The Hawksmoor Inheritance

About the Challenge

Welcome to the National Cipher Challenge, a nationwide, online codebreaking competition introduce the competitors to the thrill of discovery experienced by professional mathematicians and computer scientists in their work. The competition will run from October 4th 2012 to January 4th 2013 and will open for registration from September 21st. It is a great extension activity (or a fantastic maths club project) which can be tackled by students in teams or on their own. Based on the fictional adventures of Nicholas Hawksmoor, the story will unfold in a series of short encrypted messages for the participants to crack, using all their skill and cunning. Together they will help Nicholas to decipher the Last Will & Testament of his disgraced Uncle Tiberius in an effort to uncover the secret of Tiberius’s downfall and to defeat his enemies. The lesson plans and notes contained at the end of this Teachers’ Pack, provide a good introduction to the skills needed by a successful code-breaker. Entrants can take part in teams as small as a solo entrant, or as large as they want, but prizes have to be shared. Each team needs at least one registered account for the team captain and competitors can build teams by designating one of them as a team captain who can then use the Team Builder to invite others to join. That way anyone in the team can use their own account to submit solutions, check for feedback, resubmit and download certificates. Challenges will be set periodically on the web-site www.cipher.maths.soton.ac.uk in the Challenges section, following this schedule:

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| --- | --- | --- |
| Challenge | Publication date 15:15 on | Solution deadline 23:59 on |
| 1 | 04/10/2012 | 10/10/2012 |
| 2 | 11/10/2012 | 17/10/2012 |
| 3 | 18/10/2012 | 24/10/2012 |
| 4 | 25/10/2012 | 07/11/2012 |
| 5 | 08/11/2012 | 21/11/2012 |
| 6 | 22/11/2012 | 05/11/2012 |
| 7 | 06/12/2012 | 19/12/2012 |
| 8 | 20/12/2012 | 04/01/2012 |

This year the first two rounds are a “warm up” exercise and will not contribute to the overall placings on the Championship leaderboard, which will be published from Round 3 onwards. You should try the early rounds as they are excellent practice and will count for the new Hut Challenge.

Registration

To take part you will need to register for the competition on our registration page: www.cipher.maths.soton.ac.uk/registration This will be open from September 21st, and you will need to provide the following information:

 Username: This will be the name you use to log on to the site to post comments, and also to submit your entries, check feedback and to print your certificate. Choose something memorable. You can share this info among the team, but do not let anyone else have it as they can use it to pose as you!

 Password: Again this is for logging on. Choose it carefully and keep it secret.

 Email address: This will be used to confirm your registration so it must be an active account you can check. We can only associate one email account to each team, so it might be an idea to set up an account (with Gmail or some other free provider) that the whole team can use for the competition. If we need to contact you this is how we will do it so add the account [cipher@soton.ac.uk](mailto:cipher@soton.ac.uk) This email address is being protected from spambots. You need JavaScript enabled to view it. to the account address book to avoid sending our emails to your junk mail bin, make sure the account is not too full, and check it regularly.

 Team name: This will be used on the downloadable certificates and the leader boards to identify you. Try to choose something interesting but tasteful. (We reserve the right to refuse offensive names!)

 Team members for the web: Enter your names as you wish them to appear on the leader board. If you wish to remain anonymous online then leave this blank or use a nickname that does not identify you.

 Team members for the certificates: These are your names as you wish them to appear on the downloadable certificates and will not be used publically without your permission.

 Number in team: While we could be clever and write a script to try and compute the number in the team from the info about team member names this is not very accurate and far too much work, so please tell us how many of you are in the team so we get some idea of how many are taking part!

 Teacher contact: Give the name of a teacher we can write to if we need to check anything. You should get their permission first! We don't usually do this unless you win a prize. If you are home schooled give us a parent or carer's name here and write home schooled in the school name field. You will still need to give us contact details in the address fields below.

 School name: Again we will use this on the certificates and the leader boards so spell it right, and if it is a common name (like King Edward's) add a location (King Edward's, Southampton) to identify it.

 School address: If you win a prize this is how we will get it to you, so it is important that you get this right. We collect the postcode separately so we can easily map the participants to give us some idea of the spread of entries.

 School postcode: See above.

Huts, Teams and solo entries

Every team needs at least one member (the team captain) and if you are entering on your own that is all you need. If several of you want to form a team to compete, whether you are in the same school or not, you can do that and again you only need one account belonging to the team captain who will then submit your entries. You can list the members of the team as you want them to appear on the leader boards and on the certificates in the team captain’s account. If you want to all be able to post entries for the team, to read the feedback and to download the certificates then you should each sign up for an account and use the Team Builder tab in the team captain’s account profile to issue invites to the other team members to join. The team members will then be able to accept the invitation by going to the same place in their own account profile. Individuals can leave a team at any time, but cannot be thrown out by anyone else, even the captain, so choose your teammates wisely. The captain can only leave a team once everyone else has. Team submissions (from anyone) belong to the team; you can’t claim them as yours if you leave. At the end of the second round of the competition (which will finish at midnight on Wednesday 17th October) we will assign each of the teams and solo entrants taking part in the Part A challenges to one of four Huts: Hut 3, Hut 4, Hut 6 and Hut 8, each named after one of the the famous Bletchley code breaking or sig-int divisions. The points won by a team or individual in each part A challenge will also be awarded to their Hut and the Huts will compete for National glory throughout the remainder of the competition. Total Hut points will be displayed on the website.

The structure of the competition

Each round of the competition will come in two parts, Part A (the Hut Challenge) and Part B (the Team Challenge). We will say more about Huts and Teams later in this introduction but for now think of them as the “easy” and the “hard” challenges (or the “hard” and “much harder” challenges if you prefer). Part A challenges will consist of letters, notes etc. sent between our protagonists as they try to unravel the secret of Uncle Tiberius’s will. You can expect these messages to be fairly lightly encrypted, at least at first, although in the latter stages of the competition security will be tightened and you will find the Part A ciphers harder to crack. Part B consists of sections of Uncle Tiberius’s Last Will and Testament, and these are encrypted in various ways. Again they will start simply but as Tiberius reveals more about his past the encryption in these challenges will become increasingly tricky. You may find that learning to use a spreadsheet or even to programme will be of particular value in tackling the later stages of the part B competition. Submitting your solutions

Submitting your solutions

You can submit solutions to either part A or part B (or to both parts together), at any time during a round, and if you need to resubmit you can use the same form. Just paste your entry as text in the appropriate box on the form. Click on the windows to reveal the boxes – the doorbell acts as a submission button and the clock tells you what time we think it is. It doesn’t matter how you format your answer – with or without punctuation and spaces and whether or not you use capital letters, however you must only type or paste in the exact text of a decrypt of the message. So the texts “Tiberius, for no apparent reason, seems to have been in trouble with the authorities” could equally be submitted as “tiberiusfornoapparentreasonseemstohavebeenintroublewiththeauthorities”. It is a good idea to use a simple text editor to type up your solution (rather than something like Word) as the spell checker sometimes tries to change what you are typing and the “mistake” might be deliberate. Don’t try to correct any errors you think we have made, always type in an exact decryption of the text. Don’t try to tell us what cipher we used, or to ask us a question, or to say how you solved the cipher in the entry form, we don’t read it and it will be marked as an error in the solution. If you need to get hold of us you can post a message on the forum or send us an email at [cipher@soton.ac.uk](mailto:cipher@soton.ac.uk) This email address is being protected from spambots. You need JavaScript enabled to view it. .

Getting help

We offer online feedback on submissions during each round to help you if you make mistakes. The feedback is delayed so you will lose points if you rely on it rather than trying to correct your own errors quickly, but it can be useful if you are on the right track (and speed doesn’t matter for part A challenges which are only scored for accuracy). The feedback consists of a score for accuracy, together with a copy of your submission with the first error highlighted. So for example, if you tried to submit a solution to the text above which missed the word “in” as below our feedback system would spot that and highlight the letter t as below. The letter t is only wrong marked here because the solution checker expected to see a letter i. “tiberiusfornoapparentreasonseemstohavebeentroublewiththeauthoritiesforsometimebythen”. At the end of each round we will publish the official decrypts of part A and part B, which sometimes contain hints at how to tackle the next round. Participants often get stuck on a Challenge but, as in real life, sometimes a good night's rest is all you need. Other times you might need more practical help and can turn to the website for clues, either hidden in earlier rounds of the competition, or posted (by us) as comments on the forum. We ask you not to post hints of your own without checking them with us first as this will spoil the Challenge for others. Anyone posting solutions or links to solutions on our site or elsewhere may be barred from the site and disqualified from the competition - we do search for them and do find them!

Scoring

Each of the two challenges in a round (part A and part B) are scored for accuracy in the same way. We strip out all the non-ascii characters, spaces and punctuation from your solution, convert it to lower case and compare that string of letters with our solution, which we have treated the same way. The more similar they are the higher the score you will get, and if they are identical you will score 100% for that challenge. If you spot a mistake in your answer you can submit again - we only ever take your most accurate answer into account and accuracy beats speed in every case, though speed is also important in the part B competition. In part B we look at all your submissions for the round and find those with the highest mark. We then take the first one of those that you submitted and award you points depending on how quickly you submitted it, according to a schedule which is published with each challenge. There are no speed points for part A, only for part B. You can find out your scores for each round in the feedback section of the site, and we will publish a leader board for each round. The first two rounds are a warmup so the points will not count for the overall leader boards but from round 3 we will publish a Championship leader board based on your total points from then in each of the competitions and we will also publish a score board for the points accumulated by each of the four Huts (see below).

Prizes

The GCHQ prize of £1,000 will be awarded to the top codebreaker or codebreaking team in the country as measured by performance in the part B competition. IBM provides a second prize of £800 and Trinity College, Cambridge awards £700 to the third place on the leader board. The position on the leader board is determined by combining an accuracy score with a time score, and the full details of how this is done can be found on the rules section of the website. www.cipher.maths.soton.ac.uk/rules The University of Southampton awards a number of smaller prizes to teams taking part in each of the 8 part A Challenges and this year the top 50 individuals in teams on the part B Championship Leader board will win a laptop rucksack from our sponsor Netcraft, together with a Raspberry Pi computer donated by GCHQ. The Prizegiving Our sponsor BCS – The Chartered Institute for IT will host a prizegiving ceremony for selected participants at Bletchley Park on 12th April 2013. Some tickets will be available by lottery and you can apply for them online at http://www2.cipher.maths.soton.ac.uk/index.php?option=com\_cipher&controller=tickets The afternoon will include a tour of the museum and tickets are always in high demand.

How many can enter?

Teams of any size and composition may enter, and a school can enter as many teams as it wishes. Teams can be run from one or several individual accounts (see above) and inter-school teams are also allowed Does everyone in a team need their own account? No, but everyone can have one! The team is principally associated with one account holder (the team captain), but team captains can invite others to join the team at any point including when it is set up. You don’t need to have an individual account to be associated with a team, as you can be listed as a member on the team captain’s account. You do however need an account if you want to be able to post comments to the forum or to post solutions for the team. You also need one to log in to see feedback and get certificates.

What does it cost to take part?

At the moment we are lucky to have several generous sponsors, and the costs of the competition are covered by the School of Mathematics at the University of Southampton so there is no charge to take part.

When does the competition start?

Registration opens on September 21st. The first part of the competition will be published at 3.15 on Thursday October 4 th. There is no need to rush to download it as you have one or two days in which to submit to achieve full speed marks. Often the website is overloaded for the first half an hour or so, and it probably pays to wait out the rush. The part B prizes will be allocated based on performance in rounds 3-8 so if you miss the first couple of challenges it won’t matter too much.

When will the Challenges be published?

At or shortly after 3.15pm on each of the following Thursdays: 4th, 11th, 18th , 25th October; 8th, 22nd November; 6th, 20th December. These dates have been chosen to avoid the most common half term dates.

How long do we have to complete each challenge?

The deadline for each Challenge is 11.59pm on the day before the next Challenge is published, The number of points you score in part B depends on how early you submit your best attempt.

What age group is it aimed at?

Principally this is an extension activity for older pupils, but the early stages of the competition are aimed at a wide audience and there is something for everyone. We have had bright year 6 pupils do well on early rounds and this prepares them for further achievement in future competitions. Many pupils return year after year as they try to improve on the number of stages they can successfully complete, and the staged certificates give everyone an incentive to keep going as long as possible. There are also some small prizes awarded at random to a few participants each week as an added incentive. Finally we are introducing the national Hut Challenge this year, in which participants are assigned to national teams, Hut 3, Hut 4, Hut 6 and Hut 8 to compete for glory (not gold!). Even the smallest contribution can make a difference to the outcome of that competition so it is worth trying even if you can’t complete the challenge.

Is this appropriate for a Math Club activity?

Certainly. The entire math club could enter as a team or you could divide up into smaller groups and use the math club meetings to discuss techniques and strategies.

Can pupils enter on their own?

Yes, we get many solo entrants and teachers do not have to be involved, but we do ask for the name of a teacher contact for prize administration.

Do team members have to all come from the same school?

No, in the past we have had several teams made up of members of different schools and colleges, and this is perfectly acceptable. However we do ask for the name of at least one of the schools and a teacher contact for prize administration, and, for now at least, the team captain’s school will get all the credit!

What are the Huts and why have you introduced them?

Good question. This year we are trying something new. At the start of round 3 each team/solo entrant to part A of the Challenge will be assigned to one of four national teams, Hut 3, Hut 4, Hut 6 and Hut 8. The password to unlock your Hut membership will be published by a fan of the National Cipher Challenge at that time. We can’t say more now, but all will become apparent later! The points awarded to the members of each Hut for their attempt at the part A challenges throughout the competition will be totted up to give a Hut total and these will be published on the website throughout the competition. Even if you don’t get get full marks on a challenge your efforts will still play an important part in the score for the Hut. No prizes, but plenty of glory for the winning Hut!

How do I know what Hut I am in?

THat's a secret until the end of round 2!

Can I be in the same Hut as my friend?

If they are in the same team as you (as selected in the Team Builder tab of the profile) then you will be in the same Hut. Other than that we make no promises.

Where can I find out more?

The rules page and the news and info pages give more information, and it is worth taking part in the forums, which we will monitor.

Rules

1. The competition is only open to persons who are in full time school-level education in the United Kingdom (Home-schoolers also qualify as do those attending schools in the Channel Islands and the Isle of Man.).
2. The competition is only open to persons aged 18 or under on 31 August 2011.
3. Entries may be received from individuals or from teams. The teams may be of any size, but we reserve the right to restrict the number of team members listed on the honours board. If you are in a big team you should make sure we have a team name as well.
4. Teams must nominate a captain who we may contact via email.
5. The schedule of messages to be deciphered is given here, the list of prizes is given below.
6. Each challenge consists of two parts, part A and part B. You may submit solutions to either or both parts of the current challenge on the entry form.
7. For each of the challenges 1 to 8 there will be a small cash prize awarded to 8 teams/competitors chosen at random from those who submit a correct entry to part A.
8. For each of the challenges 1 to 8 for which you submit an entry for part B you will be awarded a score, based on the accuracy of your best submission for that challenge and the order in which we receive the submissions. The scores will be used to determine your position on the leaderboard for that challenge. The scores for Challenges 3B, 4B, 5B, 6B, 7B and 8B will be aggregated to determine the Championship Leaderboard and to decide on the winners of the main Prizes, who will be chosen from among those achieving the highest total scores.
9. A solution will only be deemed to be correct if, disregarding the punctuation [and spacing], the deciphered plaintext (only involving the Roman characters A to Z [UPPER or lower case is fine]) is letter perfect as compared to our master solution.
10. A submission will only be deemed to be valid if it is submitted on the entry form and all the instructions on the entry form are adhered to.
11. The Challenge Committee may publish clues on the competition web-site if it considers it appropriate to do so.
12. If a correct solution of a challenge is not received before the deadline given on the schedule the Challenge Committee will have the discretion to not award the prize or award some or all of it to the entrant or entrants whom it judges to represent the best solution or solutions.
13. The competition will be judged by the Prize Committee, whose decision will be final in all matters regarding the competition including the award of prizes.
14. In order to qualify for any of the prizes all entrants, whether solo or part of a team agree to their school names being used in publicity associated with the competition including publication on the competition web-site. We will publish team member names only with your permission. When registering you will be asked to list the team member names, or appropriate nicknames for them that you are happy for us to publish on the website and in publicity associated with the competition.
15. In submitting an entry solo entrants vouch that it is solely their own work and teams warrant that it is solely their own collective work.
16. Entrants who do not abide by the rules will be disqualified from the competition and will not qualify for any of the prizes.
17. In submitting an entry to the competition, all entrants, be they individuals or members of a team agree to be bound by all the rules of the competition.
18. Winners and their schools will be notified as soon as possible after the solution deadline for each message. We will inform you on the website in the News and Info section and by email using the email address you provide. Please ensure that our messages to you are not filtered by your spam filters by adding our email address [cipher@soton.ac.uk](mailto:cipher@soton.ac.uk) This email address is being protected from spambots. You need JavaScript enabled to view it. to your address book.
19. The organisers reserve the right to change any aspect of the competition at short notice and to split prizes where it is deemed appropriate. Such changes will be announced on the competition web-site as soon as practical.
20. Rapid fire multiple submissions put an unreasonable load on the servers and make it difficult for others to submit. Anyone who makes an unreasonable number of submissions will be open to disqualification. In the first instance this will mean that anyone who submits more than 20 times in 10 minutes will be disqualified.
21. Anyone posting a solution in any public forum before the deadline for the given Challenge will be disqualified and barred from the forums. Please do not publish hints without checking with us first as this may spoil the competition for others.

Terms and conditions

1. In accepting these Terms & Conditions you are agreeing to abide by the rules of the competition as printed on the competition website.
2. You are also agreeing that the challenge organisers are permitted to publish on the challenge website the content of those fields that are marked as visible on the registration page together with the contents of the field entitled "Team Members for Web".
3. You are further agreeing that we may use your contact details to contact you in relation to your entry in the Cipher Challenge competition and that we may contact your "Teacher Contact" if this is felt necessary.
4. The software we use to generate our webpages sometimes places small amounts of information on your device, for example, computer or mobile phone. These include small files known as cookies. They cannot be used to identify you personally but are used to allow you to login to our site and take part in the Cipher Challenges and read/post information on the forums. Under EU law, we need your consent to store these cookies on your device. Consequently, you are further agreeing to allow our software to store these cookies on your device.
5. We agree that we may not use any of the information obtained from the registration page or from your entry to the competition for any other purpose except administration of the competition and information about future Challenges unless we have your explicit permission to do so. We also agree not to divulge any information about you except where specified in item (2) to any third-party.



**Login**

Top of Form

Username

Password



Remember me



* [Forgot login?](http://www.cipher.maths.soton.ac.uk/registration/lostpassword)
* [Register](http://www.cipher.maths.soton.ac.uk/registration/registers)

Bottom of Form

**Harry's Place**

**Who's Online**

* [Alex](http://www.cipher.maths.soton.ac.uk/component/comprofiler/userprofile/Alex)
* [Alice](http://www.cipher.maths.soton.ac.uk/component/comprofiler/userprofile/Alice)
* [Goldies](http://www.cipher.maths.soton.ac.uk/component/comprofiler/userprofile/Goldies)
* [Smaug](http://www.cipher.maths.soton.ac.uk/component/comprofiler/userprofile/Smaug)
* [Winning\_Combination](http://www.cipher.maths.soton.ac.uk/component/comprofiler/userprofile/367)