The following is a completely logical way to teach simple areas:

1. AREA is the amount of space COVERED by a shape.
(but later on, VOLUME is the amount of space FILLED by an object.)
2. I think the logical order in which to teach areas is: rectangle parallelogram triangle trapezium
Surprisingly, few text books do this!
3. By simply counting squares we soon get the idea for finding the area of a rectangle:

Instead of just counting each square, we can see this is 5 columns of 3

$b=5$
$\boldsymbol{h}=3 \quad$ So the area is $5 \times 3=15 \mathrm{~cm}^{2}$
This obviously leads to a quick way using a formula that we made ourselves:

Area $\boldsymbol{A}=\boldsymbol{b} \times \boldsymbol{h} \quad$ or base $\times$ height

I THINK IT IS VERY IMPORTANT TO ACTUALLY MAKE ALL THE AREA FORMULAS AND NOT JUST STATE THEM.

Mathematicians MAKE formulas for OTHERS to use.
4. It is logical to consider PARALLELOGRAMS next.

I believe all pupils should know the following:


This sequence of diagrams clearly shows that the area of the first parallelogram is equal to the rectangle that it has been changed into.

Also, it did not matter what the value of side " $a$ " was because in the final rectangle " $a$ " disappears.

So, the area of a parallelogram is
$\boldsymbol{A}=\boldsymbol{b} \times \boldsymbol{h}$ and is nothing to do with side " $a$ ".

## 5. TRIANGLES



ANY triangle is obviously a half of some parallelogram as shown on this diagram. So the area of a triangle is $\boldsymbol{A}=\frac{\boldsymbol{b} \times \boldsymbol{h}}{2}$

I personally do not like the version Half base $\times$ height
because students think they have to always divide the base by 2 when often this is not the ideal thing to do.
e.g.

$\mathrm{b}=9 \mathrm{~cm}$

Clearly in this example we should write $\mathrm{A}=\frac{b \times h}{2}$
$=\frac{9 \times 6}{2}$
$=9 \times 3$
$=27 \mathrm{~cm}^{2}$
which is far more preferable than

$$
A=4.5 \times 6
$$

6. If we are logical, we have no need for a special formula for the area of a trapezium.

$$
A=\frac{h(a+b)}{2}
$$



If we split up the trapezium as shown, we just find the area of the two triangles.

$$
\begin{aligned}
A & =\text { bottom } \Delta+\operatorname{top} \Delta \\
& =\frac{8 \times 5}{2}+\frac{4 \times 5}{2} \\
& =20+10 \\
& =30 \mathrm{~cm}^{2}
\end{aligned}
$$

In fact, whenever we need the area of a triangle in class, I ask the class "Why is the area of a triangle equal to $\frac{b \times \boldsymbol{h}}{2}$ ?"
and I expect my students to say "Because a triangle is half of a parallelogram"!

