SPRITING TUTORIAL - V. 2.0

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This tutorial is design to give an insight as to how to approach spriting Doom-style game sprites and HUD graphics. It is only meant to guide you, not teach you every intricate detail in art. Because understanding of a subject is unique to each individual, no amount of tutorials or how-tos will magically give you all you need. It is the goal of this tutorial, however, to guide and show a path to attaining that personal understanding in this art form.

Before proceeding, note that this tutorial depicts only one of many methodologies in spriting. Each artist has their own touch and style, and I'm only able to show what I know. By no means should you take any of this tutorial to be absolute. I will try my best not to force any of my personal styles upon you, and do my best to guide you to your own understanding of the subject.

To make this tutorial meaningful, the basics needed for spriting must first be introduced. This includes simple perspective (mostly for weapons) and basic anatomy (for monsters). The understanding of the fundamentals paramount for most forms of art, however it's beyond the scope of this tutorial to show you everything you might need. Only what I find absolutely necessary will be shown.

Finally, improvement doesn't come from reading tutorials and how-to books, it stems from dedication and aspiration. To improve, you must practice, consistently, and be self-critical enough to pick out flaws from your current works, and improve them in future attempts. Without practice and an intention to improve, no amount of reading will make you any better. I will, however, show you some shortcuts I've learned over the years to make the spriting process faster.

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I. BASIC PERSPECTIVE

Perspective is a way to represent a three-dimensional object, scenery, or space accurately and convincingly on the two-dimensional surface of your canvas. It's goal is to create the a sense of space and distance. Although there are many forms of perspective, some stylistic, an understanding of the basics in this area is of absolute importance if once wishes to produce convincing pieces of art with space. To create HUD weapons, this is an absolutely necessary lesson.

1. Eye-Level

The Eye-Level line (or Horizon Line) is the first and foremost concept that one must understand in perspective. It is an imaginary line (or of you can see the Horizon, then the eye-level is the Horizon line) that tells you what object is above your view, and what is below your view. The Eye-Level is basically the height of the viewer's eyes.

Here is an example:

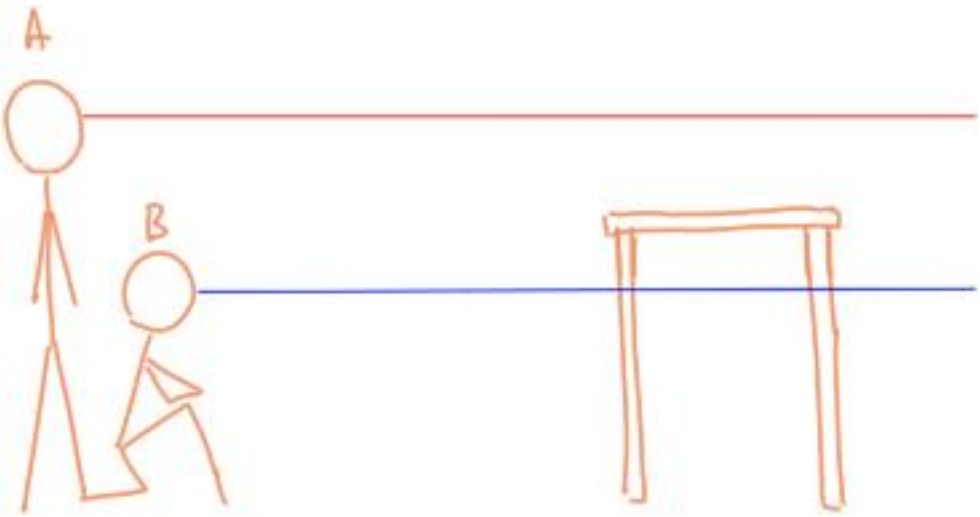

Figure 1: child A and B's eye-level

Say you have 2 children looking at a table. Child A is standing, while child B is kneeling. The red and blue lines represent the eye-level of Child A and B, respectively. This is how high, relative to the table their eyes. Tilting one's head up and down won't really change this (although the vanishing points will change - but that's not important right now).

Below are what the two children see.

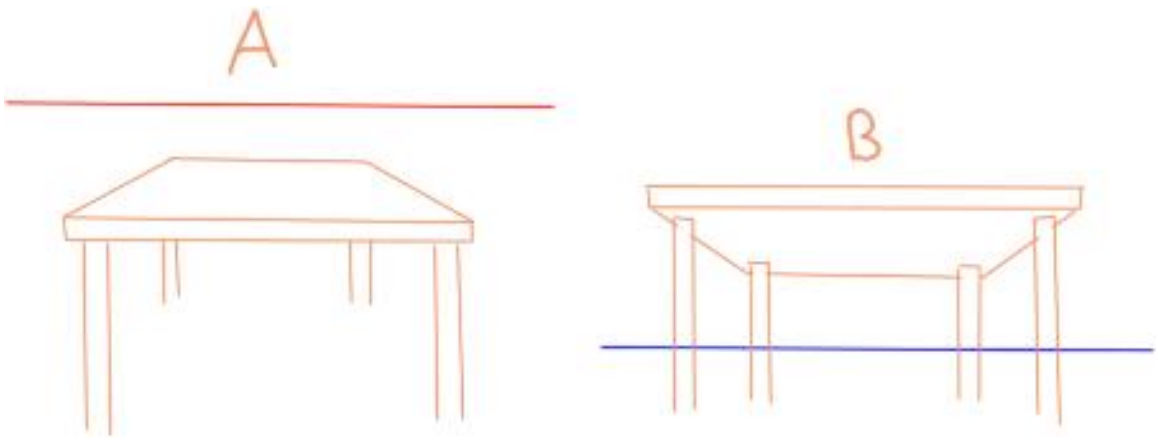

Figure 2: table viewed by Child A vs. Child B

The red horizontal line is the eye-level of Child A, and the Blue horizontal line is that of Child B. You can see, since Child A's eye level is higher than the top of the table, it sees the table from the top, whereas Child B's eye level is lower than the table, thus he sees the table from below. (Note: The eye-level line should raise or lower as the viewers eyes raises or lowers).

In summary, your eye-level determines how you will view the object. Anything above your eye-level will be seen from below, anything below your eye level will be seen from above, and anything exactly at eye-level will be seen dead one - neither from above nor below.

Below are some further examples:

Say you're looking at three magically floating boxes that are vertically parallel to one another. You would see them as shown on the right.

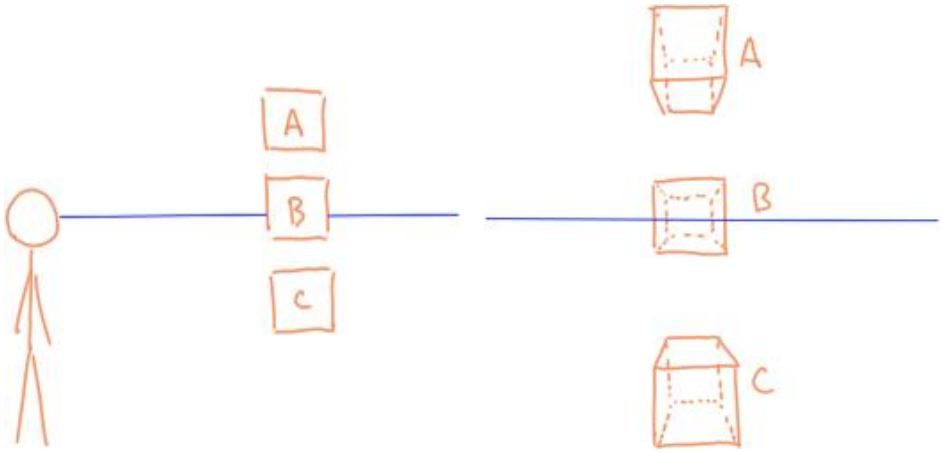

Figure 3: three boxes relative to eye-level

2. One-Point Perspective

You might have noticed that the an object gets smaller as it gets further away. This is the second most important aspect of perspective - vanishing points. It is important to note that **all sets of parallel lines in perspective will have a single vanishing point**. The simplest of these is one-point perspective, aptly named because there are only 1 set of parallel lines in perspective, and thus 1 vanishing point.

Below is an example:

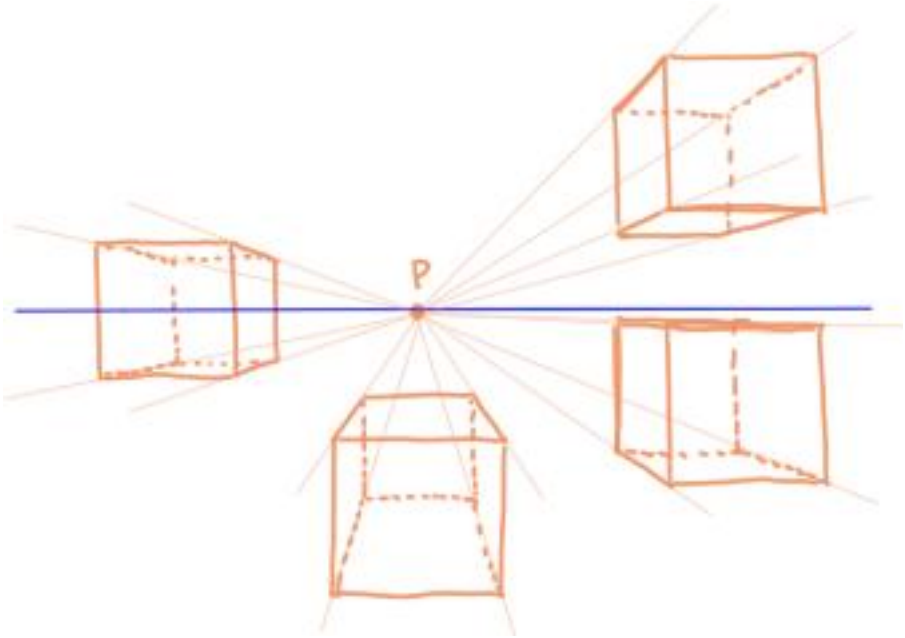

Figure 4: boxes in one-point perspective

Note that the vertical and horizontal lines don't have vanishing points, since their plane is parallel to you viewing plane. The viewing plane can be imagined as a piece of glass where you are looking through, and that you are drawing what you see through it on its surface. Since the backs of these cubes have the same orientation as your "glass" canvas, they don't have vanishing points that you can see. You will notice that the box gets smaller as it extends into the distance. The reason of why this is shown in figure 5 below.

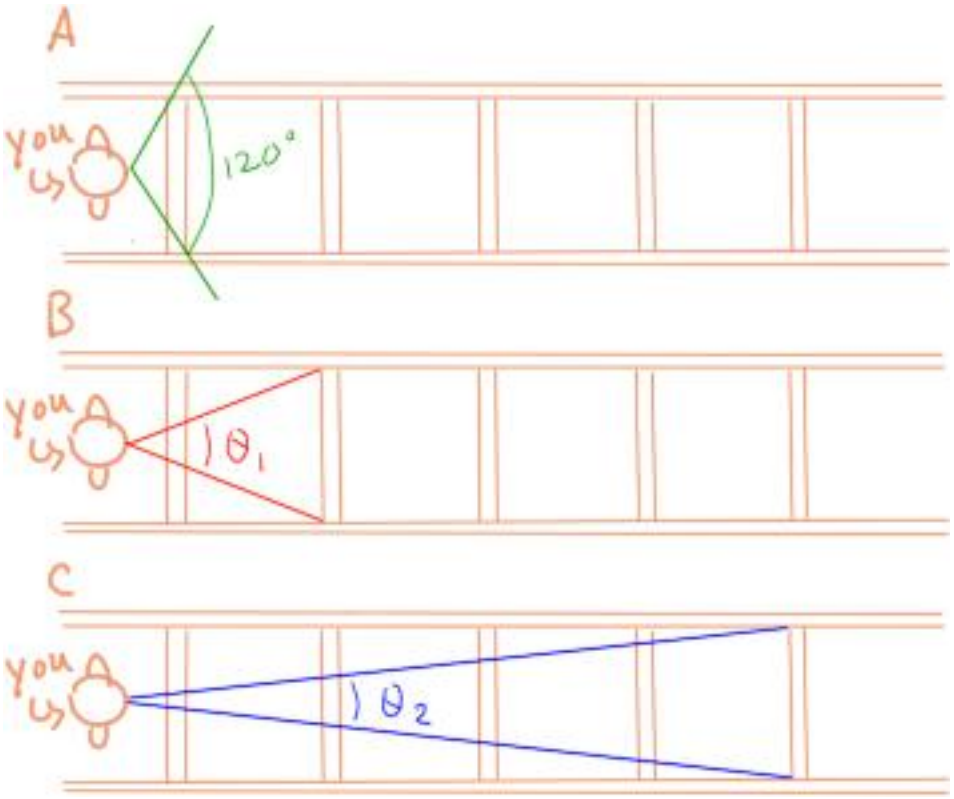

Figure 5: field of view and object size

Using the above figure as the reference, say you're staring down a railroad track. Assuming that the human field of view is about 120º in either direction (not perfectly accurate), image A represents how wide of an image you can see (120º). Why images looking bigger up close, and smaller far away is explained by B and C. Objects up-close ($\tilde{e}_1$) has a large viewing angle than objects farther away ($\tilde{e}_2$). Since you're representing a circular view on a flat surface, objects that occupy a larger portion of your field of view must be larger, and thus objects closer to you appear larger than objects further away. In relation to the boxes in figure 4, the edges closer to you occupies a larger view-angle than the edges farther out, face farther away appear smaller, and thus the boxes looks like they converge toward a single point in perspective.

As you can imagine, one-point perspective is a bit limited in application since it limits you to depicted objects that are wither 90º or 180º relative from your view. Still understanding one-point perspective is essentially all you will need for HUD weapon graphics, rather they centered or angled. Although monsters will need more.

Realistically, one point perspective will only get you so far, since rare do objects all align themselves within 90 or 180º within your view. To completely cover everything necessary for this tutorial, we must also explore two-point perspective.

3. Two-Point Perspective

The next level of up in understanding perspective is two-point. As the name might imply, there are two vanishing points. This isn't terribly useful for HUD weapon graphics at low resolutions, but has it's uses depending on how your weapon is oriented (in the next section). Below is an example and how to find your two vanishing points on paper/canvas.

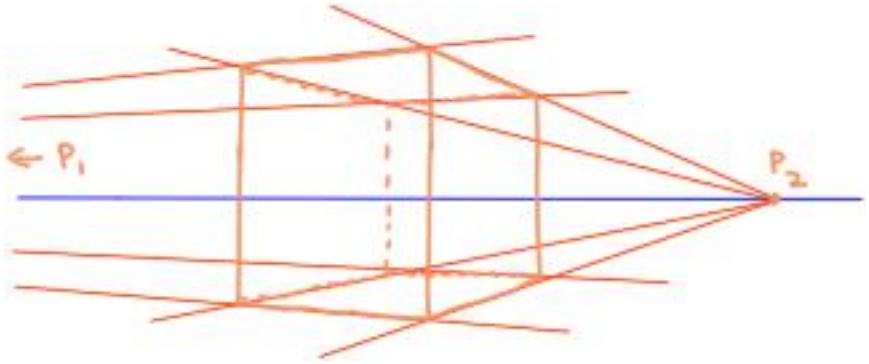

Figure 6: box with two-point perspective.

As you can see, this box has 2 vanishing points p1 and p2. In two-point perspective you will often find that one or both vanishing points are off the page (in this case, point p1). As before all parallel lines converge onto one point.

It's important to learn to find the right vanishing points if you want to create a convincing image. This is often difficult, but there are several methods to find rather your vanishing point is on or off the canvas. This is shown below

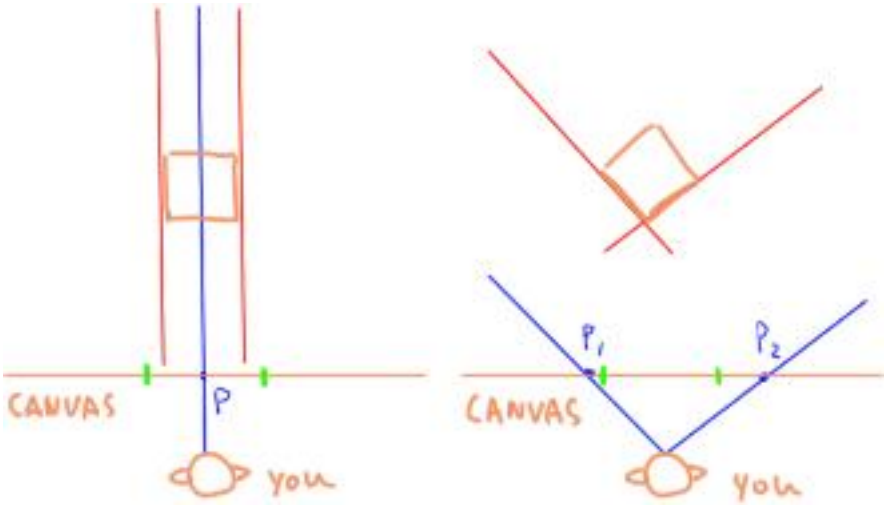

Figure 7: finding vanishing points

To find the right perspective, imagine holding a piece of glass in front of you, and that this piece of glass is your canvas and you are to capture the image you see through the glass, on the glass' surface. The canvas in figure 7 is representing by the horizontal orange line.

To show how this method works, both one-point and two-point perspectives. For one-point perspective, the VP is trivial - it's always at the center of the canvas. This point is found by first finding any line on your object that isn't parallel with the canvas, and extending them (red lines). Then draw a view-projection (blue line(s)) that is parallel to those extensions from the center of your head (to keep it simple). You will notice that from the center of your head, there **can be only one** view-projection that is parallel to extensions. Where this line intersects with your "glass" canvas is where your vanishing point is on the canvas. This works the same way with an object that isn't oriented to have any of it's surfaces parallel to your canvas. In the second image in figure 7, there are two sets of parallel lines that are not orthogonal to your canvas - thus two VPs.

There are two things that determine rather your VPs will be on or off the canvas. The first is how large your canvas is. Notice that in the right image of figure 7. if the canvas was the full length of the orange line, the vanishing points are on the canvas. If the canvas only extended between the two green markers, then the points are off the canvas.

The second thing that determines rather the VPs are on the canvas or not is the orientation of your object. This is shown below.

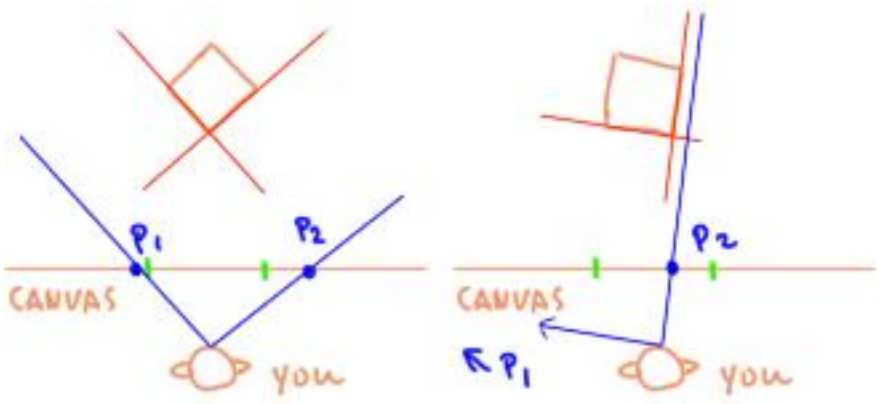

Figure 8: vanishing points based on orientation

As one can see, rotating the object to change its orientation changes the vanishing points location on the canvas. The second image in figure 8 has p1 being completely off the canvas.

There are a number of aspects, however, that will NOT change the vanishing points location. These include the objects size and position. The best way to demonstrate this, is through an example image:

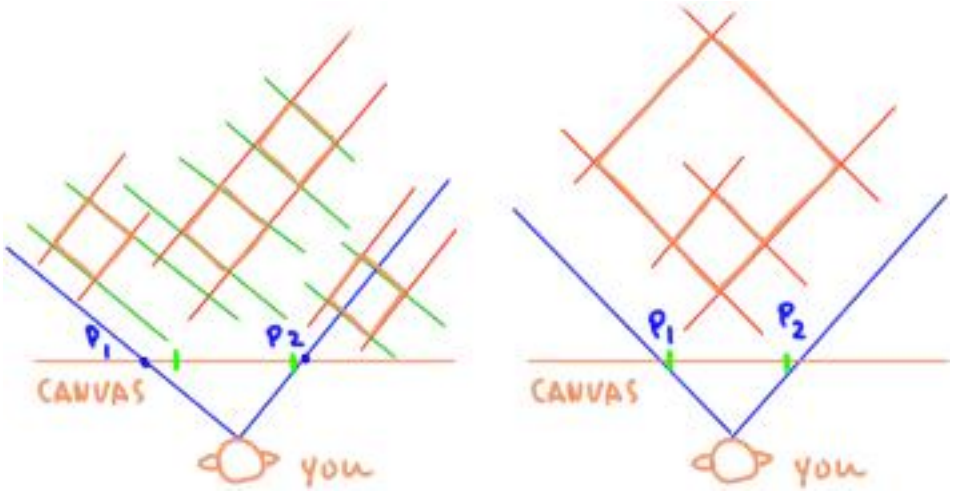

Figure 9: VP relationship with size and position

From the left image in figure 9, it's clear that regardless of the orange boxes position, if all the red and green extensions are indeed parallel, then there can one only 1 view-projections that are parallel to each, and thus there are 2 vanishing points on the canvas. The same is true for the sizes of the object. The large and small boxes on the right image have the same vanishing points.