perspective()

Sets a perspective projection for the camera.

In a perspective projection, shapes that are further from the camera appear smaller than shapes that are near the camera. This technique, called foreshortening, creates realistic 3D scenes. It's applied by default in new `p5.Camera` objects.

`myCamera.perspective()` changes the camera's perspective by changing its viewing frustum. The frustum is the volume of space that's visible to the camera. The frustum's shape is a pyramid with its top cut off. The camera is placed where the top of the pyramid should be and points towards the base of the pyramid. It views everything within the frustum.

The first parameter, `fovy`, is the camera's vertical field of view. It's an angle that describes how tall or narrow a view the camera has. For example, calling `myCamera.perspective(0.5)` sets the camera's vertical field of view to 0.5 radians. By default, `fovy` is calculated based on the sketch's height and the camera's default z-coordinate, which is 800. The formula for the default `fovy` is `2 * atan(height / 2 / 800)`.

The second parameter, `aspect`, is the camera's aspect ratio. It's a number that describes the ratio of the top plane's width to its height. For example, calling `myCamera.perspective(0.5, 1.5)` sets the camera's field of view to 0.5 radians and aspect ratio to 1.5, which would make shapes appear thinner on a square canvas. By default, `aspect` is set to `width / height`.

The third parameter, `near`, is the distance from the camera to the near plane. For example, calling `myCamera.perspective(0.5, 1.5, 100)` sets the camera's field of view to 0.5 radians, its aspect ratio to 1.5, and places the near plane 100 pixels from the camera. Any shapes drawn less than 100 pixels from the camera won't be visible. By default, `near` is set to `0.1 * 800`, which is 1/10th the default distance between the camera and the origin.

The fourth parameter, `far`, is the distance from the camera to the far plane. For example, calling `myCamera.perspective(0.5, 1.5, 100, 10000)` sets the camera's field of view to 0.5 radians, its aspect ratio to 1.5, places the near plane 100 pixels from the camera, and places the far plane 10,000 pixels from the camera. Any shapes drawn more than 10,000 pixels from the camera won't be visible. By default, `far` is set to `10 * 800`, which is 10 times the default distance between the camera and the origin.

Examples

```
// Double-click to toggle between cameras.

let cam1;
let cam2;
let isDefaultCamera = true;

function setup() {
  createCanvas(100, 100, WEBGL);

  // Create the first camera.
  // Keep its default settings.
  cam1 = createCamera();

  // Create the second camera.
  cam2 = createCamera();

  // Place it at the top-right.
  cam2.camera(400, -400, 800);

  // Set its fovy to 0.2.
  // Set its aspect to 1.5.
  // Set its near to 600.
  // Set its far to 1200.
  cam2.perspective(0.2, 1.5, 600, 1200);

  // Set the current camera to cam1.
  setCamera(cam1);

  describe('A white cube on a gray background. The camera
toggles between a frontal view and a skewed aerial view when
the user double-clicks.');
```

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// Double-click to toggle between cameras.

let cam1;
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  cam2.camera(400, -400, 800);

  // Set its fovy to 0.2.
  // Set its aspect to 1.5.
  // Set its near to 600.
  // Set its far to 1200.
  cam2.perspective(0.2, 1.5, 600, 1200);

  // Set the current camera to cam1.
  setCamera(cam1);

  describe('A white cube moves left and right on a gray
background. The camera toggles between a frontal and a skewed
aerial view when the user double-clicks.');
```

Syntax

```
perspective([fovy], [aspect], [near], [far])
```

Parameters

fovy	Number: camera frustum vertical field of view. Defaults to `2 * atan(height / 2 / 800)`.
aspect	Number: camera frustum aspect ratio. Defaults to `width / height`.
near	Number: distance from the camera to the near clipping plane. Defaults to `0.1 * 800`.
far	Number: distance from the camera to the far clipping plane. Defaults to `10 * 800`.

This page is generated from the comments in src/webgl/p5.Camera.js . Please feel free to edit it and submit a pull request!

Related References

camera
Sets the position and orientation of the camera.

centerX
The x-coordinate of the place where the camera looks.

centerY
The y-coordinate of the place where the camera looks.

centerZ
The y-coordinate of the place where the camera looks.