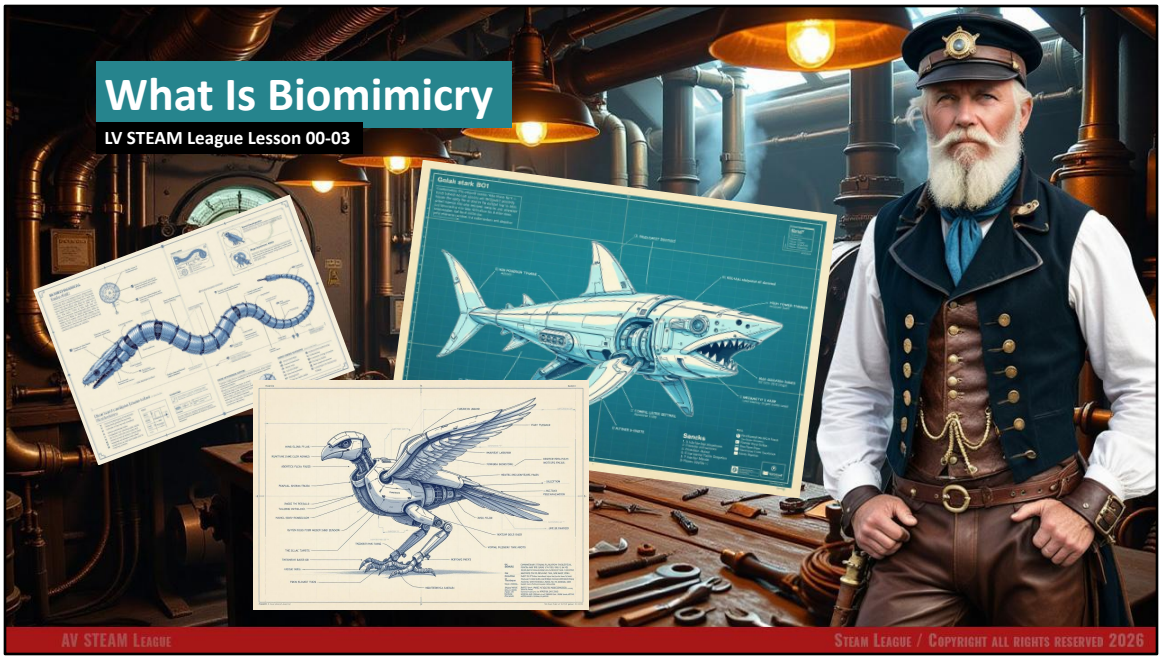
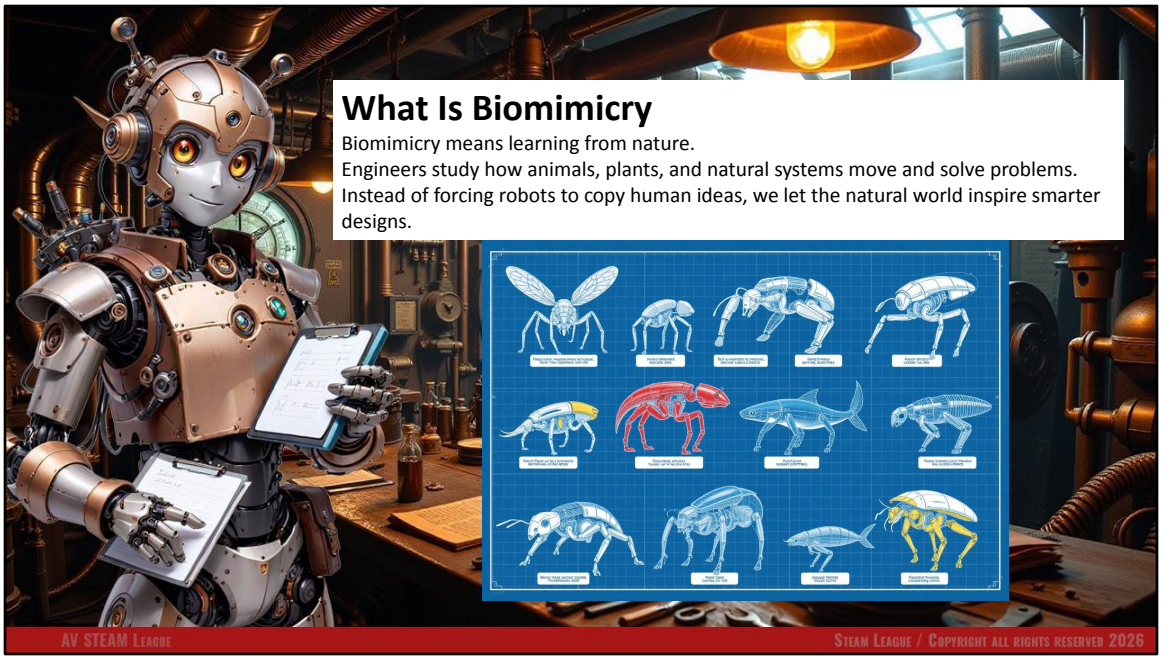


What Is Biomimicry



What Is Biomimicry

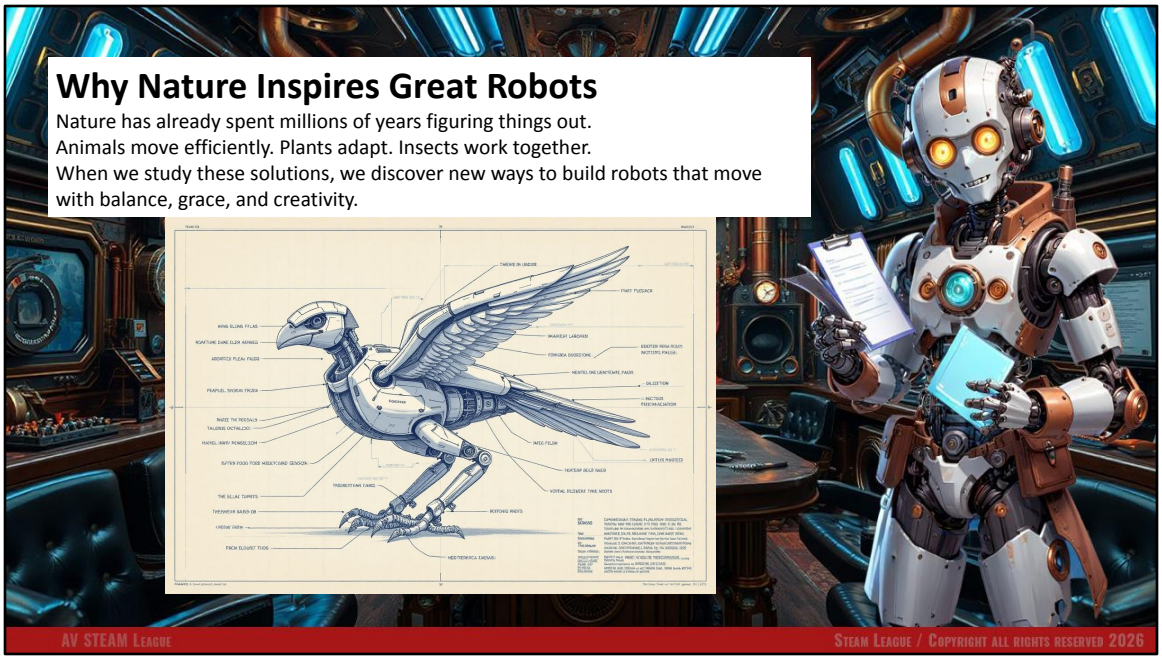
Biomimicry means learning from nature.
Engineers study how animals, plants, and natural systems move and solve problems.
Instead of forcing robots to copy human ideas, we let the natural world inspire smarter designs.

For many thousands of years humans have looked to nature for ideas, imitating animal skins for warmth, mimicking bird flight, or emulating natural structures.

In the 20th century, the idea of using biological principles to guide engineering took a more formal shape. In the 1950s, American biophysicist Otto Schmitt developed early work in this area, including a device modeled on how nerve impulses travel and around that time coined the term Biomimetics

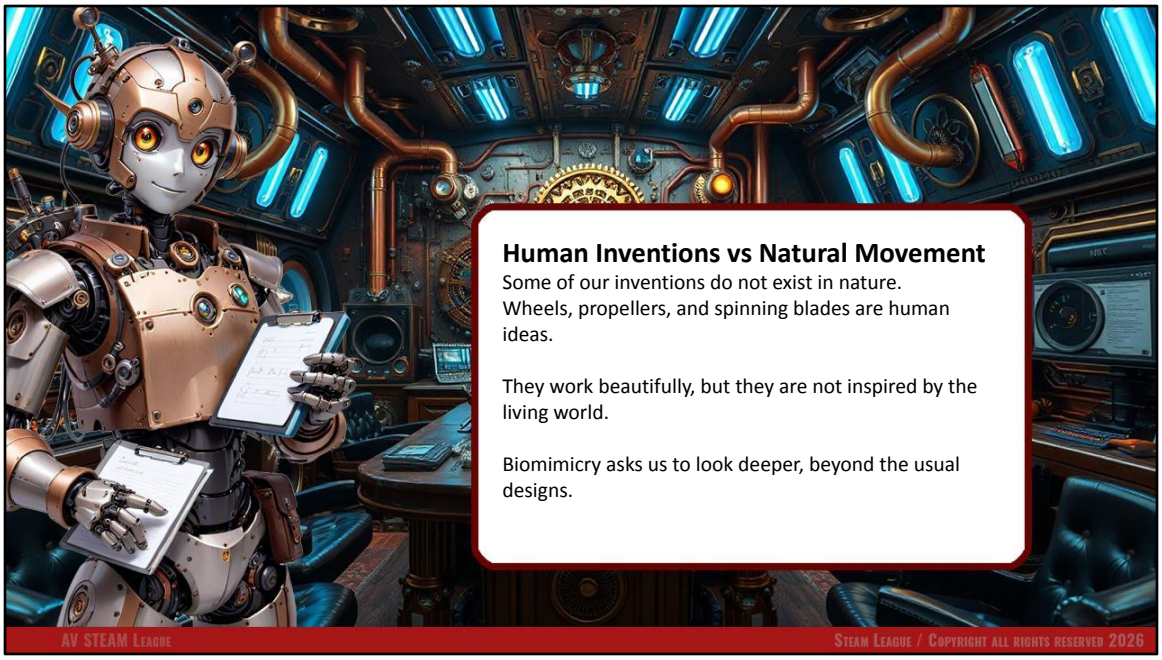
By the 1990s and especially in 1997, the term “biomimicry” itself was popularized by biologist and writer Janine Benyus through her book Biomimicry: Innovation Inspired by Nature. In that book she described biomimicry as a way to treat nature as a “Model, Measure, and Mentor” — inspiring engineers, designers and thinkers to solve human problems using lessons honed by billions of years of evolution.

Since then, biomimicry has grown from a hopeful idea into an interdisciplinary movement. Architects, engineers, scientists, and designers now collaborate drawing on nature’s time-tested strategies for efficiency, sustainability, adaptability, and resilience.



Why Nature Inspires Great Robots

Nature has already spent millions of years figuring things out.
Animals move efficiently. Plants adapt. Insects work together.
When we study these solutions, we discover new ways to build robots that move with balance, grace, and creativity.

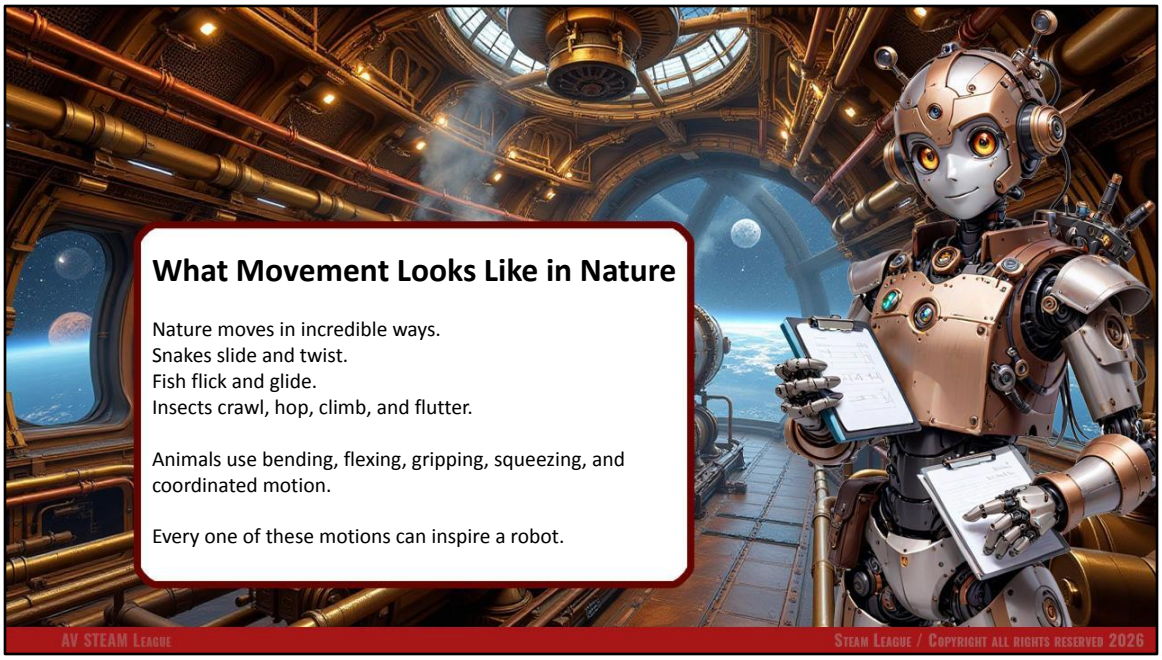


Human Inventions vs Natural Movement

Some of our inventions do not exist in nature.
Wheels, propellers, and spinning blades are human ideas.

They work beautifully, but they are not inspired by the living world.

Biomimicry asks us to look deeper, beyond the usual designs.

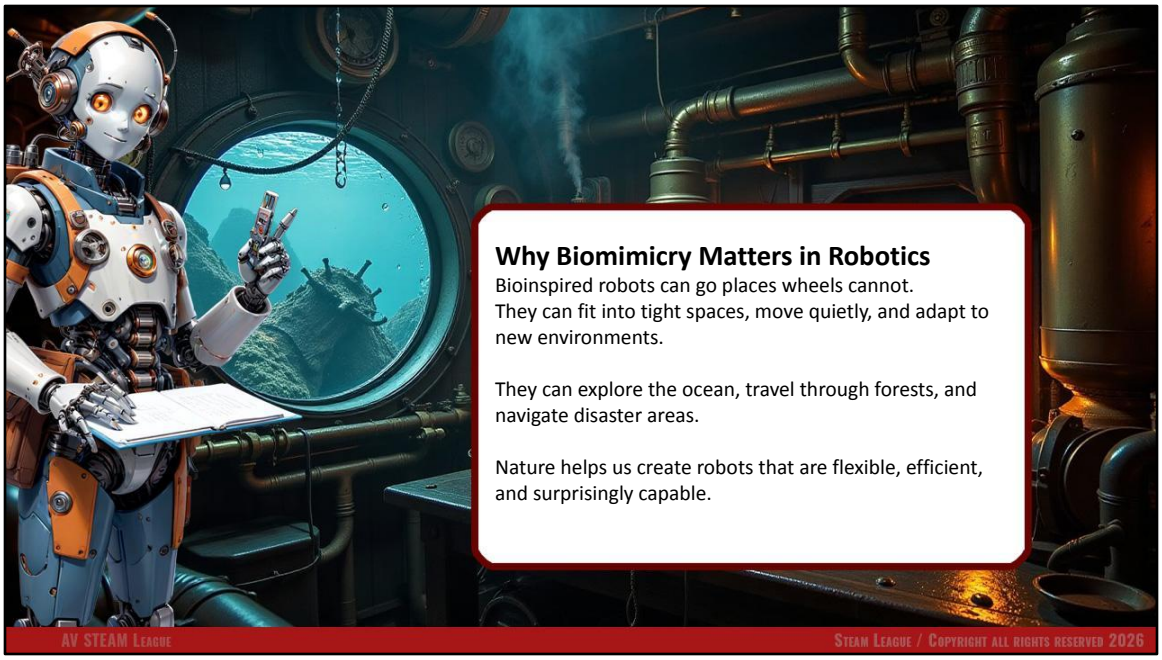


What Movement Looks Like in Nature

Nature moves in incredible ways.
Snakes slide and twist.
Fish flick and glide.
Insects crawl, hop, climb, and flutter.

Animals use bending, flexing, gripping, squeezing, and coordinated motion.

Every one of these motions can inspire a robot.

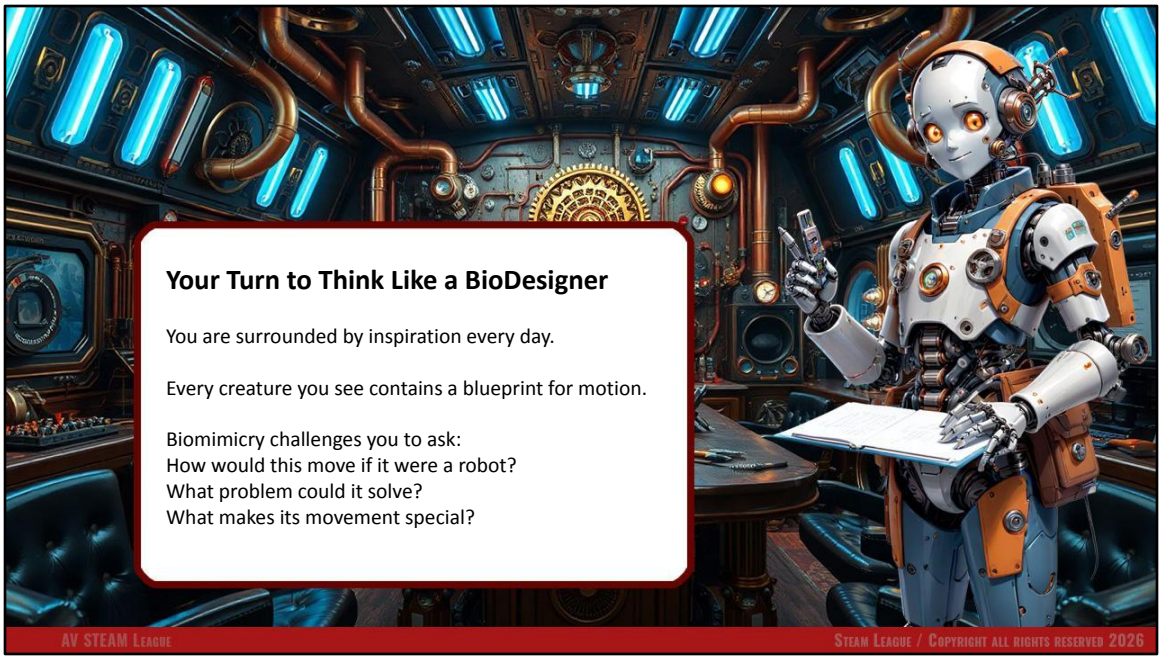


Why Biomimicry Matters in Robotics

Bioinspired robots can go places wheels cannot.
They can fit into tight spaces, move quietly, and adapt to new environments.

They can explore the ocean, travel through forests, and navigate disaster areas.

Nature helps us create robots that are flexible, efficient, and surprisingly capable.

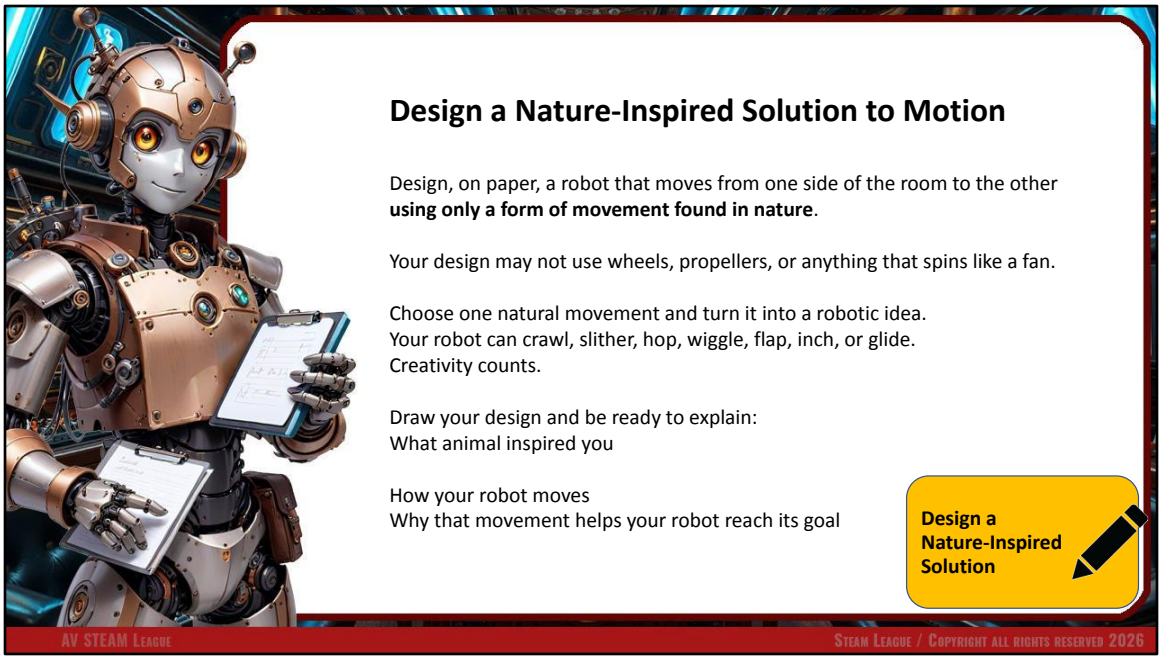


Your Turn to Think Like a BioDesigner

You are surrounded by inspiration every day.

Every creature you see contains a blueprint for motion.

Biomimicry challenges you to ask:
How would this move if it were a robot?
What problem could it solve?
What makes its movement special?



Design a Nature-Inspired Solution to Motion

Design, on paper, a robot that moves from one side of the room to the other **using only a form of movement found in nature**.

Your design may not use wheels, propellers, or anything that spins like a fan.

Choose one natural movement and turn it into a robotic idea.
Your robot can crawl, slither, hop, wiggle, flap, inch, or glide.
Creativity counts.

Draw your design and be ready to explain:
What animal inspired you

How your robot moves
Why that movement helps your robot reach its goal