

Introduction to Cybersecurity

Overview

The job of a cybersecurity team is to try to find vulnerabilities in software or websites that allow someone to get information or access that they shouldn't have. To find those vulnerabilities, the cybersecurity team (sometimes called pen testers or white hat hackers) has to try to break into the website. In this lesson, students will take on the role of a cybersecurity team and try to find vulnerabilities in websites!

Activity Plan

Part I: Meet a Cybersecurity Expert!

Watch this news feature on Parisa Tabriz, Google's Security Princess: <https://www.youtube.com/watch?v=usGw6zosbms>

Lesson Goals

- Look through a website's code to see how it is made
- Modify a website's code in the browser

Materials Needed

- Access to the internet
- Accounts on Hackthissite.org
 - One of the challenges requires a real email address, so use one you can access when you sign up
 - You may need to have your school IT whitelist this site

Tell students: *Today we're going to be a team of cybersecurity experts, like Parisa Tabriz's team at Google. We're going to try to find exploits that allow us to get information from websites. The first thing we're going to do is practice accessing and changing the code behind a website.*

Part 2: Inspecting Websites

Teacher Note: For this section, students will modify Google's main search site. They will change the text and the images on the website, and it will look different on their screens. It's important to note that they're not actually changing Google's website. The files for any website live on a server somewhere, and students are not modifying those original files in this example. Instead, they're modifying the version of the website that they have on their computers. If someone else loads Google on their computer, or if the student refreshes the page, the site that loads will be Google's site from the server, and any changes the student made will be erased. That said, as we'll see when we move to Hack This Site, there's still a lot of vulnerabilities that can be exploited even without access to the original files!

Have students go to google.com, and open up the Inspect panel.

If security were all that mattered, computers would never be turned on, let alone hooked into a network with literally millions of potential intruders.

-Dan Farmer

With the Inspect panel, you should be able to change the About/Store text at the top of Google's homepage, the main Google image above the search box, and the text below the search buttons. You might be able to change more! (It will depend somewhat on the Google homepage on the day you do this.) Have students experiment and see what they can change!

Here is a video showing how to make these three changes (notice how when Google reloads at the end, our changes have been erased):

[How to change Google's homepage](#)

And here are instructions for changing the About/Store text

at the top:

- Load google.com
- Right click on the page, and choose Inspect. This will bring up a panel on the right of the screen where you can see the code for the website.
- If you hover over the code, the section of the website that's controlled by that section of code will be highlighted.
- Find the div section that controls the About and Store text on the top left.
- Click on the arrow to the left of the div to expose the nested code. You should now see two sections that start with "<a class". At the end of the first section, you should see "About ", and at the end of the second section, you should see "Store ."
- Change the "About" and "Store" text and see what happens!

Have students get comfortable with navigating the code that makes up the website. This will be important when you move to Hackthissite.org!

Part 3: Hack This Site!

Once students are comfortable modifying the code, have them log on to Hackthissite.org. Students should try to complete the following challenges:

- Basic missions (1-6):
<https://www.hackthissite.org/missions/basic/>
 - 1-5 can be completed using the Inspect panel or View Page Source
 - 6 is a cryptography challenge--students must figure out the code!
- Realistic mission 1:
<https://www.hackthissite.org/playlevel/1/>
 - Can be completed using the Inspect panel

Answers

- Write-up