Cryptic Challenge
Teacher Information Sheet

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multiplying opportunities

This activity can be run with able KS3 or KS4 students. The format is a quiz, where in each round teams have to solve a different type of code or cipher. We would recommend grouping pupils in teams of four and also printing out two copies of each round, so all pupils can see the problems.

In the past we have given out 10 points to the first team to finish a round, 9 points to the next team to finish the round and so on.

Please also read the notes on the PowerPoint slides to understand each mini activity.

Suggested timings:

5+ minutes	**Introduction.** Mathematicians are employed to crack codes and encrypt data, in fact GCHQ (Government Communication Head Quarters) has the largest group of mathematicians in the country employed on this very task. However lots of other employers really want employees who are good at problem solving and have good logical skills. This activity will test these skills!
5+ minutes	**Pig Pen Cipher.** Pupils use the sheet 'aims_starter.doc' to solve the pigpen cipher which will reveal their lesson objective.
1+ minute	**Give out the Number Phrase round** from 'bonus Number Phrase Round.doc' This can be completed by teams who have finished the other rounds early, over the whole course of the activity.
10+minutes	**Round 1: Texting Challenge** (**+** explanation). Pupils use the sheet 'Texting Challenge.doc'. They also need a copy of the phone in the same document.
10+minutes	**Round 2: Transposition Challenge** (+explanation) Pupils are firstly given the example sheet 'Transposition Challenge Examples.doc'. Then they need the sheet 'Transposition Challenge.doc'
10+minutes	**Round 3: Pencil Code** (+explanation). Pupils need a pencil and a strip which has been cut from the sheet 'CODE for pencils.doc'. (Teams can share.)
10+minutes	**Round 4: Binary Round** (+explanation). Pupils need a copy of the sheet 'Binary.doc'. (We enlarged this to A3 size.)
10+minutes	**Round 5: Error Checking** (+explanation). For this you need copies of 'error checking.doc', cut up into the numbered grids. Pupils take sheet one. When they have completed it, they return to the table to get it checked and to pick up sheet two and so on. This is run as a race, so the team who finishes sheet 10, is the winner etc.
15+minutes	**Round 6: Frequency Analysis** (+explanation). For this pupils need a copy of the code in 'Frequency Analysis.doc'. (We enlarged this to A3 size) They also need a copy of the frequency graph in the same document.
5+minutes	**Answers to the number phrase round (+prize giving)**

The message we wanted to emphasise was that maths is everywhere, fascinating and extremely useful!

more maths grads is a three-year project funded by the Higher Education Funding Council for England to develop, trial and evaluate means of increasing the number of students studying mathematics and encouraging participation from groups of learners who have not traditionally been well represented in higher education.