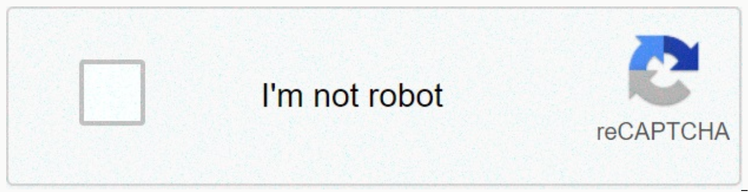

Continue

Polar biome animals and plants

When we think of the word plants, we usually imagine trees, shrubs, grasses and ferns— so-called vascular plants because of their complete systems of leaves, stems and roots. However, the realm of plants also includes mosses, livers, and hornworts, simpler plants that lack these aquatic transport structures. Photo courtesy of Scott Kinmartin and Andrew Fogg via Flickr. A defining characteristic of plants is their ability to produce energy through photosynthesis. Through this process, plants capture solar energy and use it to fuel chemical reactions that convert carbon dioxide and water into oxygen and carbohydrates containing energy (sucrose, glucose or starch). Plants can reproduce sexually through flowering and seed production or by producing spores. They are reproduced asexually by lumps, the formation of bulbs and other types of vegetative reproduction. Although most algae and fungi are no longer classified in the realm of the plant, they are often still included in discussions about plant life. Algae include microscopic, single-celled and multicellular photosynthesizing organisms such as algae and green, red and brown algae. The structures that characterize vascular and non-vascular plants were missing and are classified in the kingdom of Protista. Red algae. Thought algae looks like plants, they are not classified in the realm of plants. Photo by Fernando Ruiz Altamrano via Flickr. Mushrooms do not produce energy through photosynthesis, but instead receive food by destroying and absorbing the surrounding materials. While previously classified with plants, mushrooms are considered more similar to animals and are in the realm of their own. Fungus. Photo by DonGato, Flickr. Many mushrooms are reproduced with fruit bodies, a controversial structure produced above the soil or a source of food. Mushrooms are a well-known example of fertile bodies. Lichets are a third group, which, although often included in plant discussions, is not classified in the realm of the plant. Lichets are a symbiotic association of fungi and algae. The fungus provides water and minerals from the growing surface, and algae produce energy for both technologies through photosynthesis. Lichets compete with plants for sunlight, but their small size and slow growth allow them to thrive in places where plants struggle to survive. Lichets are a symbiotic association of fungi and algae. They're not plants. Photos courtesy of Trapak and brewers via Flickr. Despite low temperatures, permafrst and short growing seasons, vascular and non-vascular plants, algae, mushrooms and lichets are found both in the Arctic and Antarctic regions. Learn more about these solid species and the adaptations that allow them to survive in such harsh conditions. 1,700 species of plants live in the Arctic tundra, including flowering plants, dwarf shrubs, dwarf, grasses, mosses and lichets. The tundra is characterized by permafrst, soil layer and partially decomposed organic matter, which is frozen all year round. Only a thin layer of soil, called an active layer, thaws and refractes every year. This makes shallow root systems a necessity and prevents larger plants like trees from growing in the Arctic. (Cold climate and short vegetation period also prevent tree growth. The tundra is characterized by small plants (usually only an inch high), growing close to each other and close to the ground. Some of the many species include: Copyright 1995 Saint Mary's College of California Arctic Willow Dwarf Bush, which is a food for caribou, musk will, and Arctic rabbits. The Inuit call it the tongue plant because of the shape of its leaves. Copyright 1999 and Buff Corsi, California Pascoe Academy of Sciences. This plant varies throughout the northwestern United States and to northern Alaska. The coating of fine silk hairs provides insulation. Copyright 2001 Robert Potts, California Academy of Sciences Bearberry.This low-growing evergreen leaves and silk hair provide protection from the cold and wind. The plant is named bearberry, because bears like to eat their red fruits. Copyright 2004 and Buff Corsi, California Academy of Sciences Purple saxifrage. This plant grows in a low, tight grip. This is one of the earliest plants to bloom. Miniature, purple, star-shaped (1cm wide) can often be seen above melting snow. Photo courtesy of Ensgar Walk Arctic Poppy. This plant is about 10-15 cm in height, with one flower on a stem. Flower heads follow the sun, and cup-shaped petals help absorb solar energy. Copyright 2002 Gerald and Buff Corsi, California Academy of Sciences Cotongrass.Named for their fluffy, white cottongrass, cottongrass is an important source of food for migrating snow geese and caribou. Lichets grow in mats on the ground and on rocks in the Arctic. Lichets provide an important source of food for caribou in winter. Deer lichets (also known as Caribou) are found in the Arctic. Its name comes from its resemblance to small horns. Photo by Jerry Atwell, Department of Fisheries and Wildlife. There are only two native vascular plants in Antarctica: Antarctic hair grass and Antarctic pearl. These species occur in small lumps near the coast of the west coast of the Antarctic Peninsula, where temperatures are lighter and there is more rainfall. Antarctic Hair Grass (Copyright 2004 and Buff Corsi, California Academy of Sciences) and Antarctic Pearlwort (Copyright 2007 Gerald and Buff Corsi, California Academy of Sciences). There are about 300 types of moss that found in colonies, colonies, 300 species of non-marine algae and approximately 150 species of li sight. Lichets can tolerate very low temperatures and thus can live where real plants can not. Lack of water, not low temperatures, is the biggest problem, and liers cope with this problem by living in cracks between the rocks. Antarctic lichets. Photo courtesy of Mykle Hoban and Sam House via Flickr. Such adaptations help plants, algae, fungi and lichets survive in both the Arctic and Antarctic. First, the size of plants and their structures make survival possible. Small plants and shallow root systems compensate for the thin layer of soil, and small leaves minimize the amount of water loss through the surface of the leaves. Plants also grow near the ground and side by side, a strategy that helps to resist the effects of cold weather and reduce the damage caused by wind blowing snow and ice particles. Fuzzy coatings on stems, leaves, buds and wave seeds cover provide additional protection from the wind. Plants have also adapted to the long winters and the short, intensely polar summer. Many species of the Arctic can grow under a layer of snow, and almost all polar plants are able to photosynthesize at extremely cold temperatures. During a short polar summer, plants use the long hours of sunlight to develop rapidly and produce flowers and seeds. The flowers of some plants are cup-shaped and direct the rays of the sun to the center of the flower. Dark plants absorb more than solar energy. Moreover, many species are perennials that grow and bloom in summer, die in winter and return the following spring from their roots. This allows plants to channel less energy into seed production. Some species do not produce seeds at all, reproducing asexually through root growth. Polar regions are of great importance as the Earth's climate warms. While we have heard of declining sea ice and its negative impact on marine animals, there is evidence that Arctic plants may be better able to adapt to a warming world. Studies of nine flowering plant species from Svalbard, Norway, have shown that Arctic plants can shift long distances (through wind, floating sea ice and birds) and follow the climatic conditions for which they are best adapted. The widespread dispersion of seeds and plant fragments can ensure the survival of species as climatic conditions change. While encouraging, these data do not necessarily extend to Antarctic species or species in temperate regions. Tundra plants Detailed information about eight plant species that are located in the

Arctic tundra. Plants of Antarctica species found in Antarctica. Life of Antarctica: Plants Information about vascular plants, liculums, mosses, algae, and mushrooms found in Antarctica. Lower low, faster, hold on! Overview of adaptations of Arctic plants. Arctic plants plants on climate change, wind blowing: Arctic plants are moving rapidly as climate change, these two articles discuss the findings relating to plant mobility in the Arctic and sustainability. The entire document on national educational standards for science can be read online or downloaded free of charge from the national website of Press Academies. The excerpt was taken from Chapter 6. Plant research is consistent with the standards of science for life science of the national educational standards of science. In class K-4, students focus on the characteristics and life cycles of organisms and how organisms live in their environment. Students in grades 5-8 expand their understanding by focusing on populations, species communities, and how they interact with their surroundings. Teaching plants can meet a wide variety of basic concepts and principles, including: K-4 Life Science The characteristics of organisms life cycles of organisms and their environments 5-8 Life science of reproduction and heredity regulation and behavioral populations and ecosystem diversity and adaptations of organisms This article was written by Jessica Fries-Gaither. For more information, see the Contributors page. Email Kimberly Lightl, principal investigator, with questions about the content of this site. Copyright March 2009 - Ohio State University. This material is based on the work supported by the National Science Foundation under Grant No 0733024. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. This work is licensed under a ShareAlike 3.0 Non-Assignable Creative Commons License. License.