UKMA news

The newsletter of the UK Metric Association

Campaigning for a single rational system of measurement

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In this issue:

Glaring omission from Queen's Speech

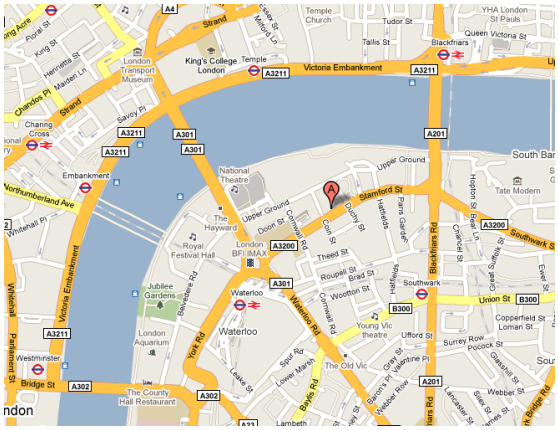
(from metricviews.org.uk):

The new coalition Government claims to be determined to clear up the "mess" left behind by the previous Government. So it is notable that Her Majesty's gracious speech included no proposals to tackle one of the biggest "messes" of all – the intractable muddle of incompatible measurement units with which her UK (but not other Commonwealth) subjects have to struggle.

See page 2 for full article.

Annual General Meeting

Date Saturday, 3 July 2010
Venue Room 2.80, Franklin-Wilkins Building, Kings College London, 150 Stamford Street, London, SE1 9NH



Provisional programme

9:30	Assembly: Complimentary tea and coffee will be available
10.00	AGM
10:30	Conference introduction
10:45	Progress
11:00	Post election and long-term strategy
11:45	Future status and constitution of UKMA
12:15	Traffic signs
13:00	Lunch
13:45	Style guide
14:15	Websites
14:30	Communication
15:00	Other issues
15:15	Members' Forum
16:00	Close (the room is available until 17:00 should the programme overrun)

Full programme details are on page 2.

Conference programme

Note: Speakers to be confirmed

10.00	AGM (See separate agenda)
10:30	Conference: introduction and general review of year (RBP)
10:45	Progress report - based on what we have done or not done (e.g. meeting with TSI/LACORS Guidance, relations with Consumers' Association) (RBP/DP)
11:00	Post election and long-term strategy Prospects under the new government (DP) Enforcement of W & M legislation (RBP) Beyond the current Parliament (general discussion)
11:45	Future status and constitution of UKMA e.g. charitable status, company limited by guarantee (RBP)
12:15	Traffic signs Traffic Signs Policy Review and proposed Traffic Signs (Amendment) Regulations & General Directions 2010(Martin Ward) Sign costs project (Tony Wilson/RBP/DP) Countering ARM activity (DP to introduce general discussion)
13:00	Lunch
13:45	Style guide (Bill Lynch/RBP)
14:15	Websites: • Main site – content management system (PH) • Prominent Peaks (RU)
14:30	Communication • Blog and Google Group (RBP) • Newsletter (Martin Clutterbuck) • Social networking – Twitter (TW) and Facebook (Keith Hodgkin/DP)
15:00	Other issues, including • Youtube/Video project (DP) • The Media (RBP)
15:15	Members' Forum • Issues raised by members, either beforehand or on the day • General discussion
16:00	Close

Queen's speech

The new coalition Government claims to be determined to clear up the "mess" left behind by the previous Government. So it is notable that Her Majesty's gracious speech included no proposals to tackle one of the biggest "messes" of all – the intractable muddle of incompatible measurement units with which her UK (but not other Commonwealth) subjects have to struggle.

Now that the General Election is out of the way and a new government installed, there is an opportunity for politicians to take a decisive step toward completing the metric conversion that was begun nearly half a century ago. UKMA has argued that, without decisive Government intervention, the current muddle of conflicting measurement systems will continue indefinitely. One way of speeding things up would be the passage of a "Weights and Measures (Completion of Metrication) Bill". Such a Bill might include some of the provisions listed below.

Ostensibly, the policy of all governments since 1965 has been "that the United Kingdom should – in stages – switch from imperial to metric units of measurement for an ever-increasing range of uses" (quoted from a letter from Tony Blair to Lord Howe in 2004). However, in recent years the Government have taken no significant practical steps to achieve that object, and they are explicitly relying on the false hope that "this is a matter that will solve itself in time" (quoted from Baroness Thornton, Hansard, House of Lords, 25 Feb 2010 : Column 1081). The reality is that the Government has virtually given up on the great metrication project and wishes that people wouldn't keep mentioning the subject.

What the noble Lady presumably meant was that, as the older age-cohorts of imperial-educated people die out and are replaced by younger metric-educated people, the transition from imperial to metric as the default system in common use would occur "naturally". However, if that were true, it surely would have

happened before now. It was in 1974 that the then Education Secretary, Margaret Thatcher, required metric units to be taught in the maths and science curriculum. Thus, anybody born after 1964 (i.e. well over half the working population aged 18-65) would have received at least their secondary education in metric units. Yet there is little sign that this transition is occurring. The popular media are still predominantly imperial, or they mix metric and imperial indiscriminately. In order to function effectively in the UK in the 2010s, adults need to be fluent with both systems.

If the "very British mess" of trying to operate two incompatible systems of measurement at the same time is ever to be ended, then it is idle to pretend that the changeover will happen of its own accord. It will require decisive government action – and this inevitably will have to include legislation.

MetricViews suggests that a new Act of Parliament – perhaps called the "Weights and Measures (Completion of Metrication) Act" – will be needed. It could include some or all of the following clauses:

- A statement of the purpose of the Act – perhaps along the lines of the Australian or American declarations[1] quoted below.
- Declaration that metric is the primary system for all legal and official purposes in the UK unless otherwise required by international agreements (i.e. currently aviation and maritime navigation)
- Duty on all organisations in receipt of public funds (inc. Government Departments and Agencies, the Crown, local authorities, statutory bodies, schools and universities, police, BBC, contractors on publicly financed projects, charities receiving grants) to work toward becoming primarily (and eventually exclusively) metric. This could include an appropriate clause to be inserted in all procurement contracts and grant agreements.
- Power of Secretary of State to direct such public agencies (either selectively or generally) to cease using non-SI or non-SI-compatible units
- Establishment of Commission to manage remaining stages of transition to primary or exclusive use of metric units
- Power of the Secretary of State to give directions to the Commission
- Reserve power of Secretary of State to take over enforcement powers of local authorities under the Weights and Measures Act where they are failing to act
- Cut-off date (say, 5 years) for ending the exemption of "road signs, distance and speed measurement" from the requirement to use SI units
- Power to prohibit manufacture, import and sale of measuring instruments that show non-SI units (might need to be some exemptions, eg. for legacy components and artefacts)
- Requirement that measurement units used in advertising and product description shall be metric, with optional supplementary indications (to be enforced against advertising agencies, estate agents, newspapers, internet service providers – but **not** against private individuals). (It would be counter-productive to enforce against private individuals as this would simply lead to the creation of "martyrs").

Ideally, this Bill should have been part of the new Government's legislative programme. Indeed, without Government support it would have little chance of becoming law. However, if the Government is reluctant to propose this measure at present, then perhaps an individual Member (of either House) – with the assistance of the Parliamentary draftsmen – would be prepared to introduce it as a "Private Member's Bill" – possibly under the "ten minute rule." Whether it then attracted Government support or not, it would obviously have to be published, might attract some publicity, and would put down a marker for future reference.

[1] Quotations from other legislatures:

Australia:

"The object of this Act is to bring about progressively the use of the metric system of measurement in Australia as the sole system of measurement of physical quantities." (Metric Conversion Act, 1970)

USA:

"Sec. 205b. Declaration of policy

It is therefore the declared policy of the United States–

to designate the metric system of measurement as the preferred system of weights and measures for United States trade and commerce;

to require that each Federal agency, by a date certain and to the extent economically feasible by the end of the fiscal year 1992, use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies

or loss of markets to United States firms, such as when foreign competitors are producing competing products in non- metric units;

to seek out ways to increase understanding of the metric system of measurement through educational information and guidance and in Government publications; and

to permit the continued use of traditional systems of weights and measures in non-business activities." (Metric Conversion Act, 1975)

Green Party View

Caroline Lucas is the UK's first Green MP. So what are the Green's views on completing the stalled metric changeover?

A BWMA member helpfully put a question about the so-called Metric martyrs to the Green Party Members of the London Assembly and received the following replies:

Darren Johnson said "I am afraid I cannot support the Metric Martyrs' campaign as I feel it is vital that this country abandons the outdated and incomprehensible imperial measurement system once and for all, just as we did with our currency in 1971".

Jenny Jones said "Whilst I sympathise with the plight of the individuals concerned, I believe it is right for the UK to use a measurement system in line with the rest of Europe and legislation is necessary to ensure compliance".

Catalogues for the twenty-first century

(and a few from the twentieth)

The British Weights & Measures Association (BWMA) has been campaigning in support of Imperial measures since 1905, often drawing comfort from the situation in the USA. It has enjoyed a new lease of life over the past 15 years as a consequence of the UK switch from Imperial to metric measures for fruit and veg, meat, fish, cheese, delicatessen, and so on,

At the BWMA AGM in May 2006, a member asked:

"that we should have a template for a letter to be sent easily to those who print metric-only catalogues".

The minutes of the meeting do not record the outcome of this request. However, a recent survey* of twenty-two catalogues illustrates the concern of that BWMA member, for it appears that Imperial measures have had their day in this business, known before the days of the internet as 'mail-order'. The results were:

	Number of catalogues
Metric only	11
Metric with Imperial in brackets	7
Random choice of measures	1
Imperial with metric in brackets	0
Imperial only	3

Interestingly, all three 'Imperial only' catalogues, named "Overstocks to clear", "Scotts of Stowe" and "The Original Gift Co", are issued by companies operating from the same address:

Cotswold House, 1 Crompton Road, Groundwell, Wilts, SN25 5AW.

Another company at that address issues a 'metric with Imperial in brackets' catalogue under the name "Solutions from Renwoods".

Needless to say, UKMA does not have a template for a letter to be sent easily to those who print catalogues.

* The survey, which was carried out by a member of UKMA included catalogues for household and/or garden items, issued between 2006 and 2010 by a range of companies from the very largest, for example Argos, IKEA and Tesco Direct, to a small company from Guernsey. All the catalogues offered an option of ordering by internet, and in addition by post and/or by telephone, and also offered home delivery.

Ounces preserved no more

Readers may remember the case of Nichola Fletcher's venison business, which came to the notice of UKMA in 2005. She wished to sell preserves in the same jars as her existing range of venison pate, but had been told by Trading Standards that this could be illegal.

Nichola's problem was that, at that time, preserves fell in a group of about thirty products that had to be packaged and sold in 'prescribed quantities'. For jelly preserves, jam, marmalade, honey, molasses, syrup and treacle the prescribed quantities were in imperial measures, namely two, four, eight, twelve, sixteen and twenty-four ounces.

In 2007, however, the government consulted on proposals to abolish some or all prescribed quantities. UKMA responded, broadly supporting these proposals. Late in 2008, it was announced that almost all PQs would go on 11 April 2009. Readers may already have noticed some resulting changes in their supermarket, for example preserves and honey are now available in a variety of sizes. But, as always, shoppers should watch out and check the label when in doubt – yes, that jar of Sainsbury's reduced sugar marmalade does contain only 415 g not 454 g.

Does deregulation have any implication regarding implied tolerances and rounding?

Wouldn't 500 g be acceptable here?

Perhaps we are so used to the nonsense of 454 g, etc. that designers of labels have forgotten what rounded numbers are.

By the way:

Deregulation has not extended to draught beer. German and Polish 'themed' bars must therefore still ensure that their theme does not extend to their beer glasses.

From USMA newsletter 'Metric Today'

NASA Inspector General Weighs in on Non-Metric Constellation Program

NASA's Office of Inspector General (OIG) has reviewed the Constellation Program's request to use non-metric units. (See *Metric Today*, March-April 2007 and January-February 2009 on NASA's decision to use SI, and July-August 2009 on the reversal of that decision.) The OIG report was released on 29 March 2010.

The report's conclusion: "The Constellation Program's request for an exception to using the metric system as its standard system of measurement does not clearly meet NASA criteria for granting such an exception. In

addition, the request does not adequately consider the long-term impact of the decision on future NASA projects."

"The request from Constellation Program officials suggests that implementing the metric system is impractical and its use could increase risk and threaten mission success. However, we found conflicting documentation attesting to the practicality of implementing the metric system as the primary system of measurement in the Constellation Program. In addition, other Constellation Program documentation we reviewed refutes the suggestion that implementing the metric system would increase risk in this Program. We also found that neither the Constellation Program nor the NASA Chief Engineer has fully assessed the long-term impact on the Agency of moving away from use of the metric system."

The Constellation Program made two main arguments for reverting: SI would increase costs, and SI would "add unacceptable risk," one of the criteria in NASA's metrication policy that allows the use of non-metric units.

Increasing costs?

As for the argument about costs, OIG said, "It is difficult for us to assess whether implementation of the metric system would result in a substantial increase in cost because Constellation Program management did not conduct a life-cycle cost analysis. While Program management estimated that the cost of implementing the metric system for Constellation was $368 million, they did not evaluate the costs of *not* implementing the metric system over the life of the program. Furthermore, cost discussions have centered on FYs 2009 and 2010, although NASA was projected to spend approximately $97 billion on the Constellation Program through 2020. To make a fully informed decision, we believe NASA needs to assess the long-term costs of not implementing the metric system, because such costs may not be apparent for decades if NASA approves the exception and subsequently decides to include international participation later in the Constellation Program."

Unacceptable risk?

As for adding "unacceptable risk," OIG noted that NASA does not define the term and observes, "The Mars Climate Orbiter mishap highlights the risks of working with and converting between the two systems of measurement and having to closely monitor components built using both metric and U.S. customary units of measure. Granting the Constellation Program an exception from using the metric system could introduce long-term risks related to use of components built in U.S. customary units and components built in metric units. The long-term risks increase if the Constellation Program involves international partners in later years—partners who, to a country, use the metric system. We recognize that the Constellation Program is using some legacy hardware built in U.S. customary units; however, the Program can minimize that risk by limiting use of that hardware and building new components fabricated in the metric system."

Further, "The Chief Engineer and Constellation Program management said they believe that the estimated $368 million for metric system implementation would be better spent on mitigating higher priority Program risks and therefore the Constellation Program's request for an exception meets the intent of the 'adds unacceptable risk' criteria. However, before waiving the requirement to use the metric system, NASA should conduct an adequate life-cycle analysis to determine whether the possible savings identified as a result of not implementing the metric system could ultimately cost NASA more in the long-term, either in the Constellation Program or its other scientific or exploration initiatives, many of which involve international partners or U.S. businesses that have made the conversion to the metric system."

The DoD role

The OIG also found that "because the Department of Defense (DoD) has not fully embraced the metric system as the manufacturing standard in its projects, and because of the size of its contracts, DoD exerts an overriding influence on the U.S. aerospace industry."

During a 2004 review of metrication at NASA, "NASA officials repeatedly expressed the opinion that until DoD, the dominant entity in the U.S. aerospace industry, completely embraces the metric system, NASA would not be able to noticeably influence the industry's transition on its own. [However,] we note that DoD and other Federal agencies have made efforts to implement the metric system in certain programs. For example, the amphibious transport dock, USS San Antonio (LPD 17), built by Northrop Grumman Ship Systems and commissioned in January 2006, is the first Navy ship to be designed in metric measurements. In addition, Lockheed Martin, the prime contractor for the Constellation Program, entered into a contract with the National Reconnaissance Office in 2007 that requires 'all supplies, components, reports, documentation, or services designed, fabricated, assembled, delivered or performed . . . to utilize the Metric System of Measurement.' However, other major programs such as DoD's Joint Strike Fighter, estimated to cost more than $300 billion, continue to be designed and manufactured in U.S. customary units."

Conclusion

In concluding, the OIG included an excerpt from their February 2001 report, "Assessment of NASA's Use of the Metric [SI] System":

By law and policy, SI is the preferred system of measurement within NASA. As the United States continues its slow transition to the metric system, NASA must decide whether it wants to be a leader or a follower in the transition process. Both roles come with a cost. If NASA chooses to push forward with the Agency's use of the metric system, near term costs may increase and short-term risk (both to schedule and mission success) may rise to some degree. However, if the Agency follows the aerospace industry's slow transition to SI, the protracted period during which NASA uses mixed metric and English systems may further increase costs and risks for NASA programs.

NASA is the nation's most visible science and technology agency, and is involved in highly publicized cooperative projects with a world that almost exclusively uses the metric system. Certainly an argument could be made that as the nation's symbol of technological prowess, NASA has a role in promoting acceptance and use of the metric system. We believe the Agency should reassess its conversion to the metric system and determine the most appropriate approach for the Agency to successfully transition to SI.

"These words are as applicable today as they were in 2001. Almost 10 years since issuance of that OIG report, NASA's Chief Engineer has approved every request for an exception to using the metric system in Agency programs. Moreover, NASA's criteria to evaluate requests for exceptions to using the metric system remains ambiguous and lacks appropriate specificity.

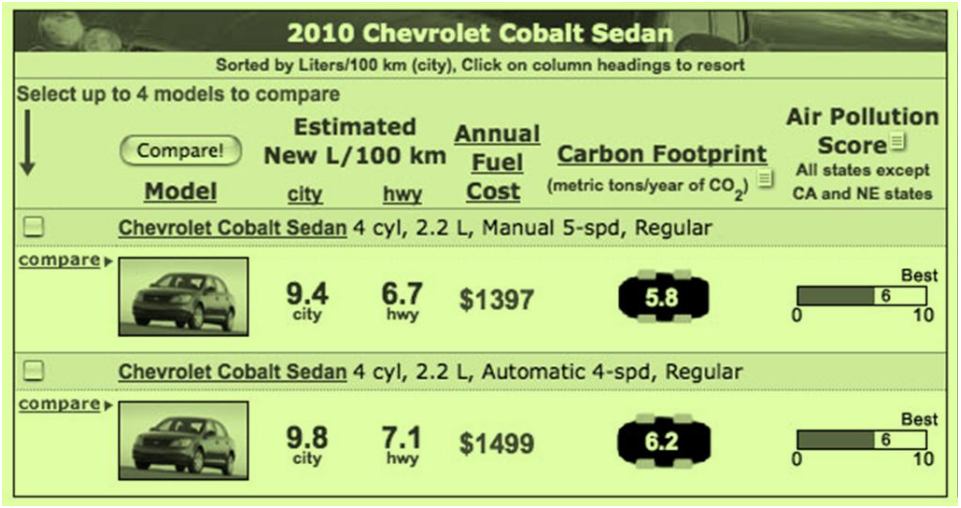
"The Constellation Program's Management Directive 030, issued in December 2007, established sound reasons for implementing the metric system; prime among them was that the metric system is simpler, less error prone, and aligns with NASA's international partners. We understand that NASA will not fully realize the value of the metric system of measurement until this standard is universally adopted by the U.S. aerospace industry. We also understand that if the major entities in the aerospace and defense industries are not moving consistently toward metric system usage, no Federal agency apart from DoD likely will be able to significantly accelerate the transition. However, NASA has the opportunity, in the words of the OIG's 2001 report, to decide 'whether it wants to be a leader or a follower in the [SI] transition process.'

"Finally, while we believe that Constellation's draft request does not meet NASA policy criteria for granting an exception, we urge the Chief Engineer in this and other cases to consider the long-term impacts of any decision to waive implementing the metric system. In addition, while [the policy] does not require NASA to re-examine previously approved exceptions to implementing the metric system, we believe NASA may be missing significant opportunities to implement the metric system in discrete projects because of an exception previously granted to the overall program."

Something more down-to-earth

For comparing cars' fuel efficiency, the U.S. uses a fuel economy metric—miles per U.S. gallon—while some other countries use a fuel consumption metric given in liters per hundred kilometers. Which is better?

Note that either metric can be expressed in a variety of units, so the question isn't whether SI units are better than U.S. customary units. Think of it this way: Were we to metricate car fuel efficiency ratings, would it be better to switch to kilometers per liter or liters per hundred kilometers?



The difference arises when comparing ratings, which is, of course, the purpose of the numbers. A rating in km/100 L is easy to compare, while a rating in mi/gal or km/L is not intuitively easy to compare. Consider an example.

The improvement in choosing a car rated at 12 MPG instead of a car rated 10 MPG sounds like exactly the same improvement as choosing a car rated 52 MPG instead of 50 MPG. Either way, it's the same 2 MPG improvement, right?

Actually, no. Going from 10 MPG to 12 MPG is a very, very big improvement, while going from 50 MPG to 52 MPG is only a small improvement. The reason, of course, is that the MPG (or km/L) scale isn't linear even though we humans interpret it as though it were. The first example is a 20% improvement, while the second example is only a 4% improvement, even though the numerical difference is the same in both cases.

Expressed using a fuel consumption metric, the corresponding numbers are 23.5 L/100 km and 19.6 L/100 km for the first example and 4.7 L/100 km and 4.5 L/100 km for the second example. Given those numbers, it's obvious that the first two cars are very different, while the second two are very similar.

Thus, ratings in L/100 km are much more easily and intuitively compared than ratings in MPG. The Department of Energy's "find and compare cars" feature on *www.fueleconomy.gov* allows you to select either units.

Symbols or abbreviations?

Your editor spotted this item published in 'The Sunday Times' recently:

10 ingear

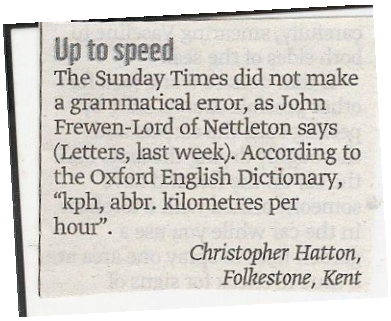
LETTERS

Wrong speed

The Sunday Times rarely makes grammatical errors. I am therefore dismayed to see you use that awful solecism "kph" when you mean "km/h", as you did in response to DB of Shropshire's letter (Car Clinic, last week). There's no such thing as kph. It's km/h to denote kilometres per hour, as a glance at the speedometer of every car you can see will confirm.

John Frewen-Lord, Nettleton, Lincolnshire

Then, the following week, this response:



Up to speed

The Sunday Times did not make a grammatical error, as John Frewen-Lord of Nettleton says (Letters, last week). According to the Oxford English Dictionary, "kph, abbr. kilometres per hour".

Christopher Hatton, Folkestone, Kent

The author's 'The Penguin English Dictionary' also shows kph as an abbreviation for kilometres per hour as well as kV for kilovolt and kWh for kilowatt-hour.

By their own definitions:

Abbreviation is 'a shortened form of a written word or phrase', so if kV is an abbreviation of kilovolt, where is the 'm' in kph?

A symbol is defined in two parts:

- Something that stands for or suggests something else by reason of association or convention
- A sign used in writing or printing to represent operations, quantities, elements, etc in a particular field.

According to the official SI brochure:

> *"Unit symbols are mathematical entities and not abbreviations. Therefore, they are not followed by a period except at the end of a sentence, and one must neither use the plural nor mix unit symbols and unit names within one expression, since names are not mathematical entities.*
>
> *In forming products and quotients of unit symbols the normal rules of algebraic multiplication or division apply. Multiplication must be indicated by a space or a half-high (centred) dot (·), since otherwise some prefixes could be misinterpreted as a unit symbol. Division is indicated by a horizontal line, by a solidus (oblique stroke, /) or by negative exponents. When several unit symbols are combined, care should be taken to avoid ambiguities, for example by using brackets or negative exponents. A solidus must not be used more than once in a given expression without brackets to remove ambiguities.*
>
> *It is not permissible to use abbreviations for unit symbols or unit names, such as sec (for either s or second), sq. mm (for either mm^2 or square millimetre), cc (for either cm^3 or cubic centimetre), or mps (for either m/s or metre per second). The use of the correct symbols for SI units, and for units in general, as listed in earlier chapters of this Brochure, is mandatory. In this way ambiguities and misunderstandings in the values of quantities are avoided."*

Note the use of 'not permissible' and 'is mandatory'; does this apply to Mr Hatton and publishers of dictionaries? Or do these directives represent a red rag to a bull?

Time for L?

Have members noticed the confusing mixture of symbols used for the Litre? Here are some samples:

Use of a capital 'L' here

But not here:

Use of Ltr and ml does not reinforce message that these are the same units as would surely be the case if 1 L and 7.5p/100 mL were used.

By the way...

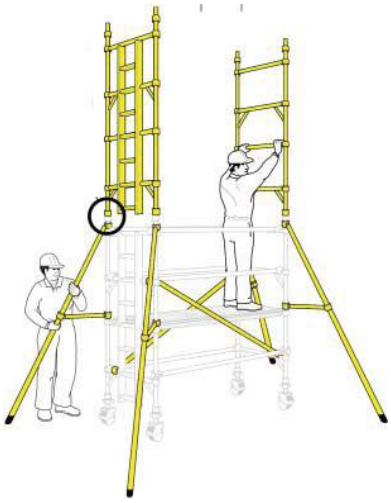
Who knows or measures the circumference of their bins?

Do we have to remember to multiply the diameter by π before going to the shop?

Precision engineering?

The author has recently been found up a ladder (or tower to be more precise!) such as the one illustrated:

When considering the positioning of the stabilisers, however it was difficult to adjust to the dimensions shown in the instruction manual!



STABILISER DIMENSIONS

	y
SP7	1227
SP10	2241
SP15	2757

How much better to use:

	y
SP7	1.2 m
SP10	2.2 m
SP15	2.8 m