## Framebuffers

- the framebuffer contains the memory resources needed to render an image
  - color buffer holds color data
  - depth buffer holds depth values
  - stencil buffer can be used to limit the area of rendering (potentially in conjunction with the depth buffer)
- the default framebuffer is used for the image that appears on the screen
  - associated with the graphics context
- additional framebuffers can be created and used for offscreen rendering
  - e.g. to render to a texture

CPSC 424: Computer Graphics • Fall 2025

101

# Render to Texture

### The idea -

- create a texture object, but without specifying image data
- create a framebuffer to render to
- attach the texture to the framebuffer as a color buffer
- create an additional renderbuffer for use as a depth buffer
- attach that renderbuffer to the framebuffer as a depth buffer
- draw to the framebuffer
- draw the scene using the generated texture

done in initGL

if depth buffer is needed

done in draw

2424: Computer Graphics • Fall 2025

Renderbuffers

- renderbuffers are memory that can be attached to a framebuffer for use as a color buffer, depth buffer, or stencil buffer
- for render-to-texture, the texture object is used as the color buffer
  - an additional renderbuffer is needed for the depth buffer if rendering texture from a 3D scene
  - (depth buffer is not needed for rendering 2D scenes)

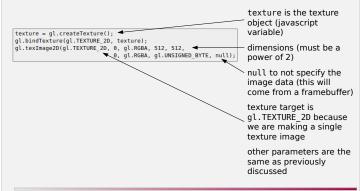
CPSC 424: Computer Graphics • Fall 2025

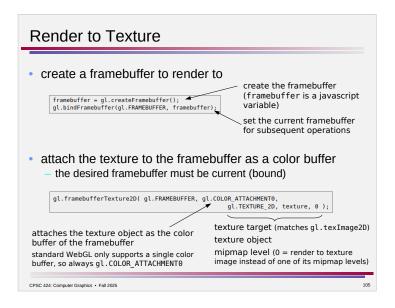
CPSC 424: Computer Graphics • Fall 2025

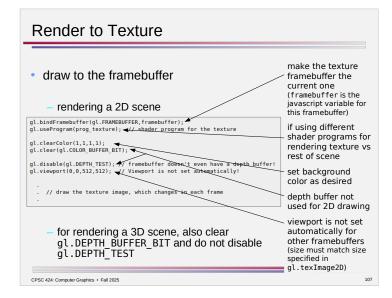
10

## Render to Texture

create a texture object, but without specifying image data







#### Render to Texture If rendering a 3D scene for the texture - create an additional renderbuffer for use as a allocate memory depth buffer bind, to set the var depthBuffer = gl.createRenderbuffer(); 🖛 current buffer gl.bindRenderbuffer(gl.RENDERBUFFER, depthBuffer); gl.renderbufferStorage(gl.RENDERBUFFER, gl.DEPTH\_COMPONENT16, 512, 512); for subsequent operations set up the renderbuffer gl.DEPTH COMPONENT16 specifies that it will be used as a depth buffer with 16 bits per pixel size must match the framebuffer size attach that renderbuffer to the framebuffer as a depth buffer the desired framebuffer must be current (bound) renderbuffer as a depth buffer gl.framebufferRenderbuffer(gl.FRAMEBUFFER, gl.DEPTH\_ATTACHMENT, renderbuffer is gl.RENDERBUFFER, renderbuffer); the variable for the buffer CPSC 424: Computer Graphics • Fall 2025

