

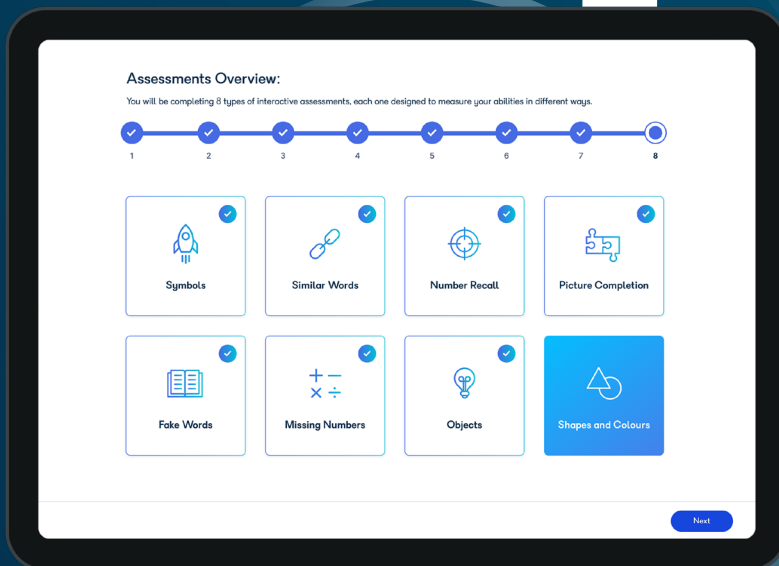
aptem.
assess

Aptem Assess: Science summary



What is Aptem Assess?

Aptem Assess is designed to provide a fast, mobile-friendly assessment to indicate whether a learner may require additional support with their learning. It is not a diagnostic test, but provides an indication as to whether there should be a more detailed discussion with a learner to determine if any additional support is required and what form that support, if any, should take.



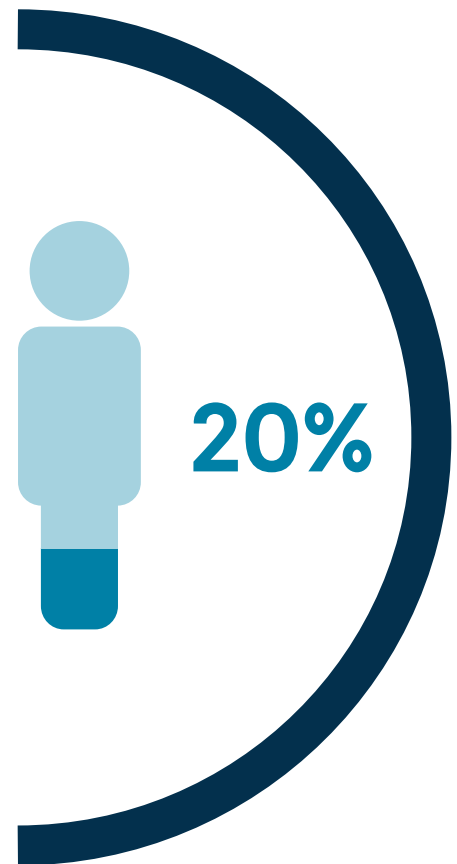


Aptem Assess comprises eight 'games' focused on assessing cognitive processes which underpin learning and assessment performance. These 'games' are based on well researched and accepted paradigms used in neuropsychology and/or educational assessments.

The 'games' were developed by Chartered Psychologists who followed psychometric best practice guidelines as described by the British Psychological Society (BPS), International Test Commission (ITC) and the European Federation of Psychologists.

How does it work?

It is estimated that 20% of adult learners will have a non-stated learning difficulty for which they may need support¹. Learners who have a formal statement of learning difficulty or EHCP, would have completed a number of cognitive tests, usually administered by an Educational Psychologist. Individuals with learning support needs (be they stated or not) can have challenges with a wide range of learning tasks which can be traced to specific cognitive processes.



Some examples include difficulties with:

- ✓ limited memory span
- ✓ perception of spatial or visual differences and details
- ✓ correctly remembering words
- ✓ slow processing of words
- ✓ confusing sounds and letters
- ✓ mixing up numbers or not accurately perceiving numbers

These difficulties explain challenges in tasks that underpin learning and knowledge acquisition such as: reading and writing, numeracy, memory and comprehension of information.

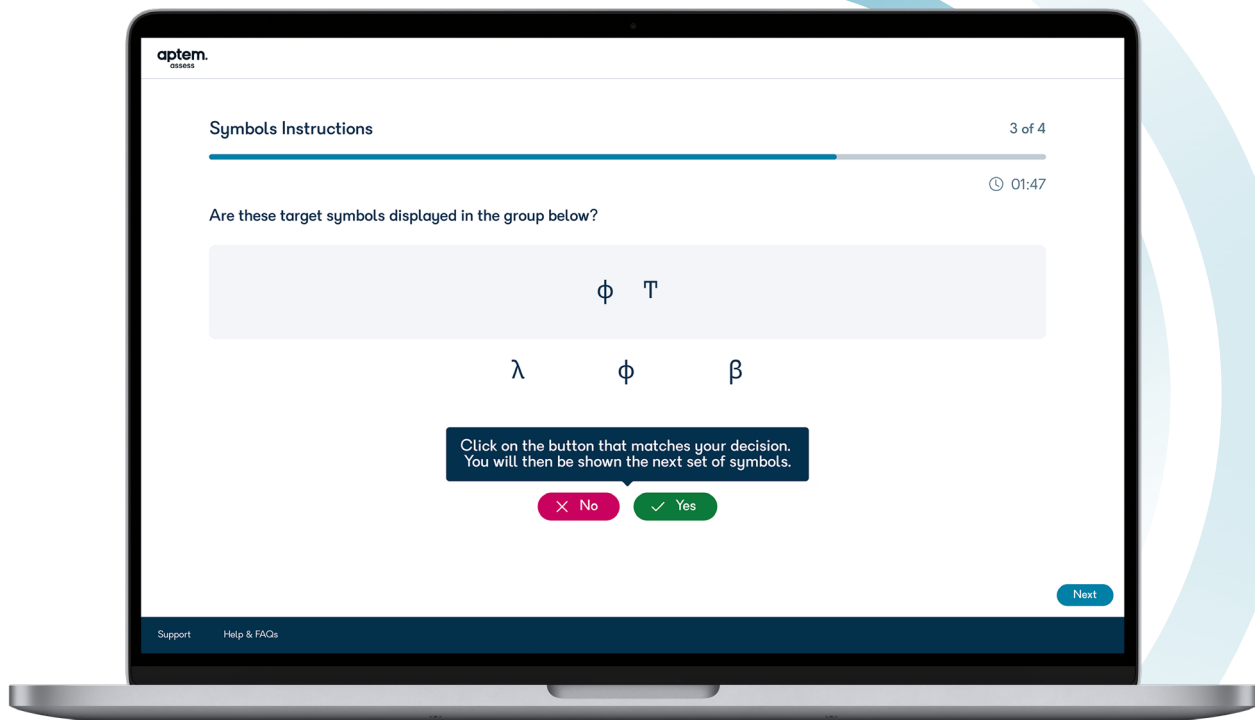
¹ McLoughlin, D., & Doyle, N. (2017). "Psychological assessment of adults with specific performance difficulties at work". The British Psychological Society. <https://www.bps.org.uk/guideline/psychological-assessment-adults-specific-performance-difficulties-work>.

A formal assessment is time-consuming and typically includes cognitive tests of key cognitive subcomponents² such as verbal comprehension, visual spatial processing, nonverbal processing; working memory, attention and cognitive processing speed. Lower performance or an imbalance in one or more of these areas, is an indication of a specific difficulty.

Aptem Assess works by measuring eight key cognitive processes that usually underpin learning. Designed to cover cognitive processing of information presented in terms of visual, spatial, verbal and numerical as well as memory and perceptual processes, Aptem Assess is adaptive and sensitive to those most likely to have additional learning support needs. Those who have no difficulty with the test content quickly progress through

all eight games (within 15 minutes), whilst those with potential difficulties on any 'game' will be presented with additional test items in order to identify the extent of that cognitive process.

A learner's score on each of the 'games' is compared to those of a representative population of adult learners, and a potential difficulty is flagged where the learner performs significantly below the average of the group. In such cases we recommend a follow-up discussion with the learner. Learners who do not perform as well may have learning support needs which impact on their learning, but they may also have previously recognised these difficulties and developed their own strategies for overcoming them.



² Sub-components are defined by the widely recognised Cattell-Horn-Carroll model of intelligence. For example see Flanagan, D. P., Alfonso, V. C., Costa, M., Palma, K., & Leahy, M. A. (2018). "Use of ability tests in the identification of specific learning disabilities within the context of an operational definition" in Flanagan, D. P., McDonough, E. M., and Kaufman, A.S. *Contemporary intellectual assessment: Theories, tests, and issues, Fourth Edition*. Guilford Publications.

Why is Aptem Assess useful?

Identifying whether learners need additional learning support can be time-consuming and disengaging for learners who do not need support.

Aptem Assess enables the quick identification of learners who may have unidentified learning needs whilst not requiring other learners to invest a significant amount of time completing lengthy tests which will not benefit them.

Aptem Assess is optimised for completion on mobile, tablet and desktop devices. A clear interface makes it easy to use, and the 'game' styling means that it appears less threatening to those learners who dislike formal tests.



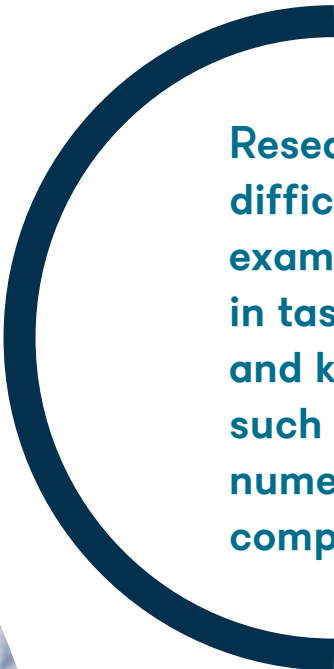
For 87% of learners, the test will take no more than 15 minutes to complete.



The science behind learning support assessments

Among academic researchers there is agreement that cognitive differences are described by the Cattell-Horn-Carroll (CHC) theory. The CHC model states that cognitive ability exists as a hierarchical structure, with an overall intelligence or general ability 'g' (level 1) under which there are nine distinct measurable level 2 sub-components, for example, short-term memory, visual processing and processing speed. Below each sub-component there are more defined cognitive abilities (level 3) that can also be measured. Current research shows that distinct learning difficulties can be linked to weaknesses in one or more of the CHC level 2 components (e.g. Flanagan et al, 2018).

The focus here is measuring whether a learner might have a specific area of cognitive weakness that might undermine learning new skills or knowledge. Learners will be asked to complete many different tests to identify if they have a weakness in one or more cognitive areas. For example, the Wechsler Adult Intelligence Scale (WAIS) is widely used for this purpose. The WAIS is an extensive battery of tests that includes assessments of various cognitive processes such as: verbal comprehension, visual spatial processing, nonverbal processing; working memory, attention, and processing speed. Lower performance in one or more of these areas compared to typical or higher scores across the rest of the test battery is an indication of a specific difficulty.



Research shows that difficulties in the above examples explain challenges in tasks that underpin learning and knowledge acquisition such as reading and writing, numeracy, memory, and comprehension of information.

What is measured by Aptem Assess?

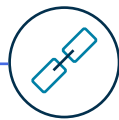
Building on the CHC model, eight 'games' were developed. The assessment techniques were designed to cover information presented in terms of visual, spatial, verbal, and numerical as well as memory and perceptual processes typically involved in learning.

The eight 'games' are:



Symbols

A measure of processing speed using visual information. This game involves quickly identifying whether target symbols are present in a larger set of visual symbols. Perceptual processing speed has been shown to underpin the acquisition of new information.



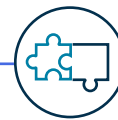
Similar words

A measure of verbal reasoning. This game involves identifying whether pairs of words are related in semantic meaning. A task used in many educational ability tests.



Number recall

A measure of digit memory span, which is a standard assessment of working memory with a normal range of 5 to 9 digits. The digits e.g. a phone number, need to be recalled in the correct order.



Picture completion

A measure of spatial and visual reasoning. This game involves identifying the missing piece of a picture from a set of options.

Regarding impact on learning, evidence shows that:

××
64398
63498

Those with dyscalculia may recall the digits but not in the correct order.



Individuals with low memory span have difficulties processing complex information.



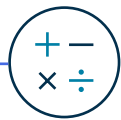
Aptem Assess enables us to tailor our support and gives tutors a clear picture of each student’s needs, which leads to much better learner outcomes.

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Fake words

A measure of word recognition. This task involves deciding whether a word is real or not and includes a range of regular and irregular words. The ability to quickly access long-term memory to correctly identify a word is a task that is challenging for many dyslexics.



Missing numbers

A measure of arithmetic involving the operations of addition, subtraction, multiplication, and division using integers.



Objects

A measure of short-term memory. This task is an assessment of memory recall for a set of previously displayed visual objects.



Shapes and colours

This is a test of executive functioning – the ability to focus and not be distracted by interfering perceptual information. Executive functioning is an important cognitive process in learning. This game is a version of the widely used Stroop effect.

How was Aptem Assess developed?

Aptem Assess was developed by Chartered Psychologists who followed psychometric best practice guidelines as described by the British Psychological Society (BPS), the International Test Commission (ITC), and the European Federation of Psychologists.

For each ‘game’ a large set of items covering varying difficulty levels were written by Chartered Psychologists with extensive experience in writing ability test items. These items were then completed by participants from a selected number of Aptem customers. Participants included a range of genders, age groups and self-reported ethnic backgrounds. 16% of the group reported having a recognised learning or health issue under the relevant ILR categories.

The data from the trialling phase was analysed applying recognised best practice in the development of psychometric tests (see guidelines published by the British Psychological Society and the International Test Commission).

For each test type, questions were chosen to create multiple versions of a short test and a longer test. The overall aim is to identify whether a learner is in the bottom sixth of performance on the test, which means they are significantly below the average performance range.



These are designed to identify whether an individual is likely to be in the bottom third of performance on the test. Those who have no difficulty with the content of the test will achieve a relatively high score.

These contain more questions and are designed to identify whether the individual’s ability to process the test content is in the lowest 16th percent of test takers.

For both short and long variants, questions were selected to ensure that the test quality followed psychometric standards in terms of reliability and validity.

The criteria included:



The item sets met accepted statistical criteria for internal reliability.



Item sets have a range of item difficulty and, where possible, content.



The short sets for a particular test type require the same amount of completion time – i.e. the average completion time for the set of items would be consistent.



The long sets for a particular test type require the same amount of completion time – i.e. the average completion time for the set of items would be consistent.



The allocated time would allow 90% of respondents to complete the items.



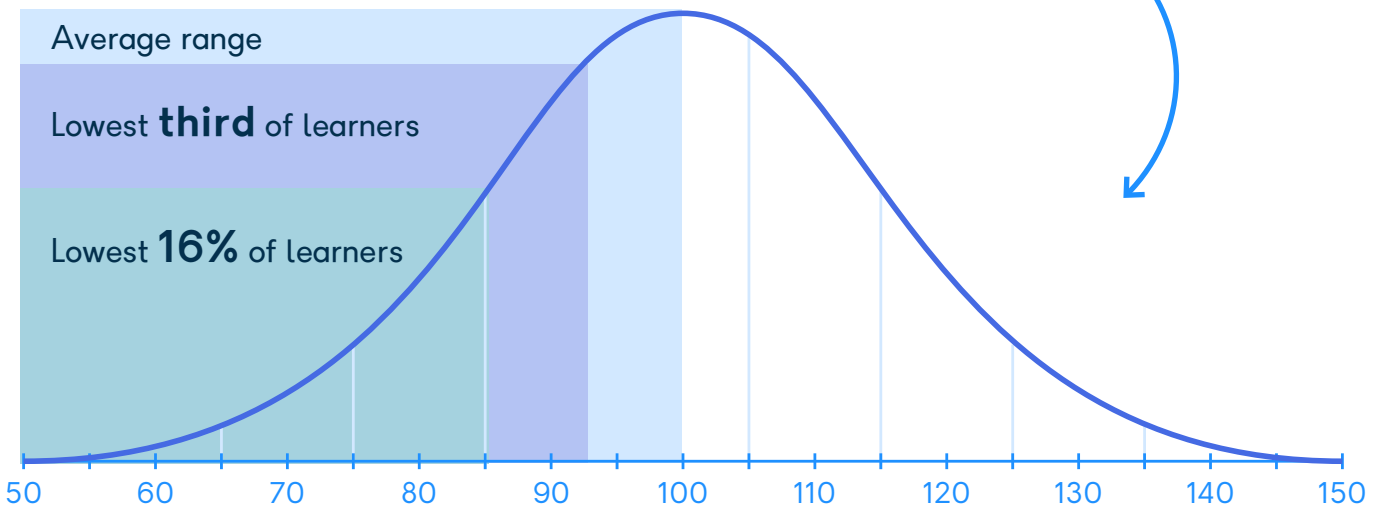
The selected items do not show any obvious performance differences based on protected characteristics such as gender, age, and ethnicity.

How is Aptem Assess scored?

Aptem Assess uses *norm-referenced scoring*. This is where an individual’s results are compared to an existing data set collected from a large group of people. The individual’s performance is interpreted relative to the population of other people who have previously completed the test.

The test score is often presented in terms of percentiles, which indicates how their score compares to others. For example, a percentile score of 70th means that the individual scores better than 70% of people taking the test. A percentile score of 50th means that the person did better than 50% of people, but also that 50% of people scored higher – i.e. their score is average.

Aptem Assess is scored on a 50 to 150 scale where 100 is the average score for each test. The expected distribution of scores is shown as a normal distribution or bell curve in the chart below.



- ✓ The shorter tests are designed to assess if an individual is in the lower third (i.e. their score would be 93 or below).
- ✓ If a learner scores higher than this then their score is at least average and it is unlikely they will have additional learning support needs.
- ✓ The longer tests are designed to check if an individual is in the lowest sixth (i.e. below 85) and thus have significantly lower scores than average. This group is likely to have additional learning support needs.
- ✓ Aptem Assess is designed to be sensitive to those most likely to have additional learning support needs, thus a result is only returned if a learner's score on any of the tests matches that of the lowest sixth of the population.
- ✓ The short tests do not contain enough questions to accurately measure where a learner might be placed in the upper range of scores. We can only say they are average.



Key features of Aptem Assess

Identifying whether learners need additional learning support can be time-consuming and disengaging for learners. Aside from learners with formal diagnoses for learning difficulties such as dyslexia and dyscalculia, some learners have unidentified needs. Many existing solutions require learners to invest a significant amount of time to complete lengthy tests, the outcome of which will benefit a relatively small minority.

Aptem Assess provides a solution that:

- ✓ Minimises the time invested by learners, such that learners within the normal range (i.e. without additional learning needs) complete the assessment within fifteen minutes, whilst the assessment length adapts to those who perform less well.
- ✓ Is optimised for completion on mobile, tablet, and desktop devices.
- ✓ Has a clear, easy to use, and engaging interface.
- ✓ Meets accepted best practice guidelines for the development of psychometrics.
- ✓ Is underpinned by relevant academic research.
- ✓ Is designed to only assess cognitive processes as opposed to mental health, physical health, or social/behavioural difficulties.

For more
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- ✓ **Aptem Apprentice**, our award-winning, highly customisable system helps providers to deliver compliant apprenticeship training.
- ✓ **Aptem Enrol**, remote onboarding of apprenticeship students, for colleges and universities.
- ✓ **Aptem Employ**, a unique, flexible, award-winning employability system that helps to get people back into the workplace quickly and for the long term.
- ✓ **Aptem Skills**, our award-winning end-to-end delivery platform that enables fully compliant Adult Skills Fund (formerly AEB) course delivery and accelerates re-employment.