NEA Analysis Research

Map Generation

* Making a 2D grid for blocks
  + A grid of GameObjects
    - Using Instantiate() and a Prefab to build a grid
    - Only sprites on the top-layer will have a collider or physics applied to optimise the game
    - Will use % to make a defined grid dimension
    - Block sprites will be spawned from Unity Prefabs
    - Mouse position will be used as a pointer for block placement, within a range of the player
* Terrain generation techniques
  + Perlin Noise
    - In Unity using Mathf.PerlinNoise to generate 1D Perlin noise to generate hills and valleys
    - Using 2d Perlin noise to generate caves.
    - Multiplying Perlin noise to vary cave systems.
  + Adding map features (e.g., trees, NPC locations)
    - Made by filtering 1D Perlin noise for areas above a defined threshold
* Chunk Loading
  + Using a Dictionary
    - Using a Dictionary to save each chunk’s GameObjects and Position, then loading and unloading them based on a players x-coordinate
    - Each chuck can be saved as a different scene in unity and loaded in and out by the SceneManager.LoadScene and SceneManager.UnloadSceneAsync
* Textures
  + Player
    - Artwork will be pixel art
    - Made in photoshop
    - Using frame by frame animation
  + Blocks
    - Blocks will be made onto spritesheets and added to each block-types prefab

Inventory System and Building

* Inventory Layout
  + UI can be made using Unity Canvas
  + Stored off screen and moved into view when activated
* Managing Blocks
  + Upon breaking a block, a placeholder item is placed in the world
  + Placeholder items are left on the ground, once they contact the player a counter is incremented for the player, placeholder item is deleted
* Building
  + A highlight is moved based on mouse position MOD by the index of the grid
  + Position of the highlight is stored, upon a button press the selected block can be instantiated at the highlighted position
  + Added to each scene based on position, which will enable each scene to be loaded in and out while saving buildings made.

Online In Unity

* <https://www.raywenderlich.com/2015-creating-a-cross-platform-multiplayer-game-in-unity-part-1>