

Pangolin Pals



What is a pangolin, and what could it possibly have to do with a backpack? As children head back to school with their supplies strapped onto their backs, making Pangolin Pets is a great opportunity to teach them about the amazing world of biomimicry and how it is connected to students just like them!

PANGOLINS & BIOMIMICRY

What is a Pangolin?

Though many think of them as reptiles, pangolins are actually mammals. They are the only mammals wholly-covered in scales and they use those scales to protect themselves from predators in the wild. When in danger, a pangolin will immediately curl into a tight ball to protect itself.



What is Biomimicry?

Biomimicry is when people use ideas from nature to solve problems. Plants and animals have different ways to solve problems that have inspired inventions. An airplane is a classic example of biomimicry.



What is the Pangolin-Biomimicry Connection?

When pangolins curl into a ball to protect themselves, their hard scales act as armor safeguarding their soft, delicate flesh and organs. The scales fit together like a jigsaw puzzle, forming a hard shell. This makes it very difficult for predators to eat them. Humans have been inspired by this brilliant design and used it in the development of roofs, equipment, and even helmets! The most famous example of this particular biomimicry is the Pangolin Backpack. It works just like the pangolin's shell does: To protect what's inside it that could get damaged if met with too much force! Everything from an apple to an iPad is protected inside a Pangolin Backpack, whereas those items would get squished inside a standard fabric backpack. When opening and closing the backpack, its scales collapse and roll up just like a pangolin's do!



MAKE A PANGOLIN PAL

Design your pangolin out of clay and then layer thumbtacks for scales to see the fascinating engineering behind these animals, and backpacks!

MATERIALS

- Clay or playdough
- Thumbtacks (a lot!)
- *Optional:*
 - *Red pipe cleaners*
 - *red ribbon*



STEPS

- 1) Sculpt your pangolin! Remember that the more clay you use, the more thumbtacks you will need. They have a lot of scales! Air dry clay works best, but any clay-type substance will work. Click [HERE](#) for a simple salt dough recipe.
- 2) Give your pangolin scales! Begin layering its body with thumbtacks, observing how their edges overlap one another just as a pangolin's do.
- 3) Consider making several pangolins in different physical stages, from walking to curling to balled up!
- 4) *Optional:* Give your pangolin a tongue! Pangolins have unusually long tongues. They can be up to 16 inches in length. They use them to reach insects burrowed underground.



OPPORTUNITIES FOR EXPANDED LEARNING

Create your own biomimicry invention! Go for a nature walk and observe the world around you. Study the design and behaviors of the plants and animals you experience in nature. What might you invent based on what you see? This can be anything from a practical tool to fun toy! Get inspired with [these fun examples of biomimicry](#).

Discover 10 cool facts about pangolins! Hear fellow children at the [Greenfinders Wildlife Initiative](#) share interesting insights about these amazing creatures.

Help protect pangolins! Pangolins are the most trafficked mammals in the world. Learn how you can help to protect them with the [World Wildlife Fund](#).



“PANGOLIN PALS” SUPPORTS NGSS!

During this activity, children will learn about Life Science while Developing & Using Models, Constructing Explanations & Designing Solutions, and exploring Patterns, Scale, Proportion, & Quantity, Systems & System Models, Structure & Function, and Stability & Change.

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