

PV272

Cv 07

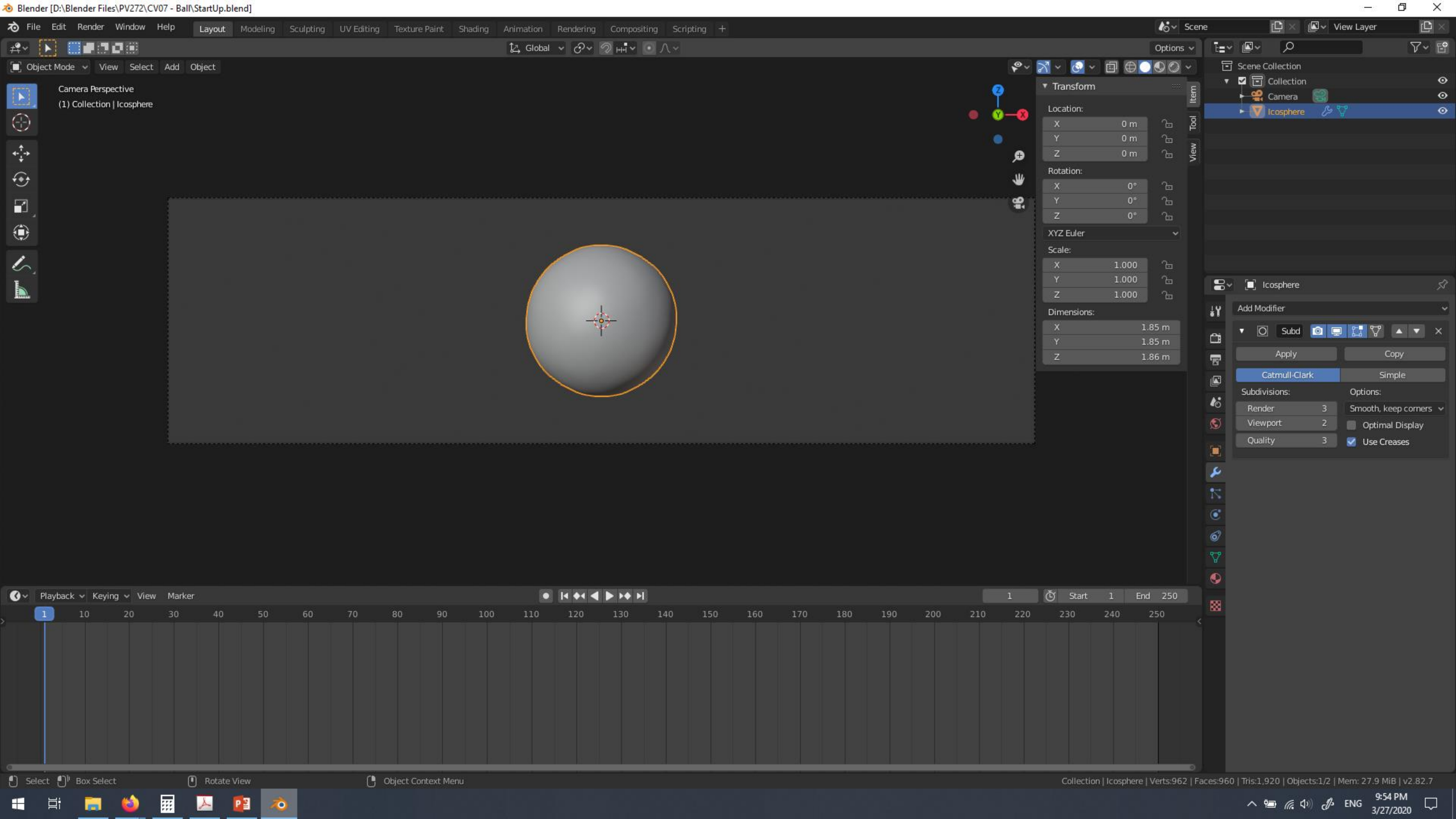
What do we create today?

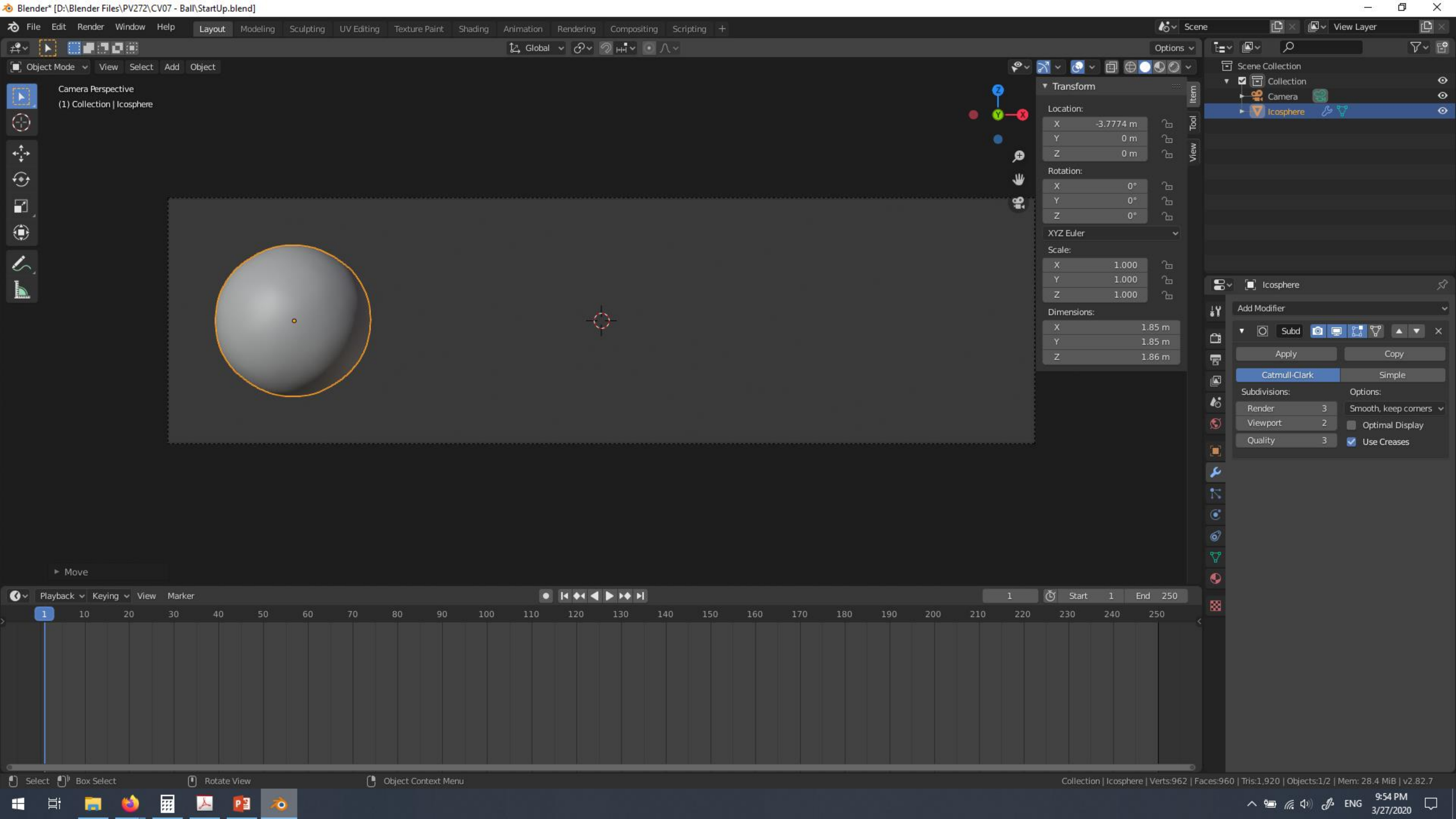
Basics of animation

How do we create it?

- Once we have our scene and models ready, we might want to animate them
- Animation = Optical illusion
 - Instead of a real motion we see static images of some object in different poses at a high rate which gives us a sense of motion
- In order to make objects move accross time, we have to create keyframes
 - Use the StartUp file
 - We the ball to the left side of the screen at time 0
 - We keyframe it (l -> LocRotScale)
 - We change the time to 250 and move the ball and keyframe it again
 - The movement between these 250 frames is interpolated
 - Once you are happy, hit play and watch the ball move

AND KEYFRAMES



Camera Perspective
(1) Collection | Icosphere

Transform

Location:

X	-3.7774 m
Y	0 m
Z	0 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.000
Y	1.000
Z	1.000

Dimensions:

X	1.85 m
Y	1.85 m
Z	1.86 m

Scene Collection

- Collection
 - Camera
 - Icosphere

Icosphere

Add Modifier

Subd

Apply Copy

Catmull-Clark Simple

Subdivisions:

Render	3
Viewport	2
Quality	3

Options:

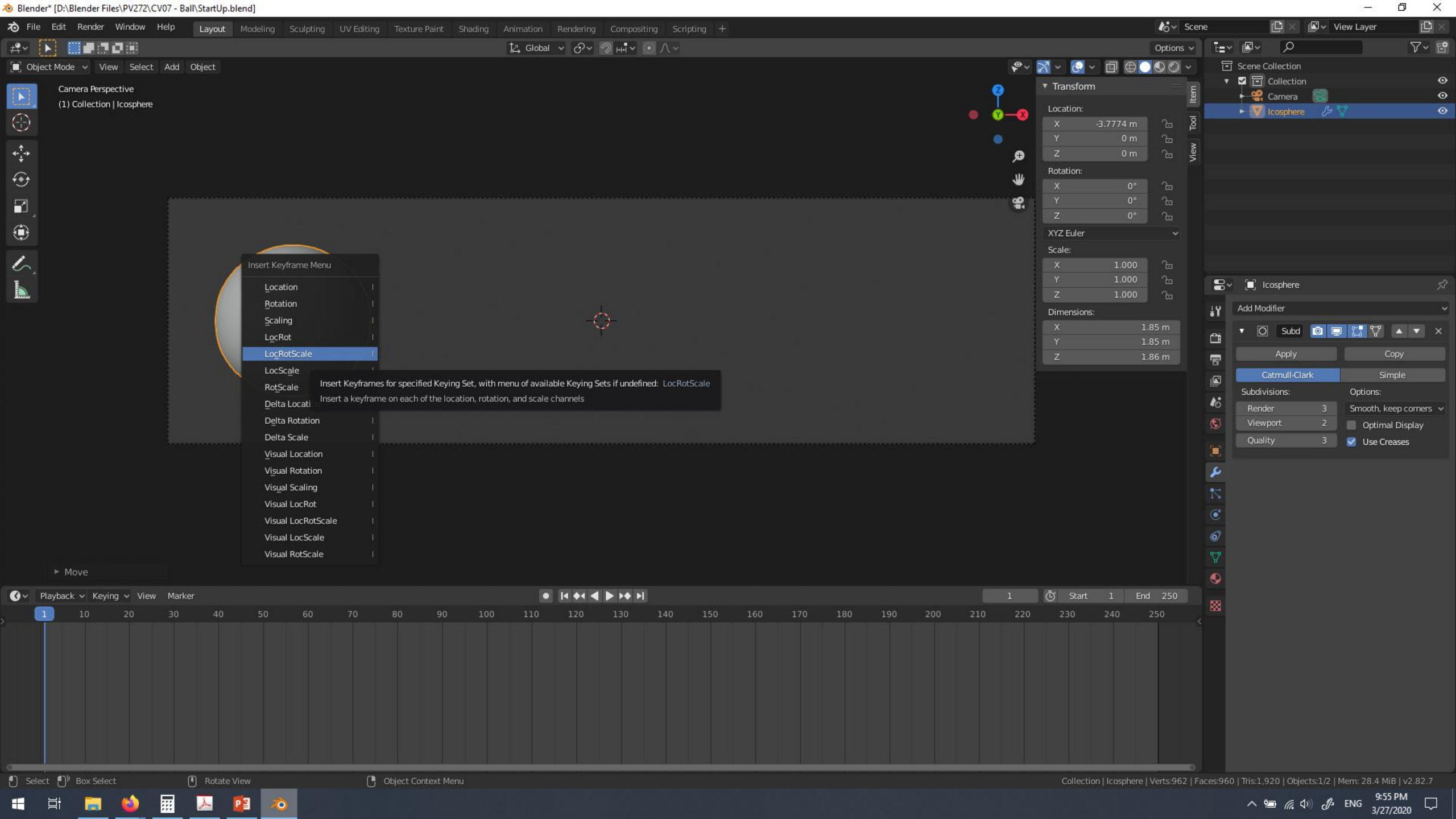
Smooth, keep corners

Optimal Display

Use Creases

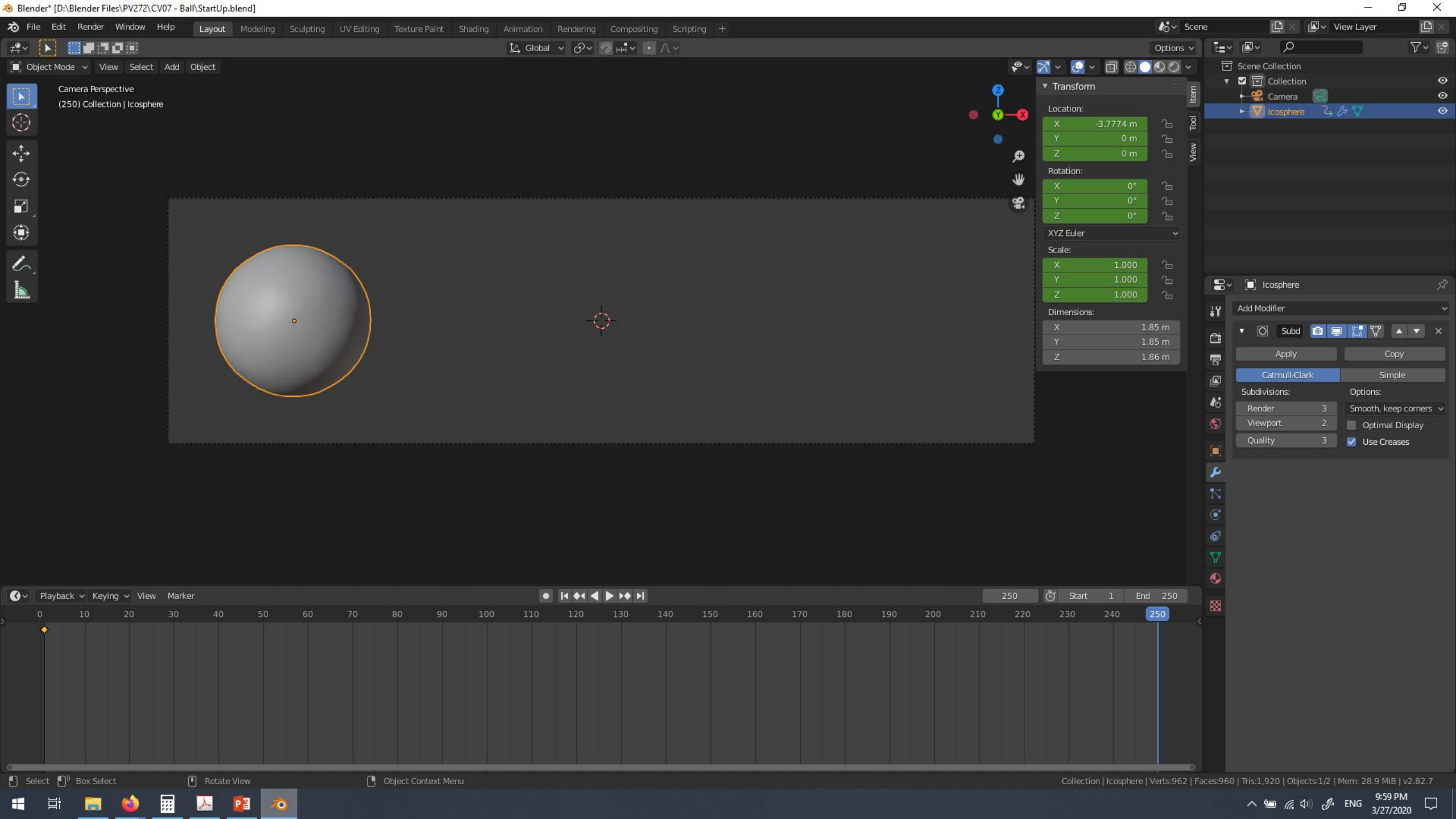
Move

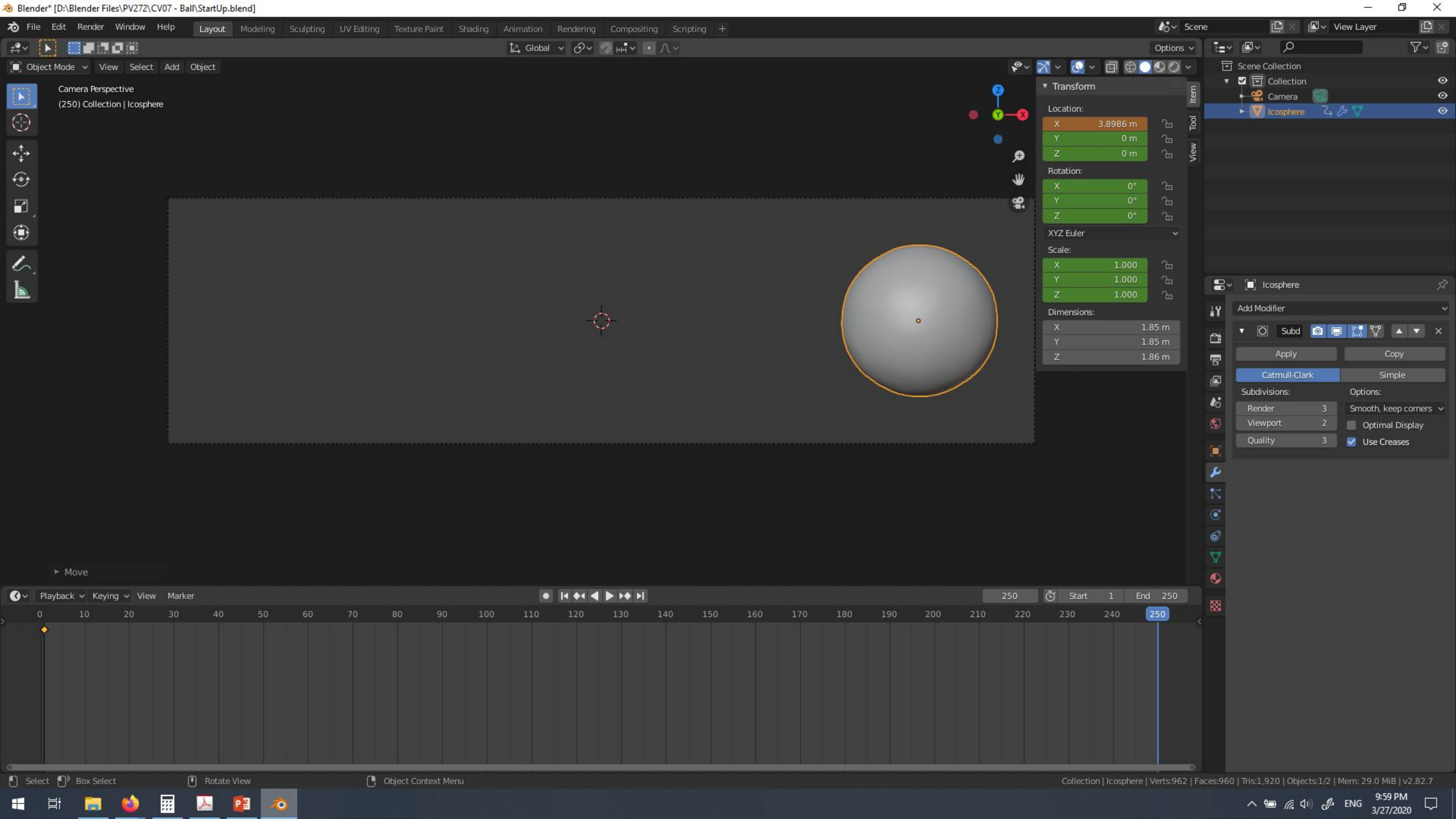




Move the slider on the timeline

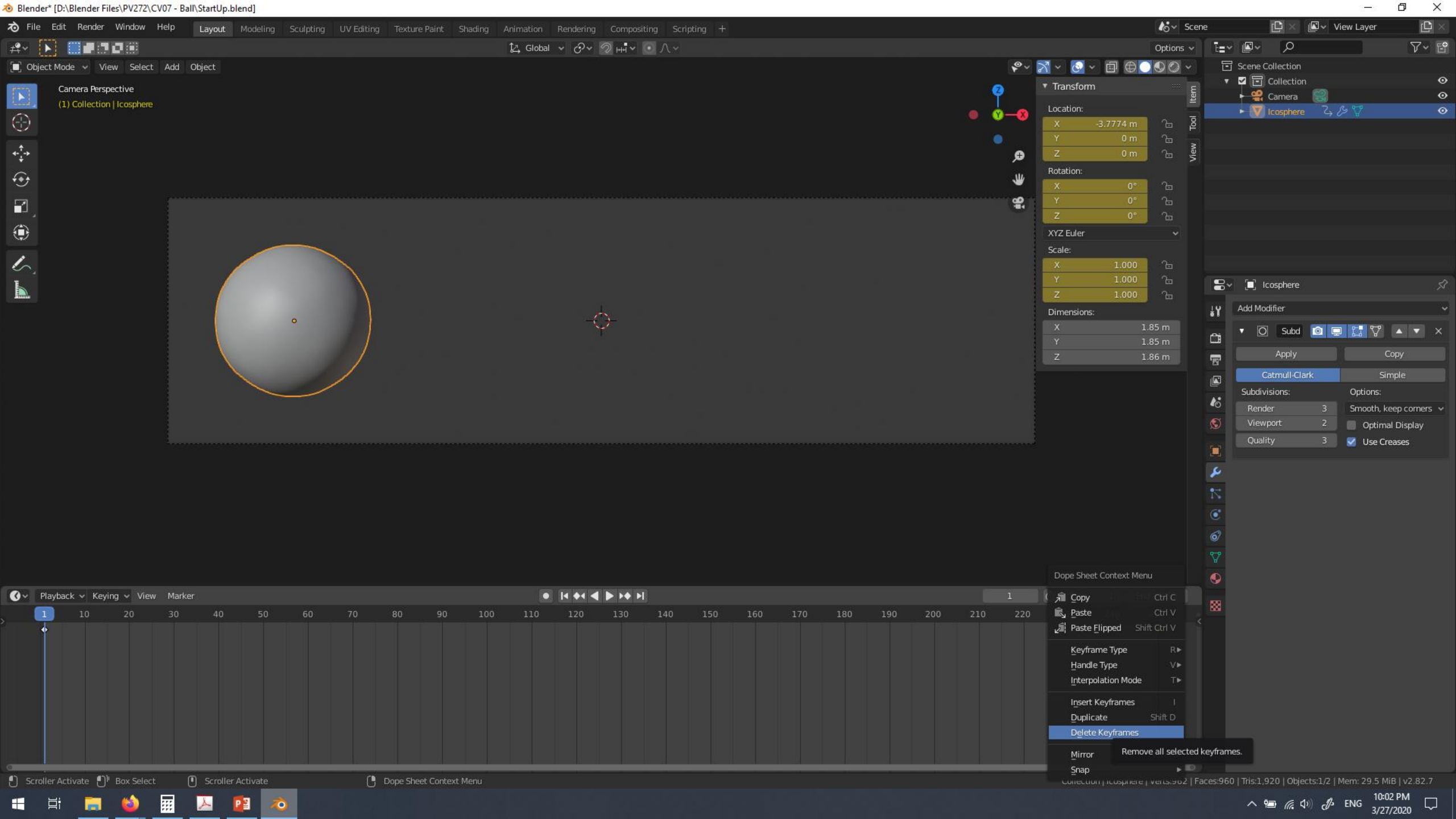
- Now we wish to move the ball and keyframe it at frame 250
- It is important to first move the timeline slider to the frame 250 and then move the ball and keyframe (I -> LocRotScale) it
- If you move the ball first and then move the timeline slider second, the ball jumps back to its previous position

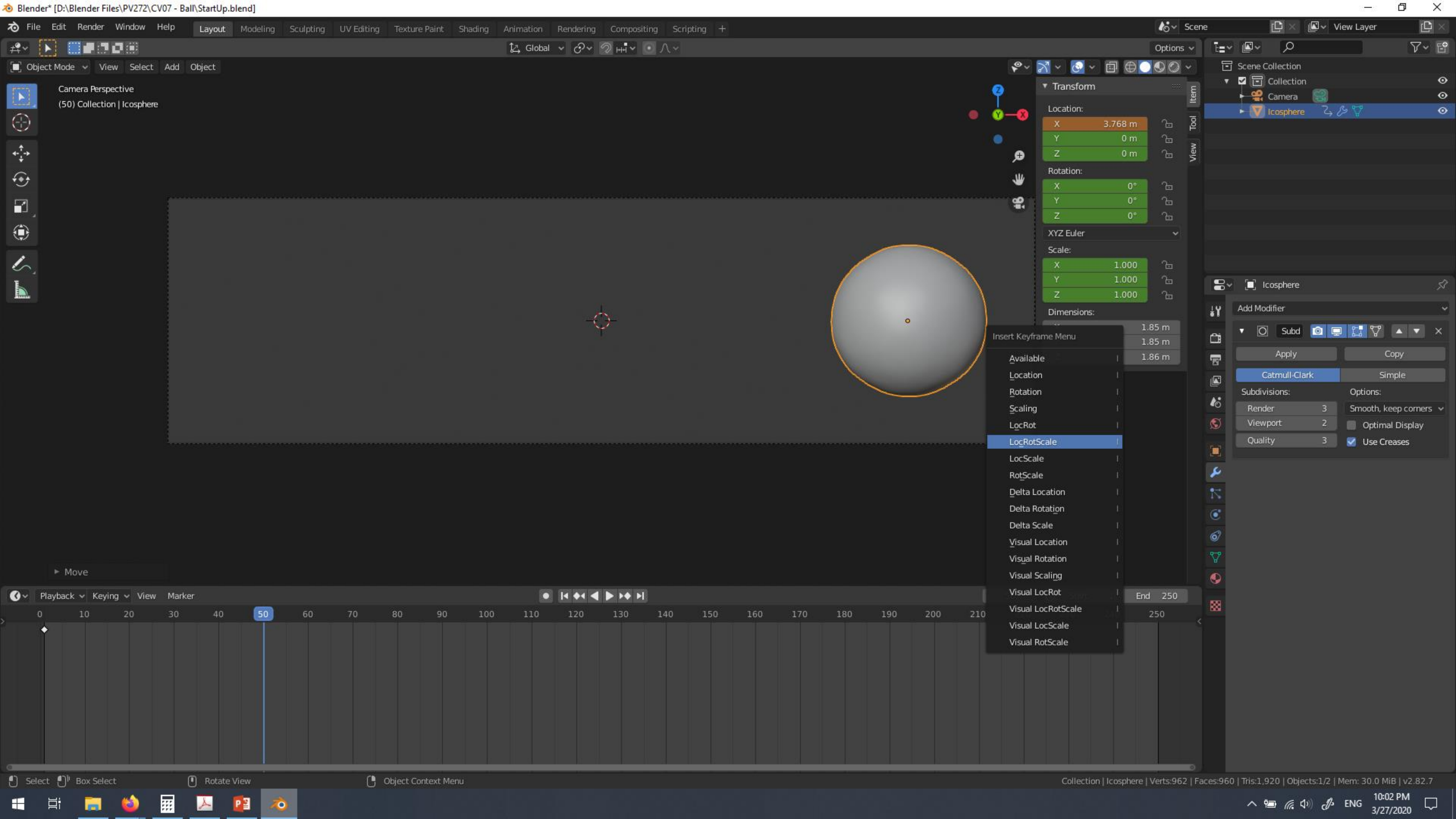


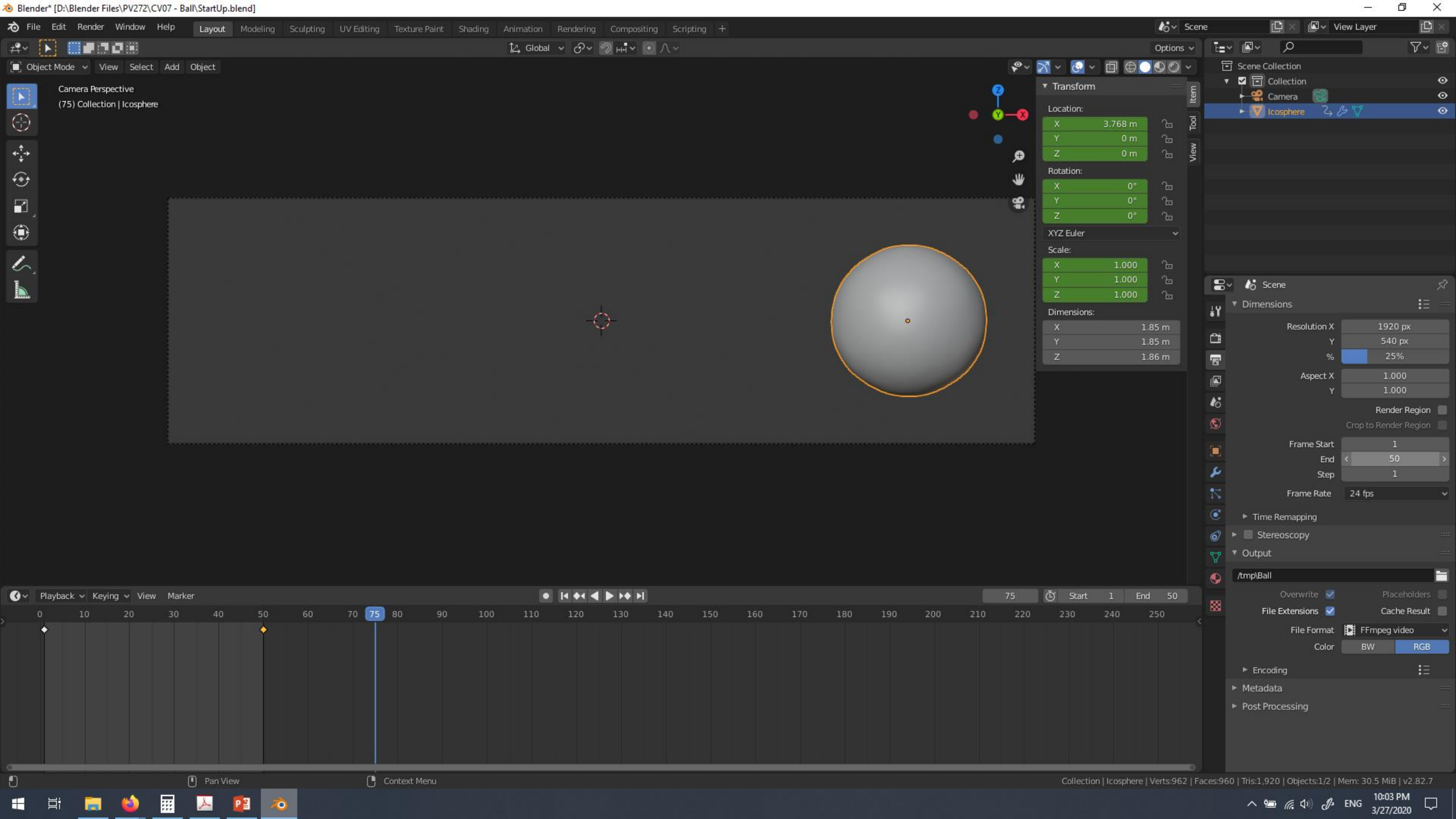


Watch your animation

- Hit play on your timeline and get ready to be impressed
- Slow, isn't it?
- This is because the ball covers small distance over large time
- So you may delete the keyframe at 250 and set a new one at 50
- You may also make the length of the animation shorter in the Output Properties panel

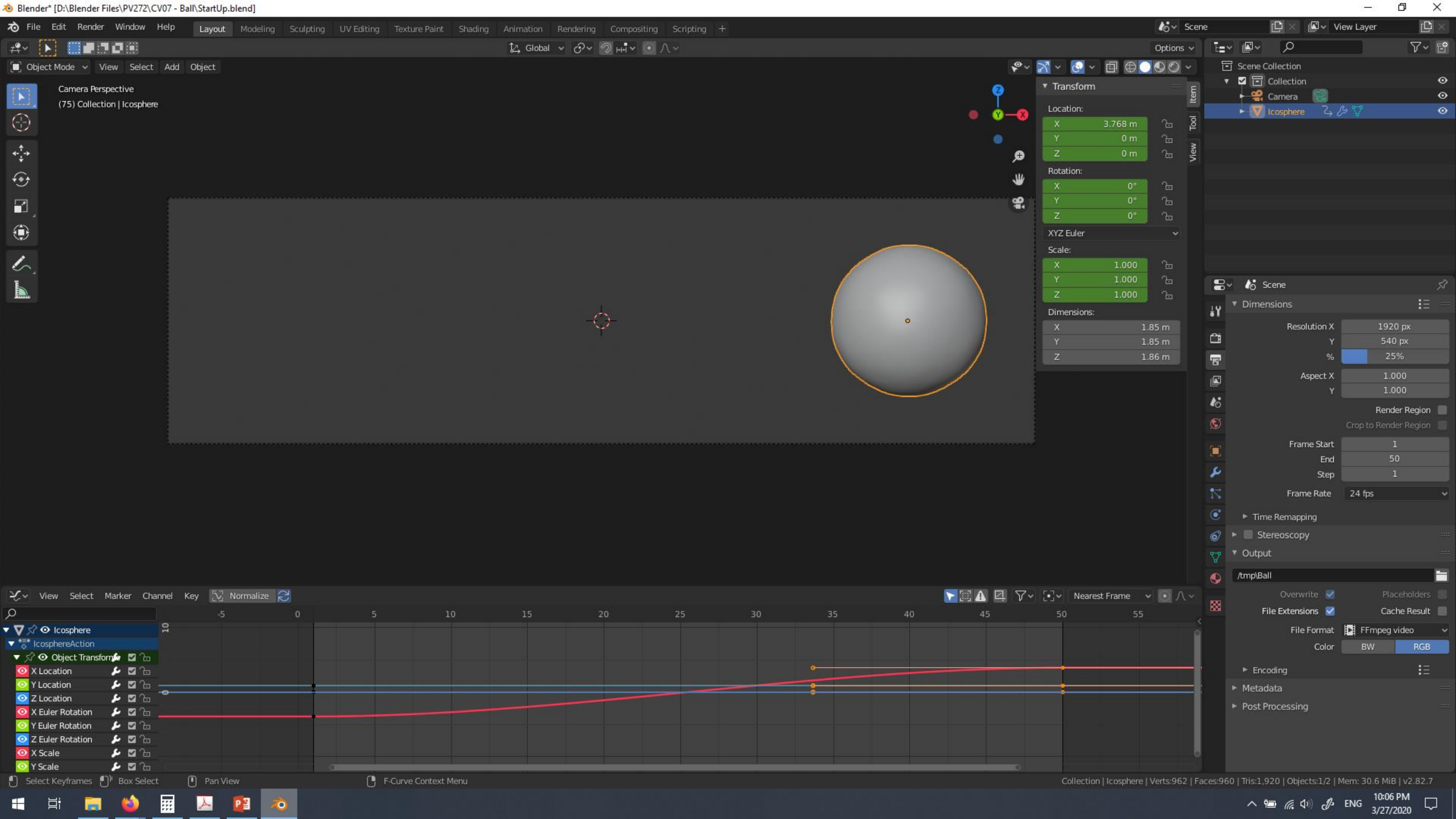






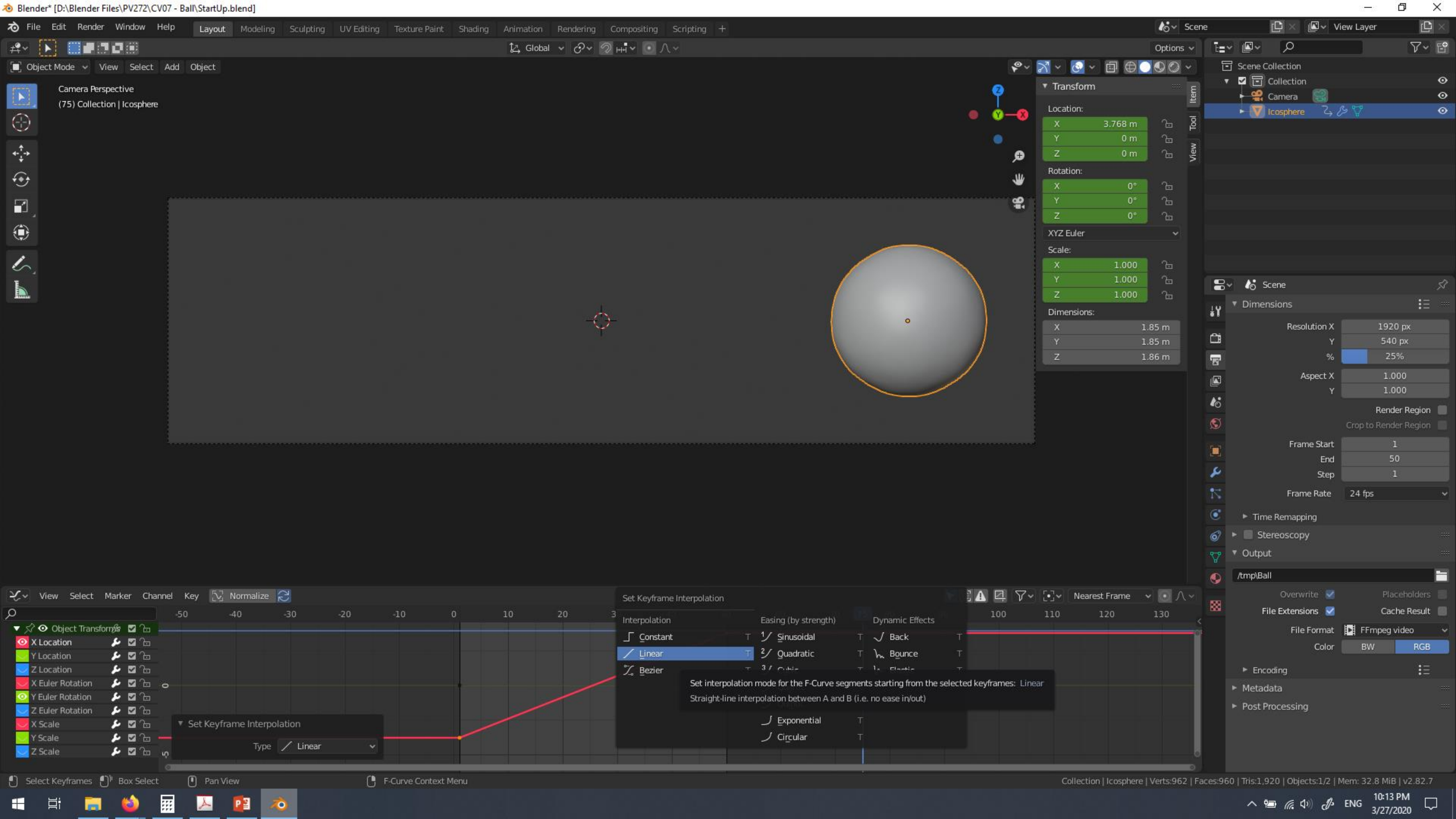
F-curves

- As you can see, the movement was interpolated, and it accelerates at the beginning and decelerates at the end
- Sometimes we do now want that and we might prefer a linear motion
- This is a job for the curve editor. Over there you can see a function of location over time for each of the x, y, and z coordinates
- Switch the timeline window to Graph Editor



F-Curves

- We are interested in the X-location curve, so make rest of them invisible (little eye icon)
- We want to make to ball to start and stop and move at constant speed
- To achieve this, select both keyframes, hit T and set the interpolation to linear
- Afterward play the animation (Shift+Spacebar) and observe the difference



Keyframing

- As you saw when setting the keyframes, you can keyframe not only the location, but the rotation and the scale as well
- For example, in order to make a bouncy ball, you have to keyframe the scale, as ball bounces off the ground, to make the animation believable
- There are several of these principles of animation and there are many videos on them
 - <https://www.youtube.com/watch?v=pDVfNf5GvPg>

Camera Perspective
(35) Collection | Icosphere

Transform

Location:

X	0 m
Y	-0 m
Z	3.9002 m

Rotation:

X	0°
Y	0°
Z	0°

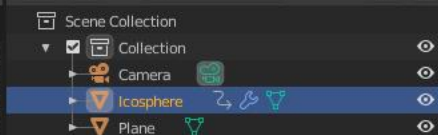
XYZ Euler

Scale:

X	1.000
Y	1.000
Z	1.000

Dimensions:

X	1.85 m
Y	1.85 m
Z	1.86 m



Dimensions

Resolution X	540 px
Y	1920 px
%	25%
Aspect X	1.000
Y	1.000
Render Region	<input type="checkbox"/>
Crop to Render Region	<input type="checkbox"/>
Frame Start	1
End	50
Step	1
Frame Rate	24 fps



Camera Perspective
(35) Collection | Icosphere

▶ Resize

Playback Keying View Marker 35 Start 1 End 50



Select Box Select Rotate View Object Context Menu

Collection | Icosphere | Verts:966 | Faces:961 | Tris:1,922 | Objects:1/3 | Mem: 33.8 MiB | v2.82.7



Scene

Dimensions

Resolution X 540 px
Y 1920 px
% 25%
Aspect X 1.000
Y 1.000Render Region
Crop to Render RegionFrame Start 1
End 50
Step 1
Frame Rate 24 fps

Time Remapping

Stereoscopy

Output

/tmpBall

Overwrite Placeholders
File Extensions Cache ResultFile Format FFmpeg video
Color BW RGB

Encoding

Metadata

Post Processing

Camera Perspective
(35) Collection | Icosphere

Transform

Location:

X	0 m
Y	-0 m
Z	-0.82192 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.356
Y	1.356
Z	0.701

Dimensions:

X	2.51 m
Y	2.51 m
Z	1.3 m

Scene Collection

- Collection
 - Camera
 - Icosphere
 - Plane

Dimensions

Resolution X	540 px
Y	1920 px
%	25%
Aspect X	1.000
Y	1.000
Render Region	<input type="checkbox"/>
Crop to Render Region	<input type="checkbox"/>
Frame Start	1
End	50
Step	1
Frame Rate	24 fps

Move



Camera Perspective
(35) Collection | Icosphere

Transform

Location:

X	0 m
Y	-0 m
Z	0.83898 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	0.818
Y	0.818
Z	1.566

Dimensions:

X	1.51 m
Y	1.51 m
Z	2.91 m

Scene Collection

- Collection
 - Camera
 - Icosphere
 - Plane

Dimensions

Resolution X	540 px
Y	1920 px
%	25%
Aspect X	1.000
Y	1.000
Render Region	<input type="checkbox"/>
Crop to Render Region	<input type="checkbox"/>
Frame Start	1
End	50
Step	1
Frame Rate	24 fps

Resize



Camera Perspective
(35) Collection | Icosphere

Transform

Location:

X	0 m
Y	-0 m
Z	3.9002 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.000
Y	1.000
Z	1.000

Dimensions:

X	1.85 m
Y	1.85 m
Z	1.86 m

Scene Collection

- Collection
 - Camera
 - Icosphere
 - Plane

Scene

Dimensions

Resolution X	540 px
Y	1920 px
%	25%
Aspect X	1.000
Y	1.000

Render Region

Crop to Render Region

Frame Start

End

Step

Frame Rate

24 fps

Time Remapping

Stereoscopy

Output

/tmpBall

Overwrite

Placeholders

File Extensions

Cache Result

File Format

FFmpeg video

Color

BW

RGB

Encoding

Metadata

Post Processing

Playback Keying View Marker

0 10 20 30 35 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

35 Start 1 End 50

Homework

- Create a random animation with a ball and use some principles of animation on the motion on the ball
- Upload the .blend file to IS by 6.4.2020
- You can read up on F-Curves more in the Blender documentation
 - https://docs.blender.org/manual/en/latest/editors/graph_editor/fcurves/introduction.html#direction-of-time