

Title: Building Better Bases: Threat Modeling for Cyber Survival

Short Description: Practice threat modeling, an important cybersecurity concept, through group discussion and guided base building.

Introduction: The internet can be a scary place, full of identity theft, data breaches, and bad apples. In this workshop students will get an introduction to threat modeling, a common information security practice, and begin to understand how security measures are shaped not only by the types of risks at hand, but also the probability they will happen and the impact if or when they did occur.

Student Ages: 8+

Subject: Computer Science

Skills: Cybersecurity, Design

Lesson Language: English

Learning Objectives:

1. Practice threat modeling, a fundamental cybersecurity skill.
2. Collect and analyze design requirements based on Minecraft knowledge.
3. Evaluate security features based on their practicality and effectiveness.

Guiding Ideas and Questions:

- *What do you want to protect in Minecraft? What info about yourself do you want to protect online?*

The idea behind this question is to get students thinking about how their security needs are individualized. Not everyone has the same threat model.

- *Who do you want to protect your Minecraft base from? For example, are you playing single player (against the computer) or on multiplayer server with other people?*

Context is key. In the same way an environment change in Minecraft could mean fending off more monsters, in the real world as laws change or website become hacked, so do your risk factors.

- *How likely is it that you will need to protect your Minecraft base?*

In other words, what's the probability of a security incident actually happening. Low probability threats are usually safe to ignore. If you go to bed at night in Minecraft there's very low probability of an attack.

- *How bad are the consequences if you fail? What's the worst-case scenario?*

Planning ahead is your best defense in Minecraft and in real life.

- *What are the tradeoffs between convenience and security?*

Many students begin the process of base design by creating doorways or path ways over lava that are extremely difficult to enter or exit, but also put themselves at risk if they are not careful. Is this really the best solution?

Student Activities:

1. Have students complete the (partially filled) out threat model on the associated worksheet individually or as a group. The top level describes what is at **risk**, and below that is each individual threat and the harm they could cause.
2. While looking at the completed threat model chart, rate each risk based on the **probability** and **impact** of each threat. Is it high, medium, or low? For example, are Creepers (high probability, high impact) a bigger threat than Skeletons (medium probability, low impact)? Should you care at all about dragons (low probability, high impact)?
3. Using the answers from the previous step and previously collected Minecraft knowledge, work towards designing the best security defenses possible in game. Try to fix or defend the *high probability, high impact* problems first. Use the Security Layer Map and/or 16x16 grid lines on the worksheet to help plan before they build.
4. As time allows, ask students to present their design ideas. Relate them back to the threat model as it was completed. Students may be eager to explain their concept in full detail. Pay close attention to the interaction between security layers and context.

Performance Expectations:

- Students should be able to explain and justify their design choices based on a complete threat model.
- Threat models do not need to be complete but should instead reflect their understanding of the game.