

Metric conversion

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When you choose a metric conversion path to take you and your companions toward full use of the metric system you are making these three learning decisions. You and all of your companions will learn:

- 1 about the metric system — this is quick and easy.**
- 2 lots about old pre-metric measures — more than you ever needed to know.**
- 3 a whole new world of conversion factors and on how to use them — these have no useful purpose in the long run — you could think of this as learning truly pointless information and developing irrelevant skills.**

To compare these three different learning paths we might consider the measurements of land for housing and for farming.

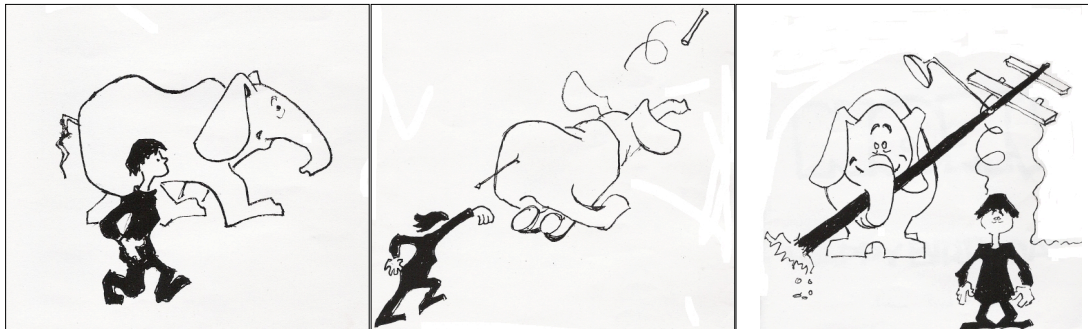
Conversions — acres and feet

1 Learn about the metric system

A square **1 metre** long by **1 metre** wide and it has an area of **1 square metre**.

A square **100 metres** long and **100 metres** wide has an area of **1 hectare**. There are 10 000 square metres in 1 hectare.

That's it — all you will ever need to know about area in the metric system for housing and farming.



Use the **KISS** principle — **Keep Its Structure Simple** — don't use more than you need.

2 Learn about old pre-metric measures

Old pre-metric measuring might involve feet, yards, rods, poles, perches, furlongs, chains, or miles together with square feet, square yards, square rods (also called roods), square poles, square perches, square furlongs, square chains, or square miles. However, although these are all valid measurements, we will only refer here to the two different kinds of feet that are used in the USA to reduce the complexity that arrives with old pre-metric measures.

You might ask if this is relevant in the 21st century and the answer is yes. If you buy land in South Carolina it will be measured using a foot that might be called an International foot, a statute foot, an Imperial foot, or a U.S. Customary foot. If you buy land in North Carolina it will be legally measured using a different foot called the survey foot.

If you buy land in Oregon, you could be using either statute or survey feet, as both are legal there. Mostly land will be measured using the International foot but there is also a chance that it will be measured using the survey foot; Oregon defines the US Survey foot as 1200/3937 meters exactly and the (International) foot as 0.3048 meters exactly; these are slightly different lengths. Obviously, if you buy land by the square foot it is best to know

which foot is being used. You will have to check the defined length of the foot for each state. If you are referring to old title deeds you also need to know how the length of the foot was defined in the past as the length of the foot has changed several times from 1795 till now.

For buying agricultural land, you will also need to know about acres. You can picture the traditional acre (defined this way since about 1834) as a strip of land 1 chain wide by 10 chains long. This is 4 rods wide by 40 rods long; 22 yards long by 220 yards wide; or 66 feet long by 660 feet long. As we have decided to only use feet, for simplicity, we can calculate that 1 acre is equal to 43 560 square feet (66 feet x 660 feet) but of course acres vary in size according to where it is and when it was originally measured because, as you now know, feet vary in length and they have also varied in historical time.

By the way, just because there was an international agreement about the lengths of the inch and the foot in 1959 does not mean that there are not people who are still wanting to change the length of a foot. For example, the UK Royal Navy uses a 'data mile' of 6,000 feet where each foot is about 223.24 millimetres and the USA Navy has defined a different mile of 6 000 feet for ballistic and cruise missiles. At about 305 millimetres, The USA Navy feet are longer than the UK Navy feet.

3 Learn about conversion factors

When you are choosing conversion factors for housing and farming land sales you need to know that:

- ◇ The length of the metre is exactly and precisely the same length as it was in 1795 — it has never changed.
- ◇ The definitions of the lengths of feet, yards, rods, poles, perches, furlongs, chains, or miles together with square feet, square yards, square rods (also called roods), square poles, square perches, square furlongs, square chains, and square miles have changed every few years — roughly every generation since the late 1700s. A current definition is based on the international inch of exactly 25.4 millimetres. This gives an international foot of exactly 304.8 millimetres. However, be aware that just prior to 1959, the inch and the foot had different lengths in Canada, in the UK (2 values), in the USA (2 values), and in South Africa.
- ◇ For buying housing or agricultural land, you need at least these conversion factors:

3 feet to 1 yard

5 1/2 yards to 1 rod

4 rods to 1 chain

22 yards to 1 chain

10 chains to 1 furlong

You need to know all these words because old pre-metric land deeds are drawn and written using various, apparently random, combinations of some, or all, of these.

Some of these differences still persist. For example as we saw earlier, a survey foot is defined (in Oregon) as 1200/3937 meters exactly and the International, statute, or Imperial foot as 0.3048 exactly. This means that the size of acres varies within Oregon as it also varies from state to state. The South Carolina acre is 4 046.856 422 square metres and the North Carolina acre is 4 046.872 608 square metres. It doesn't vary by much but people worry when thousands of acres are involved.

If you are looking at an old map of land you wish to buy, you will probably need to know how long each foot is, and how long the foot was when the map was made, and by whom it was made. As an example, consider the city of Melbourne in Australia, which is famous in town planning circles for its regular grid lines that are 6 080 feet (using British Imperial feet of the year 1837) from north to south and 12 160 feet from west to east. Although this area is

sometimes called the 'golden mile', few Melburnians realise that the 'golden' miles are actually 'golden' nautical miles because the surveyor, Robert Hoddle, was a Naval Officer. Now, in the 21st century, land sales in Melbourne still have to accommodate 'Hoddle feet' whenever land is bought or sold.

If you ever decide to take the '*metric conversion*' path to completing your upgrade to the metric system keep in mind that you will need to confront all three of the above issues. Be aware that others have taken this path and they have spent many, many years trying to complete their metrication upgrade this way.

Typically, you can expect to take 100 years or more on a '*metric conversion*' program and you can expect bitter fights about which definition you should choose from the many old pre-metric definitions available and about which is the '*correct*' conversion factor to use according to its historical use.

Personally, I think that it is best to simply choose step 1 from the three learning paths — and then to stop there:

- ◇ learn as little as you need to know about the metric system for your current task;
- ◇ use the **KISS** principle — **Keep Its Structure Simple** — don't use more than you need;
- ◇ only use metric system units from the International System of Units (SI), and;
- ◇ wherever and whenever you can, don't use metric conversion for anything!

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Metric system consultant, writer, and speaker, Pat Naughtin, has helped thousands of people and hundreds of companies upgrade to the modern metric system smoothly, quickly, and so economically that they now save thousands each year when buying, processing, or selling for their businesses. Pat provides services and resources for many different trades, crafts, and professions for commercial, industrial and government metrication leaders in Asia, Europe, and in the USA. Pat's clients include the Australian Government, Google, NASA, NIST, and the metric associations of Canada, the UK, and the USA.

Pat specialises in the modern metric system based on the International System of Units (SI), but he is mostly concerned with the processes that people use for themselves, their groups, their businesses, their industries, and their nations as they go about their inevitable metrication process. See <http://www.metricationmatters.com/> for more metrication information, contact Pat at pat.naughtin@metricationmatters.com or subscribe to the free 'Metrication matters' newsletter at <http://www.metricationmatters.com/newsletter/>

