Class Starters & Enders

Making the Most of Instructional Time
Five Minute Lessons

Class Starters and Enders help utilize the last minutes of class when a lesson ends but there is not enough time to start another, or for an interest approach at the beginning of class. Mini-lessons correlate to GPS in the programs areas below.

I'm Hooked...by Velcro!

Program Areas: All CTAE Program Areas

Instructions: Read the material and make notes of important points, answer questions, and be ready to discuss this topic.

What's scratchy, fastens shoes, and secures objects on space shuttles? Velcro!

Burrs like this, which have hooks that stick to loops on clothing, fur, and hair, were the inspiration for Velcro.

This hook-and-loop fastener was invented in 1941 by Swiss engineer George de Mestral. The idea for Velcro came to him one day after he returned from a hunting trip in the Alps with his dog. He took a close look at the burrs, or seeds, of plants which stuck to his clothes and his dog's fur. Mestral examined the burrs under a microscope and noticed they had hundreds of "hooks" which caught on anything with a loop – including clothing, animal fur, or hair.

Mestral was suddenly inspired. He realized there was a possibility of binding two materials reversibly in a simple fashion if he could figure out how to duplicate the burr's hooks and loops, and voila – Velcro was born.

Because they were easy to use, maintenance-free and safe, the hook-and-loop fasteners are used for just about every conceivable application where a temporary bond is required. Velcro held together a human heart during the first artificial heart surgery and it is used in nuclear power plants and army tanks to hold flashlights to walls. Cars use it to bond headliners, floor mats, and speaker covers. In the home, Velcro is used in the home to pleat draperies, hold carpets in place, and attach upholstery. It also closes backpacks, secures pockets, and holds disposable diapers on babies.

NASA makes use of Velcro as well. Each space shuttle has 10,000 inches of special Velcro made of Teflon loops, polyester hooks, and glass backing. In the near-weightless conditions in orbit, Velcro is used to temporarily hold objects and keep them from floating away. A Velcro patch is even installed in astronauts' helmets to serve as a nose scratcher.

Some institutions, however, have decreased their use of the material in the past few years. In the military, Velcro's tiny loops became clogged with sand and dust, causing product failure. The ripping noise Velcro makes also has the potential to alert enemies of the army's whereabouts, and has thus become replaced with a more conventional device – the button.

Review

1. What year was Velcro invented?
2. Why did burrs stick to the fur of Mestral's dog?
3. What are two common household uses of Velcro?
4. How is Velcro used in space?
5. Why has the military reduced its use of Velcro?

Math Connection

If a square inch of Velcro contains 200 hooks, how many hooks can be found on the space shuttle?

History Connection

Research one way the military used Velcro. Summarize your findings in a one-page paper.

Science Connection

Suggest three new ways Velcro can be used. How do you use Velcro in your science laboratory? Is Velcro used by professionals in your pathway?

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