Dangerous Cold and Dangerous Rain Curriculum Resources

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Background information to Dangerous Rain, Dangerous Cold and other curriculum materials

The curriculum materials attached are one of the products of a two-year EU funded research and development project called Compass. Central to the design of the materials is a pedagogical device called a bridging concept which facilitates interdisciplinary learning between mathematics and science. The notion of a bridging concept is unique to these materials and Howes and Hardy first reported their application to the European Science Education Research Association conference, Lyon in September 2011. A bridging concept is a single idea or phenomena that spans between the mathematical and scientific elements of the curriculum matters under consideration. In the example attached, the concept of FLOW is utilized to help learners make better sense of both the mathematical and scientific dimensions of real-life problems.

Learning is also supported by the use of pupil research environments. These are online learning environments where pupils have opportunity to predict-observe-explain.

The efficacy of the application of a bridging concept was investigated with a network of nine schools in the NW region. The research established that the bridging concept allowed opportunities for both teachers and students to utilize new approaches to develop knowledge that synthesizes mathematical and scientific ideas and practices. In such approaches it was found that pupils needed much less support to understand the new concepts and the language with which to discuss these. The ease with which the pupils moved across curriculum boundaries to apply in an interdisciplinary manner was a noticeably strong. Questionnaires, interviews and classroom observations were used, together with an analysis of pupil work, to describe and evaluate the learning processes and outcomes for teachers and pupils associated with these using these new materials. There were many examples, where within the focus group interviews, pupils reported strong interaction of subjects and synthesis of ideas. The efficacy of the bridging concept will be reported to the American Education Research Association conference in April 2012.

The draft National Curriculum for England (to be finally published in 2013) promotes of notion of interdisciplinary learning but without any guidance as to how this might be achieved. This research and the resulting curriculum materials is making a valuable contribution within this area by developing approaches and pedagogies, which are distinctive, powerful and manageable for teachers. The range of materials is extensive with only two examples attached here, called Dangerous Cold and Dangerous Rain. A further nine examples can be found at: http://compass-project.eu/resources.php?ug_preselfl=sdtnvqddt-qgq

Learning is enhanced through the use of pupil research environments. These are online learning environments where pupils have opportunity to predict-observe-explain. The research environments connected with Dangerous Cold and Dangerous Rain can be found at:

http://www.compass-project.eu/applets/5/index_EN.html

http://www.compass-project.eu/applets/7/index_EN.html

http://www.compass-project.eu/applets/8/index_EN.html

All of the materials are being disseminated within six European countries, representing considerable potential impact on the pedagogy of science and mathematics teachers across Europe.