

INTERNATIONAL SPACE CHALLENGE

Introduction

The International Space Challenge was designed jointly by Business Language Champions and the National Space Academy with funding from the Institution of Engineering and Technology and the Institution of Mechanical Engineers, and has been run in the East Midlands in various guises in 2014, 2015 and 2016. The main premise of this project is that opportunities for careers in engineering and STEM subjects can be significantly enhanced by the ability to speak another language.

The aim from the point of view of our two funding organisations was to promote engineering and STEM subjects. They are particularly keen to encourage girls into engineering and hence the enthusiasm to support us, as languages are perceived to be more of a girls' subject. From our point of view, our aim is generally to promote languages, and we are very keen to promote languages particularly to boys through the science angle. **The successful running of this project therefore requires collaboration between your Language Department and your Science Department.**

Apart from the video task, which has a slightly different emphasis, the main story behind the challenge is that the students will be working in a European consortium to design, build a model and market a space hotel to rival that which the Russians are planning to put into space.

The documents are not immediately down-loadable as we would like to assimilate information on how many schools are using our resources and how they are being used. Please therefore contact Sally Fagan at Business Language Champions (see below) in the first instance. She will send you the complete package of resources. We suggest you start with the document called ISC Main Challenge Options. All the possible tasks are listed here, and as a Word document you can modify this to use as your task briefing document for your students. The suggested agenda options are also in Word format so that you can adapt them for your own use in-school.

We suggest teams of 5 or 6 students. Each team needs to be able to work in a common target language. It is possible to have teams working in different languages at an event, so long as you have staff or volunteers who can cover each language.

View the Main Challenge Options document as a 'menu' from which you can choose tasks to suit your time available, the level of the students and the required balance between STEM and Languages. Many of these tasks require supporting documents, which are also contained in the package. An overview of all the documents is below.

Support

For all support on the **STEM** elements of this programme, please contact Andy McMurray at the National Space Academy.

Tel. 0116 258 2141 or email andym@spacecentre.co.uk

For all support on the **language** elements of this programme or general enquiries about the programme, please contact Sally Fagan at Business Language Champions.

Tel. 01494 860167 or email sally@business-language-champions.co.uk

All telephone and email support will be **FREE OF CHARGE** until the end of the March 2017. After that, consultancy time will be charged at a rate agreed in advance.

Grants of up to £600 might be available from the Institute of Physics in association with the Institution of Engineering and Technology to help you run a challenge. Only schools can apply for this and they are currently very interested in applications regarding astronomy. The deadlines for applications are 1st June, 1st November and 1st February for events being run in the Autumn, Spring and Summer Terms respectively. See http://www.iop.org/about/grants/school/page_38824.html
The application form is not too onerous!

PERSONAL SUPPORT is also available for your event from the National Space Academy or Business Language Champions. The current charge for this is £200 per person plus expenses at cost for a half-day event or £300 per person plus expenses for a full day event. Note that any charges from the National Space Academy will be subject to VAT.

We run our events with the help of a number of volunteers and we always like to find inspiring speakers to start the day. We have included a profile for speakers/volunteers in the package (see below), which we hope will be useful for you. Our speakers and volunteers come from a range of backgrounds and industries, and we also approach the local universities where we often get help from undergraduates, postgraduates and lecturers. Many universities run an Outreach or Widening Participation department that is worth contacting. We deem this an important element of our programmes to bring in people from outside to work with

students. Many of you will be familiar with the Gatsby recommendation of employer contact. This suggests that the more contact opportunities that a young person has with employers, the less likely it is that the student will become NEET. Remember that you also have a valuable resource amongst the parents of your students, who have a vested interest in helping you! A letter or email to parents is a quick and easy place to start.

Materials

The documents and ideas are all available to you **FREE OF CHARGE**. We have two requests to you in return for using them:

- Please retain all logos on the documents that you use
- Please ensure that all participating students and teachers fill out the evaluation questionnaire at the end of the event and return these to us

Thank you for your help in this regard!

Internet

It is possible to construct a half day agenda without needing access to the internet. For full day events we recommend access to the internet for research purposes or access to a laptop and printer for designing and printing a promotional leaflet.

Overview and instructions for the documents in the package:

- BEFORE EVENT Preparation suggestions – here are some useful suggestions to work on with the students in the run up to the event to make sure they can make the most of the day.
- Introductory PowerPoint with a Space Trivia ice breaker quiz, an introduction to the challenge of low earth orbit and basic concepts of hotel design. There are a few additional notes underneath some of the slides. Note that on the space trivia quiz, the slide first comes up with the four possible answers and a second click will reveal the answer.
- ISC Video Challenge: Task for students to make their own video in either English or in the target language on the subject of 'To Mars and Back'. This encourages research into the issues surrounding space travel including those of language and cultural barriers where astronauts are from different nationalities. This can be used as 'warm up' event for the main challenge or as a stand-alone competition for your students. It has been left as a Word document in case you need to tweak it.
- Mars movie from Abbeyfield School in Northampton. This is an excellent example of what can be done by year 11 students. As this is a very large file, please request this separately and it will be shared with you via a Cloud sharing site such as Dropbox.
- MAIN CHALLENGE options – pick and choose the events that you wish to put in. As this is a Word document you can modify this to create a briefing sheet for the students.
- TASK 1 Design Sheet. Print out as A3. This is an important element in the eyes of the IET. The students should be given the opportunity to design their hotel in as much detail as possible and to scale if possible. Another element is to consider how their model has changed once they have built it and why these changes were necessary.

- TASK 2 Order forms in French, German and Spanish with an English translation. This is a suggested list of craft materials to offer to students to build their model. The students are given either a nominal €50,000 to spend on materials to build their space hotel model (so they cannot spend more than this amount) or it is even better for language practice if you can give each team €50,000 of Monopoly type money to purchase their materials. The latter requires the physical hand over of money, so the students need to understand and use the numbers in their target language. As well as the standard craft materials, we suggest collecting cereal cartons (collapse these down for easier handling), egg boxes and small plastic water bottles (max. 2 per team for each item). Note that the numbering in the English version, which is in alphabetical order, corresponds item for item in the foreign language versions. The latter are therefore no longer in alphabetical order. These have been left in Word format so they may be altered if you wish to add or take away any items or alter the maximum number of each item that they may order. You will need to set up a supply table for the items for the students to buy which will need to be manned by helpers who are able to converse in the language(s) the students are studying. The rule we usually make is that once they are at the supply table, they may only converse in French/German/Spanish. We recommend handing out the relevant order form once the initial 30 minute planning period is over.
- TASK 2 Photographs of a typical supply table.
- TASK 3 Power Consumption sheet. This requires the students to work out how much power they will need to generate to run their hotel in space. This is better printed out on A3.
- TASK 3 Hotel Data Sheet – an extended version of the previous sheet. As well as Power Consumption, this helps students explore water and oxygen needs for the hotel as well. May be printed out on A4 or A3.
- TASK 7b Tweet form. This forms part of the marketing strategy for the hotel. It should be completed in the target language.
- TASK 8 Hubble Work Sheet. This worksheet is included as providing fun facts for guests to the Space Hotel. Students are asked to work out how many galaxies are in the universe. May be printed out in A4 or A3.
- TASK 8 Density of Neutron Stars – this is another worksheet to provide fun facts for guests. For this one they have to calculate the volume that the whole human race would occupy if it were to have the same density as a neutron star. May be printed out in A4 or A3.
- Judging sheet – suggested judging sheet showing criteria for each task. This shows potential criteria for every task, so not all the lines here will be needed. Again this has been left as a Word document so that you can delete the lines that are not relevant to your event.
- Suggested half day and full day agendas. These are again in Word so that you can alter to suit your timings and tasks. On the half day agenda, the assessment has to be very quick with one engineering team and one language team going round to each table and spending a few minutes with each, asking questions. For the full day we suggest a carousel whereby the teams rotate around doing their engineering presentation, their language presentation and two further assessment teams going round the tables to finalise a mark for the data sheets and the design sheet. We suggest collecting in the design sheets and data sheets at lunch time to give the assessors some initial time to work through the sheets more thoroughly and note any questions that need to be asked. Whilst the judges are deliberating on the full day agenda we put in a half hour language taster in Russian. This is relevant as astronauts are required to learn Russian (cf. both Helen Sharman and more recently Tim Peake). If you don't have any contacts or teachers who could do this, then you

could set one of the other tasks requiring internet research (4, 5, 6 or 8), but you will not have time to assess this. In this case, spend around 10 minutes gathering in their ideas. You can assign this task a bit earlier if you wish, as the teams will have a bit of time to spare in between their carousel judging times.

- Post event questionnaire for students – please print this out and ask each participating student to fill this in and return to us for evaluation. **NOTE THIS IS A MANDATORY REQUIREMENT IN RETURN FOR FREE MATERIALS.**
- Post event questionnaire for teachers – please complete this either as a hard copy and return with the student questionnaires, or return to us electronically. **NOTE THIS IS A MANDATORY REQUIREMENT IN RETURN FOR FREE MATERIALS.**
- Speaker and volunteer profile. Volunteers from outside are an important element to add weight to the message that you are giving to the students. We hope that this profile will be useful to you when approaching local businesses and universities. You can use this document to send to potential organisations and it is in Word format so that you can insert relevant details, which are currently shown in red.