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Introduction to 3D Modelling

Fundamentals of 3D Creation and Design



Fundamentals of 3D Creation and Design

What is 3D Design?



What is 3D Design?

3D design is about creating models that exist in a three-dimensional space, which means they have width, height, and depth.

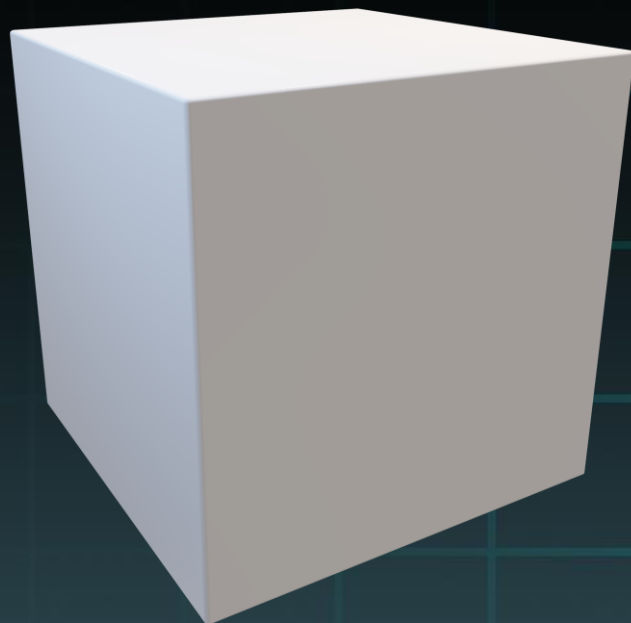


In games, animation, and film, 3D models are used to represent characters, environments, and objects. You can think of 3D design as the foundation for creating virtual worlds.



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Most 3D models are made using a combination of simple shapes called primitives (like cubes, spheres, and cones) that are adjusted to form more complex shapes.



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Basic Components of a 3D Object



Basic Components of a 3D Object

Every 3D model is made of three fundamental parts:

- **1. Vertex:** A point in 3D space. You can think of it as a dot that helps define the shape.
- **2. Edge:** A line connecting two vertices. Think of it like a straight line connecting two points.
- **3. Polygon (Face):** A flat surface made up of connected edges. This is what makes up the surface of your 3D model.

By connecting these parts together, you can create any shape in 3D space.



Vertices – The Building Blocks

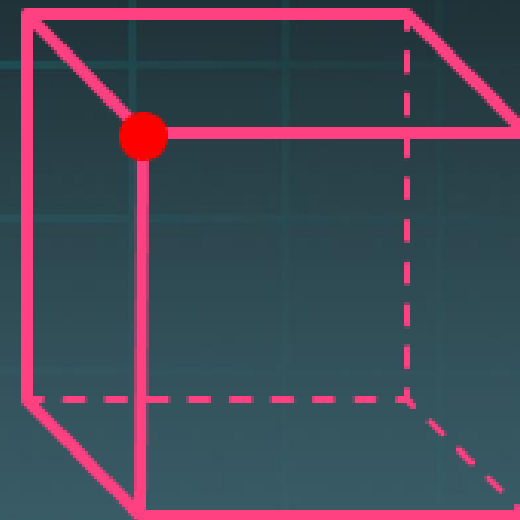
Vertices are the most basic element in a 3D model. They represent points in space, and you will often move them around to shape your object

Vertices are crucial for precision when you need to define sharp corners, edges, or adjust the shape of your object.



Vertex

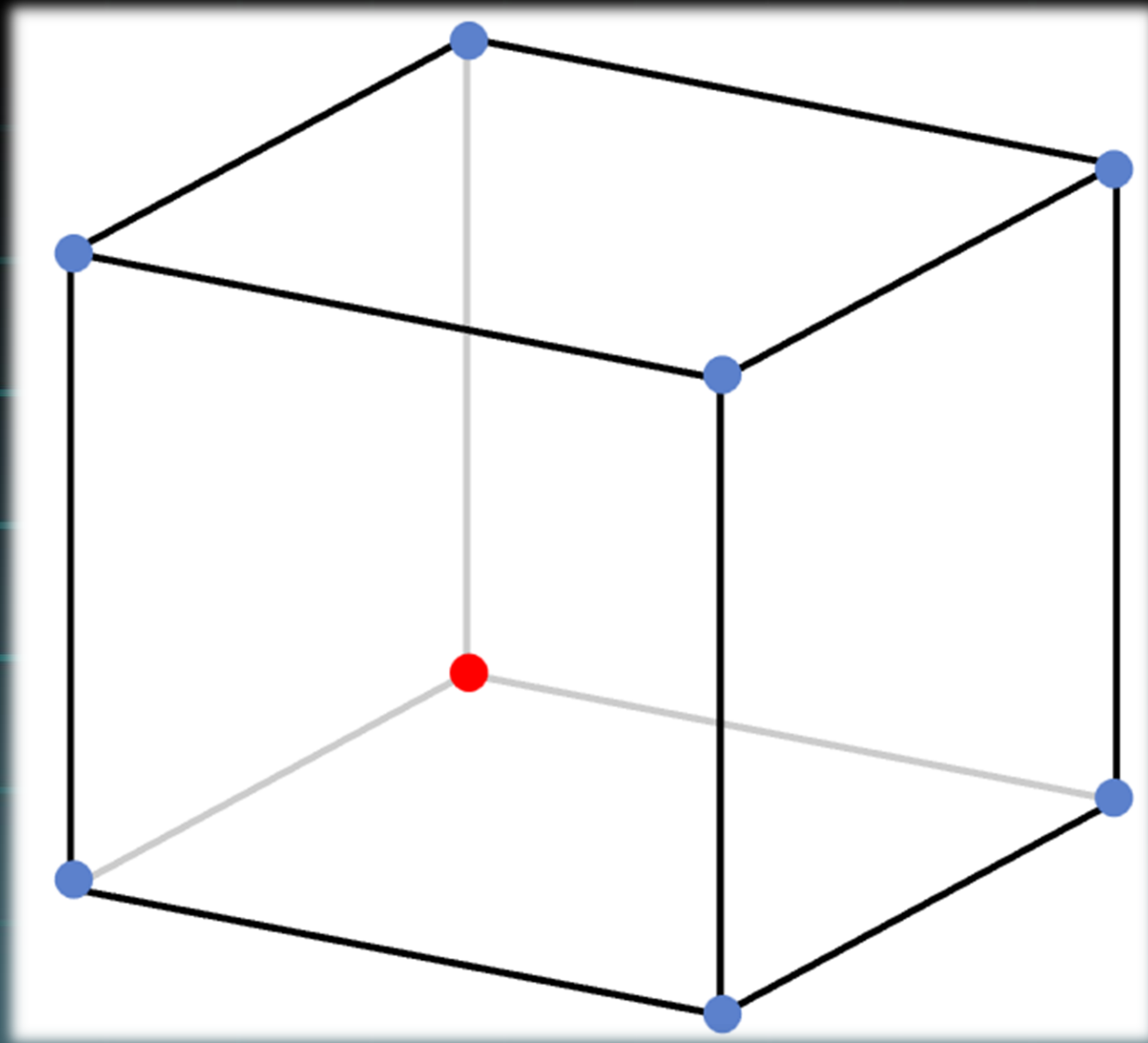
A point where two or more edges meet (like a corner)





For example, imagine a cube. It has 8 vertices—one at each corner.

By moving these vertices, you can change the shape of the cube.

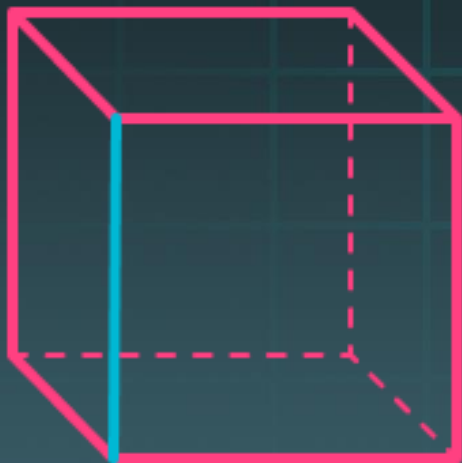




Edges – Connecting the Dots

Edge

A straight line where two faces meet and connects two vertices



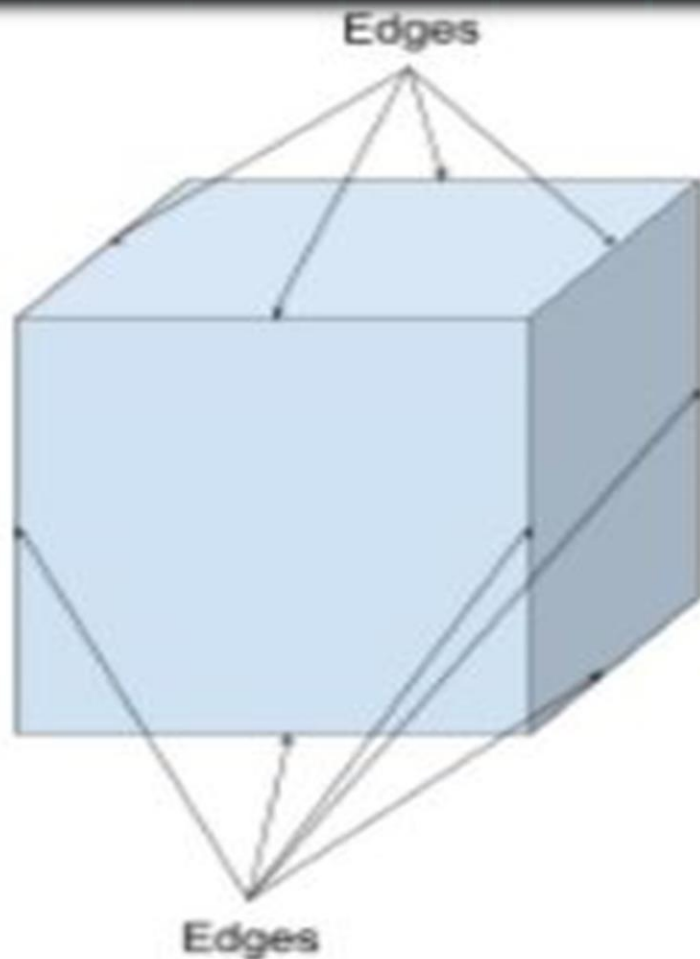
An edge is simply a line that connects two vertices. When you connect enough edges together, you start to form the structure of your model.

Edges are important because they define the skeleton of your object.



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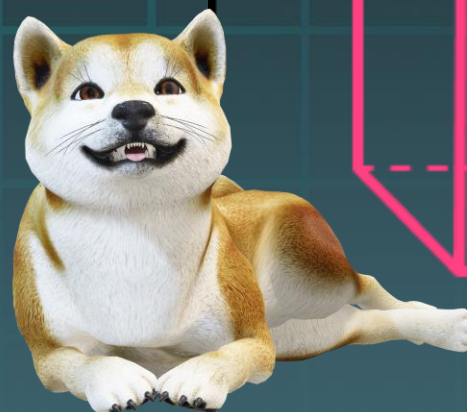
For instance, if you connect 4 edges, you form a square, and by connecting more, you can create shapes like cubes, pyramids, or even complex designs.



Polygons (Faces) – The Surfaces You See

Polygons, or faces, are flat surfaces enclosed by edges. Most 3D models are made up of polygons, typically triangles or quads (squares).

Each polygon is a 'face' of the model, and when multiple faces are joined together, you can create complex 3D shapes.



Face

A flat 2D shape surrounded by edges and vertices





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When you see a 3D model in a video game or animation, you are mostly looking at the polygons that form its surface. These polygons can be textured to add another level of detail and artistic style.



Shaping your Model

By manipulating vertices, edges, and polygons, you can create different shapes and models.

For example, moving vertices allows you to make an object more rounded or pointed, while adjusting edges lets you stretch and bend the model.

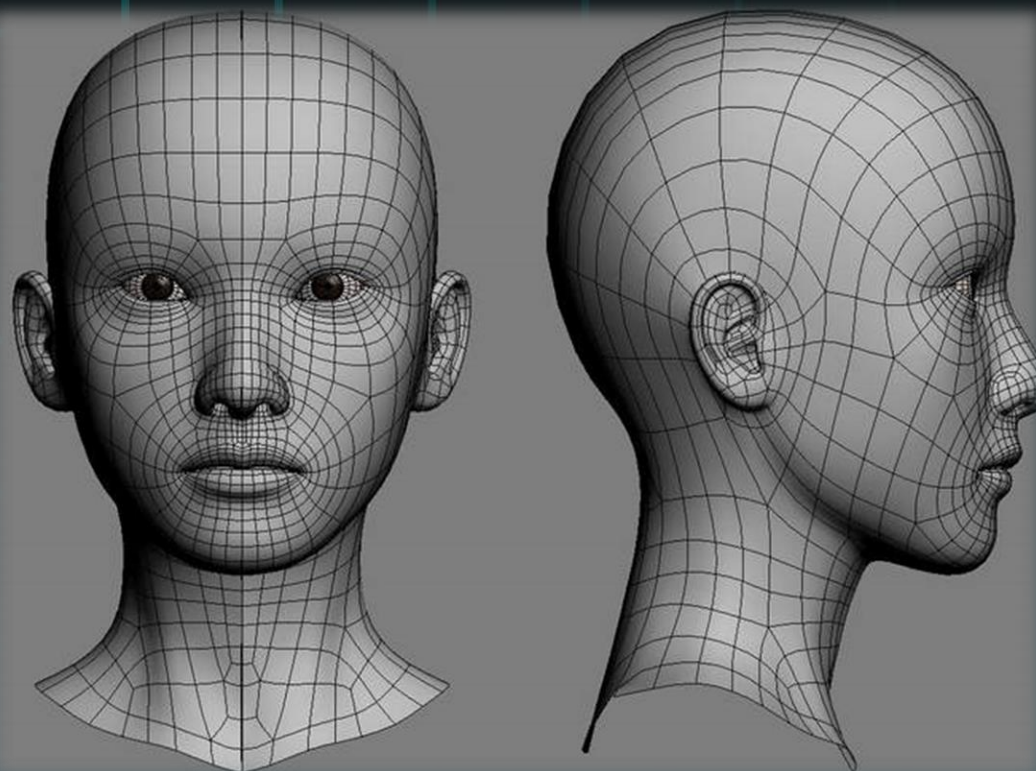
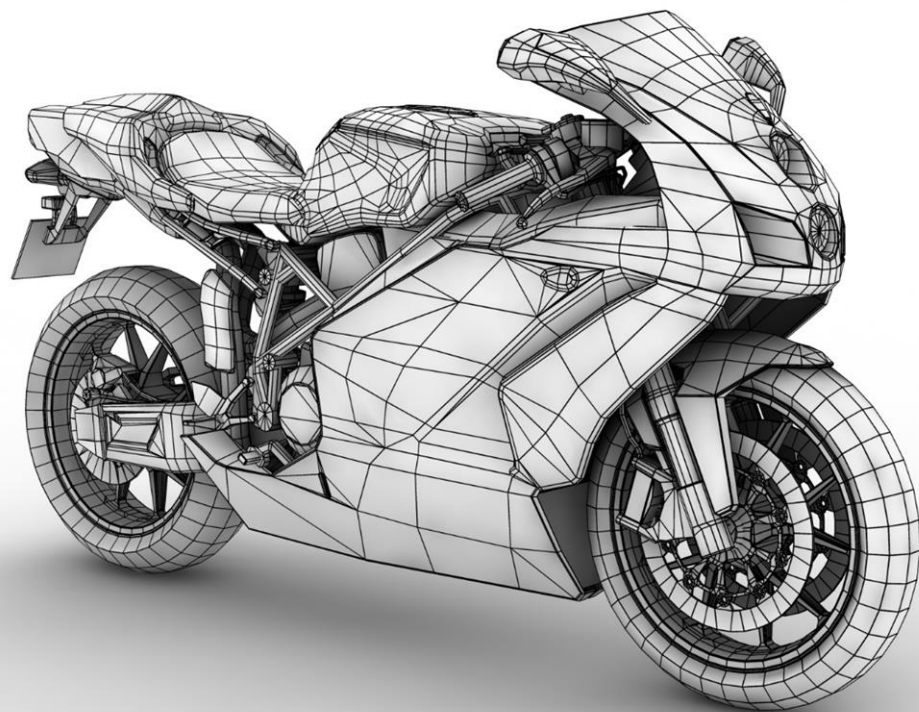




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It's important to understand and remember these basics because they form the foundation of creating more advanced 3D models.





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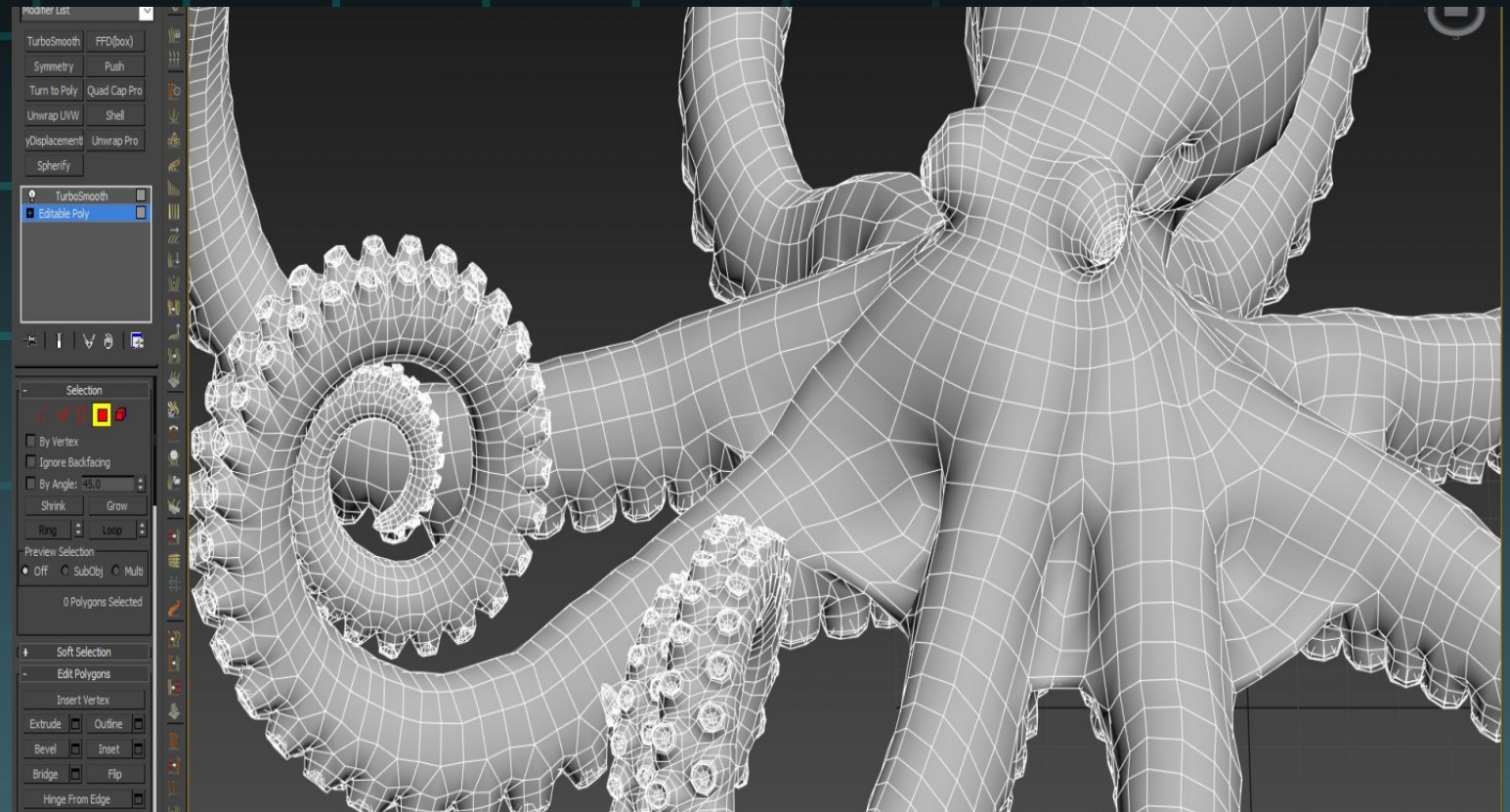
Conclusion – Mastering the Basics



Conclusion

Understanding how vertices, edges, and polygons work together is key to mastering 3D modelling.

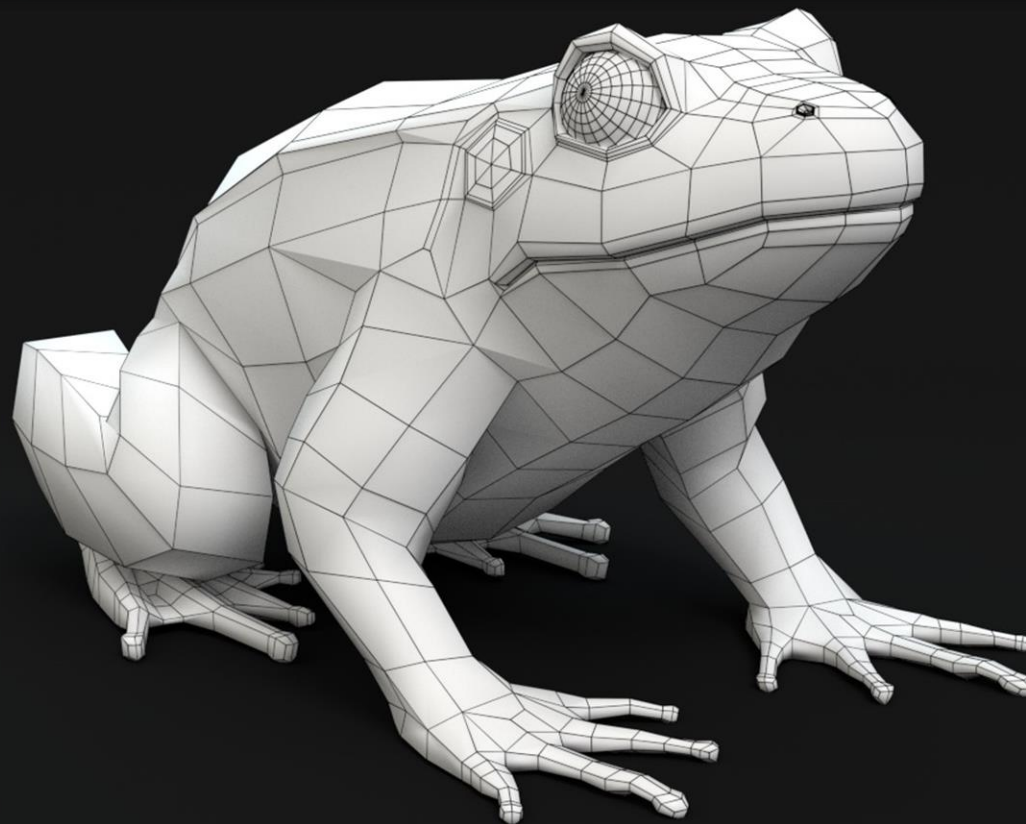
These are the building blocks you'll use to create characters, environments, and objects for games and animations.





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As you become more comfortable with these concepts, you'll be able to create more complex and detailed 3D models!



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ANY QUESTIONS?



Remember:

**SAVE YOUR WORK
AND SAVE IT OFTEN!**