 MANY HUNDREDS OF YEARS before Linnaeus developed our current system of classification (back in 1753), Muslim scientists were collecting vast numbers of plant species and sorting them according to their uses. Their knowledge of herbal medicines was extensive and impressive, and coupled with access to information on earlier attempts to classify plants, they developed sophisticated methods of classifying the living world. One Muslim scientist – Ibn al-Baytar of Malaga, Muslim Spain – studied 3000 plant species and their medical properties, and recorded his findings in a vast encyclopedia. The scientific skill of ‘try it and write what it does’ goes back a long way! In this activity, students classify useful plants before exploring the pros and cons of herbal medicine in today’s world.

Curriculum links

<table>
<thead>
<tr>
<th>11-14</th>
<th>QCA 7d - variation and classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• compare different styles of recording observations</td>
</tr>
<tr>
<td></td>
<td>• explore different ways of classifying living things</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11-14</th>
<th>QCA 9m - investigating scientific questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• consider the strength of evidence in relation to the question investigated</td>
</tr>
</tbody>
</table>

Learning objectives

Students will:
- Learn about the pioneering work of Muslim scientists on plant classification
- Explore the pros and cons of herbal medicine in today’s world

Running the activity

Starting the activity
Display Activity 5a (either projected or as an OHT). Point out the differences in plant knowledge between pre-Enlightenment Europeans and scientists from the Muslim world.

Ask students, in small groups, to
- discuss the three questions at the bottom of the page
- classify the plants on cards made from Activity 5b into sensible groups

Encourage students to draw out these points in their discussions: plants were used as remedies, for food, clothing and building; Muslim scientists were particularly interested in recording the medicinal properties of plants; they used the skills of collecting, observing, recording data and classifying.
Encourage students to try different methods of classifying the plants on the cards; part way through this activity, reveal that Muslim scientists were particularly interested in classifying plants according to remedy, and get students to try doing this themselves.

**Running the main part of the activity**

Ask students – either individually or in small groups – to read the information 'from the packets' of herbal and conventional remedies (Activity 5c, 5d, 5e), decide which ones they would choose if required, and justify their choices. Their answers can be used to discuss issues such as:

1. How do we know the remedies are effective (what evidence is there)?
2. Perceptions about herbal remedies being more natural or ‘better’ than artificial ones, especially with the sleeping pills example where the active chemicals in both the herbal and the conventional medicine are essentially the same (alkaloids)
3. Should we always use drugs (natural or artificial) anyway?

Ask students to prepare for the debate, as described on Activity 5f. Make sure you have some students planning to speak for each ‘side’! Then run one large debate or get students debating in small groups.

**Running the plenary**

Lead a discussion to bring out the following points:

- Much of what scientists do today is trial and error
- Hundreds of years ago Muslim medics and plant scientists gathered vast amounts of knowledge about plants. Many of their findings are still useful in today’s world

**Web links**

- [http://observer.guardian.co.uk/magazine/story/0,11913,1157031,00.html](http://observer.guardian.co.uk/magazine/story/0,11913,1157031,00.html)
  This is an article discussing the new EU regulations (from a particular viewpoint!)
- [http://www.muslimheritage.com/topics/default.cfm?articleID=525](http://www.muslimheritage.com/topics/default.cfm?articleID=525)
  More details about the work of the Muslim scientists in this activity
- [http://muslimheritage.com/topics/default.cfm?ArticleID=515](http://muslimheritage.com/topics/default.cfm?ArticleID=515)
  An article about agricultural developments in the Muslim world
**500 - 1500**
**Muslim World**

**Puzzling plants**

![Illustration of a book with plants and agricultural images]

- We know *loads* about plants. They're amazing!
- I've observed and classified *thousands* of plant species. It's taken years! Look – here's the plant encyclopaedia I wrote – it's massive!

**Why did Muslim scientists collect so much plant knowledge?**

**Discuss**

- What do you think people in the Muslim world used plants for?
- What do you think scientists wrote down about plants?
- What scientific skills were these early scientists using?

**500 - 1500, Europe**

![Illustration of a peasant and a woman with crops]

- We're only interested in plants we can eat. There aren't many of them.

**Classify** the 12 useful plants on page 2 into sensible groups.

© 2006 Foundation for Science, Technology and Civilisation
Coconut Palm
*Part used:* whole plant mostly nut and leaves
*Uses:* biofuel, food, thatching

Peppermint
*Mentha piperita*
*Part used:* whole plant
*Uses:* lubricant, floor polish, cosmetics, to treat skin problems like burns, sores and acne, possible future fuel

Jojoba
*Simmondsia chinensis*
*Part used:* seeds
*Uses:* food, cooking, roofing material, weaving baskets

Banana
*Musa sp.*
*Part used:* fruit and leaves
*Uses:* food, cooking, reducing nausea, decongestant, flavouring

Ginger
*Zingiber officinale*
*Part used:* rhizome
*Uses:* helps digestion, reduces nausea, reduces cold and flu symptoms, flavouring

Myrrh
*Commiphora molmol*
*Part used:* gum resin from stem
*Uses:* fights gum infections, cleans wounds, reduces bruising

Cotton
*Gossypium sp.*
*Part used:* seed head
*Uses:* making fibres for weaving into cloth

Garlic
*Allium sativum*
*Part used:* bulb
*Uses:* protects against heart disease, kills fungi and bacteria, clears chest infections, flavouring

Lady's Mantle
*Alchemilla vulgaris*
*Part used:* whole plant
*Uses:* controls bleeding, controls diarrhoea

Aloe Vera
*Alo barbadensis*
*Part used:* sap from leaves
*Uses:* speeds wound healing, laxative, treats skin problems like burns, sores and acne

Agrimony
*Agrimonia eupatoria*
*Part used:* whole plant
*Uses:* heals wounds and bruises, heals digestion, improves bladder control

Empress Candlestick
*Senna alata*
*Part used:* leaves
*Uses:* treats fungal diseases, treats stomach problems, making soap
1 In the 21st century, would you still choose herbal medicine?

**Herbal medicine**

**Garlic capsules**
A traditional remedy for the symptoms of coughs and colds. Can also benefit the heart and circulatory system. Has anti-bacterial properties too.

**Contains**
Soya bean oil and garlic oil in a gelatine capsule.
All natural ingredients – no known side effects.

---

**Conventional medicine**

**Anadin paracetamol**
For the effective relief of mild to moderate pain including headache, migraine, toothache, period pains, aches and pains, rheumatic pain, feverishness and symptoms of colds and influenza.

**Contains**
Paracetamol and hydroxypropyl methyl cellulose (E464). Do not take with any other paracetamol-containing products. Immediate medical advice should be sought in the event of an overdose, even if you feel well.

**Do not take if:**
- you are suffering from kidney or liver disease.
- you are allergic to paracetamol or any of the other ingredients listed.

---

**My comments**
If I were suffering from **cold** and **flu** symptoms, I would take... because...

---

© 2006 Foundation for Science, Technology and Civilisation
2 In the 21\textsuperscript{st} century, would you still choose herbal medicine?

**Herbal medicine**

**Neem**

is a powerful anti-bacterial and anti-fungal herb that is extremely bitter, with powerful detoxifying chlorophyll, and acts as an invaluable skin and blood cleanser. It is very effective for normalising gut bacteria.

**Contains**

Extract and powder of Neem Leaf.

**Do not use if pregnant**

---

**My comments**

If I were suffering from **spots**, I would take _______ because...

---

**Conventional medicine**

**PanOxyl Bar**

Helps clear existing acne blemishes and helps prevent the development of new acne pimples, blackheads and whiteheads.

**Contains**

10\% Benzoyl Peroxide. Cetostearyl alcohol, cocamidopropyl betaine, corn starch, glycerin, hydrogenated castor oil, mineral oil, PEG-14M, silicon dioxide, sodium potassium lauryl sulfate, titanium dioxide, water.

**Side effects**

This product may cause irritation, characterized by redness, burning, itching, peeling, or possible swelling. Keep away from eyes, lips, and mouth. Avoid contact with hair and fabrics.

© 2006 Foundation for Science, Technology and Civilisation
3 In the 21st century, would you still choose herbal medicine?

Herbal medicine

**Californian poppy**
Contains alkaloids and in particular one called californidine. This plant is a natural hypnotic: it prepares for peaceful sleep and reduces sleeping problems, particularly nightmares, waking during the night and difficulties in falling asleep. It is also an anxiolytic and a sedative: it helps anxious people of all ages recover and have a calm life without stress.

**Contains**
Californian poppy aerial flowered, part powder.

**Do not use if pregnant**

My comments

If I were having **difficulty in sleeping**, I would take ______ because...

Conventional medicine

**Sleeping pills e.g. zopiclone**
If they haven't been prescribed to you personally then it is illegal to take them.

**Contains**
Zopiclone, lactose, hydroxypropyl methyl cellulose, microcrystalline cellulose and sodium starch glycollate.

**Side effects**
Daytime drowsiness and a bitter taste in the mouth.

**Warnings**
Dependence can develop after as little as one week of continuous use.
The EU is debating new laws to control herbal medicines and food supplements.

Plan to play a part in the debate.

Choose one of these roles:

* an EU official who believes the regulations are vital to protect citizens.
* the director of a shop chain that sells herbal medicines.

I'm convinced I escaped a cold this year as a result of taking those garlic supplements.

The products for sale must be proven to be safe.

Chemicals are chemicals – they can be dangerous whether herbal or synthetic.

Without laws, some manufacturers could make false claims about products.

Daily News: New laws may hit herbal remedies

New European regulations may soon prevent the sale of many of Britain's favourite food supplements. Opinion about the new regulations is sharply divided. Some believe them to be a vital safety measure, and say that they will prevent the sale of substances that may be harmful. Others believe the laws are yet another example of the EU unnecessarily interfering with people's lives.

Fighting sickness
In the UK, we realise that diet is directly linked to our health. We regard vitamin and mineral supplements as foods, not medicines. Many people buy these supplements – and herbal medicines – as part of their fight against illness.

Restricted list
Soon, only those vitamins and minerals listed by the European Union Food Supplements Directive will be able to be sold legally. To start with, this will mean the loss of at least 270 nutrient supplements. Later, all nutritional supplements will be scrutinised.

Herbal medicines hit too
The EU plans to restrict the sale of herbal medicines, too. It proposes a register of herbs which have been 'in safe use for 30 years'. It will not be possible to use newly discovered herbal medicines immediately.