Report: Creating a Jellyfish Animation in Blender

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1 Introduction

This report explains how to create a realistic jellyfish animation in Blender. The process involves four main stages: modeling, shading, animation, and camera/scene setup..

2 Modeling

The jellyfish model starts from a UV Sphere.

- Add a UV Sphere (Shift + A → Mesh → UV Sphere) and set segments to 36.
- In Edit Mode, delete the bottom half and scale the remaining vertices on the X and Y axes (S + Shift + Z).
- Duplicate the shape (Shift + D) and move it slightly down to form the inner layer.
- Extrude the bottom loop (E + Z) and scale it down twice to shape the jellyfish's body.
- Select certain vertices and scale or move them to form soft curves.
- Create the tentacles by extruding the bottom loops multiple times (Shift + R, about 14 times).
- Scale down the tips of the tentacles for a natural look.
- Assign a vertex group named "Body" to the upper parts of the jellyfish for later simulation.

3 Simulation and Modifiers

After modeling, two main modifiers are applied: Wave and Cloth.
Apply Wave Modifier with these settings:

- Along Normals: X and Y
- Height: 0.4
- Width: 1.5
- Narrowness: 0.7
- Vertex Group: "Body"
- Speed: 0.02
- Apply Cloth Simulation (Preset: Silk):
- Vertex Mass: 3 kg
- Air Viscosity: 2.0
- End Frame: 2000

- Pin Group: "Body"

- Self Collision: Enabled (Distance: 0.001)

- Object Collision: Disabled

- Gravity: 0

Finally, add a Subdivision Surface Modifier with Level 2 for smoothness.

4 Shading

Switch to the Shader Editor to create a glowing material:

- Create a new material named "jelly.fish".

- Delete Principled BSDF and add:

- Emission Node (Strength: 4.0)

- Color Ramp Node

- Layer Weight Node

4.1 Connect:

- Emission → Material Output (Surface)

- Color Ramp → Emission (Color)

- Fresnel (Layer Weight) → Color Ramp (Fac)

- Set Blend value to 0.12.

4.2 Color Ramp:

- Black (0), Light Blue (0.1), Light Pink (0.15).

- Enable Ambient Occlusion and Bloom under the Render tab.

- Set World Strength to 0 for a dark background.

5 Animation

Create a Path for the jellyfish to follow:

- Add a path (Shift + A → Curve → Path) and rotate it -90° on X-axis.

- Move its vertices in Edit Mode to define the movement path.

- Add a Follow Path Constraint to the jellyfish and set the path as the target.

- Rotate the jellyfish -90° on Z-axis and keyframe the offset from 0 to -100 over 2000 frames

To make the motion more realistic, add two wind forces:

- Wind Strength: 100

- Animate the Y rotation between 120° and 230° every 200 frames, then repeat using a Cycle Modifier in the Graph Editor.

6 Particles

To simulate small glowing dust around the jellyfish:

- Add an Icosphere and scale it to 0.2.

- Use the same material but with:

- Fresnel Blend: 0.5

- Emission Strength: 20

In the jellyfish Particle System:

- Number: 8000

- Frame Start: -100

- End: 2000

- Lifetime: 120

- Normal Velocity: 0.1

- Render As: Object (Icosphere)

- Object Scale: 0.04

- Scale Randomness: 1.0

- Gravity: 0

- Wind: 0.001

7 Camera and Scene Setup

- Position the camera (Ctrl + Alt + 0) and adjust X, Y, Z coordinates.

- Switch to portrait resolution by swapping X and Y values in the Output tab.

- Duplicate the jellyfish to create three in total.

- Organize winds into a collection.

- Add Depth of Field:

    - Select the first jellyfish as the focus object.
    - Set F-stop to 0.1 for strong blur effect.

8 Conclusion

This process results in a soft, glowing, and realistic jellyfish animation floating through the scene. By combining wave and cloth simulations, custom shaders, and subtle wind and particle effects, the animation captures the elegant motion of a jellyfish in deep water.