Resource 1: Pictures of white willow and meadowsweet, and information about salicylic acid.

Both plants contain salicin from which salicylic acid is derived. This was widely used in the 19th century for fever, gout, pain and inflammation. However, high doses of salicylic acid often resulted in gastric irritation and vomiting. In 1893, a scientist named Hoffman synthesized acetyl salicylic acid, or aspirin, which is less toxic than salicylic acid and less likely to irritate the stomach.

White Willow *Salix alba* *By Willow*

Meadowsweet
Filipendula ulmaria
By Sten Porse

Healing body and soul

Classroom resources

Resource 2: Information sheets on the medicinal properties of several plants.

Nb: full sized sheets are available as individual PDFs

HB_foxglove.pdf
HB_sage.pdf
Hb_whitewillow.pdf
HB_meadowsweet.pdf
HB_umckalo.pdf
HB_cinchona.pdf

Foxglove


FOXGLOVE

It can raise the dead and kill the living
Folk saying

Plants of the genus Digitalis contain a drug that has a powerful effect on the heart. This drug, when extracted from the plant, is known as Digoxin (Digitalin) and is used to treat heart conditions such as congestive heart failure. Digoxin enables the heart to beat more slowly, powerfully, and regularly; at the same time it acts as a diuretic, i.e. it stimulates the production of urine to lower the volume of the blood and hence lessen the load on the heart.

Ironically the plant is highly toxic, and even the ingestion of small amounts can be fatal, hence the folk saying.

In medical history, foxglove is best known as the discovery of William Withering, an 18th century English country doctor. Curious about the use of the plant by a local herbalist, he explored it's potential medical use. His work led to the production of the heart medication we know today.

A century after Withering several European scientists discovered the active ingredients in the plant, known as Digoxin or Digitalin. This is still extracted from the plant today because making it synthetically is quite expensive and difficult. However, it is becoming less frequently used due to the potential for negative side effects.

In South America the powdered leaves of the foxglove plant are also used to relieve asthma, as sedatives, and as diuretics. In India an ointment that contains digitalis is used to treat wounds and burns.

Scientific name
Digitalis sp.

Common names
Foxglove, Dead Man's Bells, Dog's Fingers, Fairy Gloves, Ladies' Glove, Witches' Gloves, Fairy Thimbles

Where found
Native to Europe, Asia and Africa

Therapeutic ingredient
Digoxin/Digitalin

Used to treat
Heart conditions

Sage


SAGE

Sage is singularly good for the head and brain, it quickeneth the senses and memory, strengtheneth sinews, restoreth health to those that have the gout and taketh away shaking trembling of the [limbs]
John Gerard 1545-1611, English herb

The use of the word sage to mean a wise person comes from the belief that the sage plant was thou to impact wisdom and improve memory. Both botan and common names are derived from the Latin sal (to save), referring to the long-believed healing properties of sage.

Salvia officinalis has been used since ancient times herbal remedies. The Romans likely introduced it t Europe from Egypt as a medicinal herb. The Empe Charlemagne recommended the plant for cultivatio the early Middle Ages, and during the Carolingian Empire, it was cultivated in monastery gardens.

The plant had a high reputation throughout the Mid Ages, with many sayings referring to its healing properties and value. It was sometimes called S. salvatrix (sage the savior), and was one of the ingredients of Four Thieves Vinegar, a blend of her that was supposed to ward off the plague.

Modern evidence shows several possible uses of s including as an antibiotic and antifungal agent. In a double blind, randomized and placebo-controlled tr sage was found to be effective in the management mild to moderate Alzheimer's disease, a degenerati brain disease that leads to dementia.
http://en.wikipedia.org/wiki/Salvia_officinalis-cite_no

Scientific name
Salvia officinalis

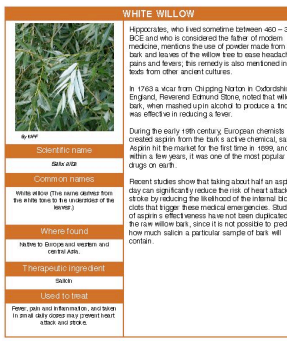
Common names
Sage, Garden Sage, Salvia, Meadow Sage

Where found
Native to the Mediterranean, now cultivated over the world. There are an estimated 500 species of Salvia, with atleast 250 found in Mexico alone.

Therapeutic ingredient
Rosmarinic acid

Used to treat
Alzheimer's disease

White willow


WHITE WILLOW

Hippocrates, who lived sometime between 460 – 3 BCE and who is considered the father of modern medicine, mentions the use of powder made from bark and leaves of the willow tree to ease headact pains and fevers; this remedy is also mentioned in texts from other ancient cultures.

In 1763 a vicar from Chipping Norton in Oxfordshi England, Reverend Edmund Stone, noted that wil bark, when mashed upin alcohol to produce a tinc was effective in reducing a fever.

During the early 19th century, European chemists created aspirin from the bark's active chemical, sa Aspirin hit the market for the first time in 1899, an within a few years, it was one of the most popular drugs on earth.

Recent studies show that taking about half an asp day can significantly reduce the risk of heart attack stroke by reducing the likelihood of the internal blo clots that trigger these medical emergencies. Stud of aspirin's effectiveness have not been duplicatec the raw willow bark, since it is not possible to pred how much salicin a particular sample of bark will contain.

Scientific name
Salix alba

Common names
White willow (The name derives from the white bark to the underside of the leaves.)

Where found
Native to Europe and western and central Asia.

Therapeutic ingredient
Salicin

Used to treat
Fever, pain and inflammation, and taken in small daily doses may prevent heart attack and stroke.

Meadowsweet


MEADOWSWEET

Meadowsweet was among the ancient Druids most sacred herbs, although no one knows if they used it as a remedy. In the Middle Ages, it was used to flavour mead, an alcoholic beverage made from honey. In Europe, it is still used as a flavouring for food.

Known by many names, in Chaucer's *The Knight's Tale* it is known as Meadwort and was one of the ingredients in a drink called save. It was also known as Bridewort, because it was strewn in churches for festivals and weddings, and often made into bridal garlands. In Europe, it took its name 'queen of the meadow' for the way it can dominate a low-lying, damp meadow. In the 16th century, when it was customary to strew floors with rushes and herbs (both to give warmth underfoot and to overcome smells and infections), it was a favourite of Queen Elizabeth I, who preferred it above all other strewing herbs.

Anti-inflammatory chemicals, called salicylates, were first extracted from the plant in the 1830s. In 1897 a pharmacist named Felix Hoffmann created a synthetically altered version of salicin, derived from meadowsweet, which caused less digestive upset than pure salicylic acid. The new drug – Acetylsalicylic acid – was named aspirin by Hoffman's employer, the German chemical and pharmaceutical company Bayer, after the old botanical name for meadowsweet, *Spiraea ulmaria*.

Scientific name
Filipendula ulmaria

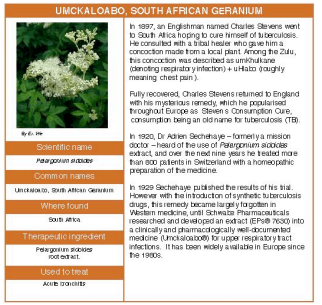
Common names
Bridewort, Dolloff, Meadsweet, Meadowwort, Queen/Lady of the Meadow

Where found
Native to Europe, and now also found in North America and North Asia.

Therapeutic ingredient
Salicin

Used to treat
Fever, pain and inflammation, and taken in small daily doses may prevent heart attack and stroke.

South African Geranium


UMCKALOABO, SOUTH AFRICAN GERANIUM

In 1897, an Englishman named Charles Stevens went to South Africa hoping to cure himself of tuberculosis. He consulted with a tribal healer who gave him a concoction made from a local plant. Among the Zulu, this concoction was described as umkhuhlane (denoting respiratory infection) + ukhsto (roughly meaning 'chest pain').

Fully recovered, Charles Stevens returned to England with his mysterious remedy, which he popularised throughout Europe as Stevens's Consumption Cure, consumption being an old name for tuberculosis (TB).

In 1920, Dr Adrien Sechehaye – formerly a mission doctor – heard of the use of *Pelargonium sidoides* extract, and over the next nine years he treated more than 800 patients in Switzerland with a homeopathic preparation of the medicine.

In 1929 Sechehaye published the results of his trial. However with the introduction of synthetic tuberculosis drugs, this remedy became largely forgotten in Western medicine, until Schwabe Pharmaceuticals researched and developed an extract (EPs® 7630) into a clinically and pharmacologically well-documented medicine (Umckaloabo®) for upper respiratory tract infections. It has been widely available in Europe since the 1980s.

Scientific name
Pelargonium sidoides

Common names
Umckaloabo, South African Geranium

Where found
South Africa

Therapeutic ingredient
Pelargonium sidoides root extract.

Used to treat
Acute bronchitis

Chinchona


CINCHONA TREE BARK

[The bark of the Cinchona tree] has turned out to be more gracious for humanity than all the gold and silver that the Spaniards have ransacked from Peru.
17th century doctor Sebastiano Badoni

In the 17th century a Spanish priest in Peru – Agostino Salumbrino (1561–1642) – an apothecary (pharmacist) by training, had observed the native Peruvians using the bark of the cinchona tree to reduce symptoms of malaria, a recurring fever caused by a blood parasite.

Salumbrino sent a small quantity to Rome for testing, as, at that time, malaria was common in the swamps and marshes surrounding Rome and was responsible for the death of countless Roman citizens. In the years that followed, cinchona bark became one of the most valuable commodities shipped from Peru to Europe.

The active ingredient of the bark, quinine, was isolated and named in 1820 by two French scientists, Pierre Joseph Pelletier and Joseph Bienaimé Caventou. The name they gave to it was derived from the name the native Peruvians used for the bark, quina or quina-quina, which roughly means 'bark of bark' or 'holy bark'.

Large-scale use of quinine as a preventative treatment started around 1630. It remained the anti-malarial drug of choice until the 1940s, when other drugs replaced it. Since then, many effective treatments for malaria have been introduced, although quinine is still used to treat the disease in certain critical situations; even though quinine can be produced synthetically, Cinchona trees remain the only economically practical source of the drug.

Scientific name
Cinchona officinalis

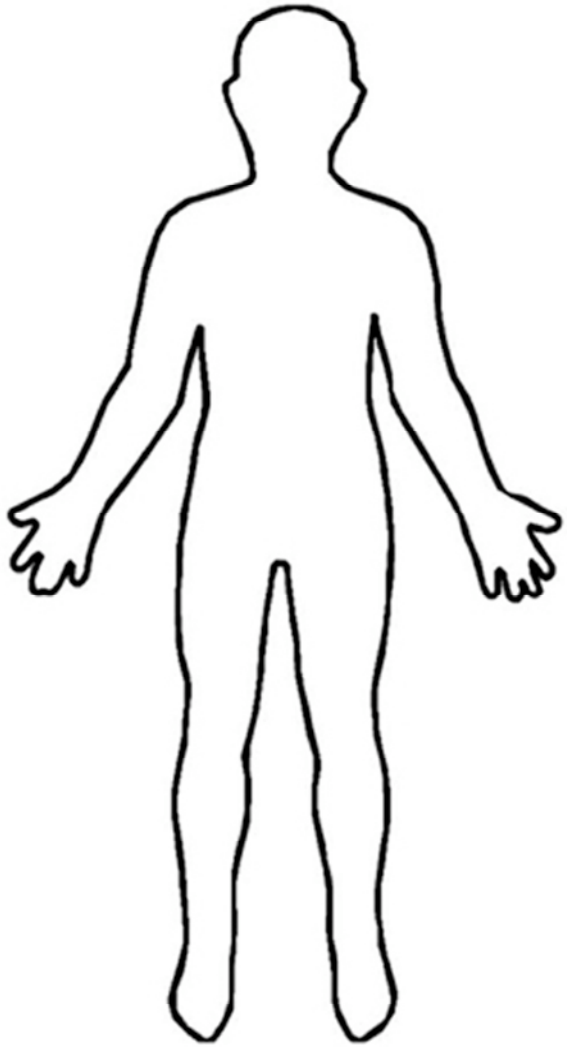
Common names
Holy bark, Peruvian bark

Where found
South America

Therapeutic ingredient
Quinine

Used to treat
Malaria

Resource 3: Outline of human body.



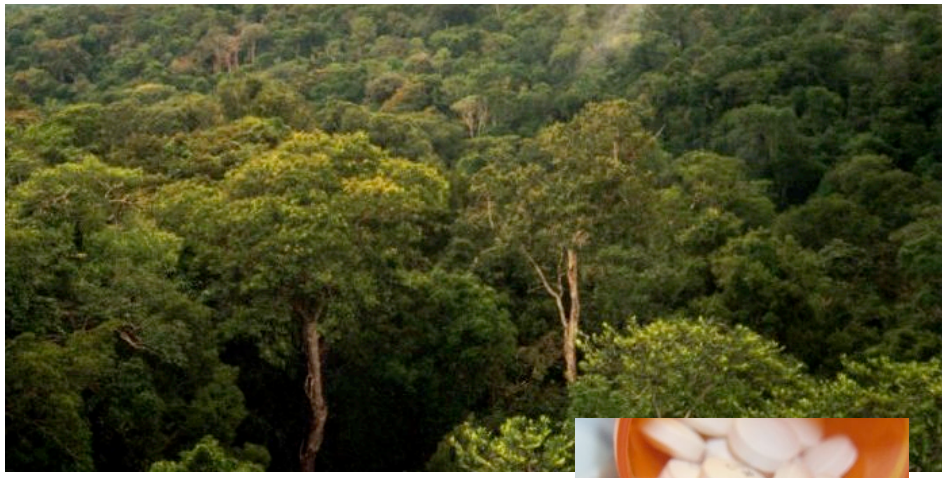
Resource 4: Background information on the story of Charles Darwin and the 'thinking path'.

Charles Darwin was a brilliant naturalist who lived over 200 years ago. He is famous for his theory on evolution which was published in a book called '*On the Origin of Species*'. Darwin believed that all species (plants and animals) have descended from a common ancestry. Through natural selection individuals develop characteristics that make them more likely to survive. They would then pass these characteristics on to their offspring, and so on.

Darwin developed his theory through a voyage he took when he was a young man. He spent five years on a ship called The Beagle and visited countries as far away as South America. During his voyage he collected a huge number of geological and biological specimens many of which you can still see in the Natural History Museum in London.

Darwin suffered from bad health in later years and this kept him confined at home. It was at this time Darwin satisfied his great curiosity with experiments involving plants, for instance insect pollination and the movement of climbing plants. He would walk through the grounds of his estate at Down House three times a day, both for exercise and because it helped him ponder the questions that were bothering him; he called it his 'thinking path'.

Resource 5: Two pictures.



Amazon rainforest, near Manaus, Brazil

By Phil P Harris

Prescribed medicine

By Calvero

The Green Rehab Garden, Gothenburg Botanical Garden

Gothenburg Botanical Garden

Web links to download the pictures included in 'Healing Body and Soul' lesson resources:

White willow
http://en.wikipedia.org/wiki/File:Salix_alba_020.jpg
Meadowsweet
http://en.wikipedia.org/wiki/File:Filipendula-ulmaria.JPG
Foxglove
http://en.wikipedia.org/wiki/File:Digitalis-stora_hultrum.sweden-24.jpg
Salvia officinalis
http://en.wikipedia.org/wiki/File:Koeh-126.jpg
Salix alba
http://en.wikipedia.org/wiki/File:Salix_alba_leaves.jpg
Umckaloabo
http://i01.i.aliimg.com/photo/v0/107908423/Pelargonium_sidoides.jpg
http://www.flickr.com/search/?q=Umckaloabo
Cinchona Tree bark
http://en.wikipedia.org/wiki/File:Cinchona_officinalis_001.JPG
Outline of human body
http://upload.wikimedia.org/wikipedia/en/0/0e/Outline-body.png
Amazon rainforest, near Manaus, Brazil
http://en.wikipedia.org/wiki/File:Amazon_Manaus_forest.jpg
Prescribed medicine
http://upload.wikimedia.org/wikipedia/commons/a/a9/Ritalin-SR-20mg-1000x1000.jpg

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