To design a character creator, we should consider ways in which the player should be able to interact with it. To make sure the player has a truly customizable experience, the player should be able to choose from many different selections of character traits and apply them to the character. Trait options will include physical characteristics such as body type, facial features, skin color, hairstyle, and additional characteristics such as clothing and accessories.

When adjusting the character's body type, the player should have access to a spectrum of features rather than just a set of predetermined choices. This approach allows the player to adjust different components of the character’s body across a scale of values. Since this approach provides players with a degree of freedom of customization, additional technical considerations need to be taken care of. We would need to ensure that animations and character movement function correctly across all the customizable components in the game.

The most common way to handle this is to break the skeletal mesh for the character into separate components rather than treating it as a single mesh. The skeleton can be broken into separate components for the torso, legs, arms, and head. Each of these components can be adjusted individually before being assembled and animated.

Many game engines such as Unity and Unreal provide their workflow for doing this, Unreal provides a Mesh Merge functionality in Blueprint that allows these separate meshes to be easily combined into a single mesh object. Additionally, Unreal provides the ability to dedicate one component of the skeleton as the Master Pose Component, which then serves as the ground truth for character animations. For example, if the torso component was labeled as the master component, then when an animation is triggered in the torso, the paired animation will be triggered in the subcomponents. This functionality is incredibly helpful for ensuring that animations remain synced between skeletal components.

Once we have the working body type in the character creator, we can then begin to consider how we will map physical features and clothing to the character skeleton. Typically, this is performed through a process called “skinning”, where a 3D mesh is attached to an existing 3D form. The 3D mesh must have vertices that match the joints in the model. This generally requires some manual work to ensure that each of the meshes fits correctly to the model. This technique can be applied to physical features as well as clothing and accessories. By configuring this system, the player will be able to select between different characteristics like facial features, skin color, hairstyle, and clothing components, and have each character be mapped independently to the skeleton.

With these techniques, we can build a modular character creator that gives the player a great deal of control over character design.