



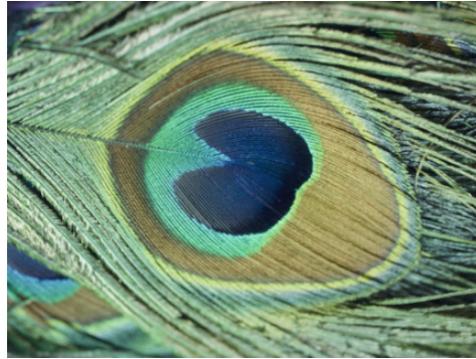
FEATHERS:

SEE HOW THEY ARE BUILT

Teacher Resource Guide
southern sciencesupply.com



These lesson ideas are developed with you in mind. We understand that you are the creative force within your classroom. You may choose to use the hand-held microscope in an inquiry center or you may have multiple scopes and teach in pairs, groups of four, or even groups of six. However you manage your classroom, these ideas will assist you in guiding your students as they observe, question, research, and experiment. These inquiry skills are invaluable life skills.

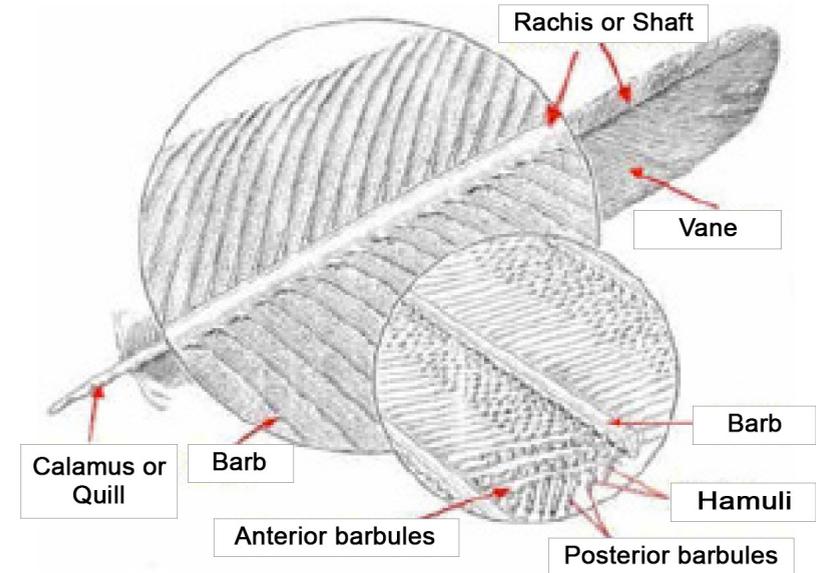


Peacock Feather © STR

Making connections, being creative, problem solving, and questioning will engage your students as they discover the microscopic world. You can extend these lesson ideas and integrate the study of the specimens into your content areas to make them even more relevant. Be creative. There is no limit to what can be discovered!

Lesson Ideas

- Observe and discover how the outer covering of an animal helps it to live in its environment.
- Observe the zipper effect of feathers. Locate the quill, vanes, and barbs. Draw the details of a feather. At higher magnifications you should be able to locate the barbules, the zipper part of the feather that aids in repelling water and holding in warmth.
- Study the three different types of feathers. Determine where each feather might be located on the bird and what its purpose might be.
- Discuss why the anatomy of a feather is so intricate. How would a thin, interlocking design be beneficial to the bird?
- The coloration of feathers ranges from the brilliant to the dull and drab. Why would birds have bright, colorful feathers? Why would a bird have drab coloration?



Feather Structure: Feathers are dead structures that appear to have evolved from scales and are composed of keratin. Scales and feathers develop in a similar fashion. In actuality, birds have both feathers and scales. You can find scales on the legs and feet of most birds. There is an opening at the very tip of the base where the blood supply entered the feather when it was growing. Once a feather is fully grown, the supply of blood is sealed off and the feather itself becomes "dead," similar to the ends of human nails.

Feathers grow from a follicle similar to mammal hair follicles and are replaced regularly by molting. Feathers are incredibly strong and yet are incredibly flexible. To allow both lift and forward movement, feathers can bend at almost a right angle.

Feathers are made of a shaft, called the rachis and the vanes are on either side. Vanes are made of barbs that are arranged side by side up the shaft of the feather. Barbules grow from the barbs, which have tiny hooks that interlock in a similar way to hook-and-loop fasteners.

Feathers have a basic form of a hollow, central shaft called a rachis and a number of smaller side branches. The side branches are called barbs and are linked together by a set of barbules and their "hooklets" sometimes called 'Hamuli' (this is perhaps best understood by seeing the diagram). The base of the feather, where there are no side branches, is called the calamus or quill.

<p>Contour feathers give the bird its characteristic smooth round shape. They also give the bird its visual coloring and provide a first level of defense against physical objects, sunlight, wind and rain. They are very important.</p>	
<p>Down feathers are smaller and lack the barbules and their accompanying hooklets so they are not zipped together and do not look as neat. In fact they are soft and fluffy. They provide most of the insulation and are so good at this that mankind for many years collected down feathers from various birds to put into sleeping bags and jackets to help keep us warm.</p>	
<p>Semiplumes are half-way between a contour feather and a down feather. These occur between the contour feathers and help to supply insulation and a certain amount of form as well.</p>	
<p>Filoplumes are very small and have only a very few barbs at their tips. They are believed to have a sensory function, helping birds keep their feathers in order.</p>	

feather information from www.fernbank.edu/Birding/feathers.htm

Feathers and Fools Paperback

by Mem Fox (Author) , Nicholas Wilton (Author)

Feathers: Poems About Birds

by Eileen Spinelli and Lisa McCue (Apr 1, 2004)

Bird Feathers: A Guide to North American Species (Birds Ornithology)

by S. David Scott and Casey McFarland (Sep 1, 2010)



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