New Data Types - Vectors

- Swizzling
  - Implemented in hardware -> almost free
- Three identical variants of accessing components as long as sets are not mixed
  - `xyzw`
  - `rgba`
  - `stpq`

```
vec4 pos = vec4(1, 2, 3, 4);
float c1 = pos.x;
float c2 = pos.w;
vec2  c3 = pos.xy;
vec2  c4 = pos.xz;
vec4  c5 = pos.wyzx;
vec4  c6 = pos.zzxx;
```

New Data Types - Vectors

- Arithmetic operations work component-wise
- Built-in functions operate on vectors component-wise
  - For example: `cos`, `sin`, `abs`, `sqrt`, ...
  - Also available `length`, `distance`, `normalize`, `dot`, `cross`, ...

```
vec2 a = vec2(13, 37);
vec2 b = vec2(85, 19);
vec2(a.x * b.x, a.y * b.y) == a * b;
```

```
vec2 a = vec2(13, 37);
vec3 b = vec3(85, 19, 08);
vec2(a.x * b.x, a.y * b.y) == a * b.xy
```