Beyond the Book Activity

Violet the Pilot

by Steve Breen

Once you have read the book, it is time to move outside. Take a few minutes to prepare for the outdoors and remember, the more comfortable you are the more success you will have on this endeavor. Follow the guide below to an adventure beyond the book!

Engage: Biomimicry

(S.2.GS.7) Violet loved to create elaborate machines from scratch and used anything she could find in her yard to make her wonderful contraptions. In this section we explore the wide variety of animals around the world and how we use what we learn from them to solve some of our technology problems.

Engineers have long taken inspiration from nature. Observations of stork wings, herring gulls, and rainbow trout inspired some of the first gliders and planes. Aircraft inspired by peregrine falcons have shown increased fuel efficiency.

More recently Japan's *bullet train* was redesigned after the kingfisher's long, narrow, and streamlined bill. The downy leg feathers that help to make the owl a stealthy hunter have inspired ways to reduce noise and wind resistance in wind turbines and cars.

This process of using ideas from the natural world to inspire our human inventions is called biomimicry.

One of the most well-known examples of biomimicry is Velcro.

Extend: Be An Engineer

(S.2.GS.6, S.1.GS.5) Here we develop a model that mimics the function of an animal in dispersing seeds.

First, we walk through some of the different ways that plants spread their seeds. Then we will draw inspiration from biomimicry and use natural objects to create our own seed dispersal mechanism.

Animals (like humans!) enjoy eating fruit – which is full of seeds. We digest the sweet sugars, and when the seeds pass through our digestive system they are released far away from the original plant.

Some seeds float in water, others float in the air. Many trees are able to convince squirrels to actually plant their seeds for them! Whatever nuts and acorns the squirrel buries and then forgets to dig back up and eat in the winter are perfectly prepared to grow into the next tree.

Go outside and find a small pebble. Imagine that it is a seed in need of traveling to its ideal planting spot. Can you create something that will help that seed either float, fly, or hook onto something else?

What materials can you find in your schoolyard to work with? Can you borrow any ideas from nature to inspire your creation?

Explore: Seed Dispersal

Velcro was inspired by the burdock plant (pictured below) which produces balls of seeds covered in tiny hooks. When an animal brushes by the plant, the seeds grab onto their fur with the tiny hooks and the seeds catch a ride to the next great growing spot!

Have you ever pulled burrs out of your clothing after being outside? If so, you've encountered a plant that travels in the same way as the burdock does: by using tiny hooks.

Resources

The Story of Velcro
https://pbskids.org/loopscoops/about-velcro.html

Plagiarizing Nature: Biomimicry
https://www.youtube.com/watch?v=V2GvQXvjhLA

Time lapse of Dandelions Taking Flight
https://www.youtube.com/watch?v=gEs6kF90xOc

Miss Maples Seeds by Eliza Wheeler, read by Michelle Obama
https://www.youtube.com/watch?v=ShaO355bpDQ

June Harless Center