Sinclair, N. and Jones, K. (2009) BSRLM geometry working group: geometrical reasoning in the primary school, the case of parallel lines. *Proceedings of the British Society for Research into Learning Mathematics*, 29(2), 88-93.

Abstract

During the primary school years, children are typically expected to develop ways of explaining their mathematical reasoning. This paper reports on ideas developed during an analysis of data from a project which involved young children (aged 5-7 years old) in a whole-class situation using dynamic geometry software (specifically Sketchpad). The focus is a classroom episode in which the children try to decide whether two lines that they know continue (but cannot see all of the continuation) will intersect, or not. The analysis illustrates how the children can move from an empirical, visual description of spatial relations to a more theoretical, abstract one. The arguments used by the children during the lesson transcend empirical arguments, providing evidence of how young children can be capable of engaging in aspects of deductive argumentation.

For the full text, please click on the following link: http://www.bsrlm.org.uk/IPs/ip29-2/BSRLM-IP-29-2-16.pdf

References

- Balacheff, N. 1988. Aspects of proof in pupils' practice of school mathematics. In D. Pimm (ed.), *Mathematics, Teachers and Children*. London: Hodder and Stoughton. (pp. 216–235).
- Ball, D.L., C. Hoyles, H.N., Jahnke, and N. Movshovitz-Hadar. 2002. The teaching of proof. In L.I. Tatsien (ed.), *Proceedings of the International Congress of Mathematicians*. Beijing: Higher Education Press, Vol. III, pp. 907–920.
- Bartolini-Bussi, M. 2009. Proof and proving in primary school: an experimental approach. In Fou-Lai Lin et al (Eds) *Proceedings of the ICMI Study 19 Conference: Proof and Proving in Mathematics Education*. Taipei, Taiwan: National Taiwan Normal University. Volume 1, pp 53-58
- Bryant, P. 2009. *Understanding Space and its Representation in Mathematics*. London: Nuffield Foundation.
- Carpenter, T.P., M.L. Franke, and L. Levi. 2003. *Thinking Mathematically: Integrating Arithmetic and Algebra in Elementary School*. Portsmouth, NH: Heinemann.
- Galotti, K.M., Komatsu, L.K., and Voelz, S. 1997. Children's differential performance on deductive and inductive syllogisms. *Developmental Psychology*. 33(1): 70-78.
- Jahnke, H. N. 2007. Proof and hypotheses. *ZDM The International Journal on Mathematics Education*. 39: 79–86.
- Jones, K. and M. M. Rodd. 2001. Geometry and proof. *Proceedings of the British Society for Research into Learning Mathematics*. 21(1): 95-100.
- Light, P., A. Blaye, M. Gilly, and V. Girotto. 1989. Pragmatic schemas and logical reasoning in 6-to 8-year-old children. *Cognitive Development*. 4: 49-64.
- Maher, C.A. and A.M. Martino. 1996. The development of the idea of mathematical proof: A 5-year case study. *Journal for Research in Mathematics Education*. 27: 194–214.
- Sinclair, N. and S. Crespo. 2006. Learning mathematics in dynamic computer environment. *Teaching Children Mathematics*. 12: 437-444.
- Sowder, L. and G. Harel. 1998. Types of students' justifications. *The Mathematics Teacher*. 91(8): 670–675.
- Stylianides, A.J. 2007. The notion of proof in the context of elementary school mathematics. *Educational Studies in Mathematics*. 65: 1–20.
- Stylianou, D., E. Knuth, & M. Blanton (Eds.). 2009. *Teaching and Learning Proof across the Grades: a K-16 perspective*. New York, NY: Routledge.