	Easter Date	*Lesson Plan*
Activity		*Notes* T: Teacher P: Pupil
1	**Introduction** T: Why does the date of Easter change? T: It depends on both the Gregorian calendar and the Jewish calendar. T: What do you know about the Gregorian calendar? *(Leap year every 4 years, except for century years when only one in every four is a leap year, e.g. 2000 was a leap year; 2100, 2200 and 2300 will not be leap years)* T: What do you know about the Jewish calendar? *(It has a 19-year cycle in which the 3, 6, 8, 11, 14, 17 and 19 years have a thirteenth month)* T: Why are these two calendars important? *(In the Bible (Luke, Ch 22) there is a description of how Jesus ate the Passover with his disciples before going to Gethsemane. The Last Supper, the Agony in the Garden and the Crucifixion were at the time of the full moon following 21 March (Spring Equinox). The hurry to remove the body from the cross before the beginning of the Jewish Sabbath (Saturday) fixes the Crucifixion on a Friday. The Church has sought to preserve this sequence)* T: Because of these complications there is no mathematical formula for the date of Easter but T O'Beirne published, in 1961, an algorithm entitled 'Ten Divisions to Easter'.	This question could be set as introductory homework for this lesson. Use Ps' knowledge to lead the discussion. You might need to explain why the Julian calendar was superseded by the Gregorian calendar. (See http://www.nottingham.ac.uk/mss/online/skills/dating/julian-gregorian.phtml) You can find this algorithm in 'Puzzles and Paradoxes' by T O'Beirne (OUP, 1965).
2	**Algorithms** T: Here is a copy of the algorithm that we will first check for the year 2006. T: We start by substituting $x = 2006$ in the first line and divide by 100. What are the values of b and c ? *(20, 6)* T: Who will take over the algorithm? T: What is the value of $5b + c$ *(*$5 \times 20 + 6 = 106$*)* … and continue in this interactive way. T: You complete the algorithm by noting that Easter Day is on the pth day of the nth month. So what is the date? *(16 April)* T: Is this correct? *(Yes)*	Give each p a copy of the algorithm and show copy on OHP or data projector. One (or two) Ps chosen to work at the front. Note the potential problems with brackets in lines 3, 4 and 7.
3	**Exercises** T: Now it's your turn; work in pairs to calculate the date of Easter 2007.	Allow time for Ps to work on this. Give individual help; check calculations. Review first 4 lines with whole class (with P putting answers on board).

4	**Extension** What is the earliest possible date for Easter Day? *(23 March)* T: … and the latest date? *(25 April)* T: What is the distribution of these dates? How could we find out? *(Draw histogram)* T: Complete the histogram but first set up a frequency chart. T: What distribution do these data follow?	Give out data sheet for the next 200 years. Encourage Ps to work in pairs on both the frequency chart and histogram. After 10-15 minutes, check histograms.