

Thank you for your interest in Enterprising Mathematics in Scotland. This document is intended as an introduction to the competition and as a guide to running a regional qualification event. There is a lot of useful information included here collected over years of arranging and running the national final. You may want to keep this document and refer to it at various stages in the run-up to (and on the day of) your event.

A brief history

The Enterprising Mathematics competition is open to pupils in S3 and S4 and has been running in Scotland since the 1980s. The national final is held in November when 4 pupils from up to 60 schools from across Scotland compete against each other over 5 rounds for the title of Scottish Enterprising Maths champion. The emphasis is on teamwork, problem solving and on the application of mathematical skills in fun, non-routine and challenging contexts. All regions are encouraged to hold a qualification event, either before or immediately after the summer holidays, with the top teams being invited to the national final. Further information can be found on the Scottish Mathematical Council website. Remember, the national final is for teams of 4 pupils from S3 & S4 where not more than two are from S4.

In this pack

In this collection of files you will find materials which have been designed to make the running of a regional qualification event as straightforward as possible. Please ensure these materials are not made widely available as other regions may be using them annually for a qualification event and widespread distribution would damage the integrity of their event.

These materials are for regional qualification events only

All timings and mark allocations are a guide. Feel free to adapt and modify to best suit your needs. Use as many or as few of the rounds as you want. You might even want to add a round or replace a round with one of your own.

If you have questions about the materials or have spotted an error, please contact us at any time on enterprisingmaths@gmail.com. Similarly, if you know of anyone interested in using these materials, please encourage them to contact us using the e-mail address above so we can offer our support and supply them with the most recent version of the pack.

Suggested running order for a full day event:

10.00 a.m.	Registration / warm-up round
10.30 a.m.	Practical Round
11.25 a.m.	Team Round
Noon	Break
1.00 p.m.	Speed Round
2.00 p.m.	Relay Round
2.45 p.m.	Award of Prizes



Before the event

The hall should be set up with desks for each team (plus a few extra to make up to the nearest multiple of 8) with 4 chairs at each desk. You will need additional chairs for the accompanying teachers but they are not required in the hall until the Speed round.

Practical Round

The practical round supplied here is an origami based challenge. Make colour copies of the instruction sheet if possible. Black and white is OK but colour is much easier to follow. You can purchase square origami paper but getting the teams to make squares from A4 could be part of the challenge. Make sure there is plenty of paper available. Wastage from your school reprographics room could be used.

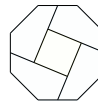
We would recommend you attempt the challenge yourself before the event and suggest you bring along a completed model to show the teams what a finished construction looks like. A giant one made from A3 paper is always fun!

At the end of the round (we recommend 40 – 45 minutes) make sure all teams stop working. You will then need to go round every team and record their marks for input into the overall score spread sheet. The more people you have doing this the better.

Team Round

Make sure each team is given a set of questions and a team answer sheet. Remind them to fill in their answer sheet and not to forget to write their school name on it! Spare paper should be made available for working. You could use some of the paper that is left over from the practical round. At the end of the round (we recommend 30 minutes) tell each team to stop and to hold their answer sheet in the air for collection by your team of helpers. Holding the answer sheet in the air prevents any more answers being added after the time is up.

Distribute the team answer sheets amongst your helpers, along with a copy of the answers and get them marked, totalled and entered into the overall score spread sheet.



Speed Round

During the lunch break you should set up the stations for the speed round. Having all the pre-prepared materials in clearly labelled wallets will help here. You should arrange the stations so that it is easy for each team to move from one station to the next. At the national final we arrange the stations in 2 rows of 4. This allows eight teams to work round a loop. This arrangement is repeated along the length of the hall. Remember, you will need to have a multiple of eight stations to allow every team to work on every station, even if you don't have exactly that number of teams. This means that some stations may be empty at times during the round. You will need to delegate a member of your team to supervise these empty stations.

At registration, we recommend allocating a station number to each accompanying teacher. See the helpful tips for more on how to do this most efficiently. When you are set up for the round, ask the accompanying teachers to sit at the station number they were allocated at registration. Then ask the pupils they brought to sit with them. To ensure impartiality, we would recommend that all teachers now move away from the pupils they brought and swap places with a teacher at the same station number but in a different "loop". This ensures that no teacher will be marking their own school.

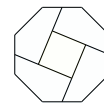
Distribute team answer sheets to every team and remind them to put their school name on it.

We recommend 8 minutes at each station plus a minute or two for marking between each station. Providing the teachers have understood their station and are happy with the way it is to be marked then there should be no delays at this stage, although it is advisable to make sure all teachers have finished marking before the teams move to the next station. Make sure teams take their answer sheet with them as they move from station to station.

After the teams have attempted all the stations, ask the teachers to calculate the total for the round and write it on the team answer sheet. Have your helpers collect in the answer sheets and input the scores into the overall score spread sheet.

Note: All stations have been designed such that no additional materials need to be purchased. Some photocopying, cutting out and laminating will be required before your event. Instructions are provided with each station round.

Station 5 in Regional Pack A requires 30 cubes. You may use any identical cubes you can find. A web address can be found in the instructions for Station 5 where very cheap wooden cubes can be bought. These can then be re-used year after year.



Relay Round

This is always the most popular round with pupils and teachers. At the end of the Speed round the teams will be sitting with a teacher who is not their own. This teacher will work with them for the Relay round. Ask the teachers to take their chairs and position themselves around the edge of the hall. As they do this, have your helpers give each teacher a pile of Relay question and an answer sheet. Make sure the pupils watch where their “new” teacher goes as they will be running to him/her for the questions.

You will now need to split each team into two couples and attempt to move one couple from each team to a different part of the hall. This can be a complicated task and will depend on the space you are using and how you have set it up. Try to ensure that no two couples from the same team are sitting too close to each other.

We usually call the couple who have moved “Couple A” and one pupil from that couple will be first to run to their adopted teacher to collect question number 1, take it back to their partner and attempt to answer it. Once they have an answer, one of them takes it to their adopted teacher for checking. If incorrect they have two more chances to return to their seat and try again before the teacher will issue the next question. If they are stuck with a question, they may pass on it but should be reminded that the questions get progressively more difficult and passing on earlier ones may be a mistake. When a correct answer is given (or a question passed) the teacher should make a note of that on the answer sheet and give the next question to the pupil from Couple A who will take this question to Couple B and the process will begin again.

It is very important that the supervising teachers write the name of the school they are working with in the space provided on the answer sheet. They will have plenty of chances to check the school name as the pupils bring answers to them.

At the end of the round, have the supervising teachers total up the number of correct answers and write this total on the answer sheet. Have your helpers collect the answer sheets and input this final set of scores into the overall score spread sheet. It is important with this round that these raw scores are scaled up to make the Relay round worth a similar number of points as the others.

You will notice that the Relay questions are laid out with 4 (non-consecutive) questions to a page. The document is designed to allow you to copy a set then use a guillotine to slice the pile into 4 smaller piles. If you do this correctly you will be able to easily create an ordered pile that goes from question 1 to question 32.



Helpful Tips

Thorough preparation is essential. You must be familiar with all the materials to be used in *each* of the rounds. All printing, copying and cutting should be done well in advance of your event. Making extra copies of everything is a good idea.

A laptop is essential for recording scores after each round and bringing along a printer is handy in case of any missing or damaged paperwork.

In addition to the teacher accompanying each team you should bring along as many helpers as you can. Senior pupils can be used here. Their job will be to distribute and collect materials before and after every round. They can also be used mark responses and possibly input scores throughout the day.

Some teachers like to take competition materials away with them. To avoid this, make sure your helpers are briefed to collect everything back in at the end of a round, especially the relay round. If teachers want they can download sample materials from the Scottish Maths Council website.

The entire event is non-calculator. Pupils only require a pencil, rubber and pencil sharpener. It is advisable to have plenty of spare pencils and sharpeners available.

If your event is to run for most of the day, be sure to tell pupils (and staff) that they should bring lunch with them. Lunchtime is when you will want to distribute materials in preparation for the Speed round. Having a separate room / area for lunch is desirable.

The teachers who have accompanied a team will be required by you to manage one station each during the Speed round. As teams register in the morning it is advisable allocate stations to the teachers. If you are using all eight stations then the 1st teacher to arrive gets station 1, the 2nd teacher to arrive gets station 2 and so on with the 9th teacher getting station 1, the 10th getting station 2 etc. Members of your team should be prepared to man a station if the number of teams at your event is not a multiple of eight.

It is essential that accompanying teachers spend time in the morning familiarising themselves with their allocated station. You should encourage teachers responsible for the same station to get together to try the station for themselves and ensure consistency in how they will mark the station.

Schools are always keen to know where they have placed in the event. Having a printer will allow you to distribute overall positions to the teams at the end of the day. We would recommend that you only release school names and positions and not the scores for individual rounds.

Once again, thank you. The Enterprising Mathematics competition means a lot to the pupils of Scotland and should be a day they will remember. Any feedback on these materials would be most welcome and if we can help you with any aspect of your event, please contact us on enterprisingmaths@gmail.com.

Good luck!