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Teaching (an introduction to!) fractals and rainfall features in kinder garden

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Why trying to teach fractals or rainfall drop size distribution to 3 to 5 year old children? Because it can easily be done in a (rather!) fun way, enabling children to grasp some complex notions and more generally get familiarized with science. This paper presents the outputs of a collaboration between a researcher and two kinder garden teachers which resulted in activities dealing with fractals and rainfall that were implemented in their class.

Fractals are geometrical objects that exhibit a similar structure at all scales. A classical natural example is a fern leaf around which an activity was developed and implemented with children aged 3-4. The first step consisted in trying to make them feel the fractal nature of the fern leaf, i.e. a whole leaf is made of smaller leafs which are also made of even smaller leafs exhibiting similar shapes. Four activities were specifically designed for this. In the second step the fractal nature of the fern leaf was used to enable the class to draw a large leaf in a collaborative way. More precisely, each child draw a leaf and they were all assembled to draw a greater one. A similar activity but this time with geometrical shapes based on triangles was implemented with kids aged 4-5. The output was a great Sierpinski triangle.

Rain drops typically exhibit sizes ranging from 0.2 to 5 mm (in terms of equivolumic diameter), and scientists uses disdrometers to analyse this distribution. An activity that consisted in developing and testing two disdrometers was implemented in a class with children aged 5-6. The disdrometers consisted of a plate with a thin layer of either flour or oil. The features of the two devices were initially compared with the help of artificial drops generated by the children with a pipette. Then the disdrometers were briefly (few seconds) put under the rain. In order to help children notice the wide variety of drop sizes they were asked to draw what they saw.

Finally an activity based on times series of rainy and non-rainy days (recorded by the class) whose aim is to the show the fractal nature of rainfall and to introduce the notion of random models will briefly be discussed.

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