**Simplification of gravitational model**

In figure 8 of ‘Playing Newtonian games with Modellus’ by Vitor Teodoro (Phys. Educ. 2004 39 421–8) the Modellus model is unnecessarily complex. In fact, a little preliminary algebra (always a good idea before writing a computer model) shows that \( m_2 \) cancels out. There is no need for any mention of \( a, a_t \) or \( a_x \).

The model becomes:

\[
\begin{align*}
 r &= \sqrt{x^2 + y^2} \\
 \frac{dx}{dt} &= -\frac{GM}{r^3}x \\
 \frac{dy}{dt} &= -\frac{GM}{r^3}y \\
 \frac{dr}{dt} &= v_x \quad \text{or} \quad \frac{dy}{dt} = v_y
\end{align*}
\]

I have also replaced \( m_1 \) with \( M \) for simplicity.

Another consequence of this simplification is the removal of a value for \( m_2 \) in the Initial Conditions window. Clearly this parameter is quite irrelevant.

**J Keith Atkin Sheffield**

**Vitor Teodoro replies**

From a formal point of view, JK Atkin is almost completely right, except for using \( M \) for mass. The SI symbol for mass is \( m \) and I’ve never understood why people use capital letters for big objects. \( M \) is used for other quantities, like molar mass.

The model presented in the article follows a rationale: the force law and the geometry of vector components are explicitly present. We now have fast computers and it is not absolutely necessary to use algebraic manipulation to make faster computations. The model suggested by Atkin hides the physics and the geometry of the problem and, in my view, is not pedagogically suitable.

Certainly, one can always ask the students to use their algebraic knowledge to simplify the model presented in the article. But this manipulation is simply a problem of algebraic manipulation, with little physical meaning.

I note that Atkin’s 1975 master’s thesis anticipated such computer modelling.

**Nigel Bowen Staffordshire**

**Equipment for Rwanda**

In David Richardson’s news item (Phys. Educ. 2004 39 450–2), he laments the poor availability of equipment for schools in Rwanda, and the problem of finding a way of training science teachers and working in partnership.

I worked in Kenya for VSO in a similar situation a few years ago. I was able to obtain suitable science equipment for use in a school laboratory by contacting an organization called LabAid, which is based in the UK. The organization, run by Alan Welch, collects appropriate equipment and then distributes it around the world according to requests from science teachers.

His full contact details are: The LabAid Trust, Normal Heights, Chiltern Road, Amersham HP6 5PH, UK. Tel/fax: 01494 726 861; e-mail: labaidtrust@yahoo.co.uk.

If any science teachers have any suitable laboratory equipment, they can donate it to LabAid.

Regarding working in partnership to train teachers in teaching methods/use of equipment, this was another part of my job description in Kenya.

I was able to do this by gathering together the teachers from a small number of schools to attend training sessions on the use of the lab equipment. These sessions were run in the evenings and at weekends, with no payment for the teachers. They were well attended. We also arranged a loan club, for sharing science equipment. Science teachers working in a development context can contact VSO, which is happy to share its expertise and resources.

**Thomas Hebbeker Germany**

**A trick of the light**

Reading the recent article in Physics Education by Wei Lee et al on CD optics (Phys. Educ. 39 384–6) reminded me of a quick experiment that I like to show in my lectures. It makes simple but effective use of laser light that is reflected off CDs and DVDs.

Shining the light of a standard laser pointer onto a CD (data side with tracks = grating, of course!) so that the reflected light reaches the white wall of the room, one clearly sees a central bright spot and secondary maxima (all in a line). The CD can be held in one hand, the laser in the other.

One can easily measure the angle between the central spot and nearest secondary maxima, then relate this to laser wavelength and separation of lines on the CD/DVD.

In particular, this simple experiment allows us to distinguish a CD (pitch 1.6 \( \mu \)m) from a DVD (0.7 \( \mu \)m), since the latter gives a larger angle. The dependence on the wavelength can also be demonstrated by alternating between a red and a green laser.