Animal Architects

Animals are talented architects that make homes especially suited to their needs and environments. These homes protect them from predators and competitors, and provide a safe space to raise their babies. Gather materials from your home and the outdoor spaces nearby and see if you can engineer these special constructions!

You will need:

Construction materials! Like our animal architects, get creative and try to recreate animal homes from items you have on hand or nearby. Here are some examples to get you started with the animal homes on the next page.

- Sticks, twigs, and grasses
- Fabric scraps
- Mud or dirt
- Glue
- Soapy water
- Straws
- Modeling clay (or a flour and water mixture)
- Kitchen sponge
- String




Nest

Many animals build very different nests from a wide variety of materials. **Small mammals** and **birds** may use grasses, sticks, and animal hair to build cup- or sphere-shaped nests in trees, fields, or manmade structures. F**ish** and **frogs** may build nests for hiding eggs by blowing bubbles in the water. Many **bees** and **wasps** drill holes in wood or clay, or create complex paper nest structures. *Can you recreate these nests by weaving grasses, sticks, and fabric scraps together, blowing bubbles in soapy water, excavating bee-sized holes in clay, or gluing straws into a nest structure?*

Burrow

Small mammals like rabbits and prairie dogs, **birds** like burrowing owls, and **reptiles** like tortoises dig holes or tunnels in the ground, sometimes lining them with plant material as insulation. They may live in large families in these spaces, or simply leave their eggs for safekeeping until they hatch. *Try recreating a burrow using a container of soil and insulation materials of your choice.*

Lodge

A lodge is a special kind of home built in waterways by **beavers**. Beavers use their special teeth to saw and assemble sticks, logs, and debris into a dome-shaped house held together by mud. They build underwater tunnel entrances and "skylight" holes for fresh air. *Can you build a mini lodge structure with sticks, grasses, and mud?*

Reef

Reefs are very complex living structures that are home to thousands of animals like **fish**, **crustaceans**, **anemones**, and many others. Reefs are special because the main components of their structure – **corals** and **sponges** – are also living animals! These slow-growing animals' bodies create hiding places and habitat for other sea life. *See if you can sculpt a model reef using modeling clay and kitchen sponges!*

Web

Spiders spin complex webs made of silky fibers. They use these webs to catch their food (insects flying through the air). *Weave your own web using scrap pieces of string!*

Inspired Innovators

Humans are remarkable for our ability to invent new ways to navigate and inhabit our environments. Biologists, designers, and architects can work together to use ideas from nature to shape the world we live in! Read about how these innovators have been inspired by the way complex systems in nature result in simple, efficient, sustainable processes.

Janine Benyus cofounded the Biomimicry Institute, an educational nonprofit organization advocating for *biomimicry*, or the copying of biological processes in sustainable innovation, manufacturing, and design. She is a nature writer, biologist, and conservationist who teaches that we have much to learn from animals, plants, and natural systems as we design and innovate new spaces and materials. **"Learning about the natural world is one thing. Learning from the natural world—that's the switch. That's the profound switch."**

Image: ESLA.org

Tara Gbolade is an architect whose designs are focused on sustainability and reducing carbon emissions. She accomplishes this by turning to nature, using many naturally-sourced sustainable materials and nature-inspired infrastructure systems like living "green roofs" that capture carbon from the atmosphere, and natural drainage systems that replenish water table underground. Just as animals must consider the conditions of their environment when assessing the needs of their homes, Gbolade says that one of the keys to her designs is combining sustainable energy systems with "**biophilic design**" that promotes the wellbeing of their inhabitants.

Neri Oxman is an architect, designer, and inventor. She first used the term "material ecology" to describe her field of study, which incorporates biology and computer science in fabrication and design. Her designs are fundamentally inspired by biological systems in a way that makes them compatible with their place in the ecosystem. She says, **"A great dream of mine would be to run a design studio full of scientists who think about science as creatively as if they were doing art."**

Image: MIT.edu