



The tail of the Common Squirrel Monkey is approximately twice the length of the monkey's body! This allows the monkey to use it as a counter balance to its own weight.



Many female Common Squirrel Monkeys can see color very well! This helps them select healthy fruits and berries.



On a branch, a tired squirrel monkey rests with his limbs dangling over the edge. By shifting his center of gravity, he is able to balance safely in the trees.



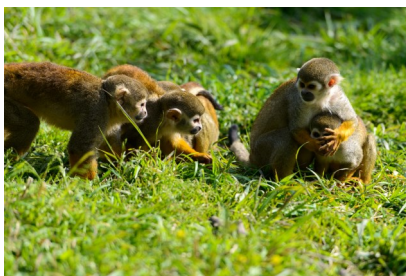
Common Squirrel Monkeys grip with their hands and feet! Each hand and foot has 5 clawed digits, making it easy to peel fruit, hang on to branches, and carry objects—even at the same time!



The Common Squirrel Monkey has thighs that are shorter and stronger than the lower leg— extra strength for jumping and efficient locomotion!



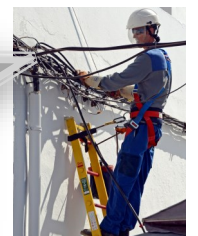
The eyes of a Common Squirrel Monkey are set close together (binocular vision). Sometimes they rotate and tilt their heads to better gauge distances.



The intelligent Common Squirrel Monkey is capable of complex social interactions; cooperation and effective communication are key! To communicate, they wiggle ears, use scent trails, and more!



Working up high requires great balance to keep us safe! The sling we sit in keeps us steady, but getting in and out of it can be difficult. Could the Common Squirrel Monkey inspire a better design?



Clipping the wrong wire can be dangerous! In low-light conditions or in small openings, it is not easy to see colors. In what ways could the Common Squirrel Monkey inspire a safer way to distinguish between wire colors?





A reliable grip ensures tools stay put, rather than falling to the ground! What design, inspired by the grip of the Common Squirrel Monkey would keep my tools where I wants them?



Trying to relax and eat lunch on the site of an incomplete building is impossible! What design, inspired by the Common Squirrel monkey, would allow workers to relax safely when up high?



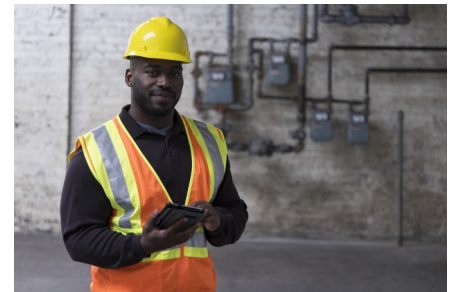
I need to estimate how much material I need for this project, but estimating from a distance is not reliable! How could the Common Squirrel Monkey inspire a better tool for distance estimation?



Roaring machines make it hard to hear your co-workers' communicating with you! In what ways could the Common Squirrel Monkey help us design a better way to communicate in these types of environments?



Rappelling from buildings is fun, but there must be a better way to get to the ground. How can the Common Squirrel Monkey inspire an improved way to get down from up high?



It's difficult to get my workers the things they need when I am on the ground and they are up high working! How can the Common Squirrel Monkey inspire a better way to communicate from afar?



I have a great team of employees, but sometimes creating a plan is difficult because each person is unique in personality and opinions.. How can the social units of the Common Squirrel Monkey inspire a way to work better as a team?



I am looking to improve employee training. I don't want to intimidate them, but I don't want to do the work for them, either. How can the Common Squirrel Monkey inspire improved training methods?



Standing on roofs is dangerous! It would be awesome if the Common Squirrel Monkey could inspire the design of equipment with improved grip-like structures to keep us safely in place!





I need to find a piece of tile that is slightly bigger than each opening. From the ground, I can't accurately judge the measurements. Can you design a tool that helps us estimate measurements from afar?



Quickly differentiating between all these white paint colors is challenging: china, lace, cotton, cloud...! In what ways can the female Common Squirrel Monkey help me?!



We use a lot of heavy machinery to move things on site: lots of fuel and excess emissions! The Common Squirrel Monkey moves without fossil fuels. Create something inspired by them!



The Common Squirrel Monkey will cooperate with others, teach necessary skills to their young, and communicate in a variety of ways.



Standing on the upper floors of a skyscraper-in-progress can be unnerving. Having a wearable device that helps me maintain balance would be ideal! How does the Common Squirrel Monkey stay safe in the trees?



Keeping heavy handheld tools steady is challenging for workers. How can the Common Squirrel Monkey inspire a design that assists the workers with balancing the load?



Collaborative Inquiry Project

Grade 8

Squirrel Monkey Adaptation Cards



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Making the Biomimicry Connection in Cleveland Metroparks Zoo



The Zoo setting provides an opportunity for guests to observe unique features, functions, behaviors, and processes that make nature exceptional. While biomimicry is often accomplished by, first, starting with a problem, then looking to nature for a solution, it can also be done in reverse: by observing interesting aspects of nature and investigating ways in which humans can solve a particular problem using this interesting feature. This 'backwards biomimicry' is common practice in the zoo setting. Nature is ready to be observed. We need, merely, to observe what is unique about the biological organisms (plants, animals, i.e.) around Zoo grounds, and think, "How could I use this interesting fact to solve a problem or meet a need?"

The most well-known example of 'backward biomimicry' is the development of Velcro®. A Swiss engineer, George de Mestral, was inspired by the burrs that clung to his clothing and his dog's fur after a hike on his property in 1948. The unique ability of this plant to disperse its seeds and genes far from itself (the parent plant) provides an evolutionary advantage that allows higher survival rates and species success. de Mestral recognized that this function had value and started making keen observations of the structure of the seeds and of how the seeds behaved or functioned. Under the microscope, de Mestral was able to see the intricate hook-like structures that allowed the burdock (*Arctium spp.*) seeds to cling to fur and fabric. While many of us get annoyed with these burrs that stick to us after a walk in the woods or fields, de Mestral was, instead, inspired to use this unique feature for solving problems or meeting a need outside of nature and seed dispersal. He realized that if he created a *mimic* of it, he could use it as a fastener. By developing 2 strips of fabric, one with the burdock's 'hooks' and one with loops for the hooks to catch onto, Velcro® was born. First, it was touted as the "zipperless zipper" (1950's) because it could replace traditional fastening devices like zippers and buttons. Business really blasted-off when NASA, in the 1960's, installed Velcro® in shuttles and on uniforms to keep items in place once in orbit. The world now saw this nature-inspired design as a Space Age fabric; everyone had to have it!^{1,2}

[1] Swearingen, Jake. 2016, accessed 2017. An Idea That Stuck: How George de Mestral Invented the Velcro Fastener. Retrieved from <https://www.velcro.com/blog/an-idea-that-stuck-how-george-de-mestral-invented-the-velcro-fastener>.

[2] Editors, Biography.com. 2014, accessed 2017. George de Mestral Biography.com. The Biography.com Website. Retrieved from <https://www.biography.com/people/george-de-mestral-9271201>. A&E Television Networks.