The following information relates to;

Achievement Objectives

Life Processes, Ecology & Evolution LW 8-1: Understand the relationship between organisms and their environment.

and

Achievement Standard

3.5: Demonstrate understanding of evolutionary processes leading to speciation.

Co-evolution and Pollination

Bees and flowers have evolved together for millions of years. It is a mutual relationship where the bee is provided with food (nectar or pollen) and the stationary plant gets to disperse its pollen (sperm cells) to other plants of the same species. For the plant this is much more efficient than using wind to disperse its pollen. Consequently, over millions of years plants have developed flowers with increasingly specialised features to attract visiting bees who, in turn, would distribute pollen grains and optimise the plant's reproductive capabilities. Simultaneously, bees underwent physiological, behavioural and structural adaptations to take advantage of the nutritional benefits offered by flowering plants. This is an example of a co-evolutionary relationship.

Honey bees are considered generalist pollinators which means they will collect nectar and pollen from a variety of different plant species. However, this does not mean they pollinate all plants. Honey bees are considered the most important pollinators and animals on Earth. It has often been said that bees are responsible for one out of every three bites of food humans eat. Most crops grown for their fruits (including vegetables such as squash, cucumber, tomato and eggplant), nuts, seeds, fibre (such as cotton), and hay (alfalfa grown to feed livestock), require pollination by honey bees. Pollinating honey bees also play a critical role in maintaining natural plant communities.

Bees make excellent pollinators because most of their life is spent collecting pollen, a source of protein that they feed to their developing offspring. When a bee lands on a flower, the hairs all over the bees' body attract pollen grains through electrostatic forces. Stiff hairs on their legs enable them to groom the pollen into specialised brushes or pockets on their legs or body, and then carry it back to their hive. Individual bees tend to focus on one kind of flower at a time, which means it is more likely that pollen from one flower will be transferred to another flower of the same species by a particular bee. Many plants require this kind of pollen distribution, known as cross-pollination, in order to produce viable seeds and increase genetic variation within the species. The business of collecting pollen requires a lot of energy, and so many flowers attract and also reward bees with nectar, a mixture of water and sugars produced by plants.

Resource

When Chinese farmers in South Sichuan Province, the largest producers of pears in that region of China, alerted the government to the absence of bees due to pesticides and that the year's crop was endangered, the government's unprecedented response was to insist on hand-pollination. Meanwhile, farmers in the United States, faced with the same dilemma, wonder if this method will someday, too, be their fate. This video segment adapted from Nature: Silence of the Bees discusses the impact of the bees' disappearance, as well as the effects Colony Collapse Disorder (CCD) has on pollination and the world food supply.
http://www.teachersdomain.org/resource/vtl07.la.rv.text.beesdisap/

References

http://www.agf.gov.bc.ca/apiculture/factsheets/111_foraging.htm

http://www.dailymail.co.uk/sciencetech/article-473897/A-bees-eye-view-How-insects-flowers-differently-us.html

http://nativeplants.msu.edu/about/pollination/

http://westmtnapiary.com/Bees_and_color.html

http://en.wikipedia.org/wiki/Waggle_dance