1.1 PROBLEM STATEMENT

What problem is your project trying to solve? Use non-technical jargon as much as possible.

Our project is trying to solve faster wireless communication which is not easy to use in rural areas compared to other areas. Our program will simulate rural wireless infrastructure in order to educate students as to how it works, as well as let them play around with it.

1.2 REQUIREMENTS & CONSTRAINTS

List all requirements for your project . This includes functional requirements (specification), resource requirements, qualitative aesthetics requirements, economic/market requirements, environmental requirements, UI requirements, and any others relevant to your project. When a requirement is also a quantitative constraint, either separate it into a list of constraints, or annotate at the end of requirement as "**(constraint)**". Other requirements can be a single list or can be broken out into multiple lists based on the category.

- Project must build upon the Minetest base game.

- Some parts of the simulation won't match 1:1 like reality, but they must get as close as reasonably possible.

- Project must be able to be distributed to every FFA and 4H student in IA

- Project must be easy to install and set up

- Each object must have communication between players, as well as environment

- Must not violate any of Minetest's copyright

- Must use a local server, designed specifically for a classroom

- Must provide a smooth gameplay experience on a variety of hardware.

1.3 ENGINEERING STANDARDS

What Engineering standards are likely to apply to your project? Some standards might be built into your requirements (Use 802.11 ac wifi standard) and many others might fall out of design. For each standard listed, also provide a brief justification.

29119-1-2021 - ISO/IEC/IEEE International Standard - Software and systems engineering --Software testing --Part 1:General concepts

https://ieeexplore.ieee.org/document/9698145

-This standard is useful to us because it breaks down the standard concepts and policies for software testing. Once we have started development of our software then we will need to begin testing it and this should help us with that.

P802.11bc/D2.0, Oct 2021 - Telecommunications and information exchange between systems Local and metropolitan area networks – Specific requirements - Part 11: Wireless LAN

Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Amendment: Enhanced Broadcast Service

https://ieeexplore.ieee.org/document/9650686

The scope of this standard is defining a medium access control and several physical layer specifications for wireless connectivity for fixed, portable, and moving stations within a local area. This standard applies because our project requires wireless communication to enable a simulation experience through Minetest in Iowa.

211-2018 - IEEE Standard Definitions of Terms for Radio Wave Propagation

https://ieeexplore.ieee.org/servlet/opac?punumber=8657411

This standard provides terms and definitions used in the context of electromagnetic wave propagation relating to the fields of telecommunications. Once we've built the system, we will need it to describe our project.

1.4 Intended Users and Uses

Who benefits from the results of your project? Who cares that it exists? How will they use it? Enumerating as many "use cases" as possible also helps you make sure that your requirements are complete (each use case may give rise to its own set of requirements).

-Students will enjoy a fun and educational experience about rural 5G broadband connections

-Farmers will enjoy it for seeing how a 5G Broadband connection can help them with their farm

-Teachers can give their students a fun and educational experience

-4H and FFA students can enjoy getting experience with the future of farming