

The Distributive Law: From Lab Gear to Algebra

Start by dealing with expressions that involve no minuses.

- A.** Given a set of blocks, make a rectangle.

Measure its dimensions in the corner piece.

Write an equation in the form $Length \cdot Width = Area$

(This corresponds to factoring.)

- B.** Given its dimensions, make a rectangle.

What is its area?

Write an equation in the form $Length \cdot Width = Area$

(This is multiplication and the distributive law.)

- C.** Repeat B, but sketch the rectangle instead of building it.

(This can be assigned as homework.)

- D.** Use a multiplication table format to multiply polynomials.

(The layout is similar to the arrangement of the blocks, but requires no manipulatives. Be sure to combine like terms to finish up the problem.)

- E.** Start using minus in the multiplication table format.

(By now, most students should no longer need the blocks. The remaining activities with the Lab Gear serve to review the distributive law, and to provide closure to the issues raised by this work.)

- F.** Use related products to introduce minus in the corner piece.

- G.** Do simple divisions in the corner piece.

- H.** Do not use the blocks!

Equation Solving: From Lab Gear to Algebra

At all times, monitor and discuss the process of working on the workmat. As students invent rules, have them present those to the class. Keep a record of them on the bulletin board, with each rule named after its inventor, perhaps under the heading “Lab Gear Rules”. Later, “Algebra Rules” can be abstracted from them.

Work should proceed from “Which is Greater?” to equation solving, with the activities organized roughly as follows:

- A.** Use the blocks to solve the problem.

Record the answer.

- B.** Write the original equation (translated from the picture.)

Record the answer.

- C.** Write the original equation.

At several points in the process, record what is on the mat. (One student can manipulate the blocks, and another one can take a "snapshot" of the workmat when there is a pause. For the next problem, the roles are switched.)

Record the final answer.

- D.** Write the original equation.

Record what you do at each step. (Again, working in pairs is helpful. To demonstrate, have one student work with the blocks on the overhead while another records each step on the chalkboard.)

Record the final answer.

- E.** Analyze the record of what you did at each step. (At this point, some students will begin to generalize, and will rely much less on the blocks)

- F.** Have one student work with the blocks, and the other without.

Compare answers.

Switch roles for the next problem.

- G.** Do not use the blocks!