BUFFER OVERVIEW

This document shows the usage of buffers during one frame

INITIALIZATION STAGE

MODIFICATION STAGE

RELEASE STAGE

Init Flags
- sets all flags to its default values

Update Alive Buffers
- copies all pointers from the AliveSwapBuffer (that was filled in previous frame) to AliveBuffer if particle is alive in current frame
- updates value in AliveCounterBuffer to to currently alive particles

Reset Force
- resets force for each particle that is alive

Emitter
- every emitter has its own region in the ParticleBuffer
- overwrites slots that are empty or where particles are dead

- adds pointers to emitted particles in AlivePointerBuffer
- updates AliveCounterBuffer accordingly

- increments EmitterCounterBuffer until enough particles got emitted

There can be an arbitrary amount of emitters. Each emitter has its own region in the ParticleBuffer. The buffersize automatically adapts to the sum of all emittersizes.

Selections
- a pointer to a living particle is added to the SelectionPointerBuffer when a particle gets selected by one or several attributes
- the SelectionCounterBuffer gets incremented then
- the ID of the successful selector is stored for every particle in the SelectionIndexBuffer

- Selections update the FlagBuffer so that following modifiers do address particles either with the SelectionPointerBuffer or the AlivePointerBuffer

Selectors can be logically combined. Note that the ID of the FIRST successful selector is stored in th SelectionIndexBuffer

Modifications
- a modification is applied to a particle according to the SelectionFlag in the FlagBuffer (they are are addressed either by SelectionPointerBuffer or AlivePointerBuffer)

- if a modifier is applied to a current selection the SelectionIndexBuffer can be used to address data that modifies the particle attribute

Update Alive Buffers
- copies all pointers to living particles from the AlivePointerBuffer to the AliveSwapBuffer

Iterator
- finally updates position, age & lifespan of alive particles

Selectors and Modificators can introduce arbitrary attributes. The particlesystem-structure automatically adapts to the them, so it is very easy to introduce completely new attributes by writing own Selectors and/or modificators.

ParticleBuffer
- stores all particle data

AlivePointerBuffer
- stores pointers to alive particles
- used in nearly all shaders to address particles

AliveCounterBuffer
- stores the number of alive particles
- used in nearly all shaders to address particles

AliveSwapBuffer
- is used to copy pointers to alive particles between successive frames

EmitterCounterBuffer
- used in emitters to control emission of particles

SelectionPointerBuffer
- stores pointers to selected particles
- used in modifier shaders to address selected particles

SelectionCounterBuffer
- stores the number of selected particles
- used in modifier shaders to address selected particles

SelectionIndexBuffer
- stores the index of the selector that succesfully selected a particle
- used in modifier shaders to assign data to selected particles

FlagBuffer
- stores flags to control behavior of shaders