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Sokolowski, Andrzej

Inductive reasoning and the theory of equation.

Math. Teach. (Derby) 233, 44-46 (2013).

Summary: The author proposes an interactive approach with grade 9 students. Students' understanding of the theory of algebraic equations is essential in their mathematics education. Equations, along with functions are also the main algebraic tools used to quantify scientific experiments, conduct statistical analyses or verify engineering designs. A substantial research body has proved that students face difficulties understanding the theory of algebraic equations, which results in failing to correctly solve them. The main reason for students' deficiencies is a lack of emphasis on the relational role of the equals sign. Equation can be defined as 'the state of being equal, equivalent, or equally balanced'. So, what image can we use to convey this 'state' to learners? The 'balance' is a frequently used device, but a seesaw is equally valid as many learners will have experienced a seesaw in their early years. This piece describes how a simulation of a seesaw – free to download – can be used in the classroom to display the concept of equation. Students begin by being immersed in the process of inductive reasoning, then move to pattern formulation and verification. The focus is on student thinking and discussion. The goal is to be able to solve linear equations where the software is used to scaffold the learning with appropriate question posing by the teacher. The software is not new, neither is it complex, but it is user friendly. In short, this is a well-reasoned approach to the teaching and learning of the theory of equation.

Classification: H33 U73 D83 M53

Keywords: elementary algebra; solving equations; approach; educational software; interactive simulation; seesaw equilibrium; balancing; physics; kinematics; inductive reasoning; teaching units; notation; mathematical symbols; equals sign; generalisation; pattern formulation; verification; confirmation; student activities
<http://www.atm.org.uk/write/MediaUploads/Journals/MT233/Member/ATM-MT233-44-46.pdf>