

Solving equations inquiry

$$\square x + \square = \square x + \square$$

The prompt acts as a template for students to explore linear equations.

It has often led to an inquiry that combines inductive and deductive reasoning in a mutually supportive process.

The inductive side can be developed from a consideration of whether equations of this form always have a solution. As students solve particular cases, the conjecture soon arises that they do (unless the coefficients of x are the same). Deductive reasoning is a feature of the solving process. It can also be evident in students' attempts to solve the general form $ax + b = cx + d$.

The inquiry begins with the teacher requesting integers to place in the spaces. Despite the closed start, the prompt has generated various suggestions for different or further inquiry. Some examples from key stage 3 classes are:

- Change the operation(s) to subtraction.
- Use fractions instead of integers.
- Re-design the equation with the unknown on one side only.
- Include a second variable on both sides of the equation.
- Re-design the equation to include an algebraic fraction.
- Add a third expression equal to the other two.