

Pharmacy

Book Reference:
Pharmacy, page 184.

EIGHT HUNDRED YEARS AGO, the Muslim world had sophisticated pharmaceuticals and regulated strict rules for their sales. The earliest inspector was a lady appointed by Caliph Umar, 640 CE, in the city of Medina. In this activity, students take on the role of a government inspector (*al-Muhtasib*) checking pharmacists and their medicines in 12th century Baghdad. They are charged to check out a rumour that a local pharmacy is selling a cheap imitation of a stomach medicine, and to use practical techniques to come to an evidenced conclusion.

Curriculum link

11-14	QCA 7e acids and alkalis <ul style="list-style-type: none"> • Where is neutralisation important
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Learning objectives

Students will learn

- That the Muslim world had sophisticated pharmaceuticals and strict rules for their sales eight hundred years ago
- To evaluate a product using a neutralisation reaction

Running the activity

Starting the activity

Display **Activity 6a** (either projected or as an OHT). Ask small groups of students to discuss which stomach cure they would buy – and why.. Then get them to discuss what they expect out a visit to the pharmacy. Encourage them to come up with answers such as ‘Nothing that’s going off’; ‘a pharmacist who knows what s/he is doing’ and ‘to be told the correct dosage’, as well as those already given on Activity 1.

Then emphasize the point that shoppers in 12th century Baghdad had the same high standards, and that government inspectors (*al-Muhtasib*) made sure that regulations were adhered to.

Running the main part of the activity

Display **Activity 6b**, which describes the scenario and sets the task. Emphasize the reference books and the wide variety of medicines available.

Give each group a copy of **Activity 6c**. This includes instructions for the practical task. Students will have learned about universal indicator and neutralization; this task is a variation on the common investigation of antacid powders. There is just one powder different from the rest: a 50:50 mixture of salt and baking powder, the others are simply baking powder with a small quantity of salt so that the difference in powders is not obvious just by looking at them.

Running the activity continued...

Beforehand, technicians will need to prepare the powders in labelled dishes A B C D E.. The acid is 0.5M HCl (stomach acid is actually about 0.15M). A good measure for the powder is a child's party candleholder with the 'petals' cut off.

Running the plenary

Ask groups to compare their findings – are their conclusions consistent? Then get small groups to discuss – or lead a class discussion about – other circumstances in which measuring might have been a useful part of Muslim pharmacists' work to develop and test new medicines.

Optional homework activity

This is described on **Activity 6d**. It provides an excellent opportunity for a simple home experiment, as well as a chance for students to learn that drugs capsules have been around for a very long time!

Web links

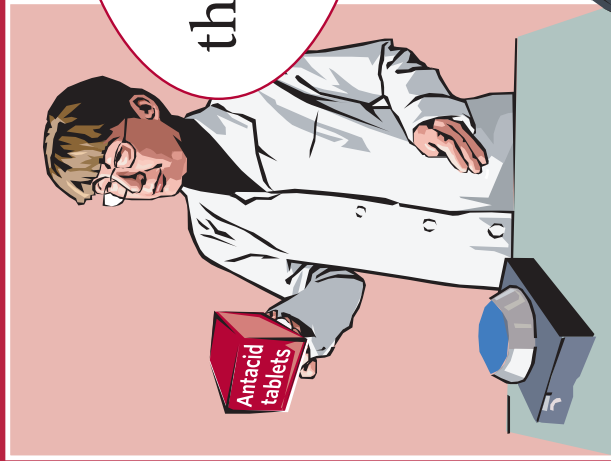
<http://www.muslimheritage.com/topics/default.cfm?ArticleID=224>

More information on Muslim contribution to chemistry

<http://www.muslimheritage.com/topics/default.cfm?ArticleID=226>

How drugs were made a thousand years ago

Which would *you* buy?



Medicines that do what they say they'll do

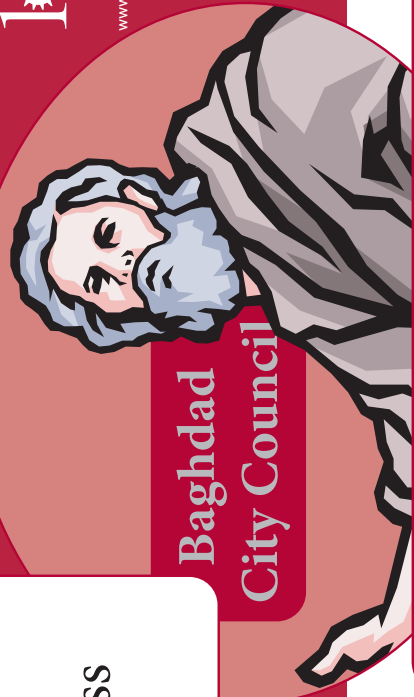
To be given the amount I'm paying for – no less!

Safe medicines



Muslim shoppers in 12th century Baghdad, Iraq, expected the same high standards. And, just like in 21st century Europe, they sent out quality control inspectors (*al-Muhtasib*) to check that pharmacists were obeying the regulations.

There's a rumour that one of the market pharmacists has mixed a cheap and useless powder with his stomach-ache cure.



Baghdad City Council



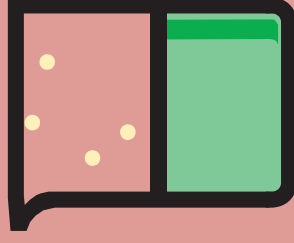
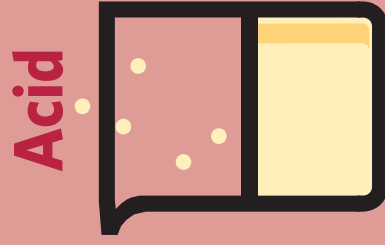
Your work today, *al-Muhtasib*, is to test the powders and find the culprit. Then we can think of a suitable punishment...



Inspector's Instruction Manual: stomach powders



**Universal
indicator**



- * Collect a stomach-ache powder sample from each pharmacy stall
- * Put the same amount of each powder into 5 labelled test tubes
- * Add 0.5 cm³ of universal indicator to each test tube
- * Slowly add 0.5 cm³ of acid to one test tube and wait to see the colour after it stops fizzing. Repeat until the indicator turns green. Record the volume of acid needed to neutralise the powder. Do the same for the other 4 test tubes
- * Record the name of the pharmacist who is cheating his customers

Drug capsules: older than you think!

❖ Hundreds of years ago, al-Zahrawi packed drugs in cat-gut parcels, ready for swallowing... Just like today's drug capsules!

❖ How quickly does the medicine come out?

Does it make any difference how much you squash up the medicine?

❖ Use the equipment to plan and do an investigation to find out!
Use teabags to represent the medicine in the cat-gut parcels.

