicircle has two tangent lines that meet at point *T*. You need to prove that a line drawn from *A* to *T* bisects *CD*. You'll also learn how to create an interactive diagram to illustrate your proof, using an applet that runs in your Web browser. If you like solving problems and thinking logically, you'll like this project.

[Difficulty](#) = 8

[Combining Computer Science and Math: Inscribing a Circle in a Triangle Using the Geometry Applet](#)

Here is a project that combines Computer Science and Mathematics. Prove a method for inscribing a circle within a triangle (as shown). You'll also learn how to create an interactive

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diagram to illustrate your proof, using an applet that runs in your Web browser. If you like solving problems and thinking logically, you'll like this project.

[Difficulty](#) = 8

[Combining Computer Science and Math: Circumscribing a Circle about a Triangle Using the Geometry Applet](#)

Here is a project that combines Computer Science and Mathematics. Prove a method for circumscribing a circle about a triangle (as shown). You'll also learn how to create an interactive diagram to illustrate your proof, using an applet that runs in your Web browser. If you like solving problems and thinking logically, you'll like this project.

[Difficulty](#) = 8