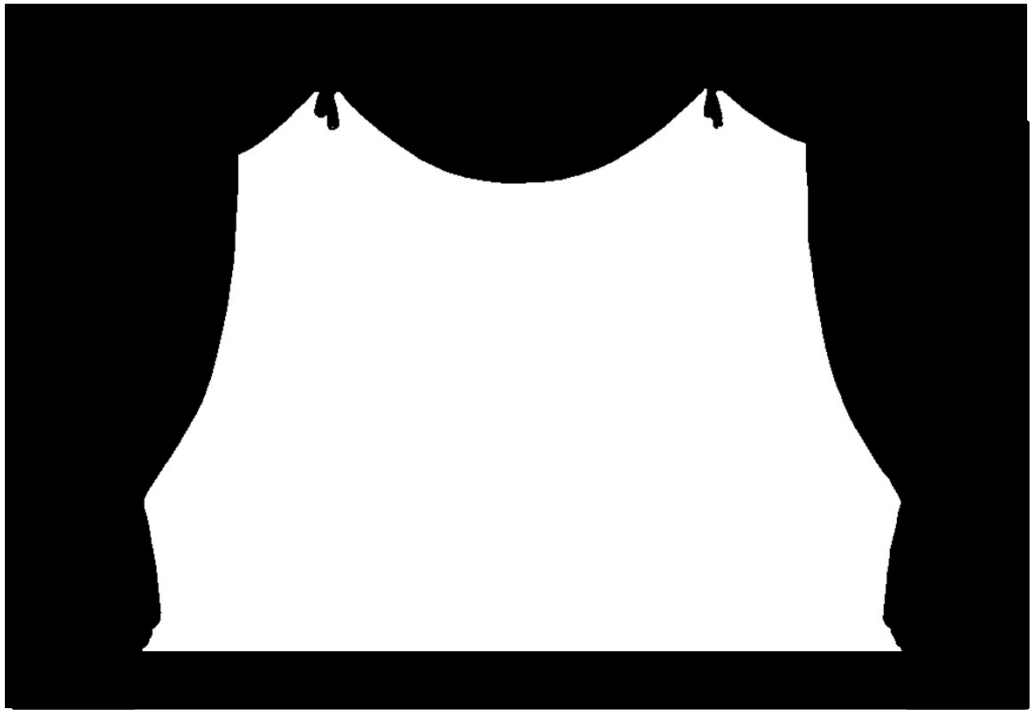
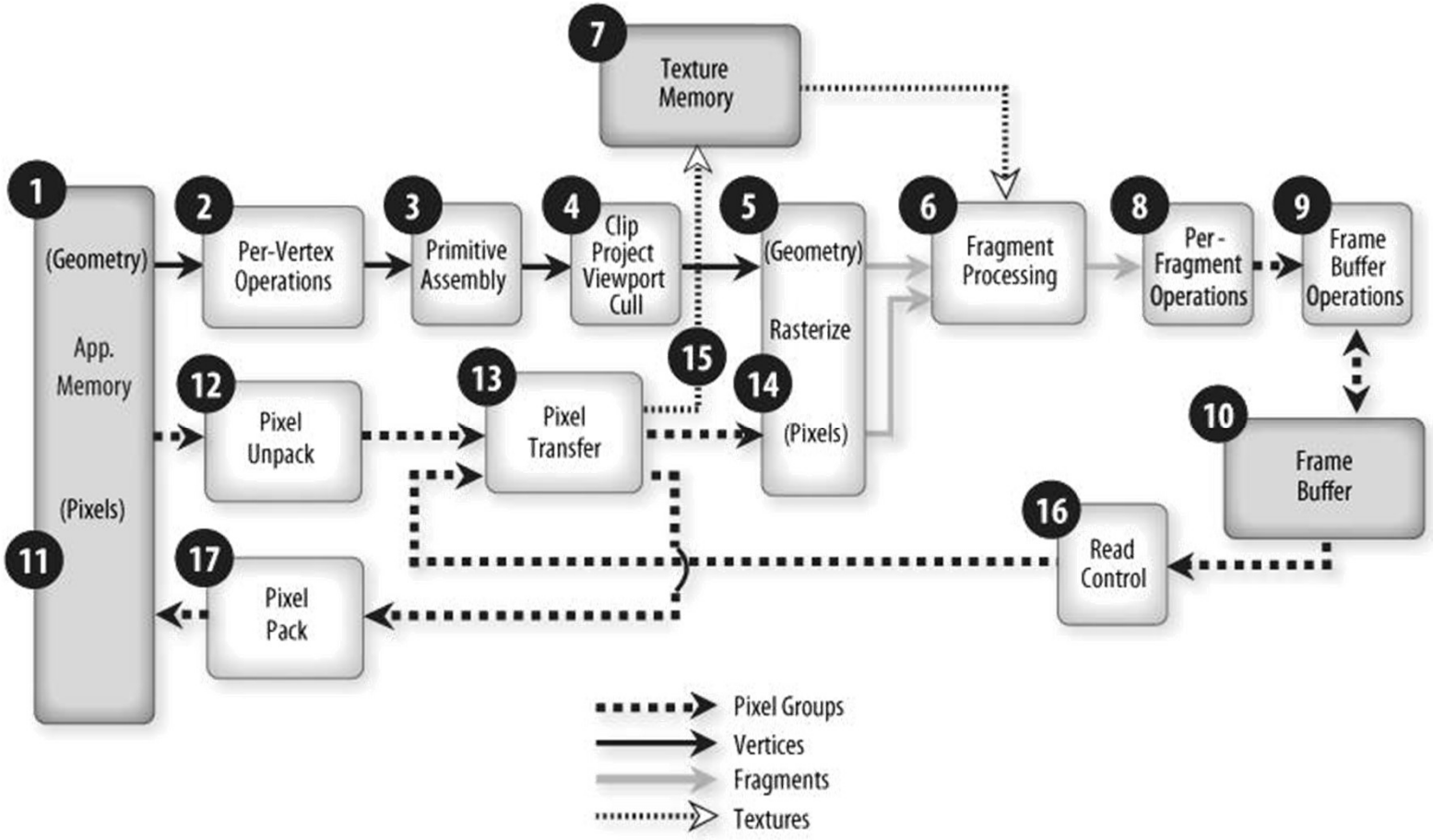
Stencil Buffer

Professors de Gràfics

Stencil buffer



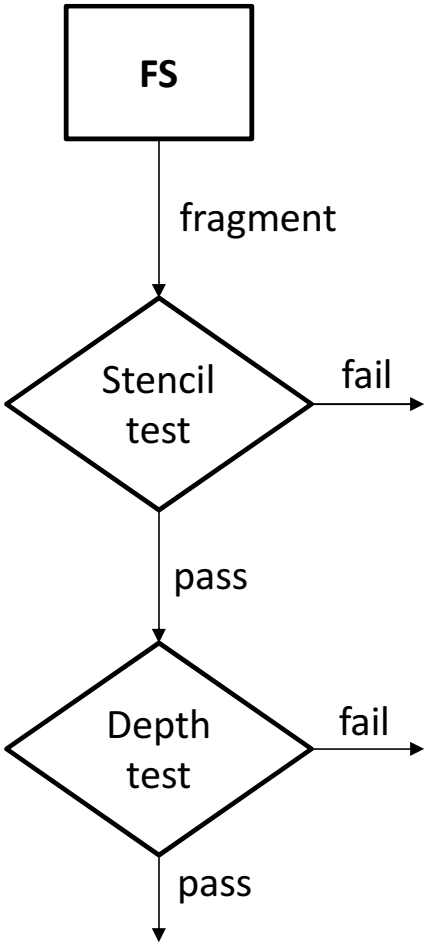
Pipeline OpenGL



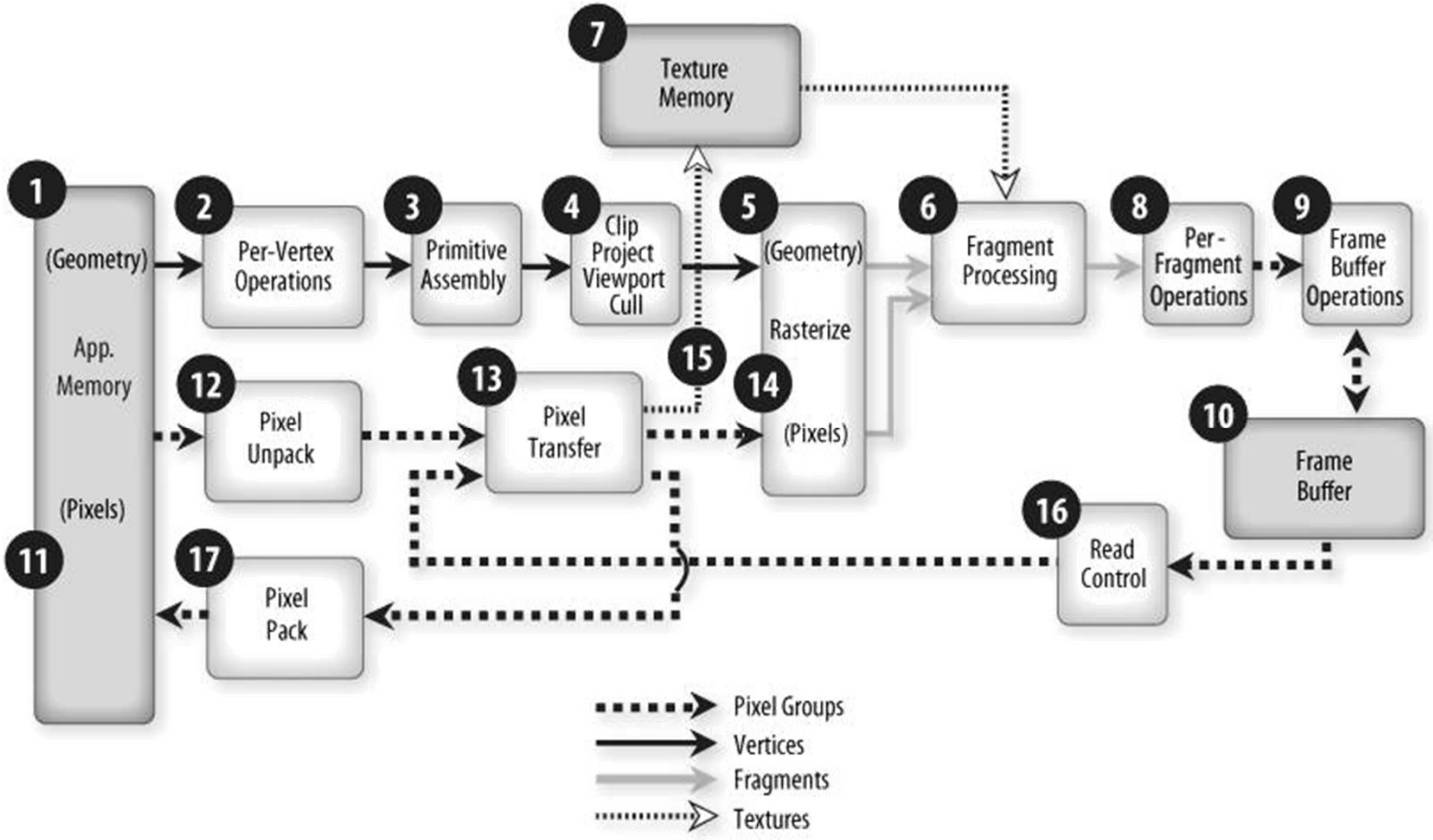
Pipeline OpenGL

8. Per-fragment operations (“raster operations”)

- Pixel ownership
- Scissor test
- Alpha test
- **Stencil test**
- **Depth test (test Z-buffer)**
- Blending
- Dithering
- Logical Ops (glLogicOp)



Pipeline OpenGL



Pipeline OpenGL

9. Frame buffer operations

- Es modifiquen els buffers que s'hagin escollit amb glDrawBuffers
- Es veu afectada per **glColorMask**, **glDepthMask**…

Stencil buffer

El stencil buffer guarda, per cada pixel, un enter entre $0..2^n-1$.

- Demanar una finestra OpenGL amb stencil:
  - QOpenGLformat f;
  - f.setStencil(true);
  - QOpenGLformat::setDefaultFormat(f);

- Obtenir el núm. de bits del stencil:
  - glGetIntegerv(GL_STENCIL_BITS, &nbits);

- Esborrar stencil (no li afecta glStencilFunc(), sí glStencilMask):
  - glClearStencil(0);
  - glClear(GL_STENCIL_BUFFER_BIT);

Stencil buffer

- Establir el test de comparació:
  - glEnable(GL_STENCIL_TEST);
  - **glStencilFunc**(comparació, valorRef, mask)
    - Comparació pot ser: GL_NEVER, GL_ALWAYS, GL_LESS…
    - Ex: GL_LESS: (valorRef & mask) < (valorStencil &mask)

- Operacions a fer a stencil buffer segons el resultat del test:
  - **glStencilOp**(fail, zfail, zpass)
    - fail -> op. a fer quan el fragment no passa el test de stencil
    - Zfail -> op. a fer quan passa stencil, pero no passa z-buffer
    - Zpass -> op. a fer quan passa stencil i passa z-buffer
  - Cadascú dels paràmetres anteriors pot ser:
    - GL_KEEP, GL_ZERO, GL_INCR, GL_DECR, GL_INVERT
    - GL_REPLACE (usa valor refèrencia)

Stencil buffer

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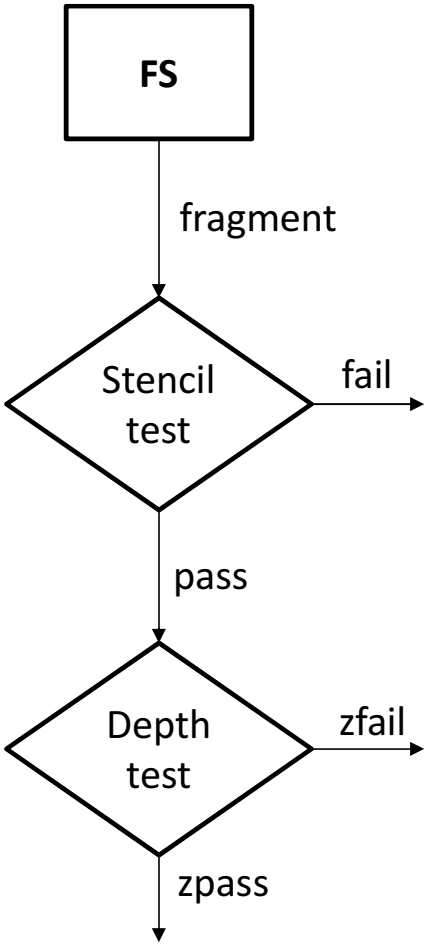
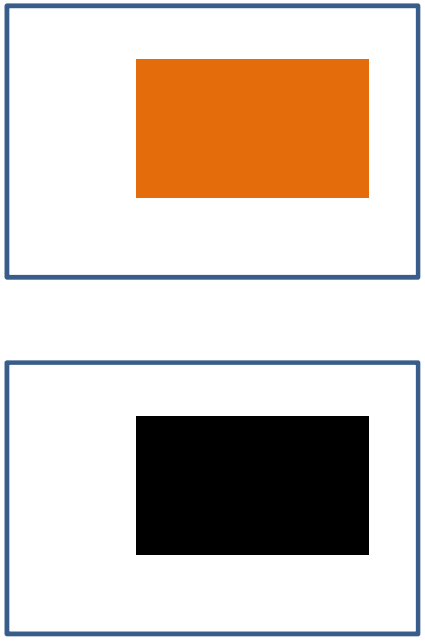
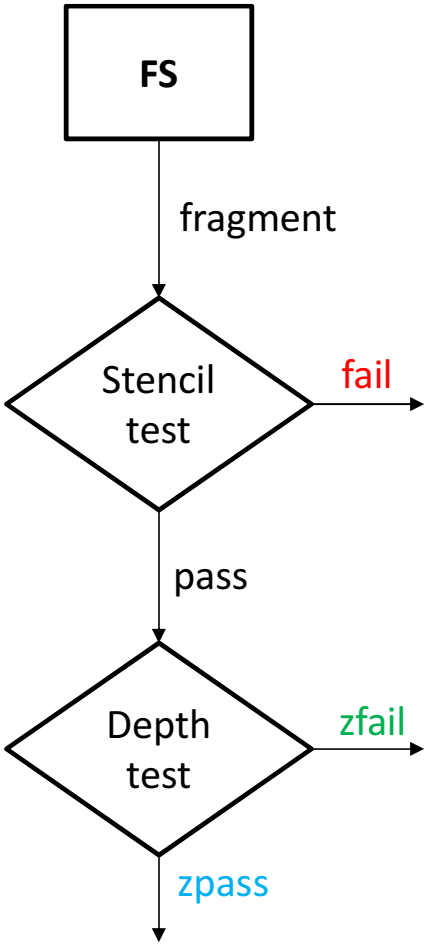


Stencil buffer

```
glEnable(GL_STENCIL_TEST);
glStencilFunc(GL_ALWAYS, 1, 255);
glStencilOp(GL_KEEP,  GL_KEEP,  GL_REPLACE);
drawQuad()
```





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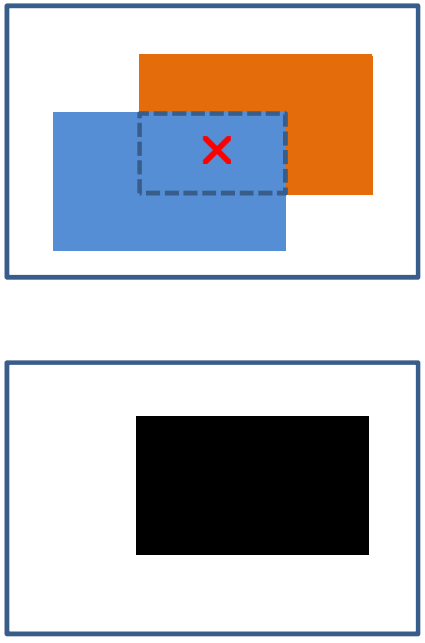
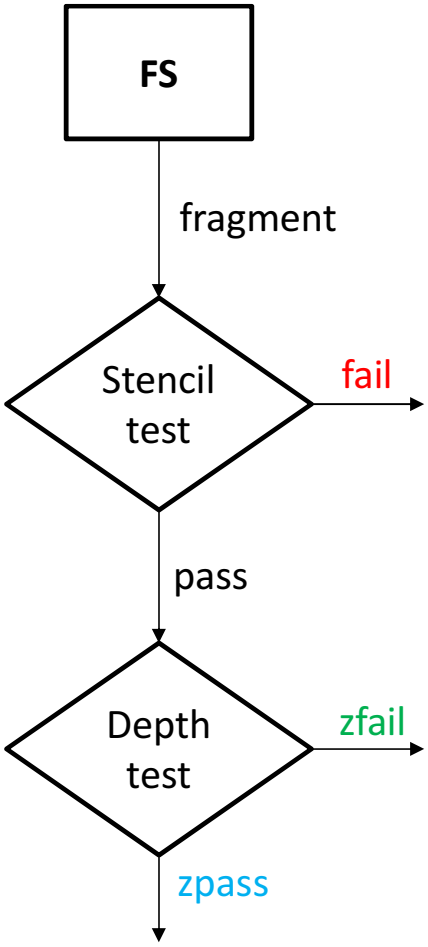
```
glStencilFunc(GL_EQUAL, 0, 255);
glStencilOp(GL_KEEP,  GL_KEEP,  GL_KEEP);
drawQuad();
```





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