WebGPU Shading Language (WGSL) type categories
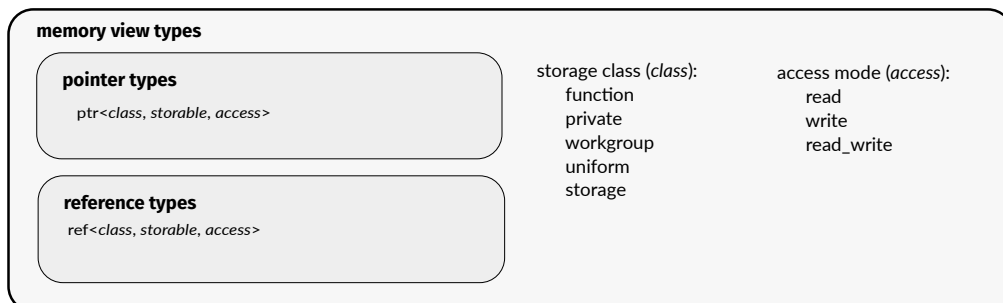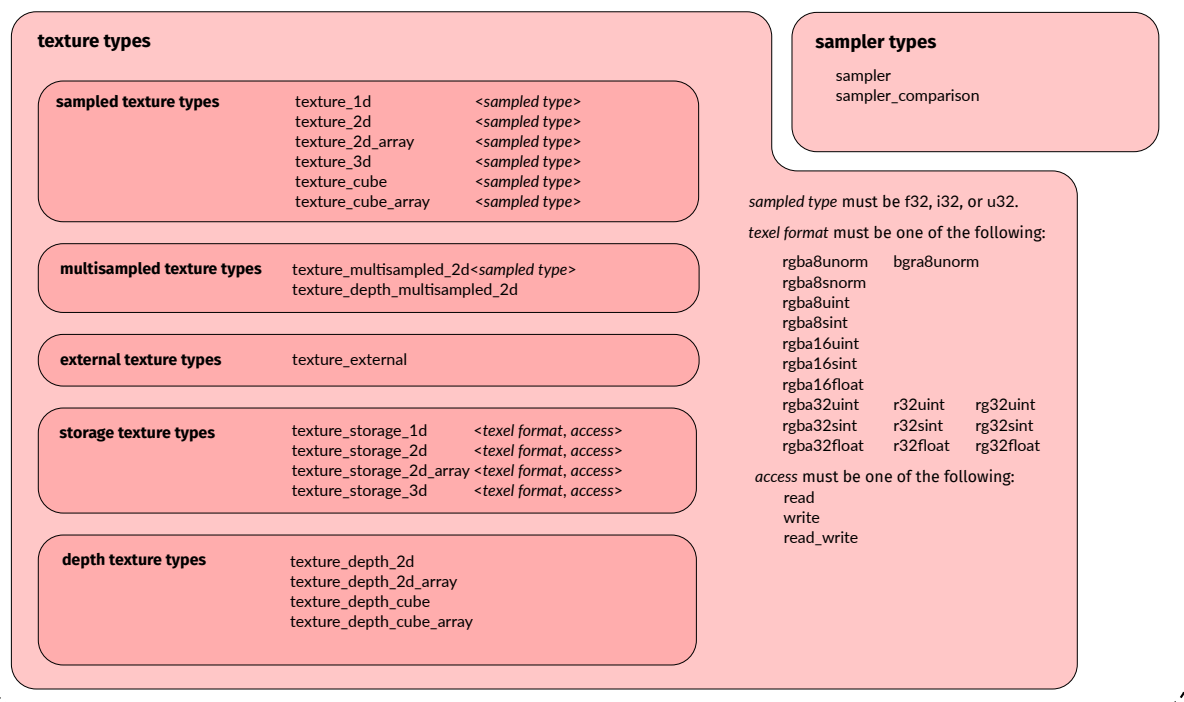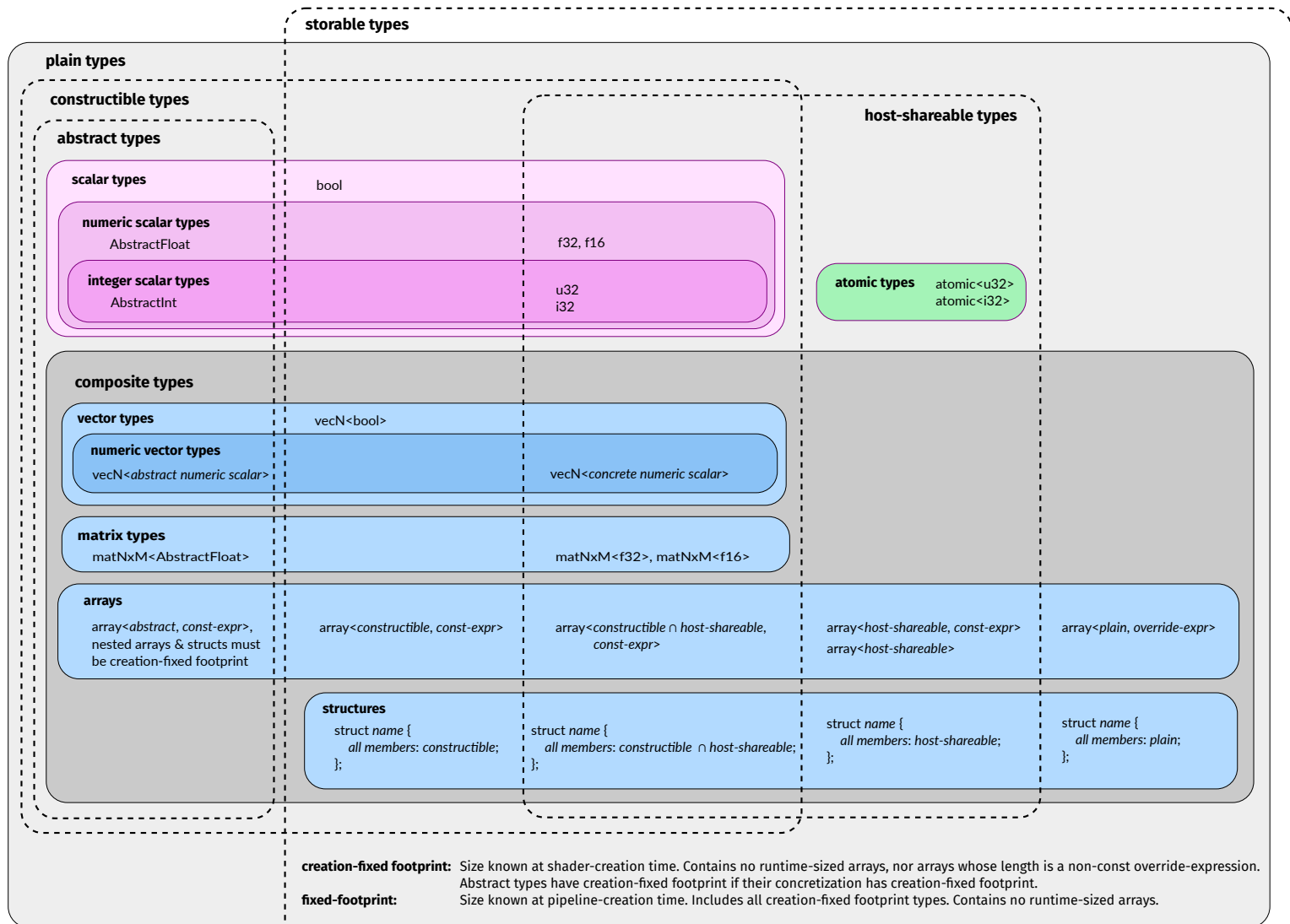
storable types

plain types

constructible types

abstract types

scalar types   bool

numeric scalar types
AbstractFloat   f32, f16

integer scalar types
AbstractInt   u32
i32

host-shareable types

atomic types   atomic<u32>
atomic<i32>

composite types

vector types   vecN<bool>

numeric vector types
vecN<*abstract numeric scalar*>   vecN<*concrete numeric scalar*>

matrix types
matNxM<AbstractFloat>   matNxM<f32>, matNxM<f16>

arrays
array<*abstract, const-expr*>,   array<*constructible, const-expr*>   array<*constructible ∩ host-shareable,*   array<*host-shareable, const-expr*>   array<*plain, override-expr*>
nested arrays & structs must   *const-expr*>   array<*host-shareable*>
be creation-fixed footprint

structures
struct *name* {   struct *name* {   struct *name* {   struct *name* {
    all members: constructible;   *all members: constructible ∩ host-shareable;*   *all members: host-shareable;*   *all members: plain;*
};   };   };   };

creation-fixed footprint: Size known at shader-creation time. Contains no runtime-sized arrays, nor arrays whose length is a non-const override-expression.
Abstract types have creation-fixed footprint if their concretization has creation-fixed footprint.
fixed-footprint: Size known at pipeline-creation time. Includes all creation-fixed footprint types. Contains no runtime-sized arrays.

texture types

sampled texture types   texture_1d   <*sampled type*>
texture_2d   <*sampled type*>
texture_2d_array   <*sampled type*>
texture_3d   <*sampled type*>
texture_cube   <*sampled type*>
texture_cube_array   <*sampled type*>

multisampled texture types   texture_multisampled_2d<*sampled type*>
texture_depth_multisampled_2d

external texture types   texture_external

storage texture types   texture_storage_1d   <*texel format, access*>
texture_storage_2d   <*texel format, access*>
texture_storage_2d_array   <*texel format, access*>
texture_storage_3d   <*texel format, access*>

depth texture types   texture_depth_2d
texture_depth_2d_array
texture_depth_cube
texture_depth_cube_array

sampler types

sampler
sampler_comparison

sampled type must be f32, i32, or u32.

texel format must be one of the following:

rgba8unorm   bgra8unorm
rgba8snorm
rgba8uint
rgba8sint
rgba16uint
rgba16sint
rgba16float
rgba32uint   r32uint   rg32uint
rgba32sint   r32sint   rg32sint
rgba32float   r32float   rg32float

access must be one of the following:
read
write
read_write

memory view types

pointer types

ptr<*class, storable, access*>

reference types

ref<*class, storable, access*>

storage class (*class*):
function
private
workgroup
uniform
storage

access mode (*access*):
read
write
read_write

(N, M = 2, 3, 4)