

# MAGIC Annual Report

*July 2016 – June 2017*

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## 1 Introduction

The MAGIC (Mathematics Access Grid Instruction and Collaboration) project commenced, with partial sponsorship of EPSRC, in October 2006. It is aimed at sharing postgraduate lectures in mathematics for PhD students using Visimeet technology to share live lectures. To date the consortium has 21 universities as partners with both small and large departments being fully involved in the delivery of the programme of lectures in addition to their students being able to participate in a wide range of lectures.

MAGIC entered into a new 5 year agreement commencing 1 October 2016. The agreement will run for 5 years until the end of September 2021. All 20 of the original consortium members signed up to the new agreement along the University of Sussex, who joined the consortium as our 21<sup>st</sup> member in November 2016. We also have a small number of subscribing students from outside of the MAGIC consortium.

In December 2016 the EPSRC approved the final MAGIC expenditure statement relating to the previous 2011-2016 agreement. As agreed at the Academic Steering Committee in July 2016, remaining monies were reimbursed to Nodes. These monies have been used to upgrade the MAGIC equipment at each institution and towards the future cost for the upkeep and maintenance of this equipment. More than half of the MAGIC Nodes carried out an upgrade during 2016.

With the new agreement, the University of Exeter assumed financial responsibility for the project from October 2016 and Node financial contributions were requested in November 2016. Course development payments were made in December 2016, where the timings are as per the new agreement.

MAGIC delivered a programme of 35 courses in 2016/17 along with a successful launch lecture in early October and 2 virtual teaching sessions designed to familiarise lectures with the MAGIC system and equipment.

We undertook a survey of PhD supervisors this year: it seems that commitment for MAGIC courses remains high. We expect a full programme to be delivered for 2017-18 including a number of new courses, however we are aware we cannot be complacent and we encourage all node reps, lecturers and students to let us know what is going well, and what is not.

The MAGIC website <http://www.maths-magic.ac.uk> will include this report, details of the current programme, the courses available and, for example, instructions for external students. Earlier annual reports on MAGIC can be found at [http://www.maths-magic.ac.uk/annual\\_reports](http://www.maths-magic.ac.uk/annual_reports). These reports give detail about how the project has developed over the years and contain information on the suite of courses which MAGIC has delivered and various technical and other issues that MAGIC has encountered.

## 1.1 Membership

**Table 1:** A list of MAGIC Consortium partners

University of Birmingham	University of Manchester
Cardiff University	Newcastle University
Durham University	Northumbria University
University of East Anglia	University of Nottingham
University of Exeter	University of Reading
Keele University	University of Sheffield
Lancaster University	University of Southampton
University of Leeds	University of Surrey
University of Leicester	University of Sussex
University of Liverpool	University of York
Loughborough University	

## 1.2 MAGIC Management Committee (2016-2017)

**Table 2:** MAGIC Management Committee

Peter Ashwin (University of Exeter)	Director of MAGIC
Tim Phillips (Cardiff University)	Programme Committee Chair
Kevin Houston (University of Leeds)	
David Aspero (UEA)	
Vladimir Bavula/ Neil Strickland (University of Sheffield)	
Dirk Schuetz (Durham University)	
Stuart Phillipson (University of Manchester)	
Toby Stafford (University of Manchester)	Deputy Director of MAGIC
James Perrin	MAGIC Technical Officer
Sam Blackburn	MAGIC Administrator

## 1.3 MAGIC Programme Committee (2016-2017)

**Table 3:** Programme Committee

Tim Phillips (Cardiff University)	Programme Committee Chair
Peter Ashwin (University of Exeter)	Ex Officio
Alexey Bolsinov (Loughborough University)	
Gianne Derks (University of Surrey)	
Tobias Kuna (University of Reading)	
Sandor Nemeth (University of Birmingham)	
Mary Rees (University of Liverpool)	
Ian McIntosh (University of York)	

## 1.4 MAGIC Academic Steering Committee (2016-2017)

**Table 4:** A list of members of the Academic Steering Committee

Nigel Peake (University of Cambridge)	Chair of Academic Steering Committee
Peter Ashwin (University of Exeter)	Director of MAGIC
Tim Phillips (Cardiff University)	Programme Committee Chair
David Aspero (University of East Anglia)	
Alexey Bolsinov (Loughborough University)	
Roger Colbeck (University of York)	
Giampaolo D'Alessandro (University of Southampton)	
Jonathan Healey (Keele University)	
Kevin Houston (University of Leeds)	
Derek Kitson (Lancaster University)	
Tobias Kuna (University of Reading)	
Antonio Moro (Northumbria University)	
Sandor Nemeth (University of Birmingham)	
Sergei Petrovskii (University of Leicester)	
Mary Rees (University of Liverpool)	
Dirk Schuetz (Durham University)	
Toby Stafford (University of Manchester)	
Neil Strickland (University of Sheffield)	
Dimitrios Tsagkarogiannis (University of Sussex)	
Matthew Turner (University of Surrey)	
Kris van der Zee (University of Nottingham)	
Alina Vdovina (Newcastle University)	

## 1.5 Minutes

The minutes of the meetings of the MAGIC Management Committee, Programme Committee and Academic Steering Committee, together with the agenda papers can be found at: [https://maths-magic.ac.uk/admin/management/list\\_meetings.php](https://maths-magic.ac.uk/admin/management/list_meetings.php)

## **2 Progress and activities 2016-2017**

### **2.1 MAGIC Administrator and Technical Support Posts**

Administrative support continues to be provided by Sam Blackburn (Exeter).

Peter Ashwin (Exeter) continues as Director of MAGIC with Toby Stafford (Manchester) as Deputy Director.

Technical support is currently provided by James Perrin (Manchester) at 0.4FTE but James will be leaving MAGIC at the end of summer 2017. At the time of writing, the consortium is looking for a replacement in time for a handover during the summer months. It was agreed that the best solution would be to find one or more technical support officers currently in post at one of the MAGIC nodes that we can support part-time. Any possible extra costs incurred from the provision of the new technical support/handover is expected to be covered by the extra income generated from external student subscriptions.

### **2.2 Video Conferencing Software/Hardware Update**

All nodes were advised where appropriate to upgrade the MAGIC equipment at their institution by the end of September 2016 to coincide with the end of the original EPSRC grant which provided funding for MAGIC. Nodes have been allocated a set amount of funding to renew equipment at their institution. MAGIC continues to use the video conferencing platform VISIMEET. Nodes are now responsible for organizing and financing maintenance of both hardware and software at their institution: there is no central provision of hardware maintenance.

### **2.3 Website**

The MAGIC website has been continuously updated in response to requirements from users and administrators. e.g. tools for the Programme Committee to view how courses have performed over the years, and managing questionnaires. Security and mobile friendliness have been also improved. We are not aware of any major technical issues this academic year - Individual problems investigated have been investigated as and when they arose.

### **2.4 Recording of lectures**

James Perrin developed a system of web-based streamed recordings of MAGIC lectures that became available from 2015-16; a significant amount of development work has gone into this and although the completed system is not yet fully automatic, feedback has been positive and so far, the usage by students high, especially around assessment times. We will however have to keep monitoring this to ensure it is as useful as possible.

### **2.5 Other activities and use of the MAGIC facilities**

#### **Sponsorship and advertising**

MAGIC provided £300 of sponsorship funding to students at the University of Sheffield towards their EL:ECTRIC conference which is taking place in June 2017. This year, we also produced a MAGIC flyer which gives information about the consortium and an example of the courses we provide. Copies of the flyer were

given to Sheffield for inclusion in their conference delegate packs. The flyer was also distributed at the 2017 BAMC conference. We hope to post some further adverts over the summer to raise awareness of MAGIC with staff and students.

## **External Students**

From autumn 2015 MAGIC has offered students from non-MAGIC Universities the opportunity to participate in MAGIC lectures as “external subscribers”. These subscribers are able to attend and be assessed for courses on payment of a subscription charge of £250 per term. The subscription gives a student access to the same services as other student members of the MAGIC consortium and allows access to live lectures and recorded lectures via the MAGIC website. In 2016-17 there were 7 registrations from external students at £250 per semester which generated an additional £1,750 of income.

## **3 Academic Aspects 2016-2017**

### **3.1 Academic Programme 2016-2017**

The list of courses given in the 2016-17 sessions (and also for previous sessions) can be viewed at the MAGIC website at <http://maths-magic.ac.uk/courses.php> . The website also gives details of the individual courses and syllabi. Details of course history and payments for course development have been added to the MAGIC website and can be viewed at [https://maths-magic.ac.uk/admin/programme/course\\_histories.php](https://maths-magic.ac.uk/admin/programme/course_histories.php)

### **3.2 Questionnaires and feedback**

The results of the questionnaire data can be viewed at (login required): [https://maths-magic.ac.uk/admin/programme/view\\_questionnaires.php](https://maths-magic.ac.uk/admin/programme/view_questionnaires.php)

An alumni questionnaire was issued in early April 2017 to students who registered for MAGIC courses in 2014-15. The aim of the questionnaire was to get responses from students who had completed their MAGIC training but who were mostly in the final stages of their PhD. The questionnaire provided a return rate of 14% which although low, was slightly higher than previous years. Feedback from the lecturers on all the courses has been obtained via online course reports and the responses are available for viewing via the MAGIC website along with other questionnaire results. The feedback from students and staff (via the questionnaire results, forums discussions) is used by the Programme Committee when it reviews the programme each year. The minutes of the Programme Committee contain some of the feedback and summarize the outcomes from the review.

Finally, for 2016-17 we undertook a questionnaire of academic staff who are supervising PhD students in mathematics within the consortium. The results of this survey can be found by via the following link; [https://docs.google.com/a/exeter.ac.uk/forms/d/1x69mfPJP846pa7XhaP0WgtYc81QMGPkhdFz7a0fiXO8/view\\_analytics](https://docs.google.com/a/exeter.ac.uk/forms/d/1x69mfPJP846pa7XhaP0WgtYc81QMGPkhdFz7a0fiXO8/view_analytics)

### **3.3 Assessment Policies**

The MAGIC assessment policy was revised in August 2016 to reflect the need to address the variation and volume of assessments which were raised as issues by the Programme Committee. The policy also emphasises the importance that final assessments can be completed in reasonable time. It was updated further in April 2017 to clarify the wording concerning timing of the exam period and assessment.

The policy can be found on the MAGIC website here:

[https://maths-magic.ac.uk/admin/documentation/documentation\\_index.php](https://maths-magic.ac.uk/admin/documentation/documentation_index.php)

The policy requires that each MAGIC course will have a single open-book style examination/assessment at the end of the module, and this will be done over a two week period after the end of the course. Lecturers are required to produce a pass/fail mark for each student requiring assessment, and to give feedback on the assessment via the MAGIC website. A payment of £10 is made to lecturers for each pass/fail assessment of student recorded on the MAGIC website.

### 3.4 Course preparation and refreshment payments

The arrangements for this year remain the same, after previous system payment for payment in advance for multiple years has expired, the institution responsible for delivering a course is paid according to the following table:

Course type	One-off payment	1 <sup>st</sup> year	1 <sup>st</sup> year total	2 <sup>nd</sup> year	3 <sup>rd</sup> year	Total over 3 years
New 20 hour	£1200	£400	£1600	£400	£400	£2400
New 10 hour	£600	£200	£800	£200	£200	£1200
New lecturer 20 hour	£600	£400	£1000	£400	£400	£1800
New lecturer 10 hour	£300	£200	£500	£200	£200	£900

### 3.5 Registration data<sup>1</sup>

The *Table 5* below shows the number of students registered for courses together with the number requiring formal assessment. The corresponding figures for previous years are also displayed in the same table. *Table 6* shows the same data but broken down via MAGIC partner.

**Table 5:** Total number of course registrations and numbers of students requiring formal assessment. The number of students in the third row is the number of people who registered for at least one course in that session and excludes those names added to the database but not signing up for courses.

	2012-13	2013-14	2014-15	2015-16	2016-2017
Registrations (assessed)	646 (434=67%)	719 (470=65%)	830 (551=66%)	806 (511=63%)	672 (373=55%)
No. of Students	256	285	300	297	281

<sup>1</sup> All data for 2016-17 is correct as per the MAGIC website 11.05.17

**Table 6:** Same data as in Table 5 but broken down by institution. Student numbers is a count of the numbers of students on the database in the particular session who registered for at least one course.

	2013-14		2014-15		2015-16		2016-17	
	No. of Students	Registered courses	No. of Students	Registered courses	No. of Students	Registered courses	No. of Students	Registered courses
External	1	1	3	38	6	51	6	19
External Ass'd			0	0	2 <sup>2</sup>	5	5 <sup>3</sup>	12
Birmingham	17	41	11	23	11	19	15	36
Cardiff	11	26	15	50	16	45	11	28
Durham	7	17	8	24	11	35	12	32
East Anglia	17	60	18	43	14	41	11	27
Exeter	15	44	15	34	16	51	18	34
Keele	0	0	4	6	3	5	9	19
Lancaster	6	29	9	35	13	41	5	14
Leeds	41	108	41	107	28	63	26	61
Leicester	8	15	19	47	14	40	6	12
Liverpool	30	67	34	80	27	70	24	73
Loughborough	13	31	17	59	17	42	25	56
Manchester	26	54	14	38	20	48	20	52
Newcastle	10	19	15	31	12	27	18	34
Northumbria	7	14	3	6	9	16	2	3
Nottingham	19	32	11	17	12	22	16	31
Reading	3	6	3	4	4	4	6	15
Sheffield	15	43	19	39	14	41	11	31
Southampton	17	57	18	82	24	60	9	16
Surrey	8	21	12	29	12	32	11	28
Sussex	-	-	-	-	-	-	8	19
York	14	34	11	38	12	48	7	20
Total	285	719	300	830	297	806	281	672

<sup>2</sup> 3 semester registrations (1 in autumn, 2 in spring) from 2 external assessed students 2015-16

<sup>3</sup> 7 semester registrations (2 in autumn, 5 in spring) from 5 external assessed students 2016-17



In *Tables 7, 8* we show assessment data for each course broken down by course. In *Tables 9, 10* we show registration data for each node and broken down by course. *Table 11* shows a summary of the data for the last few years.

**Table 7:** Autumn 2016-2017 courses with numbers of registered students and number of students registered for assessment.

	Course	Registered	Assessed
MAGIC002	Differential topology and Morse theory (Dirk Schuetz, Durham)	23	6
MAGIC008	Lie groups and Lie algebras (Alexey Bolsinov, Loughborough)	39	27
MAGIC022	Mathematical Methods (Jitesh Gajjar, Manchester)	41	30
MAGIC049	Modular Forms (Jens Funke, Durham)	15	8
MAGIC050	Set Theory (David Aspero, East Anglia)	16	6
MAGIC059	Dynamical Systems I (Flows) (Jan Sieber, Exeter)	12	5
MAGIC061	Functional Analysis (Amanda Turner, Lancaster)	17	14
MAGIC066	Numerical Analysis (Tim Phillips/Agis Athanassoulis, Cardiff/Leicester)	32	18
MAGIC067	Integrable Systems (Alexander Vesselov, Loughborough)	13	9
MAGIC071	Erlangen program in geometry and analysis: $SL(2, \mathbb{R})$ case study (Vladimir V. Kisil, Leeds)	14	8
MAGIC073	Commutative Algebra (Evgeny Shinder, Sheffield)	26	18
MAGIC080	Geometric Mechanics (Cesare Tronci, Surrey)	5	2
MAGIC081	String Theory (Thomas Mohaupt, Liverpool)	8	6
MAGIC085	Metric Number Theory (Sanju Velani, York)	13	2
MAGIC090	Introduction to Continuum Mechanics (Mitchell Berger, Exeter)	18	9
MAGIC092	Introduction to superfluids and turbulence (Davide Proment, East Anglia)	10	4
MAGIC093	Introduction to Markov processes, with coupling and convergence rates and applications (Alexander Veretennikov, Leeds)	18	5
MAGIC095	Calculus of Variations (Matthias Kurzke, Nottingham)	35	21
<b>Total</b>		<b>355</b>	<b>198</b>

**Table 8:** Spring 2016-2017 courses showing numbers registered and numbers of students registered for assessment.

	Course	Registered	Assessed
MAGIC009	Category Theory (Michael Rathjen, Leeds)	32	21
MAGIC010	Ergodic Theory (Charles Walkden, Manchester)	14	10
MAGIC014	Hydrodynamic Stability Theory (Jonathan Healey, Keele)	13	4
MAGIC021	Nonlinear Waves (Roger Grimshaw, Loughborough)	14	9
MAGIC028	Geometric Structures on surfaces and Teichmuller Space (Mary Rees, Liverpool)	17	5
MAGIC040	Operator Algebras (Michael Dritschel, Newcastle)	10	6
MAGIC044	Complex Differential Geometry (Derek Harland, Leeds)	17	9
MAGIC058	Theory of Partial Differential Equations (Alice Thompson, Manchester)	33	22
MAGIC060	Dynamical Systems: Maps (Toby Hall, Liverpool)	10	6
MAGIC062	Introductory Functional Analysis (John Pryce, Cardiff)	22	17
MAGIC063	Differentiable Manifolds (Kirill Mackenzie, Sheffield)	15	7
MAGIC064	Algebraic Topology (Frank Neumann, Leicester)	27	12
MAGIC075	Representation Theory of Groups (Kay Magaard, Birmingham)	28	18
MAGIC087	Applied Algebraic Topology (Jacek Brodzki, Southampton)	15	6
MAGIC089	Stochastic Processes (Tobias Kuna, Reading)	18	9
MAGIC091	Mathematical Biology (Markus Owen, Nottingham)	19	9
MAGIC094	Classical Wavelet Theory (Jonathan Partington, Leeds)	13	5
<b>Total</b>		<b>317</b>	<b>175</b>

**Table 9:** Data for autumn 2016-2017 courses showing registration data broken down by node and course code. Note that in the 'Autumn Course code' row, the number in blue refers to a MAGIC course code, e.g. 002 is MAGIC002. The shaded boxes indicate which node delivered the course.

	<a href="#">002</a>	<a href="#">008</a>	<a href="#">022</a>	<a href="#">049</a>	<a href="#">050</a>	<a href="#">059</a>	<a href="#">061</a>	<a href="#">066</a>	<a href="#">067</a>	<a href="#">071</a>	<a href="#">073</a>	<a href="#">080</a>	<a href="#">081</a>	<a href="#">085</a>	<a href="#">090</a>	<a href="#">092</a>	<a href="#">093</a>	<a href="#">095</a>	
*External	3	1	1					1			1			2	1			1	11
*Ext_Assessed		2							2										4
Birmingham		3	1	2	3	1	1	1			2							2	16
Cardiff	1		2		1		1	2		1	1				1				10
Durham	2	4	1	2	1		1		1	1			1	2			3		19
East Anglia		3	1	2	1	1	2				3			2					15
Exeter			4	2		1	1	4	1		1	1		1	3			2	21
Keele			7												6				13
Lancaster	1	1		1	1		1							2			1		8
Leeds	5	5	3	2		2	1	2	1	3					1		4	1	30
Leicester		1	1					4			1						1		8
Liverpool	2	2	2	2	3		1	2	1	4	4		4	3	1		2	6	39
Loughborough	1	2	7	1	1	1	1	2	3	2	1						4	2	28
Manchester	1	2	1		1	2	1	6	1	1	3				2	3	1	4	29
Newcastle	1	2		1	1		3	1			2					3		2	16
Northumbria						1													1
Nottingham		1				1		1		1	1		1			2	1	5	14
Reading	2		1		2			1				2					1	2	11
Sheffield	3	4	3	1			1	1	1		4	1	1	1					21
Southampton	1		2			1		2			1					1			8
Surrey		1	2	1		1	1		1			1	1		2	1		2	14
Sussex			1					1							1			5	8
York		4			2		1		1	1				1				1	11
Autumn Course Code	<a href="#">002</a>	<a href="#">008</a>	<a href="#">022</a>	<a href="#">049</a>	<a href="#">050</a>	<a href="#">059</a>	<a href="#">061</a>	<a href="#">066</a>	<a href="#">067</a>	<a href="#">071</a>	<a href="#">073</a>	<a href="#">080</a>	<a href="#">081</a>	<a href="#">085</a>	<a href="#">090</a>	<a href="#">092</a>	<a href="#">093</a>	<a href="#">095</a>	
	23	39	41	15	16	12	17	32	13	14	26	5	8	13	18	10	18	35	355

**Table 10:** Data for spring 2016-2017 showing registration data broken down by node and course code (cont'd on next page). Note the in the 'Spring Course code' row, the number in blue refers to a MAGIC course code e.g. 009 is MAGIC009. The shaded boxes indicate which node delivered the course.

	<u>009</u>	<u>010</u>	<u>014</u>	<u>021</u>	<u>028</u>	<u>040</u>	<u>044</u>	<u>058</u>	<u>060</u>	<u>062</u>	<u>063</u>	<u>064</u>	<u>075</u>	<u>087</u>	<u>089</u>	<u>091</u>	<u>094</u>	
*External	1	1	1	1	1		1	1				1						8
*Ext_Assessed	1			3						2	1		1					8
Birmingham	3	1			1			1	1	2	1	2	6				2	20
Cardiff	3	1		1	1	1		1		4	1	1		1	2	1		18
Durham	2	1			3		1			2	1		2		1			13
East Anglia	1		1			2		2	1			1	2		1	1		12
Exeter		2			1	1				1			2	1	2	2	1	13
Keele			4	1				1										6
Lancaster	2				1		1				1			1				6
Leeds	3				1	3	4	3		2	1	4	2	2	2	1	3	31
Leicester								2								1	1	4
Liverpool	5	1			3		3	3	2	3		5	2	2	1	3	1	34
Loughborough		4	1	3	2		1	5	1		3	1	2	1	2	2		28
Manchester	4		2	2	1		2	3				2	1	1	2	3	1	23
Newcastle	1	1	2		1					5		1	1	1	1	1	3	18
Northumbria			1						1									2
Nottingham	5	1				1	1	1	2		1	2	1		1	1		17
Reading								3							1			4
Sheffield					1	1	1				2	3	2					10
Southampton								1		1		1		3		1		8
Surrey			1	2			1	5	1		2			1			1	14
Sussex	1			1				1			1		2		3	2		11
York		1				1			1			3	2	1				9
Spring Course Code	<u>009</u>	<u>010</u>	<u>014</u>	<u>021</u>	<u>028</u>	<u>040</u>	<u>044</u>	<u>058</u>	<u>060</u>	<u>062</u>	<u>063</u>	<u>064</u>	<u>075</u>	<u>087</u>	<u>089</u>	<u>091</u>	<u>094</u>	
	32	14	13	14	17	10	17	33	10	22	15	27	28	15	18	19	13	317

**Table 11:** Summary of registration data per node.

	2012-13			2013-14			2014-15			2015-16			2016-17		
	Autumn	Spring	Total	Autumn	Spring	Total	Autumn	Spring	Total	Autumn	Spring	Total	Autumn	Spring	Total
External	3	3	6	0	1	1	20	18	38	24	27	53	11	8	19
External Assessed	0	0	0	0	0	0	0	0	0	2	3	4	4	8	12
Birmingham	28	26	54	22	19	41	11	12	23	10	9	19	16	20	36
Cardiff	13	14	27	17	9	26	26	24	50	24	21	46	10	18	30
Durham	16	9	25	13	4	17	12	12	24	13	22	35	19	13	32
East Anglia	22	12	34	28	32	60	14	29	43	14	27	41	15	12	27
Exeter	11	22	33	20	24	44	15	19	34	27	24	51	21	13	34
Keele	1	1	2	0	0	0	4	2	6	3	2	5	13	6	19
Lancaster	8	6	14	16	13	29	15	20	35	13	28	40	8	6	14
Leeds	33	31	64	50	58	108	50	57	107	24	39	64	30	31	61
Leicester	15	9	24	6	9	15	23	24	47	17	23	40	8	4	12
Liverpool	22	23	45	39	28	67	37	43	80	37	33	74	39	34	73
Loughborough	35	30	65	21	10	31	38	21	59	22	20	45	28	28	56
Manchester	51	51	102	28	26	54	19	19	38	24	24	55	29	23	52
Newcastle	13	8	21	10	9	19	13	18	31	13	14	26	16	18	34
Northumbria				8	6	14	3	3	6	16	0	18	1	2	3
Nottingham	11	5	16	15	17	32	8	9	17	9	13	22	14	17	31
Reading	5	1	6	2	4	6	1	3	4	2	2	4	11	4	15
Sheffield	19	12	31	21	22	43	17	22	39	19	22	41	21	10	31
Southampton	22	14	36	29	28	57	45	37	82	29	31	60	8	8	16
Surrey	8	5	13	16	5	21	13	16	29	17	15	39	14	14	28
Sussex	-	-	-	-	-	-	-	-	-	-	-	-	8	11	19
York	18	10	28	21	13	34	21	17	38	19	29	48	11	9	20
Total	354	292	646	382	337	719	405	425	830	378	428	806	355	317	672