Some mathematics activities to develop oracy

Story books
Some examples of story books which can lead to philosophical enquiry within a mathematical context are referenced below:

- Allen, P.(1980) ‘Mr Archimedes’ Bath’. Puffin Books, London
- Foreman, M. (1972) ‘Dinosaurs and all that Rubbish’. Puffin Books, London
- Wormell, C. (2003) ‘Two Frogs’. Red Fox, London
- Lasky, K. (1994) ‘The Librarian Who Measured the Earth’, Little and Brown, New York.

Storywise activities

Karin Murris and Joanna Haynes in 'Storywise' (2000), have produced a range of starting points for philosophical enquiry including some with a numerical theme. These include a range of philosophical positions on 'number', and an invitation to consider what life would be like without numbers. To explore the later, children are invited to organise a 'no-number-day'. Every time a number is used the user gets a tick by his/her name. The person with the least number of ticks at the end is the winner.

- Murris, K. and Haynes, J (2000) ‘Storywise: thinking through stories’ Dialogue Works. Newport, Pemb.

‘Marion Bird’ activities
These are open-ended tasks for use from Foundation to Key Stage 3 where a mathematical situation is presented and pupils formulate their own questions for further exploration.

- Bird, M. (1991) ‘Mathematics for Young Children: An active thinking approach.’ Routledge, London
- Bird, M. (1983) ‘Generating mathematical Activity in the Classroom’ West Sussex Institute of Education, re-printed by the Mathematical Association.

CAME, CASE and P-CAME activities such as ‘Home and Away’
It is explained that a number of teams have to play each other in a competition. How many games will be played altogether? What are some good strategies for finding this out and for recording the results?

- Adhami, M. and Shayer, M. ‘Thinking Maths’ Cognitive Acceleration in mathematics Education. Heinemann, Oxford.

Concept Cartoons
A situation is presented, such as, ‘two numbers are multiplied together’ and a range of possible consequences are expressed, for example, ‘The answer is always bigger than either of the initial numbers’, or ‘if the two initial numbers are odd then the answer is never even’. Pupils are invited to agree or disagree with the follow-up statements and to create their own. They can also be invited to create their own concept cartoon.

- Dabell, J et al (2007) ‘Concept Cartoons in Mathematics Education’, Millgate House Publishers

Quick Starters
These could be available at the start of lessons as pupils enter the classroom, with the invitation to, 'Generate as many questions as you can about these, write your questions on post-it notes' See the document on p4c maths starters

Barrier Games
Generating questions is not strictly a part of these activities but they are good for stimulating the use of mathematical language.

Mathematical activities where two people can't see each other's work and have to communicate in some way. 'Battleships' is one example. More likely to stimulate mathematical language is the activity where two pupils sit back-to-back. Each has a selection of unit cubes available. Pupil A makes a shape by joining six cubes. Pupil B has to attempt to construct a replica of A's shape by asking questions.

'David Wells' activities
David Wells published (in 1990) two volumes entitled 'Problem Solving for National Curriculum mathematics'. They are full of genuine, open-ended starting points such as; 'How many fractions are there on the number line between 2/3 and 3/4?' and 'How many prime numbers are there?'

- Wells, D. [1990] 'Problem Solving for the National Curriculum, books 1 and 2' Blackwell, Oxford.

Stories from Graphs.
The two graphs in the stories from graphs document can be used as starters with the question 'What stories could these graphs represent?'

Pictures with a mathematical theme.
Pictures such as the chambered nautilus or an Escher print, could be used to stimulate and enquiry. These can be found on the internet.

Music as a stimulus
Music with a strong rhythmic line can be used to stimulate question generation. In particular music such as that composed by Steve Reich ['Music for Hammered Instruments' is one appropriate piece] since the rhythm changes over time.

Julian Baggini (2006) thought experiments
A number of Julian Baggini's starters for enquiry have a mathematical theme, such as, 'Squaring the Circle' (p 70) and 'Wheel of Fortune' (p16).

- Baggini, J. (2005) 'The Pig That Wants to be Eaten'. Granta Publications, London.