The Slide Rule

Cardboard kit for a fully functional slide rule, the predecessor of the electronic pocket calculator. Allows for easy multiplication, division, calculation of square, cube, square and cubic roots, as well as inverse values.

The slide rule was invented in 1632 by the Reverend William Oughtred. It finally made multiplication and division as simple as adding and subtracting. This is accomplished with the help of non-linear distances of the digits on the scales. The scale is exponential, so you are actually adding or subtracting exponents, which results in a multiplication or division.

Instructions for construction and use

Before commencing, remove the foil for the sliding cursor from the back of the cardboard. Cut out the parts as accurately as possible using a sharp craft knife and a ruler. Only cut out the parts as you need them. Use only standard solvent based all purpose glue, e.g. UHU, Evo-Stik Impact, B&Q Diall All Purpose Glue. ***Do not use water-based glue****: it softens and warps the cardboard. Make sure you glue the parts exactly flush on top of each other. Let the parts dry thoroughly before carrying on, best on an even surface and weighed down with a book.*

Step 1: Glue the two parts of the base [A1] and [A2] back to back flush on top of each other.

Step 2: Glue the other two base parts [A3] and [A4] back to back flush on top of each other as well. You now have two separate base parts consisting of two layers each: [A1 + A2] and [A3 + A4].

Step 3: Glue the two base parts with the sides marked [A2] and [A3] on top of each other. *This completes the base of the slide rule. Now we will construct the rails between which the slide can move back and forth.*

Step 4: Glue the first and second layer of the lower rail [B1] and [B2] first back to back and, after the glue has set, onto one of the striped areas on the base. Make sure that no glue reaches the inside of the slide rule, which would inhibit the movement of the slide.

Step 5: Glue the first and second layer of the slide [B3] and [B4] back to back. These two layers form the back of the slide, which is slightly wider than the top (constructed in Step 8).

Step 6: Glue the first and second layer of the upper rail [B5] and [B6] first back to back and, after the glue has set, onto the other striped area on the base. Before the glue sets, check that the back of the slide fits snugly between the rails and can move smoothly.

Step 7: Glue the 3rd and 4th layer of the lower rail [C1] and [C2] back to back and then onto the first two layers [B1 + B2]. Make sure that the outside edges are completely flush, so that the top layers protrude towards the inside, which will later retain the slide.

Step 8: Glue the 3rd and 4th layer of the slide [C3] and [C4] back to back to form the top of the slide. Now slide the back of the slide between the rails and, first without glue, put the top of the slide on top, so that the points on the scales C and D are exactly flush.

Step 9: Glue the 3rd and 4th layer of the upper rail [C5] and [C6] back to back. Let dry thoroughly.

Step 10: Glue the top of the upper rail [C5 + C6] onto its lower layers [B5 + B6], so that the outer edges and the points of the scales A and C are exactly flush. The inner edge protrudes and covers the edge of the back of the slide.

Step 11: Now glue the upper layer of the slide on top of its back and check that the slide moves smoothly.

Step 12: Wrap the foil of the sliding cursor around the slide rule, so that the ends of the black line lie exactly on top of each other. Connect it on the back of the slide rule with a piece of sticky tape. If you want, you can crease the foil at the edges of the slide rule. The cursor is used to read the results more accurately.

Now your slide rule is complete. Congratulations!

Example for multiplication: 2.5 x 3.0 =?
Move the slide until the "1" of scale C is exactly above the "2.5" of scale D. Move the cursor over the "3.0" on scale C. It then shows the result on scale D ("7.5"). Important: for "25 x 30" or "250 x 0.3" you do exactly the same, but you have to calculate the number of decimal points in your head. *Hint: If the result is outside of scale D, use the "10" on the opposite side of scale C instead of the "1".*

Example for division: 65 ÷ 5 = ?
Move the cursor over the "6.5" on scale D and then the slide so that the "5" on scale C lies exactly under the cursor. The result can be read on scale D under the "1" of scale C ("1.3"). An estimation of the decimal points shows that the correct result is "13".

Square, cube, square roots, and inverse:
The square of the numbers on scale D/C can be read directly on the scales A/B and the cube on scale K (and in the opposite direction square root and cubic root).
The inverse of the numbers on scale C can be found on scale CI.
Check Wikipedia for more information.

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