# Sun

This guide explains how to **recreate this project from scratch** in WebGPU Studio (without loading an example).

## 1) Goal and principle

We will create the buffers, paste the WGSL helper functions, write the compute shaders, then configure the Pass.

Steps (in order):

- **Pipeline 1**

## 2) Create a new project

1. Launch WebGPU Studio.
2. Click `New`.

## 3) Create the buffers (Buffers tab)

Create the following buffers (names must match exactly):

- **`texture1`**: size `128×64×128`, type `uint`, fill `random`

After each change, click `Apply`.

## 4) Add the helper library (Functions tab)

For each entry below:

1. Paste the WGSL.

### Bibliothèque 1

```
const SX = 128 ;
const SY = 64  ;
const SZ = 128 ;
```

## 5) Create the compute shaders (Compute Shaders tab)

For each shader:

1. Paste the WGSL.

### Shader `Compute1`

Workgroup: `8×8×1`

```
@compute @workgroup_size(4, 4, 4)
fn Compute1(@builtin(global_invocation_id) gid : vec3<u32>) {
    let index = gid.z * SX * SY + gid.y * SX + gid.x;
    // Soleil orange
    let dx = f32(gid.x) - ( f32(SX) / 2.0 + 10.0*cos( f32(step) / 20.0)
) ;
    let dy = f32(gid.y) - SY / 2 ;
    let dz = f32(gid.z) - SZ / 2 ;
    let d = sqrt(dx*dx + dy*dy + dz*dz) ;
    if ( d < 32.0 ) {
        texture1[index] = 0xFF4477FFu - u32(     d + 200.0 + 200.0*sin(
f32( gid.x+gid.y*gid.y + gid.z*gid.z*gid.z*5 + step) / 50.0   )       )
;
    } else {
        texture1[index] = 0x08FF7744u ;
    }
    // Mer bleue
    if ( gid.y <= u32( 6.0 + 5.0*cos(  f32(gid.z) / 5.0 +   f32(step) /
10.0 ))) {
        texture1[index] = 0xFFFF0000u ;
    }
    // Bordures rouges
    let bx: bool = (gid.x == 0u) || (gid.x == SX - 1u);
    let by: bool = (gid.y == 0u) || (gid.y == SY - 1u);
    let bz: bool = (gid.z == 0u) || (gid.z == SZ - 1u);
    let nb_bords: u32 = u32(bx) + u32(by) + u32(bz);
    if (nb_bords == 2u) {
        texture1[index] = 0xFF0000FFu;
    }
}
```

## 6) Configure the Pass (Pass tab)

Create the pipelines/steps in the following order:

- **Pipeline 1**: dispatch `32×16×32`

## 7) Compile and run

1. In the `Buffers` tab, select **`texture1`**.
2. View it in `2D` or `3D`.
3. Click `Compile`.

4. Click `Run` (or use `Step`).

## 8) Quick checks (if it doesn’t work)

- `Console` tab: read WGSL errors.
- Check buffer **names** match the WGSL code.
- Check buffer sizes (X/Y/Z) and Pass dispatch.

## 9) Save

Click `Save` to export the project as a `.wgstudio` file.