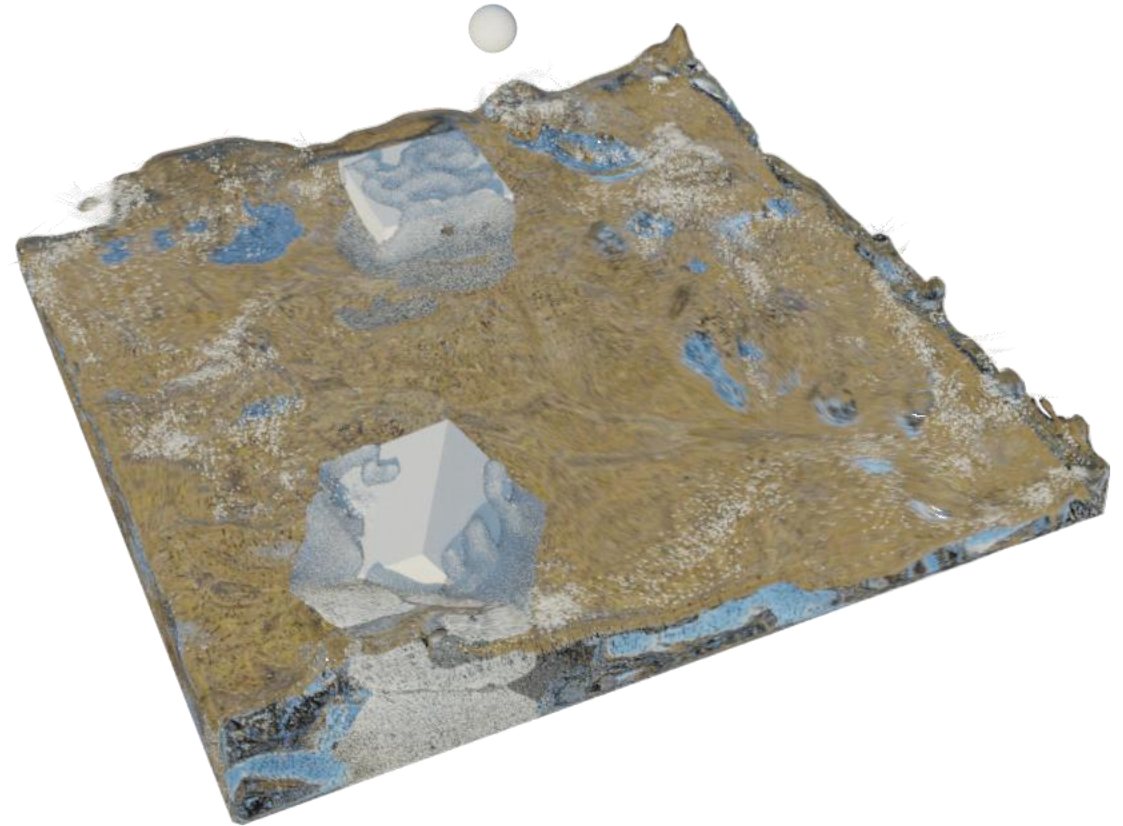


PV272

Cv 11

What do we create today?

Water



How do we create it?

- We are going to try and understand the basic workflow of liquid simulation in Blender
- Watch the finished result in the video in the zip

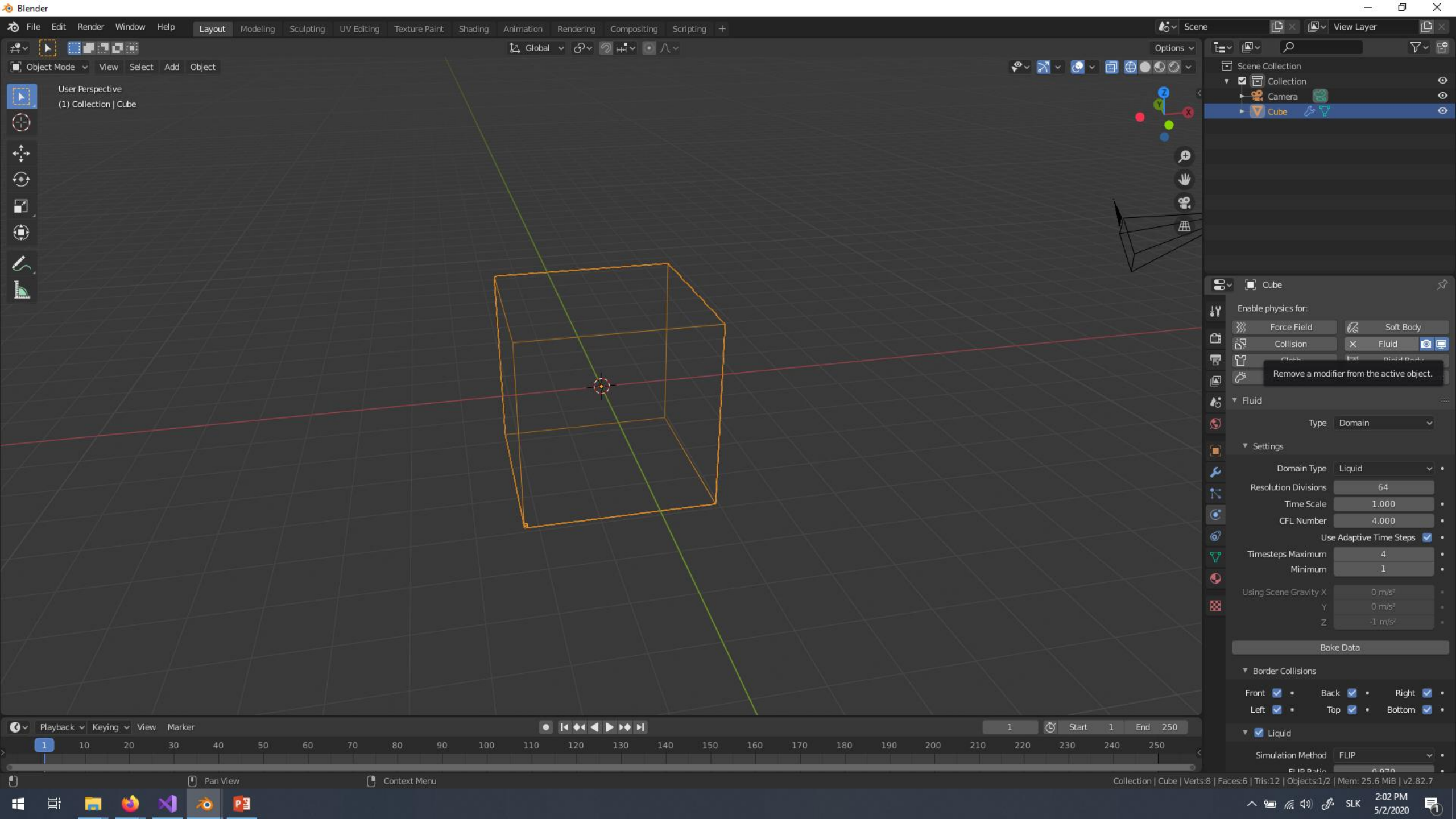
**SIMULATED
FLUID**

Source, Container and Obstacles

- In order to simulate fluid you need to
 - Create a container, where the simulation will take place
 - Create the source of the liquid
 - (Optional) Add various obstacles that will influence the liquid
- Liquid simulation and render is processor-heavy task, so we will do only a very basic setup, you can experiment more with various options on your own

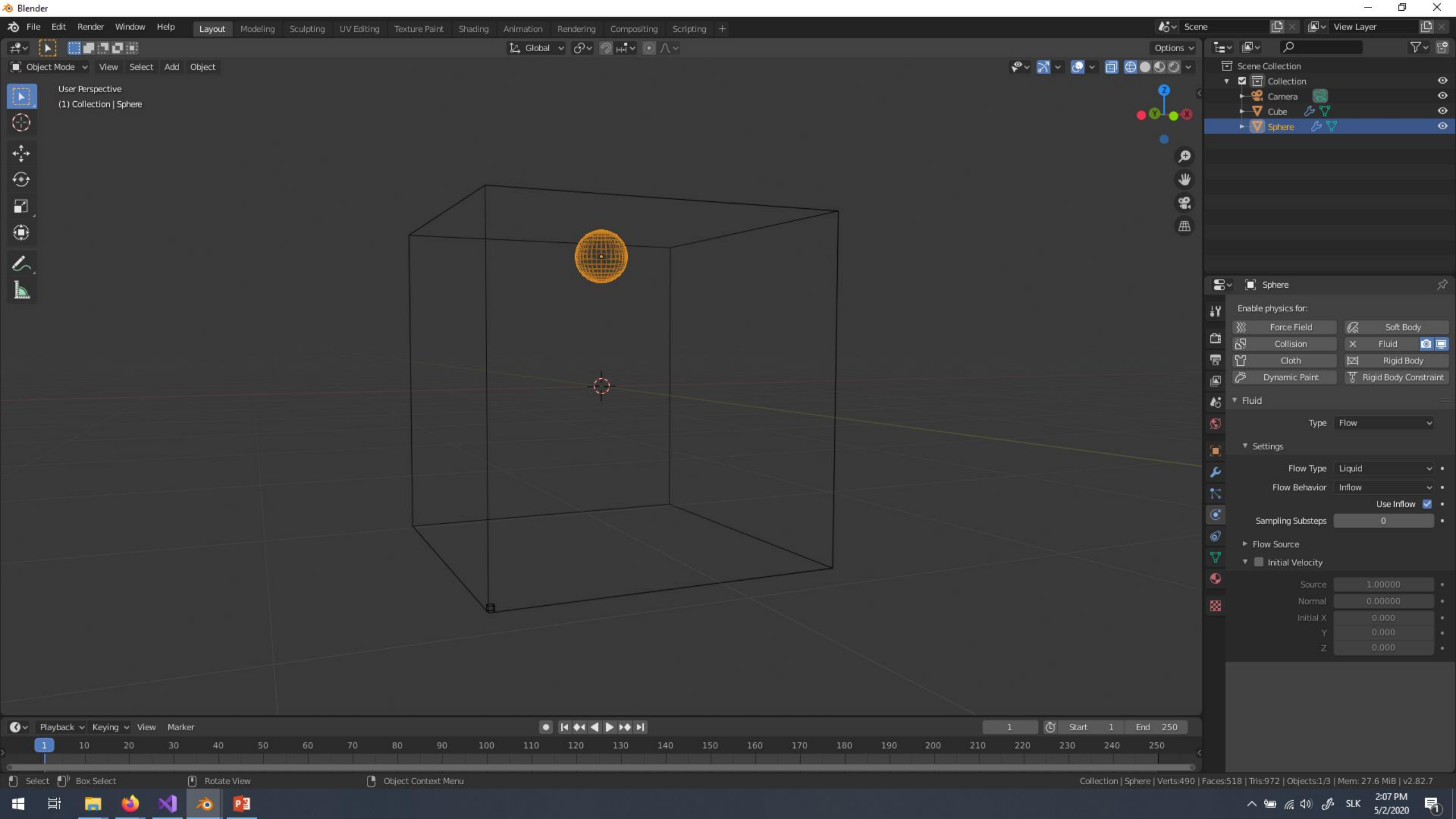
Create the container

- Select the default cube, make it double the size
- Go to the Physics tab
- Activate Fluid
- Select Domain from the drop-down menu
- Set Domain type to Liquid



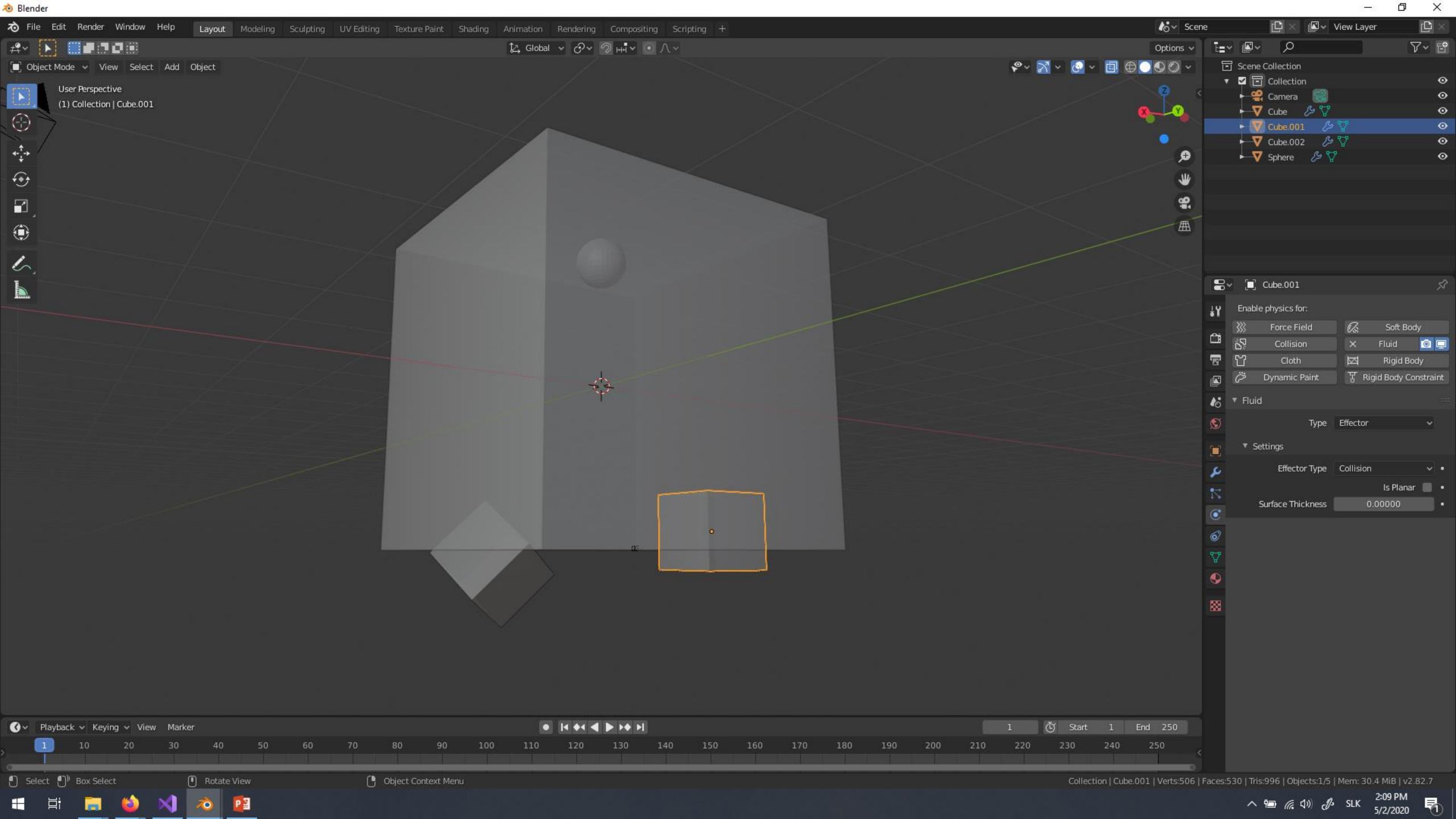
Create the source

- Add a UV sphere into the scene
- Make it small and place it inside the box, to the top
- Liquid will start pouring from this object as this is the source and will bounce around in the container
- Once again activate Fluid in the Physics tab
- Select Flow from the drop-down menu
- Flow type to Liquid
- Flow behavior to Inflow
 - This means the object will be used to add liquid into the scene
- We want the inflow to stop early so the container does not fill completely
 - Go to frame 40 and keyframe the “Use Inflow” checkmark
 - Hover mouse over it and press I
 - Go to frame 41, uncheck the “Use Inflow” field and keyframe it



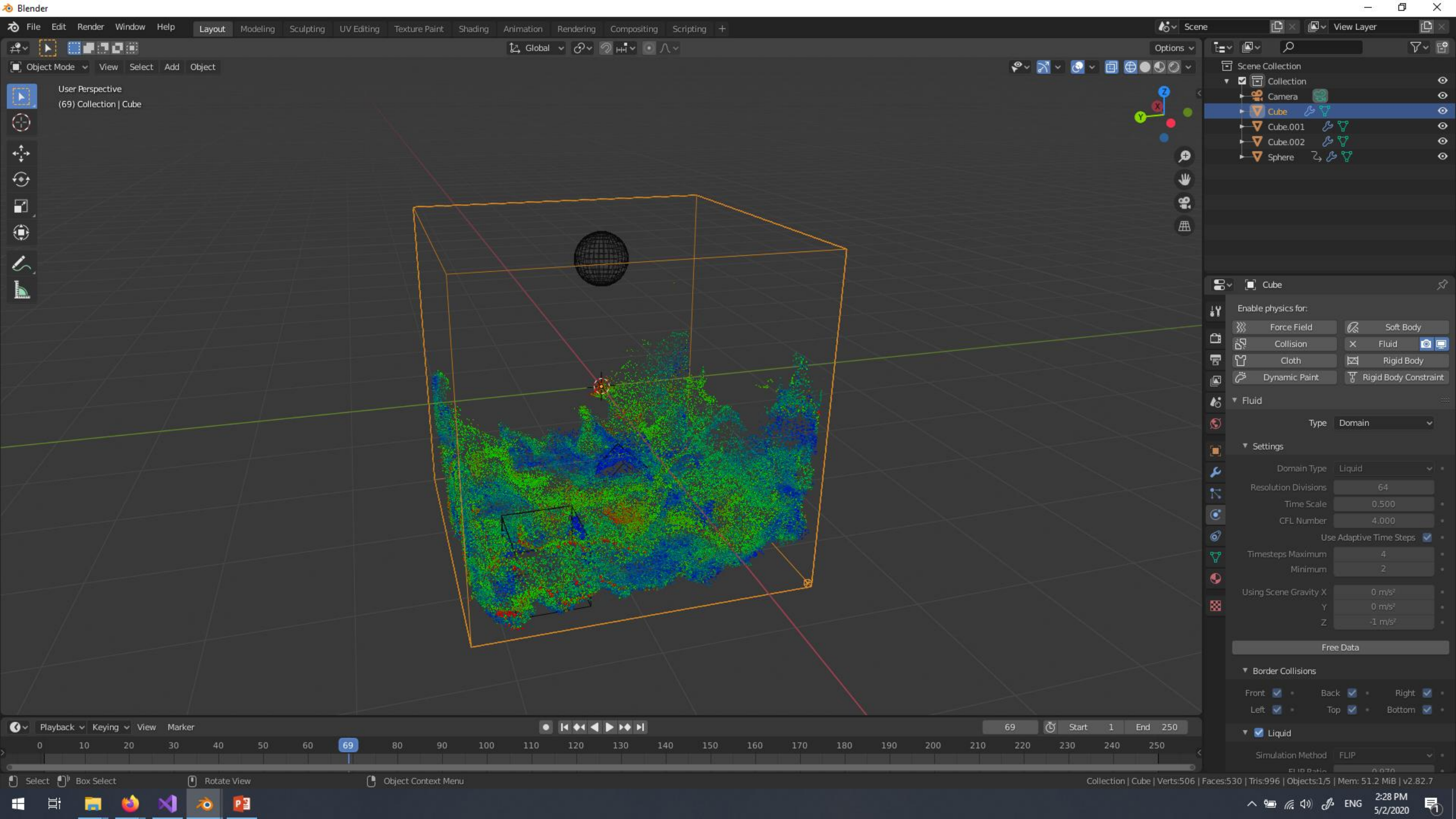
Create the obstacles

- Add a few cubes and place them at the bottom of the container
- Go to the Physics tab, activate Fluid
- Select Effector from the drop-down menu



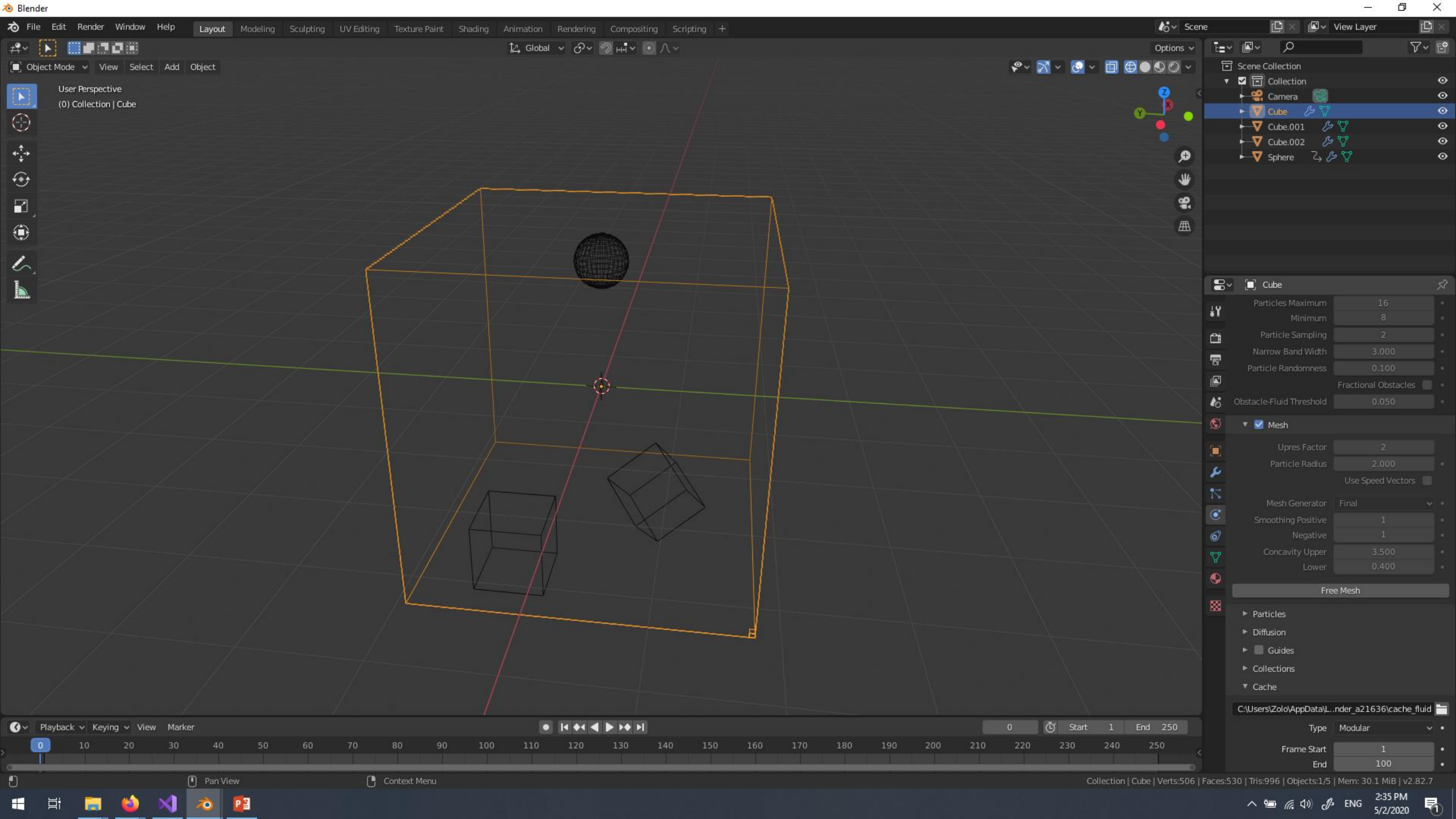
Bake the simulation

- In order to create the simulation we need to bake it
- This process will create particles that represent the flow of the liquid
- When completed and happy we will bake the liquid mesh, which is created from the previously mentioned particles
- The next step is to bake bubbles, foam and spray particles
- Select the domain cube, and set the following settings
 - Set Time Scale to 0.5 to have a slower simulation, otherwise it is quite fast
 - Set Timesteps Minimum to 2, to have more precise simulation
 - Set Frame End to 100
- When all is set, hit Bake data
- If all was done correctly, hit Shift + Space and watch the particles fill the container



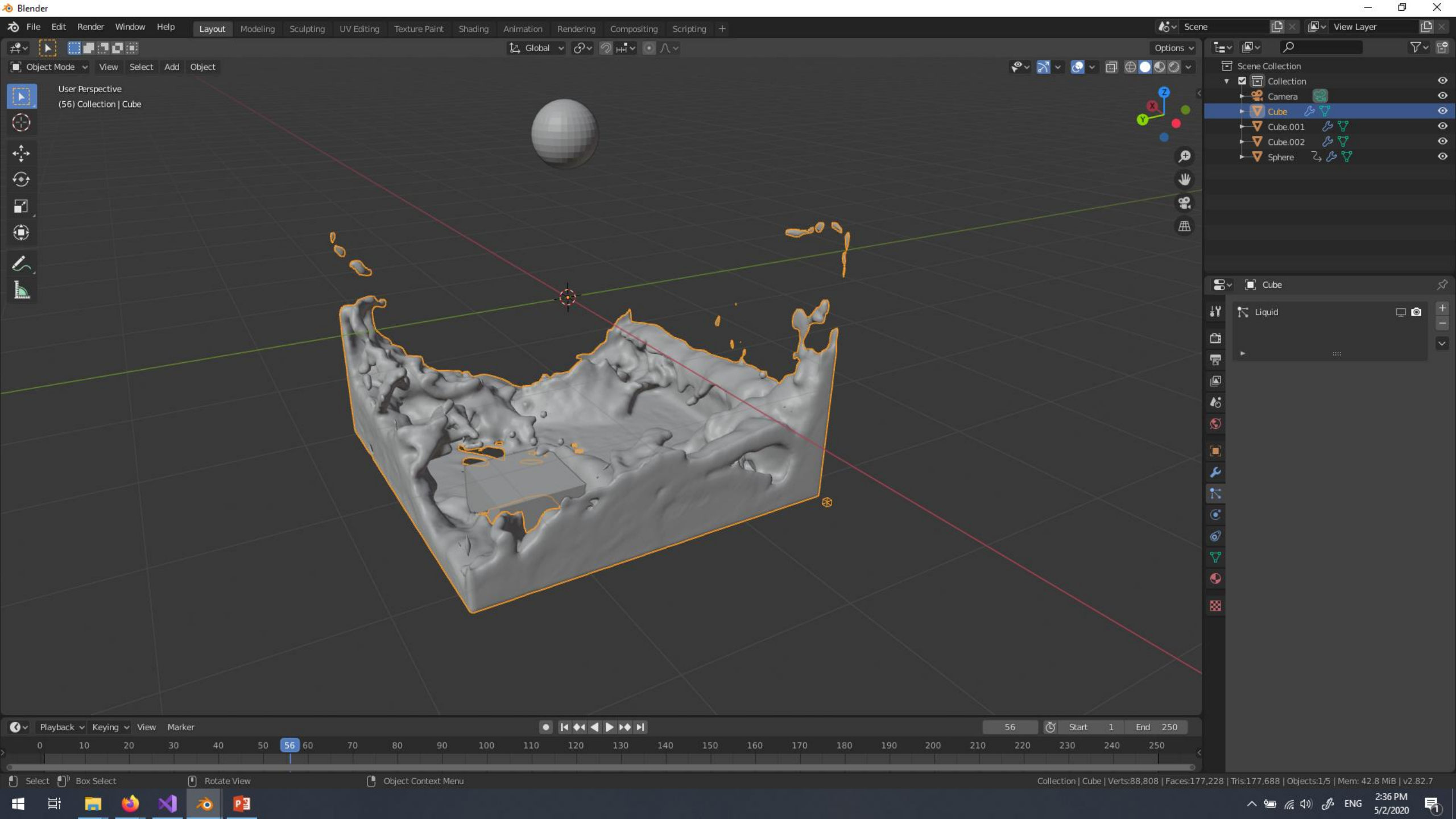
Create the mesh

- With the container selected, check the Mesh option
- Keep the settings as they are and hit Bake Mesh
- If all was done correctly, hit Shift + Space and watch the mesh representing the liquid fill the container
- Hide the Fluid particles so they do not slow down computer
 - Go to Particles tab and disable Liquid Realtime option



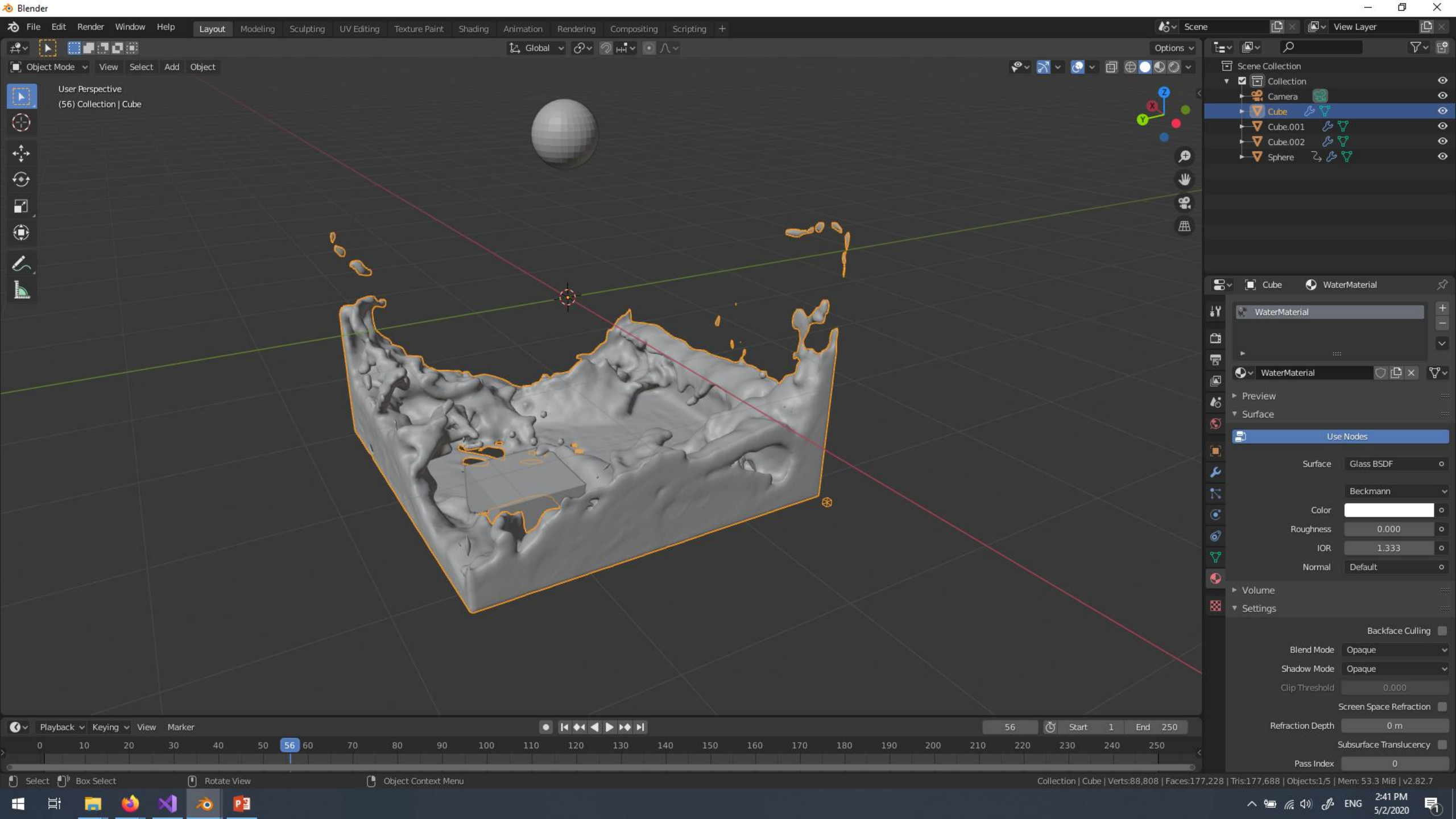
User Perspective
(0) Collection | Cube

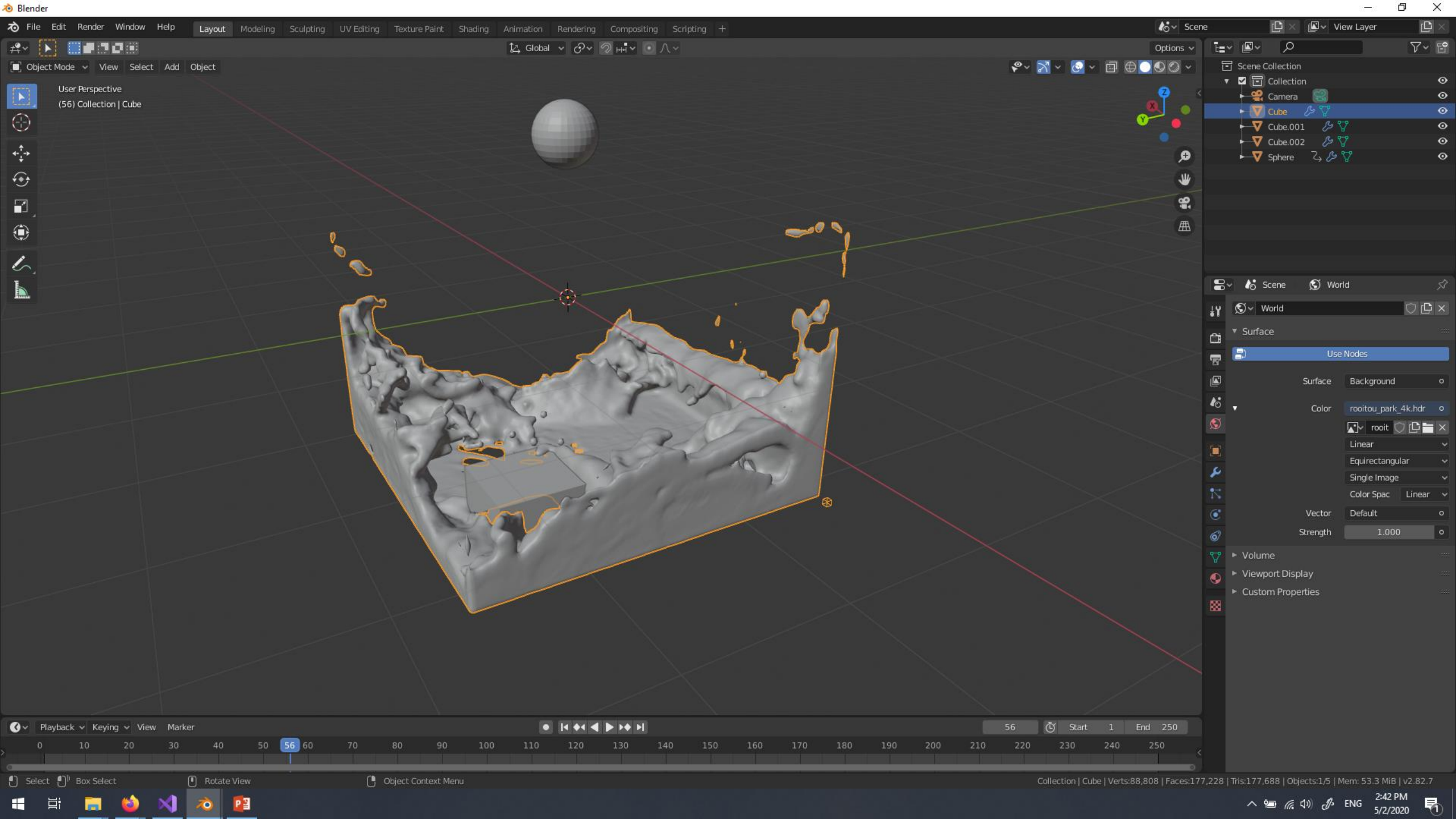


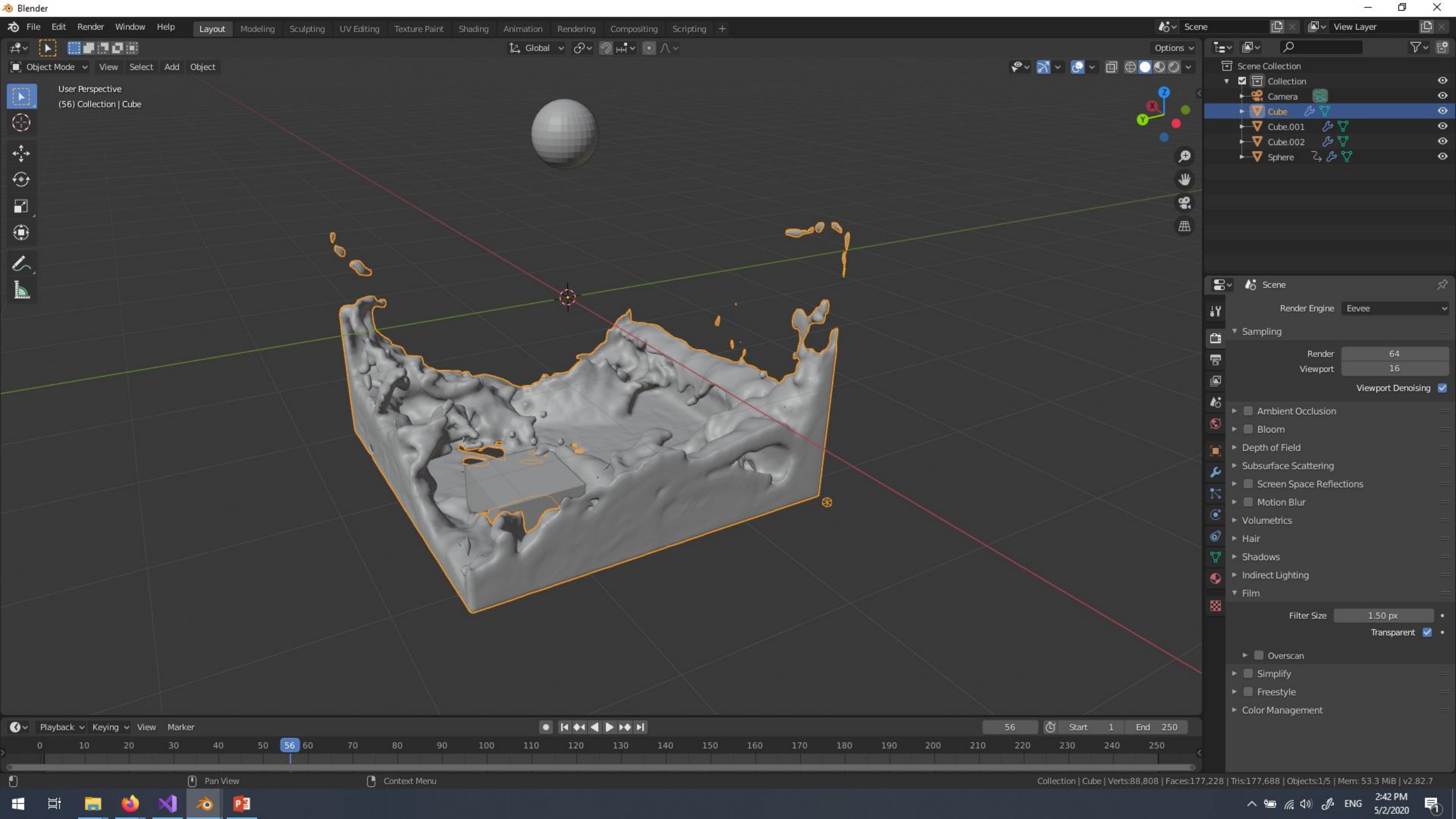


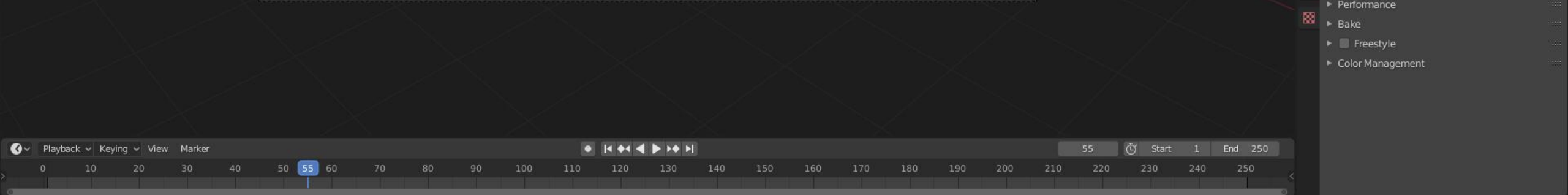
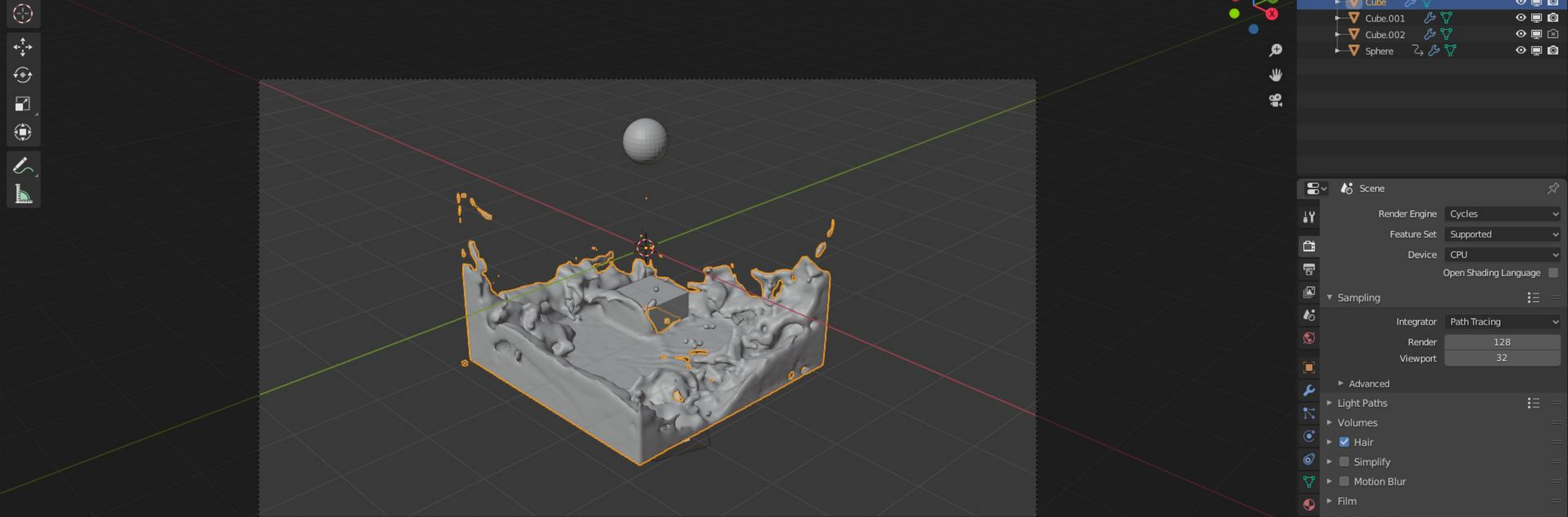
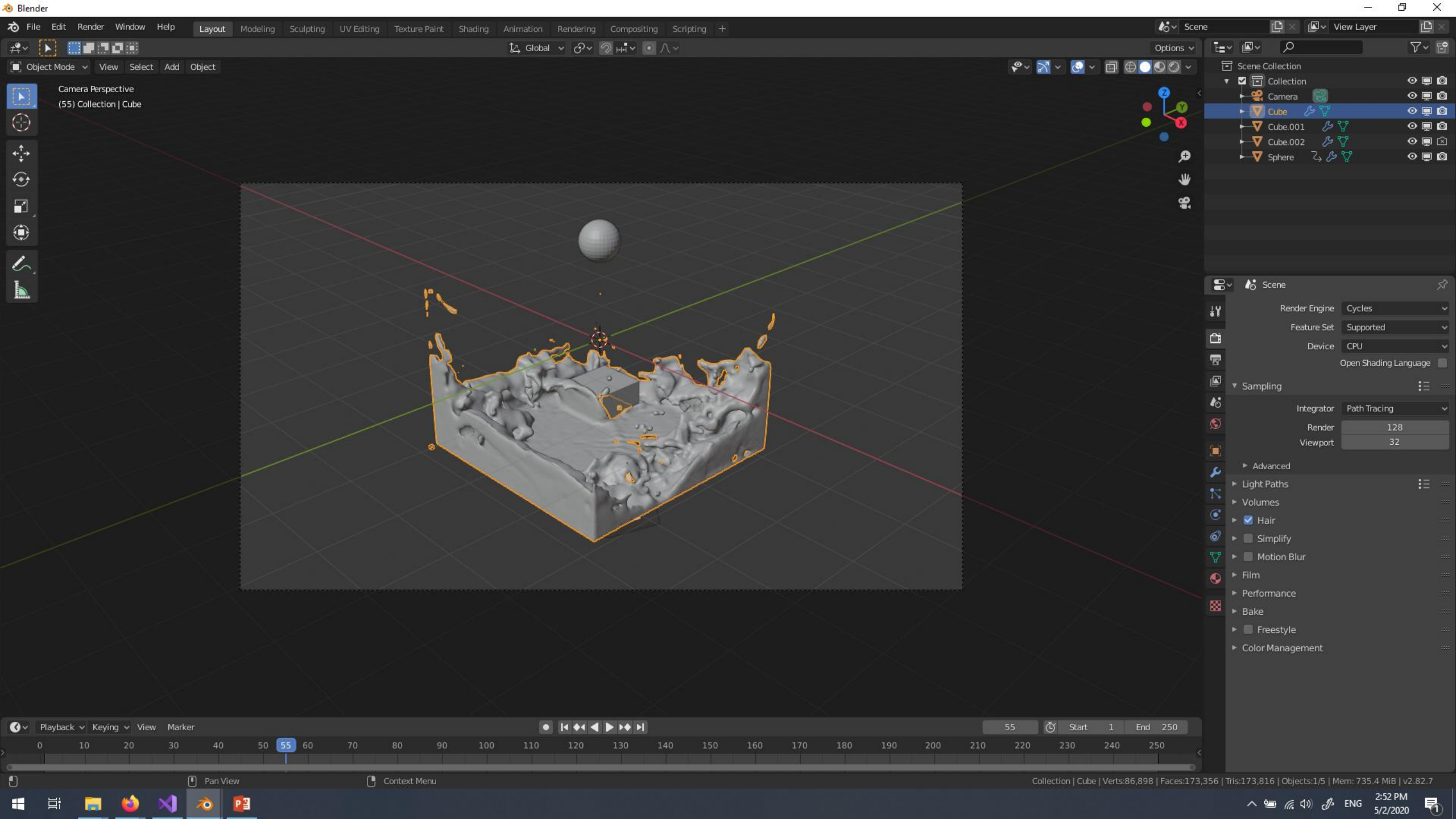
Set the materials

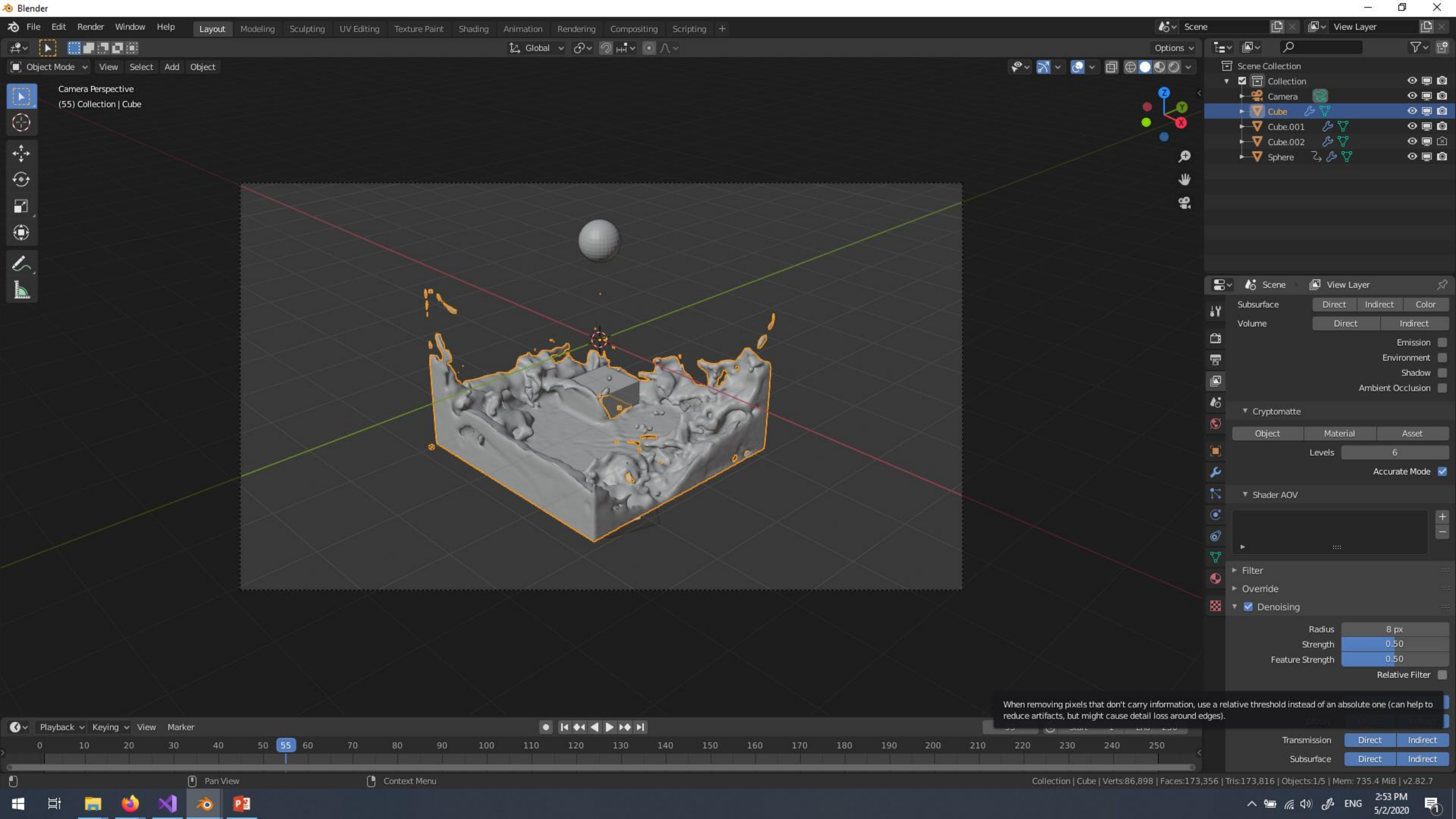
- Shader best representing water is Glass Shader with Index of Refraction set to 1.333 (water refractive index) and roughness of 0
- Add material to the mesh and set the shader accordingly
- Add an Enviromental image to represent the scene lighting
- Make the background transparent
- Set render engine to Cycles
- Turn on Denoising
- Render the image (at frame 55)

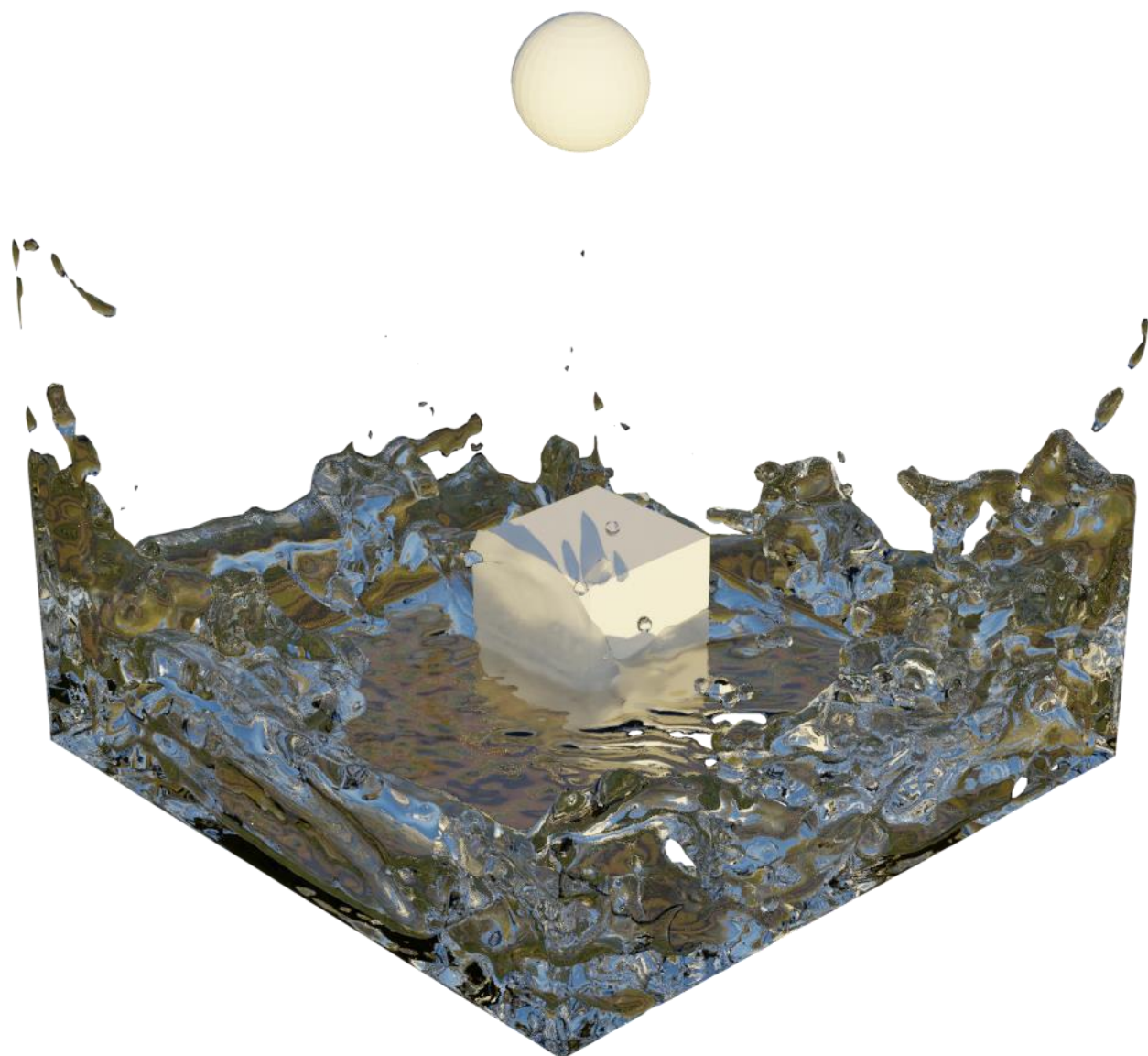






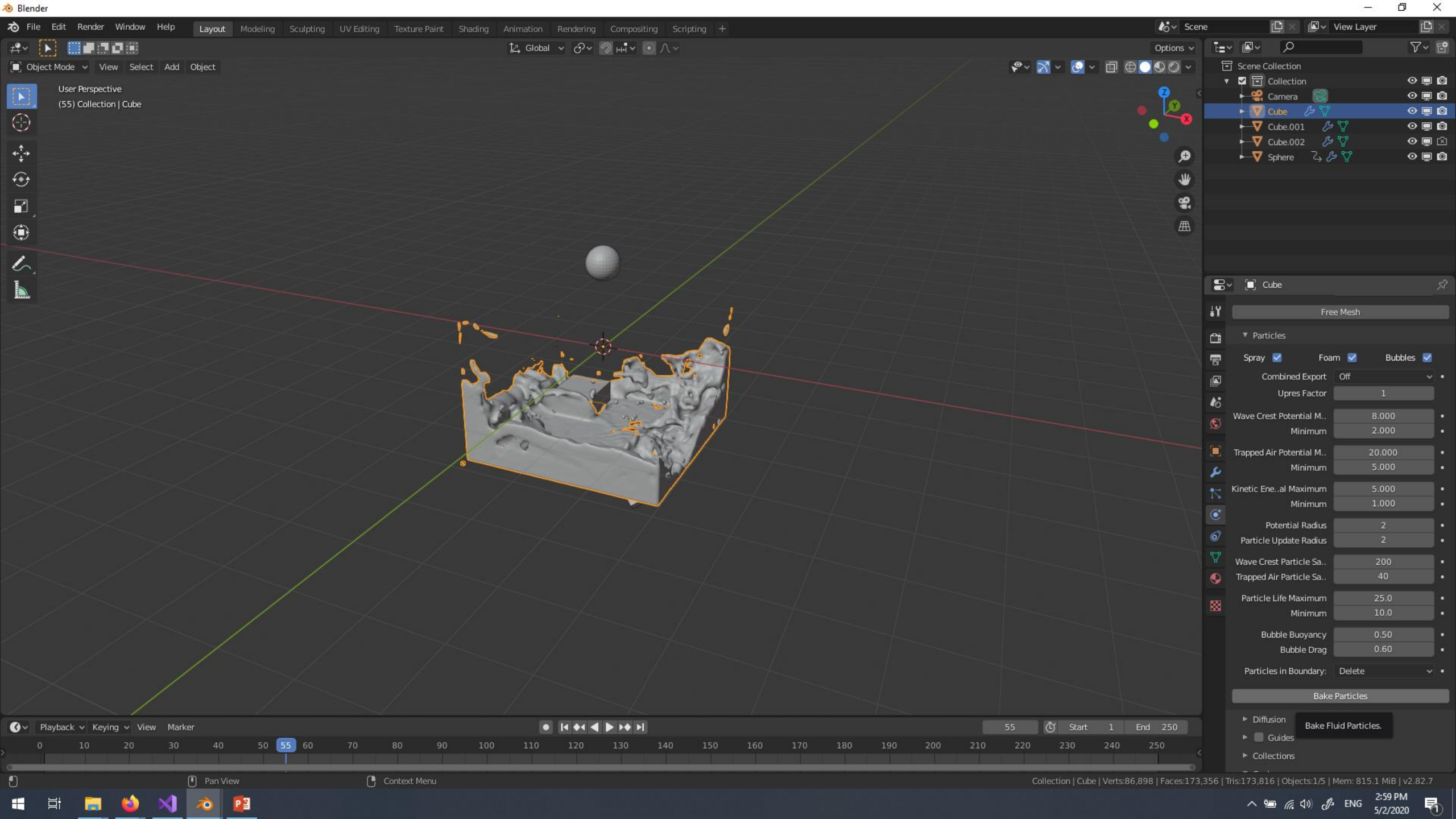


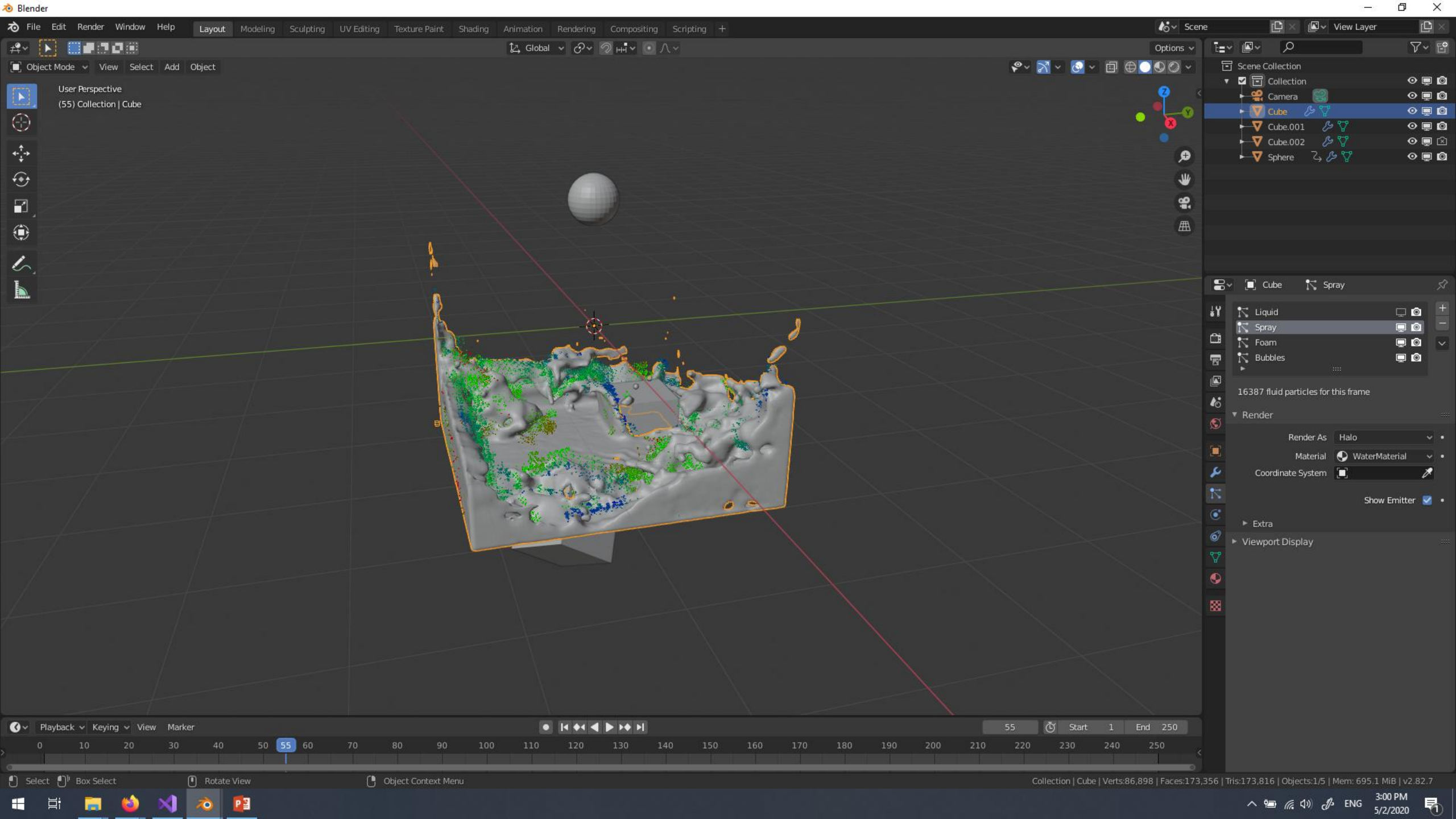


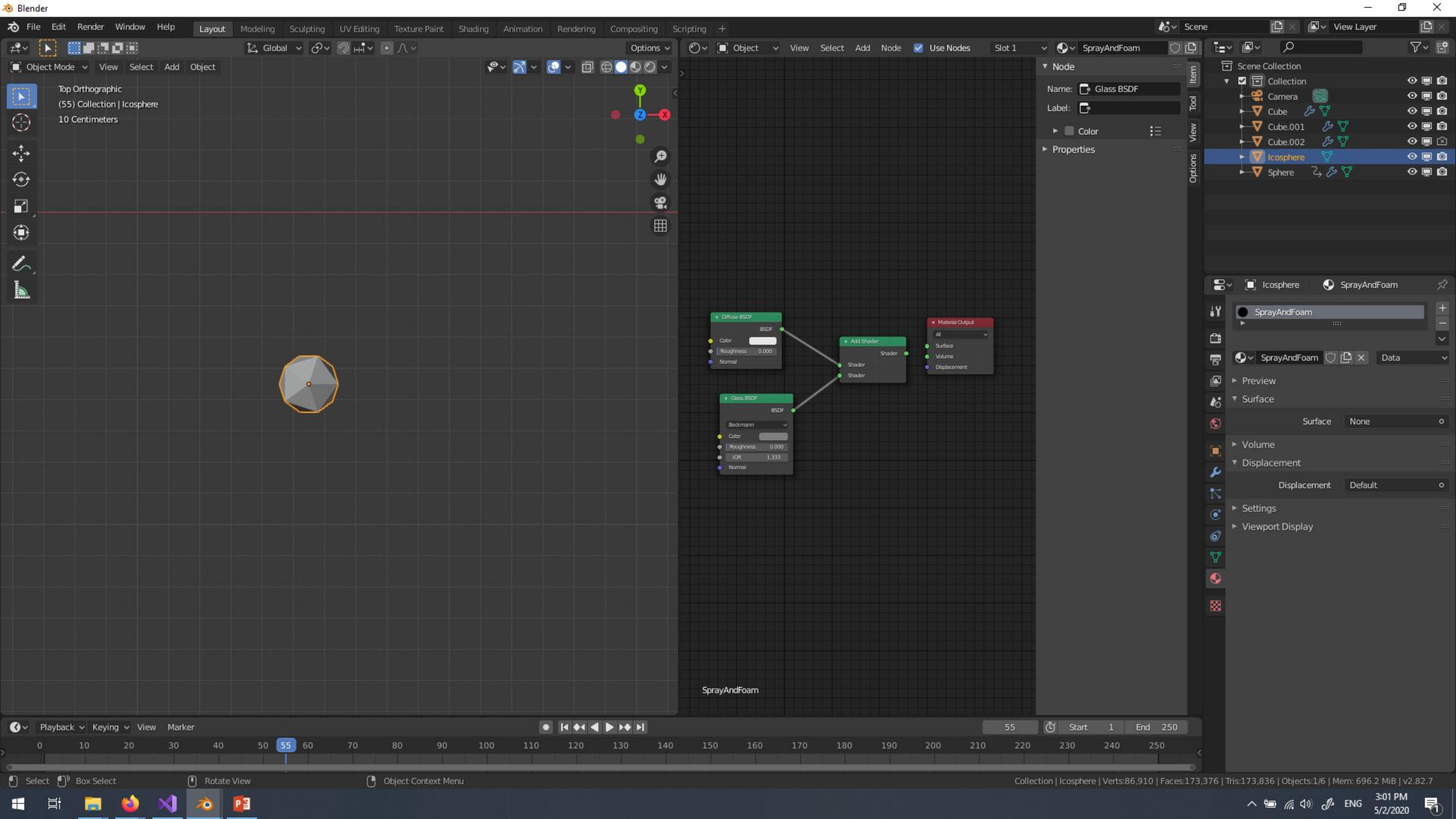


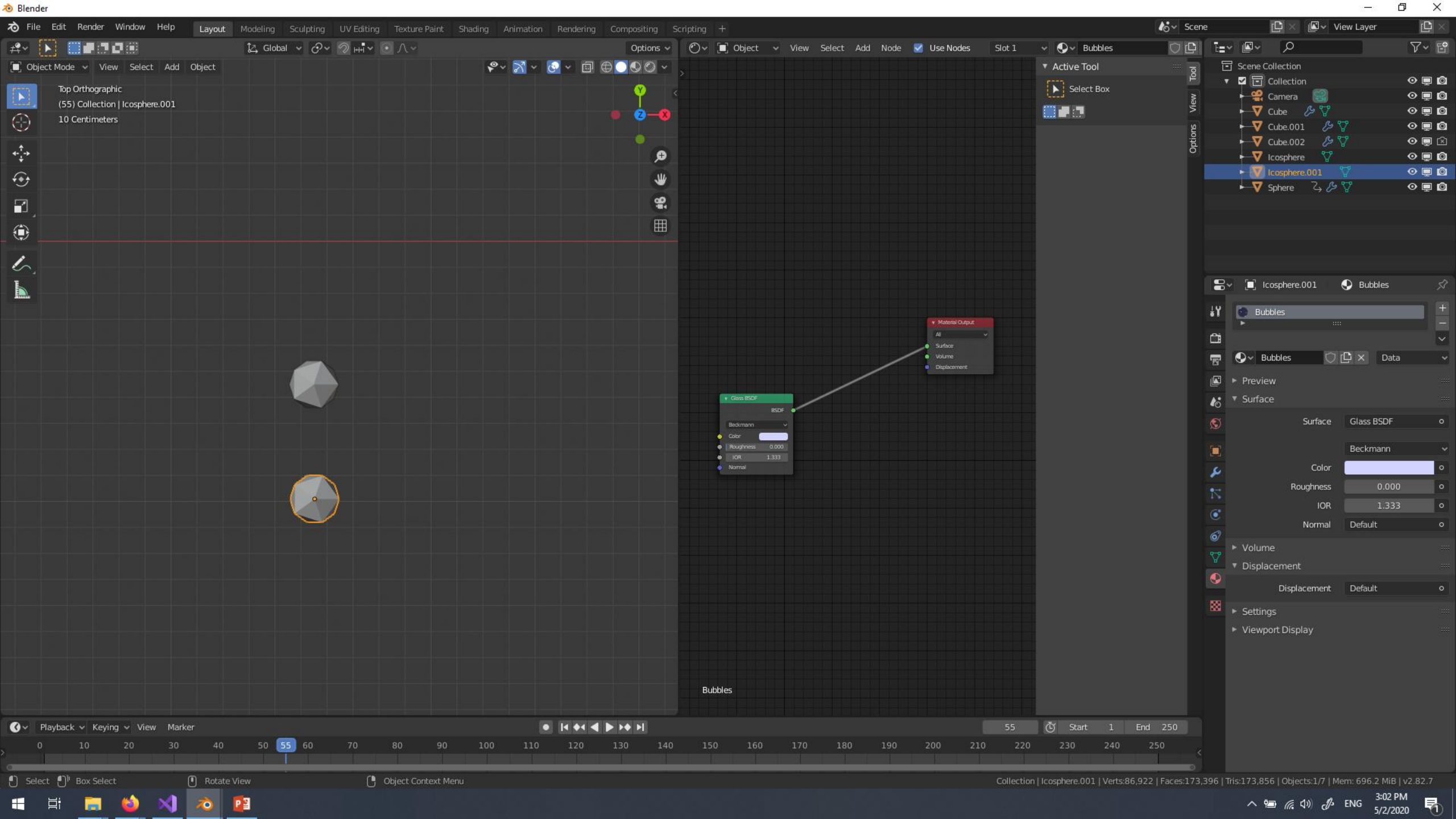
Bake Spray, Foam, Bubbles

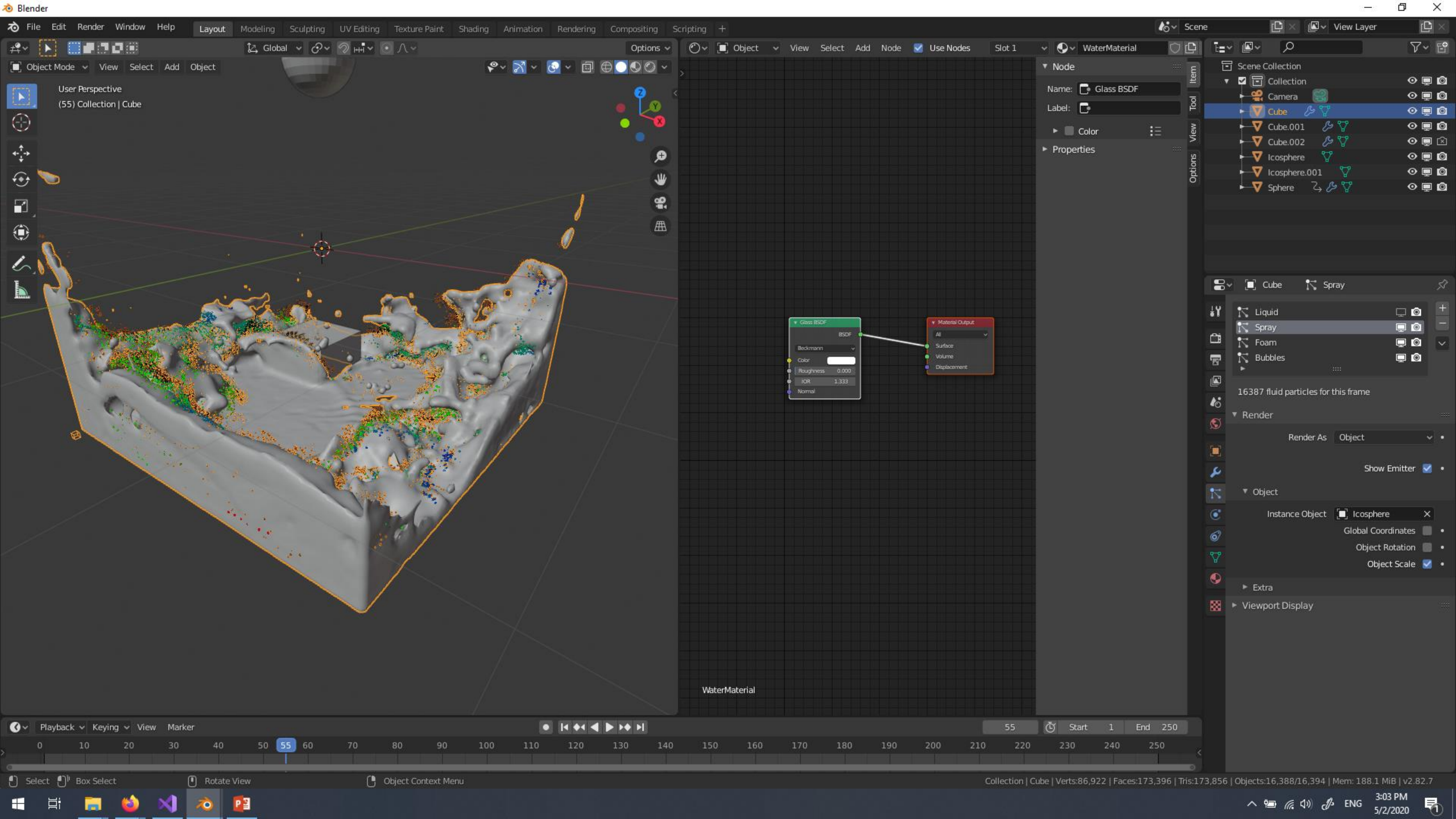
- Select the container
- Enable Spray, Foam, Bubbles options
- Keep the setting as they are
- Bake them
- This will create new particle systems
- We will create 2 Icosphere objects representing the Spray and the Foam (one object) and the Bubbles (second object)
- We will set the particles to be rendered as these icospheres

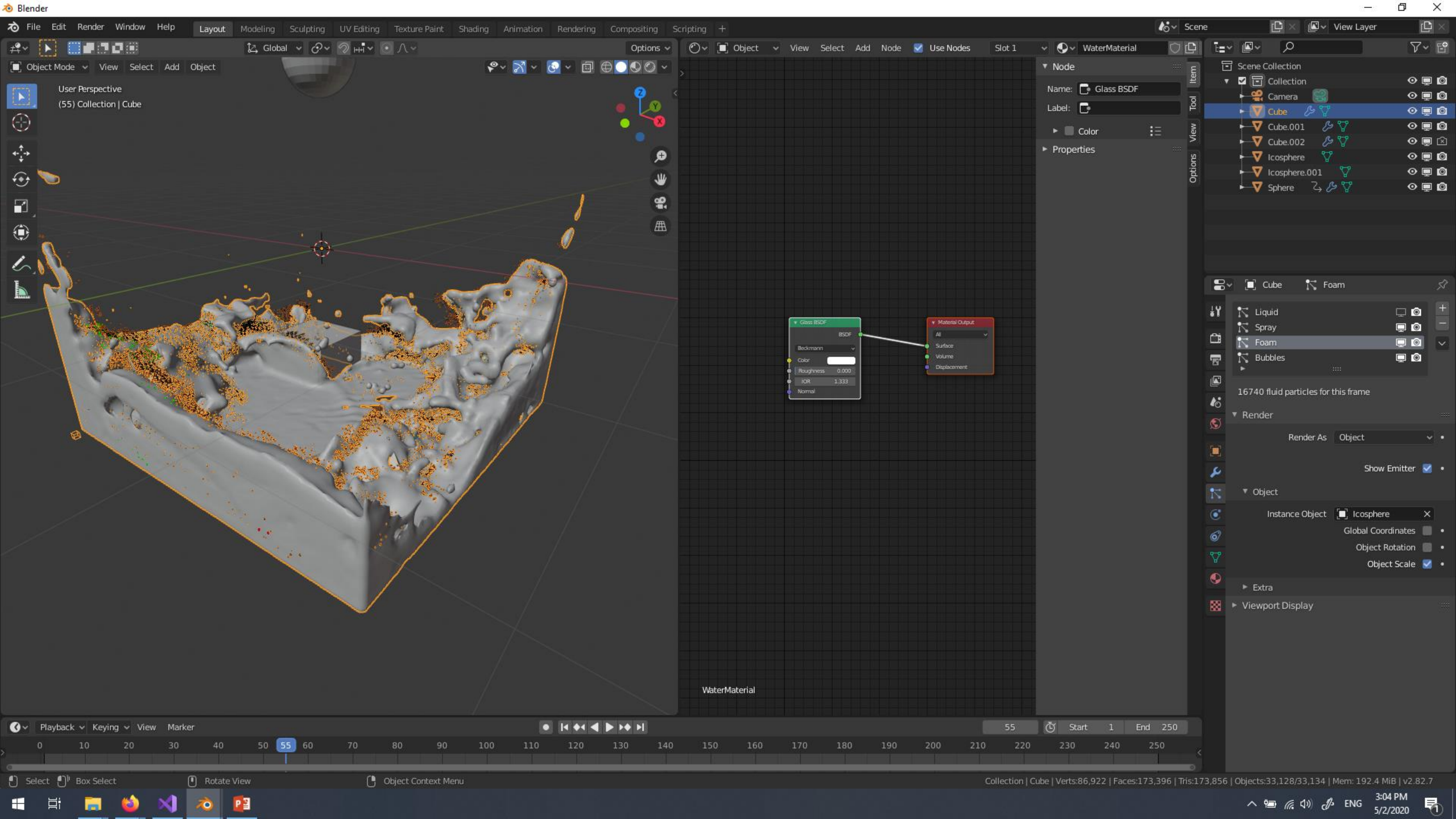


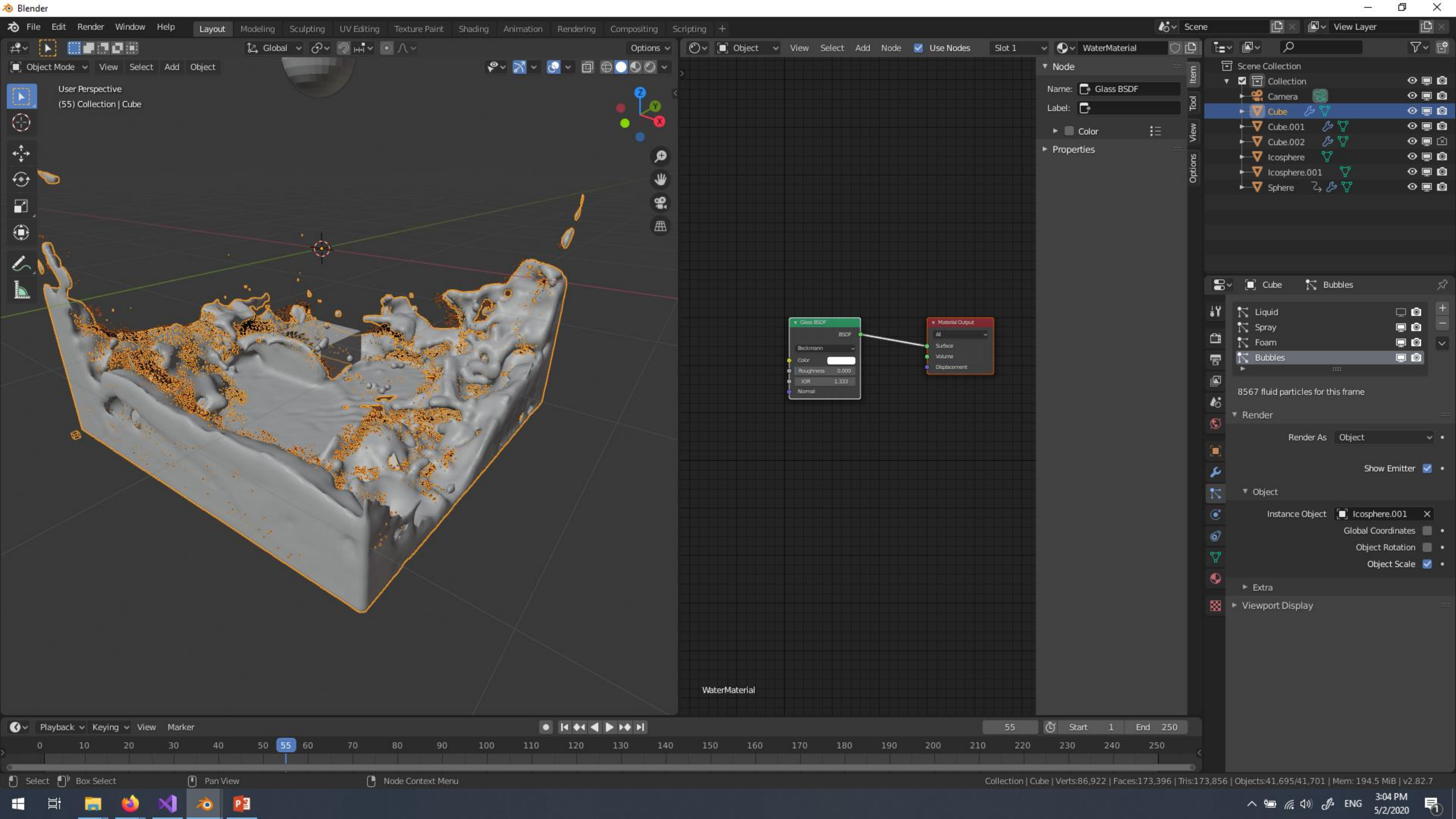












Finish

- This is the most basic workflow you can follow to create liquid simulation
- Now you can play around with various settings to see what effect they have and even create an animation
- Motion blur of the water
 - Adds realism to the scene
 - Go to the container object, Fluid simulator and under Mesh check Use speed vectors
 - In the View Layer Properties check Vector under Passes tab
 - In the compositor set the motion Blur as demonstrated in the next images
- No need to upload any results to IS, as this simulation might be too straining on some weaker computers. I strongly encourage you try it.

