

Technical Aptitude Range

Technical Summary



Technical Aptitude Range-R & -Rx

Technical Summary

Contents

1. Technical Aptitude Range Test Information
2. Norm Groups Available
3. Report
4. Practice and Preparation
5. Development
6. Languages Available as of June 2017
7. Reliability
8. Validity
9. Fairness
10. Technical Aptitude Range-Rx (2018) Norms Summary
 - 10.1 International Technical Occupations (2018, N=1001) Norm Group Description
 - 10.2 International Apprentices (2018, N=605) Norm Group Description
 - 10.3 UK Technical Occupations (2018, N=2269) Norm Group Description
 - 10.4 UK Apprentices (2018, N=2261) Norm Group Description
11. Technical Aptitude Range-R Norms Summary
 - 11.1. Apprentices (2012, N=309) Norm Group Description
 - 11.2. Mixed Occupational Group (2012, N=628) Norm Group Description
12. Appendix 1: Swift Technical Aptitude-Rx Sample Report
13. Appendix 2: Method for Calculating Criterion Related Validity of a -R SingleTest from the Equivalent Swift Sub-Test

1. Technical Aptitude Range-R & -Rx Test Information

- Randomized versions available of all tests in the Technical Aptitude Range
- Available for unsupervised use online (Invited Access, IA)

Test	Sub-Test	No. of Questions	Time Limit (mins)
Swift Technical Aptitude-R & -Rx	Total	28	10
	Spatial Reasoning	12	3
	Mechanical Reasoning	8	3
	Diagrammatic Reasoning	8	4
Spatial Reasoning Aptitude-R & -Rx	Total	32	8
Mechanical Reasoning Aptitude-R & -Rx	Total	32	12
Diagrammatic Reasoning Aptitude-R & -Rx	Total	32	16

Note: Hard-Copy (HC) and Supervised Access (SA) Technical Aptitude Range tests using fixed content presented in a fixed order are available for follow-up testing but are not covered in this -R test summary document.

2. Norm Groups Available

Technical-Rx Tests

- International Technical Occupations (2018, N=1001)
- International Apprentices (2018, N=605)
- UK Technical Occupations (2018, N=2269)
- UK Apprentices (2018, N=2261)

Technical -R Tests

- Apprentices (2012, N=309)
- Mixed Occupational Group (2012, N=628)

Please refer to Section 10 and 11 for a visual comparison of the norms and norm group descriptions.

The Apprentices norm groups are most suitable when using the Technical Aptitude Range in recruitment for apprentice roles. For more general selection to technical posts, the Technical Occupations (2018) and the Mixed Occupational Group (2012) norm groups are most appropriate.

In addition to the core norm groups listed above, a range of country-specific norms are also available. Please contact Saville Assessment for the latest norm availability information.

3. Report

A sample report for Swift Technical Aptitude–Rx is included in Appendix 1. Sample reports for other assessments are available upon request from Saville Assessment.

4. Practice and Preparation

Online Practice Tests are available and there are individual PDF Preparation Guides for each of the Technical Aptitude Range areas:

- **Swift Technical Aptitude (online)**
- **Spatial Reasoning (online & PDF)**
- **Mechanical Reasoning (online & PDF)**
- **Diagrammatic Reasoning (online & PDF)**

These are designed to provide a realistic set of example questions in order to help familiarize the test taker with the format and style of the aptitude assessment questions, as well as additional information about the assessment process.

The online Practice Tests also provide individual feedback on the responses given, featuring realistic time limits which replicate a real assessment scenario. The Preparation Guides provide a flexible offline alternative to the online Practice Tests.

The aptitude practice and preparation materials can be found on the Saville Assessment website (www.savilleassessment.com).

5. Development

The Technical Aptitude Range-R/-Rx comprises large banks of Spatial Reasoning, Mechanical Reasoning and Diagrammatic Reasoning items. Items are drawn from these banks to form the single Spatial Reasoning, Mechanical Reasoning and Diagrammatic Reasoning tests and the corresponding sub-tests of Swift Technical Aptitude.

6. Languages Available as of June 2017

STA-Rx

Instrument – English (Australia, Canada, Ireland, South Africa, UK & US), Russian and Spanish (Spain).

Report – English (UK & US), Russian and Spanish (Spain).

SRA-Rx, MRA-Rx, DRA-Rx

Instrument - English (Australia, Canada, Ireland, South Africa, UK & US).

Report - English (UK & US).

We are engaged in an ongoing, active program of translation and localization for all of our aptitude assessments. For the latest availability information, please contact Saville Assessment.

7. Reliability

The internal consistency figures presented here are Separation Indices. This method produces similar figures to Cronbach's Alpha (Andrich, 1982¹) and allows for an internal consistency calculation to be made in item-banked tests, rather than fixed-form tests.

This section presents internal consistency reliability figures for each of the Technical Aptitude Range-R tests.

For Swift Technical Aptitude-R, it is worth noting that the greatest level of reliability is found at the total score level, which is designed to be the decision-making score. The sub-test scores provide additional test-taking information, but we would not recommend that these are used in isolation for decision making.

The mean percentage correct figures broadly reflect the design aim of giving a positive candidate experience where many candidates answer around 50% of questions correctly.

The large standard deviation values seen in these tables reflect the ability of the items to differentiate performance through a wide score range. This is required to give an accurate representation of test-takers' ability.

For details about mean performance in each of the norm groups, please refer to the 'Norms' section.

Swift Technical Aptitude-R (IA) Internal Consistency Reliabilities (N=358)

	Mean % Correct	SD	SEm Sten	SEm 'T'	r
Total	61.32	21.83	1.02	5.10	.74
Spatial	64.23	21.63	1.31	6.56	.57
Mechanical	63.68	18.59	1.44	7.21	.48
Diagrammatic	53.84	24.87	1.28	6.40	.59

Spatial Reasoning Aptitude-R (IA) Internal Consistency Reliability (N=455)

	Mean % Correct	SD	SEm Sten	SEm 'T'	r
SRA-R	66.89	19.35	.94	4.69	.78

Mechanical Reasoning Aptitude-R (IA) Internal Consistency Reliability (N=999)

	Mean % Correct	SD	SEm Sten	SEm 'T'	r
MRA-R	50.61	17.64	.92	4.58	.79

¹Andrich, D. (1982). An index of person separation in latent trait theory, the traditional KR-20 index, and the Guttman scale response pattern. *Education Research and Perspectives*, 9(1), 95-104.

Diagrammatic Reasoning Aptitude-R (IA) Internal Consistency Reliability (N=414)

	Mean % Correct	SD	SEm Sten	SEm 'T'	r
DRA-R	64.41	21.51	.82	4.12	.83

8. Validity

This summary document includes criterion-related validity information for the total score and three sub-tests in Swift Technical Aptitude, based on a sample of 308 individuals for whom third-party ratings of workplace performance were collected. The criteria used here represent a priori predictions of the areas of work performance which each test was designed to predict.

It is worth noting that the greatest level of validity is found at the total score level, which is designed to be the decision-making score. The sub-test scores provide additional test-taking information, but we would not recommend using them in isolation for any decision making.

The greatest validity contribution comes from the Mechanical Reasoning sub-test, with the least coming from the Spatial Reasoning sub-test. The trial Spatial Reasoning test version used in this sample was made up of just 8 items and has since been increased to 12 items. As a result, the validity of this sub-test is expected to increase, thus enhancing the overall validity figure.

For further information about the criterion-related and other forms of validity evidence for Technical Aptitude Range assessments, please contact Saville Assessment.

Swift Technical Aptitude Criterion-Related Validity (N=308)

	Correlation with Sum of Working with Designs, Systems & Equipment (Rater) r (Uncorrected)	Correlation with Sum of Working with Designs, Systems & Equipment (Rater) r (Corrected)
Total	.23	.41
	Correlation with Working with Designs (Rater) r (Uncorrected)	Correlation with Working with Designs (Rater) r (Corrected)
Spatial	.06	.10
	Correlation with Working with Equipment (Rater) r (Uncorrected)	Correlation with Working with Equipment (Rater) r (Corrected)
Mechanical	.24	.39
	Correlation with Working with Systems (Rater) r (Uncorrected)	Correlation with Working with Systems (Rater) r (Corrected)
Diagrammatic	.19	.45

Note: Any raw correlation higher than .12 is statistically significant at the $p < .05$ level (two-tailed) and any raw correlation higher than .10 is statistically significant at the $p < .05$ level (one-tailed). $N=308$. The criterion inter-rater reliability figures from Project Epsom ($N=263$) and the corrected figures are based on the inter-rater reliability figures for each of the Working with Designs, Equipment and Systems criteria (.33, .36, and .18 respectively). The criterion internal consistency of ratings ($N=308$) was .79 (Designs, Equipment, Systems; together known as Working with Things). Other than taking into account unreliability of the criterion measure, there has been no other adjustment for any statistical artefacts applied.

The Spatial, Mechanical and Diagrammatic Reasoning –R single tests are longer than the Swift Technical Aptitude combined assessment and cover the same areas of aptitude in greater depth. It is appropriate to assume that the Swift Technical Aptitude validities are a conservative and lower-bound estimate of the validity of the Technical Aptitude–R single tests, which are likely to show incremental validity over the Swift assessment.

9. Fairness

Gender Group Differences

Swift Technical Aptitude – Gender Group Differences (N=561)

	Male Mean	Male SD	Female Mean	Female SD	Pooled SD Difference
Total	19.49	3.77	17.89	4.18	-.40
Spatial	8.92	1.81	8.48	2.02	-.22
Mechanical	5.47	1.64	4.39	1.73	-.61
Diagrammatic	5.10	1.84	5.01	1.87	-.05

Male N=203

Female N=358

In Swift Technical Aptitude, males tended to score more highly on the overall test, plus the Spatial Reasoning and Mechanical Reasoning sub-tests. The effect on the Total score and Spatial score were small, while the size of the Mechanical effect was moderate. There were no notable differences between males and females on the Diagrammatic Reasoning sub-test.

Technical Aptitude Single Tests – Gender Group Differences (N=346)

	Male Mean	Male SD	Female Mean	Female SD	Pooled SD Difference
Spatial	19.57	4.38	18.95	4.71	-.14
Mechanical	18.57	5.54	15.42	4.69	-.62
Diagrammatic	17.13	4.80	16.86	4.55	-.06

Male N=141

Female N=205

In the Spatial and Diagrammatic Reasoning Single Tests, no noticeable effects were observed, while in the Mechanical Reasoning Single Test, males tended to score more highly. The size of this effect was moderate (.62). The group difference is broadly in line with general research literature which indicates males tend to outperform females on mechanical reasoning tests, which may for example be influenced by cultural/education factors.

Age Group Differences

Swift Technical Aptitude – Age Group Differences (N=506)

	Under 40 Mean	Under 40 SD	Over 40 Mean	Over 40 SD	Pooled SD Difference
Total	18.74	3.97	17.84	4.52	-.22
Spatial	8.72	1.89	8.69	1.92	-.01
Mechanical	4.85	1.74	4.80	1.93	-.03
Diagrammatic	5.17	1.84	4.35	1.93	-.44

Under 40 N=432

Over 40 N=74

A medium-sized effect was observed on the Diagrammatic Reasoning sub-test and a small effect was observed on the Total score, in both cases where the 'Under 40' group tended to outperform the 'Over 40' group. There was no appreciable effect observed between the groups on the Spatial Reasoning or Mechanical Reasoning sub-tests.

It is worth noting that the above data should be interpreted in light of the relatively small sample size currently available for presentation here. Some caution in generalizing these results, which have been included for the sake of completeness, is therefore recommended. Saville Assessment engages in an ongoing program of data collection and analysis and we will continue to publish further fairness data as it becomes available.

Technical Aptitude Single Tests – Age Group Differences (N=344)

	Under 40 Mean	Under 40 SD	Over 40 Mean	Over 40 SD	Pooled SD Difference
Spatial	19.61	4.58	17.47	4.04	-.48
Mechanical	16.84	5.15	16.16	5.94	-.13
Diagrammatic	17.42	4.71	14.98	3.67	-.54

Under 40 N=285

Over 40 N=59

Medium-sized effects were observed on the Spatial Reasoning and Diagrammatic Reasoning tests, of -.48 and -.54 respectively, where the 'Under 40' group tended to outperform the 'Over 40' group. There was no appreciable effect observed between the groups on the Mechanical Reasoning test.

The pattern of results suggest that Spatial and Diagrammatic Reasoning tests have a greater 'speed' element where younger candidates can draw on greater 'fluid' abilities and are more used to working to strict test time limits from exams etc. The Mechanical Reasoning test, on the other hand, acts as a 'power' test that is fairly unspeded.

It is worth noting that the above data should be interpreted in light of the relatively small sample size currently available for presentation here. Some caution in generalizing these results, which have been included for the sake of completeness, is therefore recommended. Saville Assessment engages in an ongoing program of data collection and analysis and we will continue to publish further fairness data as it becomes available.

Ethnicity Group Differences

Early monitoring on White British versus groups of all other ethnic origins (Black, Asian, Other White groups, etc.) indicates the White British are only slightly higher on average than the 'Other' category (Spatial .26 of an SD, Mechanical .26 of an SD and Diagrammatic .18, White British N=192, Other N=152). We continue to collect and monitor differences as our usage grows. At the time of writing, we have insufficient data from individual ethnic subgroups to provide meaningful breakdowns of differences between these groups.

Group Differences Summary

The data presented on the differences between the means for different groups reveal a number of small or moderately-sized group differences on the total scores of the Technical Aptitude assessments. The differences shown here are broadly in line with the research literature and in many cases tend to be less pronounced than has been found in other studies.

The information presented here is from actual usage data of the Technical Aptitude Range and as a result the differences on some variables may reflect differences in the composition of the various groups. For example, age differences could be related to longer tenure in organizations and generational differences. Similarly, observed gender and ethnic differences could be a reflection of other biographical differences in the composition of these groups (e.g., level and type of education), rather than actual group differences.

It is also important to bear in mind that each sample of individuals is different and group differences should not be generalized beyond these specifically-reported samples in an excessively broad manner. For example, some ethnic differences seen with cognitive tests are likely due, at least in part, to a difference in language proficiency across the specific groups of people sampled, rather than to other factors. While those group differences which do exist are interesting, it is worth noting that it is frequently difficult to isolate these variables as the sole determinant of the apparent difference.

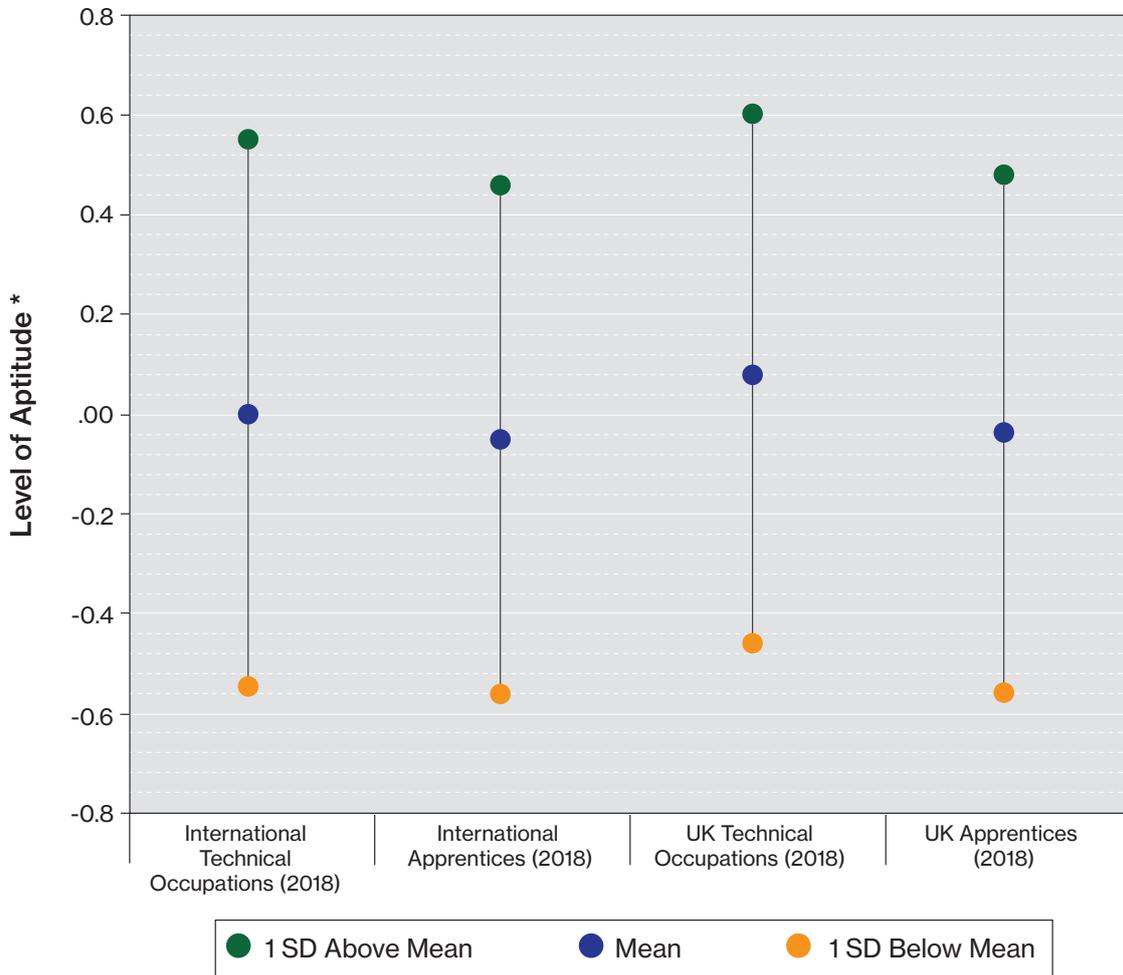
As measures of cognitive ability, Technical Aptitude Range tests will occasionally reveal small to moderate differences between groups. To ensure that any interpretations made based on a test showing any group differences are meaningful, relevant and fair, it is important to make sure that the use of such tests can be justified. This is especially true when using a test in selection with a cut-off score. Justifying the use of any test involves making sure that the skills being assessed by the test are relevant and valid and that the level of any cut-off applied is demonstrably appropriate. The use of job analysis and, where possible, local validation studies, is particularly important for demonstrating the link between a test and the job it is being used to select for.

It is one thing for an assessment to be designed to be fair and valid, and another for it to be used fairly. The clearer and more consistent the structure and process presented for aligning the Technical Aptitude Range to a job and agreeing consistent criteria for decision making based on the test, the less likely it is that the assessments will be unfairly applied by using different standards for candidates in different groups.

In general, the differences between age, gender and ethnic groups are small or moderate and therefore we do not advise that specific differences in profile interpretation should be warranted when considering test results from different groups defined according to these variables.

We do not, unless local legal frameworks permit or mandate such an approach, recommend using separate norms for age, gender or ethnic groups. For further information, please contact Saville Assessment directly.

10. Technical Aptitude Range-Rx Norms Summary



*Based on average (mean) group theta values, also showing the range of one standard deviation above and below the mean

10.1 International Technical Occupations (2018, N=1001) Norm Group Description

Used for:

Swift Technical Aptitude-Rx (IA)

Spatial Reasoning Aptitude-Rx (IA)

Mechanical Reasoning Aptitude-Rx (IA)

Diagrammatic Reasoning Aptitude-Rx (IA)

This international group consisted of 1,001 individuals employed in a range of job areas/functions¹. Of these, 73% worked in the following job areas/functions: IT and Engineering, Operations, Construction, Customer Service, Sales and Marketing, Hospitality, Transport and Security. The remaining 27% worked in other job areas/functions including: Education, Administration, Design, Health, Public Safety, Research, Leisure and Consulting.

The breakdown of the group is provided below (with response rates for each biographical section given in the footnotes):

Gender²

12% of the group were female and 88% were male.

Age³

The age of the group ranged from 15 to 66 years old, with a mean age of 29 years old.

Education (Highest Qualification)⁴

15% of the group had a postgraduate degree as their highest qualification, 23% had a first/undergraduate degree, 6% had professional qualifications, 44% had school-level or some college qualifications with the remaining 12% having other or no formal qualifications.

Level of Responsibility⁵

33% of the group were team leaders or had managerial status and 67% described themselves as being an individual contributor or having no management responsibility.

Work Experience⁶

14% of the group had more than 20 years' work experience, 24% had 10-20 years', 17% had 6-9 years', 16% had 3-5 years', 11% had 1-2 years', and the remaining 18% had less than 12 months' work experience or answered 'Not applicable'.

¹ Based on 82% sample response

² Based on 100% sample response

³ Based on 94% sample response

⁴ Based on 89% sample response

⁵ Based on 76% sample response

⁶ Based on 88% sample response

Cultural Background⁷

73% of the group described themselves as White (including British, Australian, and European), 22% as Asian (including Malaysian, Indian, and Chinese), 2% as Black and the remaining 3% described themselves as coming from a range of other backgrounds.

Country of Completion⁸

25% of the group completed the aptitude test in Australia, 25% in the United Kingdom, 11% in the United States, 11% in Malaysia, 4% in New Zealand, 3% in France, 2% in Italy, 2% in Spain, and 2% in Greece. The remaining 15% completed the test in various other countries (including India, the Netherlands, Portugal, United Arab Emirates, Germany, Hong Kong, Japan, Poland and Thailand).

⁷ Based on 71% sample response

⁸ Based on 100% sample response

10.2 International Apprentices (2018, N=605) Norm Group Description

Used for:

Swift Apprentice Aptitude-Rx (IA)

Swift Comprehension Aptitude-Rx (IA)

Swift Technical Aptitude-Rx (IA)

Verbal Comprehension Aptitude-Rx (IA)

Numerical Comprehension Aptitude-Rx (IA)

Error Checking Comprehension Aptitude-Rx (IA)

Spatial Reasoning Aptitude-Rx (IA)

Mechanical Reasoning Aptitude-Rx (IA)

Diagrammatic Reasoning Aptitude-Rx (IA)

This international group consisted of 605 apprentices and apprentice applicants. Based on a 52% group response, 74% worked in the following job areas/functions: IT and Engineering, Construction, Hospitality, Operations, Customer Service, Sales and Marketing, Transport and Education. The remaining 26% worked in other job areas/functions including: Human Resources, Executive, Consulting, Health, Administration, Design and Leisure.

The breakdown of the group is provided below (with response rates for each biographical section given in the footnotes):

Gender¹

20% of the group were female and 80% were male.

Age²

The age of the group ranged from 15 to 25 years old, with a mean age of 20 years old.

Education (highest qualification)³

58% of the group had school-level or some college qualifications as their highest qualification, 23% had a first/undergraduate degree, 2% had professional qualifications, 1% had a master's degree with the remaining 16% having other or no formal qualifications.

Cultural Background⁴

61% of the group described themselves as White (including British, Australian, and European), 34% as Asian (including Malaysian, Chinese and Indian) and the remaining 5% described themselves as coming from a range of other backgrounds.

¹ Based on 100% sample response

² Based on 100% sample response

³ Based on 88% sample response

⁴ Based on 70% sample response

⁵ Based on 99% sample response

Country of Completion⁵

31% of the group completed the aptitude test in Australia, 31% in the United Kingdom, 26% in the Malaysia, 4% in the United States and 2% in New Zealand. The remaining 6% completed the test in various other countries.

⁵Based on 100% sample response

10.3 UK Technical Occupations (2018, N=2269) Norm Group Description

Used for:

Swift Technical Aptitude-Rx (IA)

Spatial Reasoning Aptitude-Rx (IA)

Mechanical Reasoning Aptitude-Rx (IA)

Diagrammatic Reasoning Aptitude-Rx (IA)

This international group consisted of 2,261 individuals in the United Kingdom employed in a range of job areas/functions¹. Of these, 70% worked in the following job areas/functions: IT and Engineering, Operations, Customer Service, Sales and Marketing, Hospitality, Construction Education and Leisure. The remaining 30% worked in other job areas/functions including: Transport, Research, Administration, Design and Human Resources.

The breakdown of the group is provided below (with response rates for each biographical section given in the footnotes):

Gender²

10% of the group were female and 90% were male.

Age³

The age of the group ranged from 15 to 69 years old, with a mean age of 26 years old.

Education (highest qualification)⁴

8% of the group had a postgraduate degree as their highest qualification, 12% had a first/undergraduate degree, 6% had professional qualifications, 60% had school-level or some college qualifications with the remaining 14% having other or no formal qualifications.

Level of Responsibility⁵

16% of the group were team leaders or had managerial status and 84% described themselves as being an individual contributor or having no management responsibility.

Work Experience⁶

17% of the group had more than 20 years' work experience, 13% had 10-20 years', 9% had 6-9 years', 15% had 3-5 years', 13% had 1-2 years', and the remaining 33% had less than 12 months' work experience or answered 'Not applicable'.

Cultural Background⁷

64% of the group described themselves as White British, 27% as White (including European and Irish), 5% as Asian (including Indian and Pakistani), 1% as Black and the remaining 3% described themselves as coming from a range of other backgrounds.

¹ Based on 82% sample response

⁵ Based on 79% sample response

² Based on 100% sample response

⁶ Based on 91% sample response

³ Based on 94% sample response

⁷ Based on 95% sample response

⁴ Based on 89% sample response

10.4 UK Apprentices (2018, N=2261) Norm Group Description

Used for:

Swift Apprentice Aptitude-Rx (IA)
Swift Comprehension Aptitude-Rx (IA)
Swift Technical Aptitude-Rx (IA)
Verbal Comprehension Aptitude-Rx (IA)
Numerical Comprehension Aptitude-Rx (IA)
Error Checking Comprehension Aptitude-Rx (IA)
Spatial Reasoning Aptitude-Rx (IA)
Mechanical Reasoning Aptitude-Rx (IA)
Diagrammatic Reasoning Aptitude-Rx (IA)

This international group consisted of 2,269 apprentices and apprentice applicants in the United Kingdom. Based on a 58% group response, 76% worked in the following job areas/functions: IT and Engineering, Customer Service, Sales and Marketing, Construction, Hospitality, Operations, Education and Leisure. The remaining 24% worked in other job areas/functions including: Administration, Health, Transport, Finance and Entertainment.

The breakdown of the group is provided below (with response rates for each biographical section given in the footnotes):

Gender¹

9% of the group were female and 91% were male.

Age²

The age of the group ranged from 15 to 25 years old, with a mean age of 19 years old.

Education (highest qualification)³

73% of the group had school-level or some college qualifications as their highest qualification, 4% had a first/undergraduate degree, 2% had professional qualifications, 1% had a master's degree with the remaining 20% having other or no formal qualifications.

Cultural Background⁴

66% of the group described themselves as White British, 20% as White, 8% as Asian (including Indian, Pakistani and Malaysian), 3% as Black (including African and Caribbean) and the remaining 3% described themselves as coming from a range of other backgrounds.

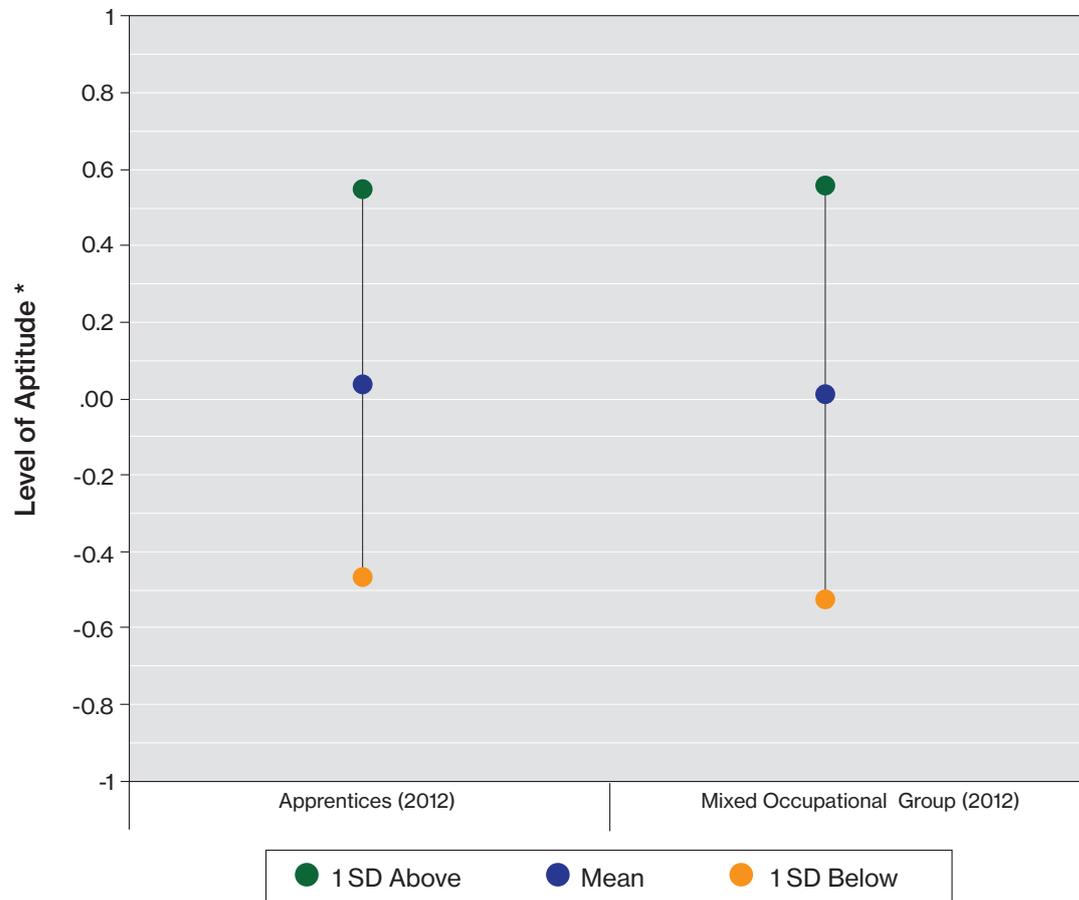
¹ Based on 100% sample response

² Based on 100% sample response

³ Based on 91% sample response

⁴ Based on 98% sample response

11. Technical Aptitude Range-R Norms Summary



*Based on average (mean) group theta values, also showing the range of one standard deviation above and below the mean

11.1 Apprentices (2012, N=309) Norm Group Description

Used for:

Swift Technical Aptitude–R (IA)
Spatial Reasoning Aptitude–R (IA)
Mechanical Reasoning Aptitude–R (IA)
Diagrammatic Reasoning Aptitude–R (IA)

This sample consisted of 309 apprentices and apprentice applicants employed across various industry sectors. Of these, 87% worked in the following industry sectors: Engineering (40%), Construction (30%), Production (9%), Distribution (4%) and Trade (4%). The remaining 13% worked in other industry sectors¹.

The breakdown of the Apprentices (2012) sample is provided below (with response rates for each biographical section given in the footnotes).

Gender²

98% of the sample were male and 2% were female.

Age³

The age of the group ranged from 15 to 25 years, with a mean age of 20 years.

Education (highest qualification)⁴

50% had a vocational qualification and 35% had completed high school. 7% had a professional qualification, 4% had completed a degree, 3% had completed college level education and the remaining 1% had no formal qualifications.

Cultural Background⁵

98% of the sample described themselves as White and 2% as Other Ethnicities.

¹ Based on 98% sample response

² Based on 100% sample response

³ Based on 99% sample response

⁴ Based on 99% sample response

⁵ Based on 99% sample response

11.2 Mixed Occupational Group (2012, N=628) Norm Group Description

Used for:

Swift Technical Aptitude–R (IA)
Spatial Reasoning Aptitude–R (IA)
Mechanical Reasoning Aptitude–R (IA)
Diagrammatic Reasoning Aptitude–R (IA)

This sample consisted of 628 participants, employed in a range of job functions across a wide range of industry sectors. Based on a 79% sample response rate, 11% worked in Technical roles including Engineering (6%), Construction (3%) and Operational & Manufacture (2%). 22% worked in Customer roles including Sales & Marketing (9%), Hospitality & Leisure (7%) and Customer Service (6%). 18% worked in professional services including Human Resources (8%), Consulting (5%), Finance (4%) and Law (1%). 12% worked in Education, 9% worked in Health and 6% worked in Design & Photography. A further 5% worked in Research and Scientific roles and another 5% worked in Administrative roles, with other job functions being represented including IT and government & public sector roles.

Based on a 77% sample response rate, 73% of the sample reported having no management responsibility. Approximately 18% reported having Managerial status and 9% reported being Team Leaders.

This sample is a subgroup of the equivalent Mixed Occupational Group norm (2012; N=1455) designed for use with Swift Comprehension Aptitude–R as well as Verbal Comprehension Aptitude–R, Numerical Comprehension Aptitude–R and Error Checking Aptitude–R.

The equivalent caliber of these two groups is evidenced by the raw total scores on Swift Comprehension Aptitude for the group of 1455 (mean = 16.27, standard deviation = 3.53) and this subgroup of 628 people (mean = 16.37, standard deviation = 3.44).

The breakdown of the Mixed Occupational Group (2012) sample is provided below (with response rates for each biographical section given in the footnotes).

Gender¹

64% of the sample were female and 36% were male.

Age²

The age of the group ranged from 16 to 65 years, with a mean age of 30 years.

Education (Highest Qualification)³

38% had a first/undergraduate degree as their highest qualification, 25% has a postgraduate degree, 20% had school level qualifications, and 16% had a professional or vocational qualification. The remaining 1% reported having no formal qualifications.

¹ Based on 89% sample response

² Based on 81% sample response

³ Based on 87% sample response

Work Experience⁴

14% of the group had more than 20 years' experience, 25% has between 10 and 20 years' work experience, 18% had between 6 and 9 years', 22% had between 3 and 5 years', 10% had between 1 and 2 years', 5% had between 6 and 12 months' and 6% had less than 6 months' work experience.

Cultural Background⁵

94% of the sample described themselves as White (58% White British, 24% White, 4% White Irish, 2% White East European, 2% White West European, 1% White North European, 1% White South European, 1% White South American, 1% Other White), 3% Asian (approximately 1% Indian, 1% Chinese, 1% Pakistani and Other Asian), and 1% Black (approximately 1% Black Caribbean), with the remaining 2% coming from a range of mixed and other cultural backgrounds.

⁴ Based on 87% sample response

⁵ Based on 88% sample response

12. Appendix 1: Swift Technical Aptitude-Rx Sample Report



Assessment Report
Sample Candidate



Swift Technical
Aptitude-Rx



Contents

Introduction to Assessment Report.....	3
Total Score.....	4
Aptitude & Pace Information.....	5
Improving Abilities.....	6
Online Test Access Summary (For Assessor Use).....	7

About this Report

This report is based upon Swift Technical Aptitude, an online test of the ability to reason with information presented in spatial, mechanical and diagrammatic formats.

The results are compared against an international group of 1,001 individuals who work in technical occupations. The results in this report are presented on a 1 to 10 Sten scale, where 1 indicates low performance and 10 indicates high performance on the test. The margin of error that should be allowed before concluding that there is a difference between scores is indicated by the diamond shape.

When reading this report, please remember that it is based on the information gained from the test completion only. It describes performance on this particular test, rather than performance at work or study. Research suggests that ability tests can be powerful predictors of successful performance in study and work activities.

The information contained in this report is confidential and every effort should be made to ensure that it is stored in a secure place.

The information contained within this report is likely to provide a valid measure of aptitude for 12 to 24 months.

The report is based on the results of the online test that the respondent was invited to complete under unsupervised conditions. The identity of the actual respondent has not been verified by a test administrator. Further testing under supervised conditions is recommended for high-stake decision making.

This report was produced using Saville Assessment software systems and has been generated electronically. Saville Assessment do not guarantee that it has not been changed or edited. We can accept no liability for the consequences of the use of this report.

The application of this test is limited to Saville Assessment employees, agents of Saville Assessment and clients authorised by Saville Assessment.

Introduction to Assessment Report

This report provides feedback on the responses of Sample Candidate to the Swift Technical Aptitude test.

Total Score

This test measures spatial, mechanical and diagrammatic reasoning, which are important in the world of work for a variety of roles. This section of the report provides a total test score relative to the comparison group: Technical Occupations (INT, IA, 2018)

The Total Score indicates how well Sample Candidate has performed overall on the test.

Aptitude Area Sub-Scores

The sub-scores provide information on how Sample Candidate performed on each of the aptitude sub-tests. The pattern of results indicates relative strengths and weaknesses across the following areas of aptitude:

Spatial - assesses the ability to visually rotate shapes, judge sizes and compare three-dimensional objects.

Mechanical - assesses the ability to comprehend mechanical problems, physical principles and movement of objects.

Diagrammatic - assesses the ability to analyse diagrams, sequences and transformations.

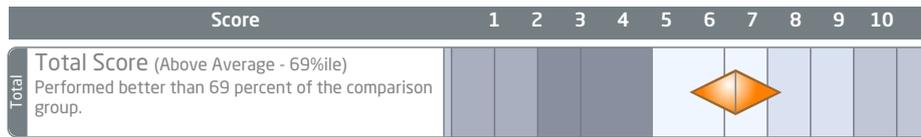
Aptitude & Pace Comparison

Aptitude and pace scores are shown for each of the areas in the test. These scores are compared in a graph using a 1 to 10 sten scale, with the sten values given in brackets. The pace score is based on the candidate's response time for the questions they completed compared to the average response time for the same questions. Pace is shown from slow at the bottom of the graph to fast at the top. Aptitude runs from low on the left of the graph to high on the right.



Total Score

This page shows the Total Score relative to the Technical Occupations (INT, IA, 2018) comparison group on a 1 to 10 sten scale.



Interpretation Guidelines

Comparison Group: Technical Occupations (INT, IA, 2018)

- Sten 1: higher than about 1% of the comparison group
- Sten 2: higher than about 5% of the comparison group
- Sten 3: higher than about 10% of the comparison group
- Sten 4: higher than about 25% of the comparison group
- Sten 5: higher than about 40% of the comparison group
- Sten 6: higher than about 60% of the comparison group
- Sten 7: higher than about 75% of the comparison group
- Sten 8: higher than about 90% of the comparison group
- Sten 9: higher than about 95% of the comparison group
- Sten 10: higher than about 99% of the comparison group

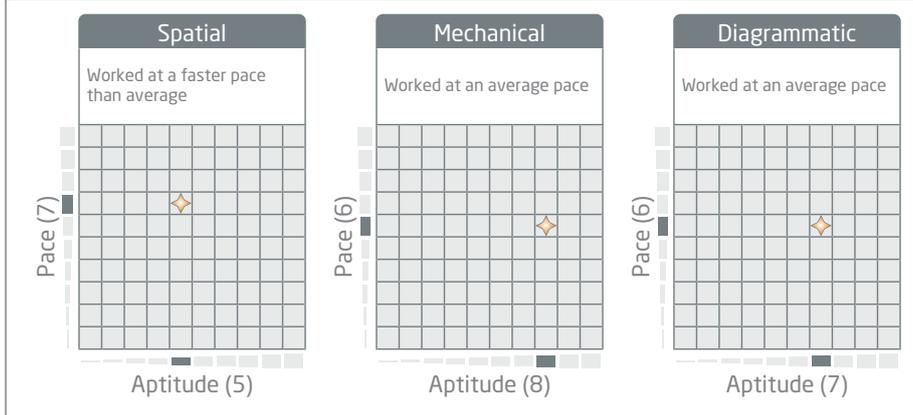
Aptitude & Pace Information

This page displays aptitude and pace information for each of the areas in the test relative to the Technical Occupations (INT, IA, 2018) comparison group.

Aptitude Area Sub-Scores

		Scores	1	2	3	4	5	6	7	8	9	10
Aptitude Areas	Spatial (Average - 34%ile) Likely to find solving spatial problems as easy as other people.						◆					
	Mechanical (Above Average - 86%ile) Likely to find solving mechanical problems easier than other people.								◆			
	Diagrammatic (Above Average - 69%ile) Likely to find solving diagrammatic problems easier than other people.								◆			

Aptitude & Pace Comparison





Improving Abilities

Some tips for improving abilities are provided below:

Spatial

- Work with plans, sketches and designs.
- Read and draw maps.
- Complete visual puzzles.
- Draw three-dimensional objects.
- Try to draw objects from a different angle.

Mechanical

- Work with tools, equipment and machinery.
- Maintain, fix and repair things.
- Build objects with moving parts.
- Learn about mechanical principles.
- Look at technical user manuals.

Diagrammatic

- Examine diagrams in books and newspapers.
- Study flowcharts of processes and procedures.
- Improve your logic by solving puzzles.
- Try to clarify different types of relationships within diagrams.
- Create diagrams in order to illustrate sequences of events.

Online Test Access Summary (For Assessor Use)

This section of the report provides additional information about the test completion.

Initial Access: 10/07/2018 (09:51 GMT)
Responses Saved: 10/07/2018 (10:01 GMT)
Language: English (United Kingdom)
Administrator Resets: 2
Candidate Aborts: 0
Time Adjustment: None

13. Appendix 2: Method for Calculating Criterion Related Validity of a -R Single Test from the Equivalent Swift Sub-Test

It is possible to calculate the criterion-related validity of each of the full-length, -R single tests based on validity evidence from the equivalent Swift sub-test. The variables used to derive the validity figures presented in this document are outlined below.

Test	Criterion Related Validity (Corrected for full length predictor reliability and criterion reliability)	Raw Criterion Related Validity of Equivalent Swift Sub-Test (Epsom N=308 unless specified)	Reliability of Equivalent Swift Sub-Test****	Inter-Rater Reliability of Sub-Test's Equivalent Criterion (Epsom N=308 unless specified)	Reliability of -R Single Tests***
Spatial Reasoning Aptitude**	.18	.09	.57	.33	.78
Mechanical Reasoning Aptitude	.50	.24	.48	.38	.79
Diagrammatic Reasoning Aptitude	.53	.19	.59	.18	.83
		(r_{xy})	(r_{xx})	(r_{yy})	(r_{zz})

* Raw Abstract validity and inter-rater reliability are taken from N=214 sample using the total score correction applied in that study (.28)

** Raw Spatial validity reported here uses the Spearman-brown Prohecy formula used to estimate raw validity for 12-items on the 8-item validity of .06 in Project Epsom = $(1.5 * .06) / (1 + ((1.5 - 1) * .06))$

*** Reliability figures for the single -R tests are all internal consistency figures from the largest sample size available in the 2014 "Aptitude Reliability & Validity Summary Document"

**** Reliability figures for the equivalent Swift sub-tests are all internal consistency figures from the largest sample size available in the relevant 2014 range handbook

Saville Assessment

Claygate House
Littleworth Road
Esher
Surrey
KT10 9FD
United Kingdom

Tel +44(0)20 8619 9000

info@savilleassessment.com

Saville Assessment

WillisTowersWatson 

Saville Assessment UK Ltd
Claygate House
Littleworth Road
Esher
Surrey
KT10 9PN
United Kingdom

Tel: +44 (0)20 8619 9000

info@savilleassessment.com



Working with 50 International Partners across 80 countries in 35 languages

Argentina • Australia • Austria • Bahrain • Belgium • Botswana • Brazil • Bulgaria • Canada
Caribbean • Chile • China • Colombia • Czech Republic • Denmark • France • Germany
Greece • Honduras • Hong Kong • Hungary • India • Indonesia • Ireland • Italy • Japan
Mexico • Netherlands • New Zealand • Panama • Poland • Portugal • Romania • Russia
Saudi Arabia • Singapore • Slovakia • South Africa • South Korea • Spain • Sweden
Switzerland • Turkey • UK • Ukraine • United Arab Emirates • Uruguay • USA • Venezuela