

STEC Guidance [Detailed Assessment of the Speed of Handwriting - 2nd Edition] September 2024	
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Publisher:	Pearson
Date of Standardisation:	August 2021 to February 2023 This is updating the DASH (2007) and DASH 17+ (2010)
Age Range:	8-25 years (different to previous edition covering range DASH: 9-16:11 and the DASH 17+: 17-25.11)
Access Level:	All professionals including class teachers
Cost	£209.74 inc VAT

What is included:

Manual, 25 record forms,

Photocopiable cards: Copy Sentence Cards, Graphic Speed Card, Free Writing Topic Cards and Lined Writing Card.

Assessors need to have a timer, paper and pens

Brief overview of the battery

- Measures the speed of legible handwriting across different tasks with different demands. A supplementary task measures the speed of controlling a writing implement when perceptual-motor demands are high but there is no language element.
- 4 core tasks: Sentence Copying tasks (Best and Fast), Alphabet Writing and Free Writing, with a supplementary Graphic Speed task.
- Total administration time for all tasks is approx. 30 minutes
- All evidence is from the timed writing of the pupil/young person
- No parallel forms but:
 - there is a choice of two copying sentences for ages 8-16 years and two for ages 17-25 years. The same sentence must always be used for both the Copy Best and Copy Fast tasks
 - for the Free Writing task there is a choice of two topics: the first of these is the same topic as that in DASH/DASH 17+ **and it is suggested that this is used in most circumstances**, with an alternative topic also available. This can be used, for example when (1) 'My Life' is not considered appropriate due to difficult family or personal circumstances, (2) an assessment is to be repeated (and 'My Life' was used in the first assessment session), (3) the examiner wants to assess handwriting speed when there are greater cognitive demands (as 'Past, present, future' has been designed as a more challenging topic than 'My Life'.)

Scoring:

- Scaled scores for each task with a mean of 10 and a standard deviation of 3. And a total composite made as a standard score using the sum of scaled scores of the 4 core tasks (Copy tasks, Alphabet Writing and Free Writing) with a mean of 100 and SD of 15 and including confidence intervals
 - Scaled score for the Graphic Speed task is interpreted separately

- Separate normative data for the two Free Writing tasks.
- 95% confidence interval should ALWAYS be used - SASC guidance and also reaffirmed in all training courses
- Comparing Copy Best and Copy Fast speeds:
 - Assessor can compare the Copy Fast and Best using percentiles, see page 121 of the Manual; Scores for the 'Copy Speed Difference' that lie at or below the 15th percentile reflects a lower than average difference score, reflecting no or little increase in handwriting speed from Copy Best to Copy Fast and a possible difficulty with adjusting their writing speed - this is 1 or less for the 8-11 years age group, 2 words or less for the 12-16 age group, and 4 or less for the 17 to 25 age group.
- Measuring degree of Illegible words:
 - Dyslexic pupils showed a percentage of 1-8% of illegible words and DCD pupils a percentage of 1-27% in the Free Writing scripts. Helpful guidance is also given on examining legibility – the 7Ss (p76-77).
- Rapid changes are noted up to 16 years (but year groups have sample of less than 200) and then changes are much slower, so single year normative data is given for up to 16 and then for multiple year groups thereafter.

Qualitative assessment is a key part, not just the scores *and the manual provides useful guidance on what to look for*: This will include pen grip, posture, pressure of pen, signs of pain or fatigue, fluency with maintaining writing and the fluency of formulating the sentences to write in Free Writing. Also, in Free Writing, the inclusion of punctuation, spelling, grammar, expression, vocabulary. In summary these can be listed as:

- attention to task, sustaining attention over the Free Writing task,
- fluency with thinking what to write/how to express thoughts.
- Handwriting mechanics (legibility, motor planning of letter formation)

Also motor sequence of writing letters, description of script e.g., mix of joined up letters and printed letters, sizing, spacing, sitting on the line

Helpful resources to further consider handwriting, including published papers etc can be found on these website:

<https://annabarnett.co.uk/resources>

The Handwriting Legibility Scale (2018)

<https://www.yesatarelearningtrust.net/Portals/0/Handwriting%20Legibility%20Scale%20%28HLS%29%20RID%202017.pdf>

and the Writing Quality Scale (2023b)

https://www.researchgate.net/publication/370420067_The_writing_quality_scale_WQS

Points to Consider

Rigour of standardisation: Sample gave normative data, from Australia, New Zealand and UK - regions considered similar demographically, education systems and SEN provision. Comparison of these regions were compared and found to be similar.

762 (UK 368, Aust and NZ 394) made up of:

- 533 in younger age group 8-16 years and 229 in older age group 17-25 years.
- 377 males and 385 females,
The samples are representative of both the UK population and the Australia and New Zealand population; based on the United Kingdom Annual Population Survey (ONS 2019) and the Australian and New Zealand censuses (Australian Bureau of Statistics, 2021: Statistics New Zealand, 2018)
3% represented by special groups e.g. ADHD, DCD, dyslexia.

Appropriate representation of age range, socio-economic backgrounds, ethnicity, gender - The sample is representative of the census information, with similar numbers of males and females and a good spread over the age range.

There was no significant difference between scores achieved by those in or not in education settings in the 17-25 year age range. Consequently, these samples were combined to provide one set of norms.

Score intercorrelations: Correlations ranged from .52 to .77 between the 4 core tasks, so scoring using these 4 core tasks is used to compute the total standard score and then use of the graphic speed task as a supplementary measure.

That this overall standard score demonstrates a global indicator of handwriting speed was confirmed through factor analysis.

Reliability:

- **Reliability:** Test-retest reliability on the 4 core tasks for 130 participants ranged from .71 to .86 and .89 for the Total Standard Score. The lowest stability coefficient was for Graphic Speed for younger and older ages (.68 and .74 respectively). All of these are considered acceptable or better.
- Inter-rater reliability: adequate stability across time (2-13 weeks) across all ages (p125) with corrected values from 0.68 to 0.89 for individual tasks. Some very slight increases, slightly more pronounced for the Alphabet Writing than other tasks (based on 140 cases).
- **Confidence intervals for total standard score only, pages 182 -184 - need to be used in reports.**
- Standard error of measurement producing the confidence interval - recommended Confidence interval is 95% p 182-184 for 95% confidence interval for total standard score only, which should be used in report writing and which generally ranges around 16-18 points around the actual standard score of the overall composite.
- **See page 126 for SEMs to work out confidence intervals at 95% level for individual tasks.**

Reliability co-efficients of .70 are regarded as sufficiently high (p 124-5 of DASH-2).

Sciencedirect.com state that a general accepted rule is that 0.6-0.7 indicates an acceptable reliability and 0.8 or greater a very good level.

Validity:

An expert panel confirmed that the revised content of DASH-2 aligned with the constructs of handwriting speed and accuracy that were being measured and was appropriate for use with the intended examinee group p 128.

Construct Validity:

The Graphic Speed task is presented as a supplementary measure and is not included in the calculation of the Total standard score. This is supported by low correlations between the Graphic Speed task and the Total Standard Score (.39), and between the Graphic Speed task and the four core DASH-2 tasks (.29-.36). This is as expected as Graphic Speed is measuring an isolated perceptual-motor skill. Correlations between the four core tasks range from .79 to .91 as they measure similar skills.

This was also supported by Factor Analysis.

Group v individual administration (p 128)

This was examined in a group of 11-15 year olds. Mean scores for all core tasks were slightly higher for those tested individually compared to those tested in a group setting. However, the differences were not statistically significant for Copy Best, Alphabet Writing, Free writing and Graphic Speed but were significant for Copy Fast ($p < .01$) and for the Total Standard Score ($p < .05$). However, the samples were small (31 students from a single UK secondary school tested in a group of 7-15 pupils, compared to 31 tested individually from the standardisation sample). Advice in the manual is given on how the interpretation of scores should take account of the setting in which the assessment was undertaken, alongside any other factors that the examiner feels is relevant.

Education v non-education settings (p 129)

A small sample of 49 examinees who were not in an educational setting were compared to those in an education setting. There was no significant difference between these group on any individual tasks or the Total Standard Score.

Standard error from the mean should be less than 1 from the mean of sample population and this was the case.

The manual states that "It is generally recommended that all five of the DASH-2 tasks are administered during an assessment" as "the sum of scaled scores from the four core tasks provides the most reliable overall measure of legible handwriting speed. The Graphic Speed score adds information about fine motor skills that is important when looking in depth at an individual's handwriting performance." (p78) **JCQ only accepts either free writing or total composite score for evidence for exam arrangements.**

Specific point to consider re difference between DASH and DASH-2:

Some professionals have commented on the difference between the norms for DASH and DASH-2. This was discussed with the test developers who were able to provide this comment:

*'It has been noted that the DASH-2 norms (published in 2024) seem to indicate slower handwriting speeds compared to previous editions – DASH (2007) and DASH17+ (2010). However, it is not appropriate to make direct comparisons for two reasons. First, and most importantly, it is now 17 years since the normative data on DASH was collected and 14 years for DASH 17+. Over this time there has been an enormous increase in the use of technology for writing, likely associated with a decrease in the use of handwriting. As a result, the indication of decreased handwriting speed over the period of 14-17 years since the previous publications, is **not** unexpected. It is partly due to such societal changes that professional bodies (including the British Psychological Society and American Educational Research Association) recommend that test*

norms are updated every 10-15 years and that test users employ the most recent editions available.

Second, since various revisions have been made to the tasks in DASH-2, comparing the different versions is not recommended. The revisions include new sentences for copying, some revisions in administration (e.g. demonstrations and prompts) and updated scoring guidelines. Consequently, when assessors use earlier versions of the test, it is advisable to use the appropriate norms for that version but ensure that this is noted in any report.'

About SpLDs:

Specialist groups:

Dyslexic group - 40 participants ranging from 8-25 - lower mean on all tasks except for Graphic Speed.

DCD: 33 participants had lower mean scores on all tasks including Graphic speed. See Manual for cross reference and validity using the Movement ABC-3 test.

Dysgraphia: Not designed to diagnose dysgraphia but can assist in the diagnostic process. The Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM-5) (6) includes dysgraphia under the specific learning disorder category but does not define it as a separate disorder. There is no professional consensus on specific diagnostic criteria.

Useful ref re dysgraphia: <https://educational-psychologist.co.uk/sen-resources-blog/2016/1/22/cannot-pass-the-knowledge-of-life-and-language-in-the-uk-test-knoll-1>