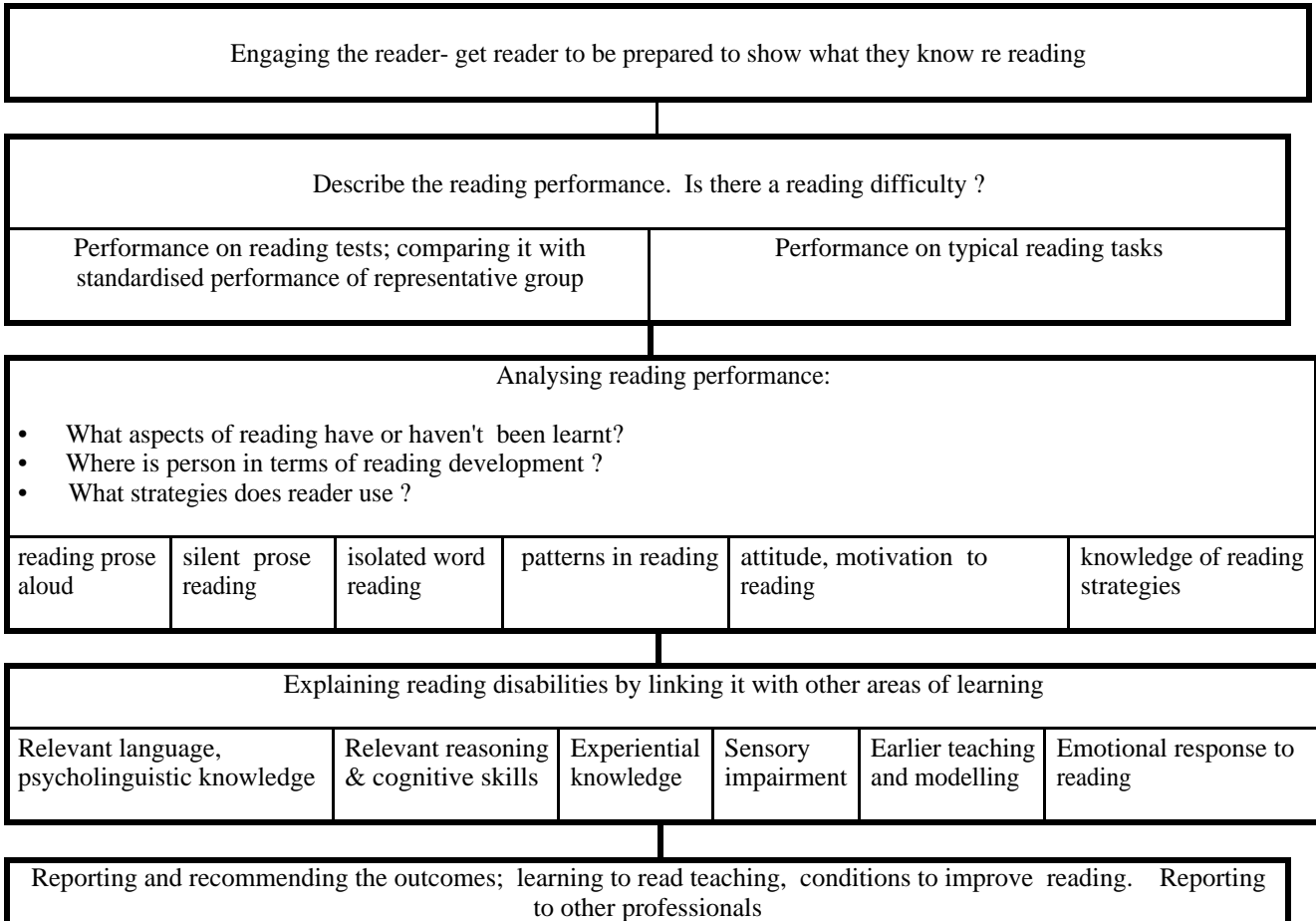


Psychology of Exceptional Learning

Diagnosing reading difficulties

John Munro

A diagnostic pathway for reading difficulties : you need to examine reading at five stages:



Developing an assessment plan : To diagnose reading difficulty gather information to answer the following questions:

engage reader in reading	
describe reading performance	Evidence of a reading difficulty ? Screen reading performance
analyse reading performance	What aspects of reading have/ haven't been learnt ? How does reader read ?
explain reading difficulty	What related areas of learning may have lead to the reading difficulty?
recommended intervention	Under what conditions can the reader more easily learn to read?

What reading behaviours do you assess ?

You can assess	To collect samples of reading for later analysis
reading prose aloud and evaluate <ul style="list-style-type: none"> word reading accuracy; proportion of words read correctly and automatically reading rate and how fluently the text is read, how well the text is comprehended at word, sentence, conceptual, topic levels how well readers can correct errors made and deal with loss of fluency 	<ul style="list-style-type: none"> record precisely what readers say as they read. record time taken to read each sample of text. do readers answer comprehension questions automatically or need time to organise their thinking ? note readers' stress, behavioural indicators record how reading ability changes when cued to read under different conditions.
reading prose silently, evaluate comprehension at <ul style="list-style-type: none"> word level; match text words with pictures or synonyms, sentence level; paraphrase, re-tell, literal tasks, conceptual level; predict, cloze topic level; summarise, skim, scan, infer main ideas, select best title The time taken to respond indicates the extent to which aspects are attention demanding.	<ul style="list-style-type: none"> in multiple choice tests, note items answered correctly /incorrectly and incorrect choices. in cloze tasks, note words inserted and whether ability changes when they read aloud where readers read a text and select the best matching picture, record the time taken to read the text initially and then to make the choice. record how reading ability changes when cued to read under different conditions. record on audio-tape the reader's ability to read the text aloud after completing the task.
reading individual words; note the types of words <ul style="list-style-type: none"> read automatically reader using analysis and segmentation that cause difficulty read in prose but not individually. 	record attempts and whether each word was read automatically

Describing reading performance Does a reading difficulty exist ? Compare how the reader reads with the reader's peer learning group or a comparable normed group.

Selecting the test The tests you will use will be determined by

- the reading behaviours test; reading aloud or silently, reading prose or individual words,
- the age / grade levels of the readers,
- the mode of administration you want; to assess readers individually or in groups and
- the information you want.

For readers > grade 2, collect samples of reading prose aloud and silently and reading individual words. For younger readers, collect as well samples of the reader's letter-sound knowledge.

To collect samples of reading for later analysis, keep record of the text read and reader's output. Useful procedures include

- for reading prose aloud:
 - record precisely what readers say as they read.
 - record the time taken to read each sample of text.
 - note whether readers answer comprehension questions automatically or need time to organise their thinking and exactly what they say; this will indicate oral abilities.
 - note readers' level of stress and any behavioural indicators of this.
 - record how reading ability changes when cued to read under different conditions.
- for silent prose reading,
 - in multiple choice tests, note items answered correctly /incorrectly and incorrect choices.
 - in cloze tasks, note the words inserted and whether ability changes when they read aloud the text having the responses. Does reading aloud assist comprehension ?
 - for tests in which readers read a text and then select the best matching picture, record the time taken to read the text initially and then to make the choice.
 - record how reading ability changes when cued to read under different conditions.
 - record on audio-tape the reader's ability to read the text aloud after completing the task.
- to read isolated words, record attempts and whether each word was read automatically.

How will you describe the reading performance ?

- standardised tests give you norm-referenced descriptions. They either
 - link the reading score with age and / or grade norms.
 - describe the performance in terms of %ile rank or stanine score for groups of students.
 - provide a standard score.
- in terms of the type of text readers can read easily, with some thought and with difficulty and
- in terms of the reading abilities or competencies displayed.

Early reading tests

Area of reading behaviour	Edwards	Early Detection of Reading Difficulties	Doren Word Reading Test
Copying written text	<ul style="list-style-type: none"> • dictation; copy shapes, upper and lower case letters, dictated words (WLPT- R) • see word and write it (Edwards) • dictation for simple sentences (Clay). 		
Visual matching	select matching letter/ word (Doren)		
Visual memory	select previously-seen word from row of words (Edwards)		
Visual word analysis	Doren		
Letter -sound recoding	<ul style="list-style-type: none"> • identify upper case and lower case letters by saying its name and a sound for that letter (WLPT- R; Edwards) and a word that begins with its sound (Clay) • hear word and select written word that begins / ends with same sound (Doren) 		
Auditory memory	memory for sentences; repeat phrases of increasing word length (WLPT- R)		
Listening skills, comprehension	listen to paragraph, retell , answer questions (Edwards)		
Phonemic awareness- rhyming	Doren		
Match written and spoken words	<i>Circle the word you hear</i> him, hip, hit, his (Doren)		
Spell phonetic, non-phonetic words	WLPT- R; Edwards		
Word meanings	name pictures of items (WLPT- R)		
Oral expression	Edwards		
Read sight words	Clay, Doren		
Aware of written text conventions	Concepts about Print (Clay)		
Express ideas in writing	write name, words in 10 minutes, analyse for <ul style="list-style-type: none"> • language level, the most complex linguistic forms • message quality (concept of written symbols, letters), (Clay) 		
Analyse prose reading aloud	Clay, Doren		

Notable features on assessment scales

- Examining orthographic processing (Doren)

Circle the letters which are the same as the first letter in each row

h	h	r	n	u	h	b
d	p	b	d	q	h	d
i	k	i	l	j	i	l
e	e	o	i	g	e	a

In each box circle the two words that are the same

yellow
little
kitchen
pretty
little

father
family
funny
father
friend

name
come
came
home
came

Tests measuring word level reading

		Outcome described	Normed ?	Format
Doren Diagnostic Reading Test of Word Recognition Skills (1973)	DorRT			
Primary Reading Test (France, 1981)	PRT	nc	UK 78, P-2	gr, mc
Domain Phonics Test (McLeod & Atkinson, 1972)	DPT	nc		ind, say
Progressive Achievement Tests: Reading Vocabulary	PAT:RV	nc, tm	Aus 70 G 3-9	gr, mc
ACER Primary Reading Survey Tests	PRS	nc	Aus 72 G 1-6	gr, mc
Peabody Individual Achievement Test: Reading Recognition	PIAT: RR	nc	US 86K-12	ind, say
Kaufman Test of Educational Achievement: Reading Decoding	KTEA;	nc, ae	US 82-3 K-12	ind, say
Woodcock Language Proficiency Language Battery - Revised (1991)	WLPB	nc	US 87-9 2-16+	ind, say

read aloud lists of isolated words of increasing complexity from 1-4 syllable words	PIAT: RR, KTEA, WLPB-R
graded word lists as IRI	
read aloud words organised into letter cluster categories; 1-syllable words with short and long vowels, and consonant and vowel blends	DPT
match written words with pictures	PRT, PRS
select word based on meaning; read a sentence from which a word has been omitted and select from a set of four words the one that fits it	PRT
match written word with homonym	PAT:RV, PRS, WLPB
word analysis; recode unfamiliar words, nonwords to spoken form	WLPB-R

Sentence, conceptual and topic level tests

		How text is read		Type of text		Format	Outcome described	Normed ?	Useful ?
		aloud	silent	short	long				
TORCH Test of Reading Comprehension (1987)	TORC		√		√	cl	nc+ae	Aus '84 grs 3-10	gr P-S
Paragraph Reading Test (A.C.E.R., 1977)	PRT		√	√		mc	nc	no	gr Sec
Neale Analysis of Reading Ability 3 (Neale, 1998)	NARA	√		√		asq	nc+ae	Aus 98 grs P -6	indiv Pri
Progressive Achievement Tests: Reading Comprehension	PATRC		√		√	mc	nc	Aus 98 grs 3 -9	gr P-S
Primary Reading Survey Tests Levels A - D (ACER,	PRS		√	√		mc	nc		gr Pri
Peabody Individual Achievement Test: Reading Comprehension	PIAT		√	√		sp	nc	US	indiv P-S
Woodcock Language Proficiency Battery - Revised	WLPB		√	√		cl	nc	US 80s age 2-79	indiv P-S
Secondary Screening Profiles : Reading	SSP:R		√		√	mc/cl	nc	UK '94 age 11-3	gr P-S
ACER Tests of Basic Skills Aspects of Literacy	TBS- AL		√		√	mc	nc	Aus '95 gr 4-6	gr P-S
Progress in English 8 - 13	PE		√		√	cl	nc	UK '90s age 7-14	gr P-S
	KTEA					asq	nc	US '83 gr 1-12	indiv P-S

Format : multiple choice (mc), answer spoken question (asq) cloze (cl) select picture (sp)

How outcome is described : number correct (nc) time to answer (tm) analyse error (ae)

Useful ? is test used for groups or individually (gr vs indiv) and for what grade levels (Pri, Sec or P-S)

read text aloud and answers comprehension questions. Time taken is used to calculate reading rate	NARA
read silently a text (fiction /non-fiction) and do cloze re-telling of it	TORC (long texts), WLPB-R (short text), SSP (long texts), PE (long texts)
read sentences silently and select picture that matches the text	PIAT
vocabulary, analogies	SSP (meanings of words in text), WLPB-R
proof reading and editing	SSP, PE (spelling and writing conventions)
match written statements	SSP (readers match points of view about a topic)
answer multiple choice items	TBS- AL (posters, poetry, written procedures, factual and narrative, PATRC, PRS

Informal Reading Inventories IRI procedures help you estimate 'how far away' students are from reading particular texts. Select unfamiliar texts graded in difficulty of 100-words for beginners to 350 words for more advanced readers, with 5 comprehension questions assessing detail recall and inference. Start with text at or below estimated level of independent reading level. If unsure of entry, use a graded word list. Cease testing when performance is below the criterion for frustration level. Use more difficult text for listening comprehension. Performance level for each IRI category is:

Reading Level	Word reading accuracy (%)	Comprehension accuracy	Qualitative description
Independent	99	90	Fluent, natural, no finger-pointing or hesitations
Instructional	95	75	Generally relaxed reading, the text is challenging
Frustration	Below 90	Below 50	Reader is tense
Listening ability		75	

Analysing reading performance. To identify areas of reading mastered

read prose aloud	read prose silently	read isolated words	habits	strategies	attitudes and feelings
<ul style="list-style-type: none"> the types of text read well and the types that -- >drop in performance comprehension accuracy 	<ul style="list-style-type: none"> texts comprehended easily or with difficulty how well they take remedial action, how they use planning and comprehending actions. 	note types of words read automatically / using word analysis and segmentation strategies / that cause difficulty.	how often they read, literature they prefer to read	what readers know about useful reading strategies	about reading, what readers believe about reading, how it is learnt and themselves as readers, their interest in reading
the conditions under which they can improve how they read, use their knowledge /strategies					

Analysing reading prose aloud. Analyse

- how accurately they read words, use letter patterns, the text meaning and grammar to assist
- how well they understand the text and
- how fluently they read it, how well they convert it to oral language.

Word reading accuracy. To categorise the errors, note whether

- words are read correctly and automatically or with an investment of attention.
- the sentence with the error is acceptable grammatically.
- the error changes the meaning of the sentence containing it.
- the miscue was corrected, that is whether readers use 'remedial' or 'fix-up' strategies
- each error looks like its matching text word (that is, has 'graphic similarity') ?
- each error sounds like its matching text word (that is, has 'phonic similarity') ?

Coding the miscues. Use the code below to record on the text how a reader says each word: denote

- words read correctly and rapidly (that is, automatically) by a tick (√)
- words on which reader hesitate before saying a word or part of a word by H.
- words that they read in parts and incorrectly by what they said; note what they said for
 - partially vocalised words, words read as non-words, words read with intonation shift
 - words read as a vocabulary or grammatical variation of a word
- self-corrections by drawing line around repeated words and note purpose for repetition:
 - show correcting an error by C
 - show replacing a correct by incorrect response IC
 - show unsuccessfully correcting an error UC
- anticipating difficult words coming up by pausing and repeating word/s A
- substituted words by writing them above their matching word in the text
- words that are omitted by circling them
- words that are reversed are drawing arrows above them
- added words by marking them on the text at the point of insertion using the Δ symbol.

- said words that had some written similarity with text words for about 50 % of errors; this suggests he uses some of the letter information, distinctive visual features (word level).
 - said words that had no sound similarity with the text words (word level).
- Don could recognise letters and letter clusters but had difficulty converting them to sound patterns.

Use of comprehending strategies. Don

- said sentences that were grammatically correct but did not use the grammar of the written sentence. Further assessment may determine whether he has appropriate grammar and uses it.
- did not seem to use the meanings of words in the text. Further assessment of his knowledge of word meanings and their links may determine his level of semantic knowledge.
- did not seem to monitor for meaning as he reads; he did not attempt to re-read when what he said didn't make sense or wasn't connected to earlier ideas.
- did not use 'repair strategies for dealing with corrections.

Comprehension; spontaneous retelling in readers' words. Give 1 point to each main idea in the text. For the text above, the key literal ideas and the ones you could infer are as follows.

Characteristic of retelling	Ideas in the story	N of ideas
the main characters	The main characters are Sam, Tom, Pat and Rob	4
theme of story	About boys who were going to the sea	1
plot of the story	One of the boys is new to the island and the others are taking him to a beach	2
events of the story	•Wherever you are on the island you're close to the sea	1
	•Some of the beaches are good for swimming and others, with big waves, for surfing	1
	•They are going along a road to a beach	2
	•Tom said Rob would like this beach	1
	•Rob could hear the waves and smell the sea	1
inferential ideas (infer, predict, explain, read between the lines)	•the island was small.	1
	•all the boys except Rob lived on the island.	1
	•some beaches were ocean beaches.	1
	•the land near the beach they were going to was hilly.	1
	•the boys liked the sea / surfing/ swimming / both.	1

There are 12 main literal and at least 5 main inferential ideas. Don re-told the text spontaneously as *There were these boys. They liked surfing. There were going to this beach to go surfing.* This re-telling specifies 3 main ideas. His re-telling score did not exceed 16 %.

Following the spontaneous re-telling, use directed questioning to examine further comprehension (cued retelling) for example for a narrative you can ask

- *Who else was in the story ? What did they do ? Did . happen first ?*
- *Why did ... happen ? Why did they do?*

Examine inferential knowledge by asking questions that go beyond the information given:

- *Why do you think happened ? Would it have happened it*
- *How do you think ?*

Examine topic knowledge by asking questions that involve a summary of the information given:

- *Make up a headline to say the main ideas in the story.*
- *What is a good title for the story ?*

For the test above, the questions Don was asked and his answers are shown below:

- What were the names of the main characters ? *Tom, Rob* (2 marks)
- Where does the story take place ? *At the beach* (0 marks)
- Did they have far to go to a beach ? *No* (1 mark)
- What sports did people do at the beaches in the story ? *Swimming, surfing* (2 marks)
- How do you know the island was small ? *I can't tell* (0 marks)
- How do you know Rob was new to the island ? *He had pictures of it.* (1 mark)

Don recalled 16 % of the main ideas spontaneously and an additional 30% under cued comprehension . Further assessment may indicate whether his comprehension for this type of text could be improved by teaching that increased his automatic reading of words, his level of existing knowledge, his ability to use what he knows, his use of comprehending strategies.

Fluency Does the reading have the 'flow' of oral language ? Fluency is distorted when readers

- read mechanically, without expression
- read word by word rather than in phrases and sentences

- read at an inappropriate rate ; either too fast for comprehension monitoring or too slow for the ideas to be retained in short-term memory
- hesitate and stumble over words so that the flow is distorted or they lose their place
- misuse punctuation.

You can assess fluency for reading different types of text by

- measuring the time taken to read the text and calculate a reading rate by dividing the number of words read by the time taken; this gives an estimate of the words read per second,
- using a checklist to describe the reading aloud

Analysing reading prose silently in various ways

- in the type of comprehension; how well readers display
 - literal comprehension; re-tell or paraphrase the ideas in the text
 - inferential comprehension; predict, interpret, apply and transfer, analyse it
 - evaluative comprehension, that is, evaluate the ideas in various ways.
- in the length of text read and amount of text to retain; some readers comprehend shorter text better because they lack
 - the strategies necessary for planning the reading, seeking and organising information
 - the motivation necessary to continue the reading.
- in the complexity of text read; readers may comprehend ideas better when in more simply written text with less complex grammar and fewer ideas per sentence.

How readers read silently . Analyse silent reading strategies :

- analyse the errors made in cloze contexts under silent reading.
- ask readers to describe how they went about reading.
- observe reading behaviours while reading silently; are they on-task and goal-oriented, do they verbalise aloud, need to re--read text to store it in short-term memory.

For each incorrect response see whether

- it follows in grammar from the immediately preceding few words.
- it fits with the overall grammar of the sentence ----> reader uses grammar at sentence level.
- it fits with the meaning of the preceding words but not with the topic or concepts of the text.
- the sentence with the incorrect response is sensible ----> readers integrate and monitor ideas.
- it fits with the meaning and grammar of the sentence but not with the concepts or topic of text.

Following is a Year 9 reader's performance on "I Want to Be Andy", from the TORCH.

Text	Reader's response	Follow in grammar	Fits with grammar of sentence	Follows in meaning	Fits with meaning of sentence	Fits with meaning of topic	Self-corrects when read aloud
who had ...in the	ambushed	√	N	√	√	√	N
labelled him as	Andy	√	√	√	P	P	N
because there was...	purple silk jacket	N	N	N	N	N	N
he realised..., because	bleading (bleeding)	N	N	P	P	N	N
such as ...and	to tell he was alive	√	√	P	P	P	N
to see ...as the cause	futcher (future)	N	N	P	N	N	N
was just ..., and his	had died	N	N	N	N	N	N
Summary data		N = 4 √ = 3	N = 5 √ = 2	N = 2 P = 3 √ = 2	N = 3 P = 3 √ = 1	N = 4 P = 2 √ = 1	N = 7

From this summary table you can see that the reader

- monitored for grammar at the phrase level in approximately 50 % of the errors.
- monitored for grammar at the sentence level in 30 % of the errors.
- monitored for meaning at the phrase level in 30 % of the errors.
- monitored for meaning at the sentence level in 15 % of the errors.
- did not self-correct any of the errors when reading the text aloud after completing the cloze.

Subsequent assessment may examine whether the reader has the oral grammatical and meaning knowledge and whether the silent reading difficulties are due in part to non-automatic word reading .

Comprehension outcomes To evaluate the different types of reading comprehension outcomes, ask reader the types of comprehension questions at each of the levels of text.

Type of comprehension outcome	text A	text B
Word level ask reader to		
Suggest synonyms and antonyms for unfamiliar words in the text		
Suggest plausible meanings for words by using the context		
Sentence level ask reader to		
Retell a sequence of sentences, paraphrase sentence		
Answer literal questions		
Conceptual level ask reader to		
Make prediction about the text		
Infer, read between the lines		
Explain cause and effect		
Topic level ask reader to		
Suggest the area of knowledge into which it fits		
Suggest a title		
Summarise or precis the text in one or two sentences		
Dispositional level ask reader to		
Suggest what the text would like readers to believe about ideas.		
Suggest how the text wants them to feel.		

You can rate a reader's performance on each comprehension outcome, for example rate

- high level of comprehension as 4
- a partial comprehension as 3
- little comprehension as 2
- no comprehension as 1.

Describe each text by noting features such as

- its genre; narrative-fiction, fantasy, expository, descriptive, poetry, play, argument
- its grammatical complexity, the extent to which sentences vary from the simple third person.
- the conceptual density of the text, the 'information load'
- the extent to which the context differs from readers' experiences
- the level of extra-linguistic support
- the level of abstractness of the ideas; whether ideas have concrete or in more abstract links.
- the level of complexity of word meanings.

If you were interested in monitoring the conditions under which a particular reader displayed each comprehension outcome, you could re-organise the matrix into a process-outcome format:

Type of comprehension outcome	Level of help needed	When read text aloud	When visualised text	When re-read text
Suggest synonyms and antonyms for unfamiliar text words				
Suggest plausible meanings for words by using context				
Retell a sequence of sentences, paraphrase sentence				
Answer literal questions				
Make prediction about the text				
Infer, read between the lines				
Explain cause and effect				
Suggest the area of knowledge into which it fits				
Suggest a title				
Summarise or precis the text in one or two sentences				
Suggest what feelings, attitudes text does text present.				
Suggest how the text wants them to feel.				

Assessing knowledge of letter clusters : Reading individual words

Readers read words in different ways;

correctly and rapidly	have learnt the letter cluster pattern for the word use particular distinctive features of the word correctly
correctly after a relatively long interval	have difficulty recalling how to say the word segment the word into several letter clusters that synthesised sub vocally
correctly by segmenting and saying each part	have letter and letter cluster -sound links and use letter-sound analysis can't process letter clusters without vocalising them

Errors can also tell you about letter cluster knowledge. Types of errors and what they mean:

Word reading error; readers	What this means for orthographic knowledge
jumble or delete letters; read 'plod' as "pold"	Reader has individual letters, not clusters or uses distinctive visual features of words.
read vowel / consonant digraphs (such as 'ar' in 'car' as separate letters).	Orthographic knowledge mainly at the letter level.
add sounds to written word	Inflexible phonological patterns and links
say word incorrectly after saying part of it correctly	Orthographic knowledge is at small cluster / letter level and reader has insufficient attention to <ul style="list-style-type: none"> retain recoded letters, continue analysing word retain recoded letters and integrate it.
say response that doesn't look like text word	Reader uses distinctive features or guessing.

Questions to ask about assessing letter cluster knowledge.

- What letter cluster knowledge do they have ?
- How efficiently do readers use their letter cluster knowledge ?
- Do readers' ability to read orthographically in the isolated word and the prose contexts differ?
- What is the nature of readers' orthographic ability when reading prose ?

Assessing level of orthographic knowledge You need to

- note how they read individually presented words of different orthographic complexity and
- identify those words and letter clusters read automatically and accurately.

To administer Orthographic Reading Test note whether readers read each word

- correctly and rapidly (that is, automatically) (denote by √)
- correctly after a longer interval (> 2 seconds) (write H above word for each second delay)
- correctly after saying part of the word first (write above the word the part/s said)
- correctly after saying each sound or some letter names (note what readers say above the word)
- incorrectly; note down what they say above the word.

clam claim	plant plate	for ford	√ men	√ hiss	drat dart	H H H drill	c, cort counts	blow boil	√ new	H all ail	stip stripe
√ place	√ eat	ac, act ace	br --> √ braid	√ den	dun dune	cub cube	scr-een screen	sed send	foil foal	bus burst	√ stamp
H H pea	fed fend	H Hcrol crawl	Hspinac spawn	√ spoon	pen pew						

Compile an orthographic profile for Michael as follows:

How word is read	
<ul style="list-style-type: none"> • correct and rapid men den pen, miss kiss, hiss spill grill, drill, still stamp cramp ash, she cow, new straw, aid, aim, train 	Types of errors
<ul style="list-style-type: none"> • correct and slow spring, sprung, strong ash, string 	
<ul style="list-style-type: none"> • correct and slow, part of it said before reading the word street ---> string --->√ part ----> p-art --->√ 	

<ul style="list-style-type: none"> incorrect send, bend, fend clamp strip -> sed, bed, fed, c-amp, stip strict, splint, prompt ----> sriect , sp/speed/split, prum shy ----> shay dew, pew ----> den, pen ape, plate, grape, ale, ace --> apple, plant, gran, all, ac/act twirl, squirm, skirts --> tweel, squick, skrits crawl, spawn, drawn ----> crol, spinach, down	sj	sd	dl	nos	spc	mv
		√				
		√				
		√	√		√	√
	√				√	√
			√			√

sj - letters in the stimulus word were jumbled in the spoken response

sd - letters in the stimulus word were deleted in the spoken response

dl - response is a word read accurately by reader and shares visual features with the stimulus

mv - mispronounces vowel digraph (vv, vc or v-c)

nos- response is a word read accurately by the reader but has no orthographic similarity to the stimulus.

Analyse patterns and compile a word recognition profile, as follows :

note orthographic similarity between words read relatively automatically	Michael read automatically the shortest words and the high frequency words, particularly those in which each letter maps into a separate sound
note how words read correctly but not automatically are similar to / different from words read automatically	Michael <ul style="list-style-type: none"> said more slowly words that had the (cc) digraph said the onset prior to the rime for some (vv) and (vc) digraph
for words read incorrectly, note similarities between the written word and the reader's response.	Michael <ul style="list-style-type: none"> deleted a letter from several consonant blends, (for example, spr, scr, end in words such as send, bend, fend, strict, clamp). juxtaposed letter positions. This suggests difficulty <ul style="list-style-type: none"> seeing letter clusters as units, for example, not seeing the 'ir' unit in skirts. linking some of vc and vv digraphs with their correct sounds, for example, ar, aw, ir, ew, ow, or, ur, ou, oi, ai, oa, u-e, i-e and a-e.
note the extent to which readers use what they know about some words to recognise others.	Michael read <ul style="list-style-type: none"> 'new' correctly, but didn't transfer the 'ew' to read 'dew' or 'pew'. 'ate' and 'place' correctly but didn't transfer the a-e to 'ape', 'plate' or 'grape'.

These patterns suggest that much of Michael's orthographic knowledge is at the individual letter level.

Transferring orthographic knowledge by analogy. The ability to transfer a letter group such as 'ew' from one word to another is necessary for efficient word reading.

Analysing differences in reading patterns

Pattern	Explanation; readers
Silent reading comprehension > word reading accuracy	have difficulty vocalising text
Word reading accuracy > silent reading comprehension.	<ul style="list-style-type: none"> lack oral language for comprehension. don't use appropriate comprehending strategies. focus attention on word level.
Shorter text comprehended > longer text	<ul style="list-style-type: none"> don't use comprehension consolidation strategies effectively. don't have sufficient short term memory thinking space. difficulty sequencing, integrating and organising text ideas. because word reading not automatised, attend to this.
Reading aloud comprehension > word reading accuracy	rich verbal conceptual knowledge, poor word reading due to poor <ul style="list-style-type: none"> phonological and phonemic knowledge vocabulary knowledge visual coding and processing.

Analysing how readers read

The types of reading strategies to look for in your assessment are:

- how readers plan and decide how they will read, the aspects of their knowledge they will use.
- what they do 'while reading', how they link and organise the ideas they read.
- how they consolidate what they have read.

Note whether the readers

- use various strategies independently,
- know when to use each strategy,
- can apply the strategy to a range of text or just to simpler text.

Assess what readers know about the strategies to use ; collect information by:

- observing what they do when they read:
 - ask them to 'think aloud' or to say how they read ('reflective reading assessment')
 - ask them to use strategies and see whether this helps their reading ('interactive assessment').
- assessing what readers know about how to read; use questionnaires and / or interviews to note what students believe they do when they read.
- assessing what students believe to be 'good' or useful actions to use when they read; use questionnaires and / or interview procedures.

By using these procedures you can :

- assess what readers know about reading strategies to use,
- assess the reading strategies readers actually use when they are reading.
- locate them on the developmental sequence and see what actions they are ready to learn next.

Interactive evaluation :Which strategies help readers read better ? .

You get an insight into the strategies students use by instructing them to use particular strategies and noting the ones that improves the reading. Interactive evaluation and dynamic assessment techniques are being used increasingly to diagnose reading. Types of conditions under which you can cue readers to read include the following;

Before beginning to read the text in detail you can ask readers

- *What is the text about ?* Ask readers to
 - guess the theme of the text and to say the information they use to decide this.
 - suggest words they might expect once they have guessed a possible theme.
- *What are you reading for ?* Ask readers to say their purpose for reading, what questions they think the text will answer.
- *What will you do to help you read ?*

While reading the text in detail, you can ask readers to

- visualise as they read.
- read a small portion of a text at a time, say it in their own words or retell it as they go.
- re-read difficult portions of the text and note whether their performance improve.
- *" Imagine you were there. What might happen next ?"* Ask them to 'think ahead', to predict and then to check their guesses.

You can increase the size of the print, cut up the text into smaller sections, each consisting of two or three sentences, allow readers to track along each line using their finger, have them read more slowly and note whether their reading improves.

Monitoring changes in reading performance under these conditions and observe those that are most conducive to successful reading .

Before beginning to read	While reading
topic level : Ask readers to suggest the possible topic of the text .	sentence level : Remind readers to talk about some of the ideas as they read them or to 'make a mental picture' of each sentence they read.
word level : Ask readers to suggest words that might come up in the text and to suggest how they would spell some of them, the letters some might begin with, etc.	word level : Assist readers to work out words they find difficult.

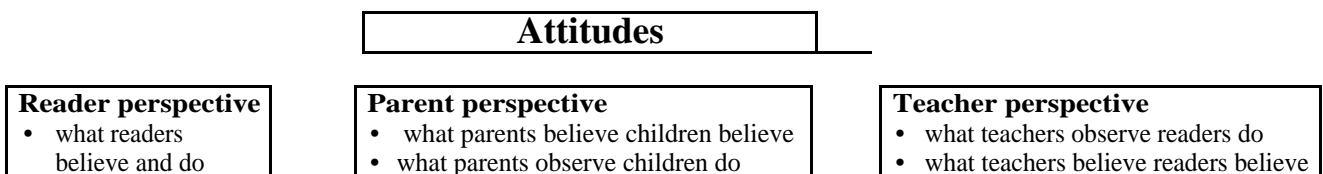
sentence level : Ask readers to talk about some of the ideas they think might arise in sentences, to talk about the images they have in their minds when they first guessed the topic.	
conceptual level : Ask readers : <i>Imagine you were there. What else might happen ?</i>	
strategy use: Ask readers to say what they will do as they read. Ask them to say where they will pause as they read.	

On task attentional and attitudinal behaviours.

Assessing attitudes to reading involves

- collecting observational data from their parents and teachers
- interviewing the readers directly about how their feeling towards reading and their reading habits
- by using questionnaires tapping attitudinal behaviours, self-reports and interest inventories.

Parents may see the anxiety and frustration caused by reading and the avoidance behaviours. Teachers and parents see how readers direct their on-task attention while reading and their reading habits.



Observing attitudinal behaviours in the classroom : whether readers:

- spontaneously approach reading and choose versus avoid reading wherever possible
- show enjoyment or satisfaction versus a dislike for reading, show negative mood changes
 - withdraw into themselves
 - try to avoid reading even to the point of mis-behaving
 - become behavioural problems, irritating and disturbing those around them
 - be more emotionally 'labile' in reading
- display curiosity and excitement versus anxiety and frustration during reading
- are interested / keen versus unwilling to show the outcomes of reading
- request the opportunity to read
- maintain interest versus easily distracted while reading
- show helplessness, increased dependence during reading, request excessive assistance
- seem less able to control and manage cognitive performance
- show an ongoing dislike of and frustration towards reading, behaviours that suggest they
 - want to stop learning reading as soon as possible
 - are overly anxious about reading, fear making errors
 - are rigid in how they read, won't take risks, explore ideas
 - lack confidence in themselves as readers

You can also observe

- how many times a week the reader chooses or elects to read.
- how well the child maintains on-task attention behaviours while reading.
- the approximate length of time for which the reader usually sustains an interest in reading.
- the types of books that interest the reader, the kinds of reading material the reader selects

Observing attitudinal behaviours in the home Parents often see whether their children

- are generally interested in reading or need to be forced to read.
- give up on reading tasks more quickly than other tasks.
- show an ongoing dislike of, and frustration towards, reading, whether they are more likely to throw tantrums when required to read.

Readers attitudes to reading The types of information you might examine include

- what they believe about reading, its values, what reading is like, its value, how it can be enjoyable, interesting or useful.
- how they feel about reading.
- their self-concept as readers.
- what they believe about how to read; what they do when they read, whether it is acceptable to make mistakes, to re-read, to guess at words they don't recognise immediately.
- their interest in reading, what they like to read.

Explaining reading performance Reading difficulties can be caused in part by

- immature earlier language development; specific delay or more global ability to communicate.
- sensory impairment; both early visual and auditory perceptual processing.
- emotional factors such as extreme lack of self concept, anxiety or depression in learning context.
- cognitive, reasoning and information processing factors.
 - Early reading requires an analytic-sequential learning preference or disposition.
 - memory processing, the amount of information the person can handle at once,
 - types of relationships person can see between ideas, the ability to see cause and effect.
- earlier access to appropriate teaching.
- involvement in contexts in which reading is not a valued activity.

It is usually not possible to infer these causes directly from reading patterns.

Referral data

Information from the reader's teacher and school

- past approaches and present approach to reading instruction
- whether the reader has the prerequisites for learning to read, such as
 - visual capacities.
 - oral language and communication strategies,
 - cognitive strategies, for example, whether the reader remembers information
 - appropriate task-organisational strategies
 - attitudes to reading; positive attitude to reading and to self as a reading student.
 - the reader's general learning in the classroom, eg learning difficulties in other areas.

Information from readers. This includes

- how they see reading; what readers do when they learn reading, how they feel about making mistakes, to re-read, to guess at words they don't recognise immediately.
- how they see reading as a discipline, its values, how it can be enjoyable, interesting, useful.
- their emotional response to reading; whether they feel frustration, anxiety
- their self-concept as reading students.

Information from the child's parents.

- view of reading held by the reader, for example, whether readers
 - are interested in reading,
 - need to be forced to do reading tasks more than other homework tasks
 - give up on reading tasks more quickly than other tasks, spend inordinate time trying to read,
 - achieved the appropriate developmental milestones in language and in other areas,
 - indicate an ongoing dislike of, and frustration towards, reading.
- view of reading held by parents, for example
 - Has the child been encouraged in the past to do reading ?
 - Have the reader's siblings shown an interest in reading ?
 - Did the reader's parents find reading hard to learn.
 - Has parent assistance in the past clashed with approaches being used at school ?
- when did the reader first began to display reading problems and whether this emergence was associated with another event, for example, a physical injury or illness, visual problems ?
- the reader's developmental history. Parents can provide information about
 - whether readers achieved appropriate developmental milestones
 - whether readers displayed intermittent hearing loss

General referral information;

- source and reason for referral,
- when the teacher or parent first became aware of the child's reading problem,
- earlier steps taken to help the child,
- learning difficulties in other areas,
- involvement of other professionals in the child's learning history such as
 - sensory impairment ; for example audiologist, ophthalmologists
 - psychologists; information re developmental delay, overall general ability, social interaction,
 - medical; eg neurologist, psychiatrist, illnesses such as asthma, epilepsy, allergies, effect of medication on learning, effect of earlier traumas and injuries on learning,
 - motor development; implications of motor disabilities on reading.

Psycholinguistic knowledge refers to the reader's knowledge of oral language knowledge:

Word level	Sentence level	Conceptual level	Topic level
<ul style="list-style-type: none"> • level of word meanings • pronunciation of words • recalling names 	<ul style="list-style-type: none"> • meaning propositions • syntax • comprehend ideas 	<ul style="list-style-type: none"> • predict cause-effect • ideas in networks, episodes 	<ul style="list-style-type: none"> • ideas for topic • topic sentence

As well, readers need to use metacognitive knowledge.

Linking reading difficulties with psycholinguistic processes.

Word reading difficulty ? Difficulty reading words accurately or automatically can be due to

- phonemic awareness knowledge
- ability to recall names automatically
- vocabulary knowledge; the reader's knowledge of word meanings
- ability to pronounce words accurately.

Assessing level of phonological knowledge

1. An implicit awareness of sound patterns			
	3-sound words	4-sound words	5-sound words
1.1 Recognise rhyming words	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1.2 Produce rhyming words	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1.3 Produce rhyming words in prose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1.4 Recognising words that alliterate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Segment words into sounds			
2.1 Segment words into onset and rime	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.2 Identifying the first sound	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.3 Identifying the last sound	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	2-syllable words	3-syllable words	4-syllable words
2.4 Segment word into syllables.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.5 Syllabic clapping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	3-sound words	4-sound words	5-sound words
2.6 Segment word into sounds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.7 Phonemic tapping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.8 Phonemic counting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Sound blending			
3.1 Onset-rime blending to make a word	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.2 Blending a sequence of sounds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Manipulating sounds within words			
4.1 Delete sound from a word	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.2 Substituting one sound for another	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Locate reader on the developmental sequence to see how far away a reader is from 2.6-8 and 3.2.

Assessing the ability to recall names automatically : Rapid naming tasks Retrieving words efficiently such as colours, letters, digits and objects and labelling items predicts later reading ability.

Pronouncing words accurately, particularly multi syllabic words.

Vocabulary knowledge

Skill	sample test
recall the names of pictures	Picture Vocabulary subtest on Woodcock (PV-WLPBR)
select picture that matches a word heard	Peabody Picture Vocabulary Test (PPVT)
define words	Vocabulary on Wechsler Intelligence Scale for Children
state synonyms and antonyms for words	Oral Vocabulary - Synonyms and Antonyms on Woodcock (PV-WLPBR)

You can compare

- naming items vs selecting the item with a name; compares receptive and expressive vocabulary
- naming items vs explaining what they mean.
- stating synonyms vs defining the words---> how readers have organised word meanings.

Literal comprehension difficulties? Understanding sentences as they written

type of understanding	Test
understanding meaning in different types of sentences; readers retell them, answer questions select picture that best matches what they heard, act out what they heard	Listening Comprehension on Oral and Written Language Scales Processing Linguistic Concepts and Processing Relationships, Ambiguities subtests of CELF
listening comprehension ; readers select pictures that match sentences hear	Listening Comprehension Scale on OWLS Grammatical Understanding sub-test of TOLD Processing Word and Sentence Structure sub-test of CELF.
imitate sentences of increasing complex grammar	Sentence Imitation subtest on the TOLD Memory for Sentences subtest of the WLPBR.
recognise grammatically correct sentences	Producing Model Sentences sub-test of the CELF
say grammatically correct sentences	Producing Formulated Sentences of the CELF

- **Ability to retain information in short term auditory memory**

type of memory skill	Test
repeat sentences of increasing complexity	Memory for Sentences on WLPBR Sentence Memory on WRAML.
retell a story heard	Story Memory on WRAML
recall verbal versus nonverbal information	Design Memory on WRAML
recall unrelated information: Short term memory span	Digit Span subtest on the WISC-III
working memory span for reading; readers read aloud a set of unrelated sentences and recall the final word in each	Reading Span Test

Inferential comprehension difficulties while reading can be due to

type of understanding	Test
predict and anticipate in listening comprehension; suggest word that completes a sentence	Listening Comprehension on WLPBR
explain cause and effect	Comprehension subtest on WISC
link two or more concepts in a network	Similarities subtest on WISC, Verbal Analogies subtest of WLPBR

Visual coding abilities :

Processing clusters of letter information

detect letter strings in longer strings without reading aloud as on the Whole Word Recognition test on the Doren Diagnostic Reading Test. Readers see a set of 5 words and circle the two words that are the same, for example,

yellow
little
kitchen
pretty
little

father
family
funny
father
friend

name
come
came
home
came

Learning to code information.; Coding subtest of the WISC III. Note

- how easily they learn the match between a number and its symbol.
- whether they vocalise as they learn the code.
- whether they operate in an impulsive way or a slower, measured way.
- whether their speed increases or decreases as the task continues

Does general ability explain the reading difficulty ?

Readers who have reading difficulty often have difficulty

- analysing information in ways that are necessary for literacy learning, for example, spontaneously using analytic strategies to develop phonemic awareness; cognitive style.
- matching what they know about a topic with how it is described and developed in a text.
- thinking about the ideas in the text in particular ways, linking the ideas in particular relationships.

Reason for assessing cognitive abilities in relation to reading difficulties may be to see whether a reader

- has access to an appropriate level of verbal and nonverbal reasoning, can relate ideas in the intended ways.
- can operate analytically.
- has knowledge organised verbally.

Which test /s to use ? Types of cognitive assessment scales differ on a number of dimensions

- what they measure; verbal, quantitative or numerical, nonverbal (or performance) reasoning
- the range of task areas
- how they measure it; group vs individual. Most group administered - multiple choice.

	areas measured	number of scales	group or individual	age range	date of norming
ACER Tests of Learning Ability (TOLA)	V, Q	3	G	8-13	1976
ACER Tests of Reasoning Ability (TORA)	V, Q	1	G	adult	1990
ACER Intermediate Tests F and G	V, Q	2	G	10-15 yrs	1982
Verbal and Non-verbal Reasoning Test Series	V, N	12	G	7-15 ys	1990
ACER Advanced Test B 40 (ATB40)	V, Q	1	G	15+	1983
Jenkins Non-verbal Test (JNV)	S	5	G	grs 3-8	1989
Coloured Progressive Matrices (CPM)	S	1	G	5-11	1995
British Ability Scales (BAS II) Second Edition	V, N		I	2-17	1996
Slosson Intelligence Test for Children and Adults (SIT-R)	V	1	I	4+	1991
Wechsler Intelligence Scale for Children III (WISC III).	V, N	13	I	6-17*	1992
Stanford Binet Intelligence Test (Fourth Edition) (SB-FE)	V, N	15	I	6-17	1992

Group administered tests have limited use in the diagnostic process because of their demands on reading and processing ability. Individually administered scales that cover both verbal and nonverbal areas are usually the most useful. Roughly comparable tasks on the WISC III and the SB-FE:

	WISC III	SB-FE
Recall verbal general knowledge, information	Information	
Describe how verbal concepts are similar / differ	Similarities	Verbal Relations
Solve quantitative problems	Arithmetic	Quantitative, Equation Building
Describe the meanings of words, vocabulary	Vocabulary	Vocabulary
Explain various phenomena	Comprehension	Comprehension
Retain information in short term memory	Digit Span	Memory for Digits, Bead Memory. Memory for Sentences, Memory for Objects
Comprehend visual information in context	Picture Completion	Absurdities
Arranging picture to tell a story	Picture Arrangement	
Analyse and construct a spatial design	Block Design	Pattern Analysis, Paper Folding and Cutting
Analyse and complete a matrix		Matrices
Arrange parts to make an object	Object Assembly	
Scan set of arbitrary visual symbols for target symbol	Symbol Search	
Learn an arbitrary visual code	Coding	
Reproduce a spatial pattern		Copying

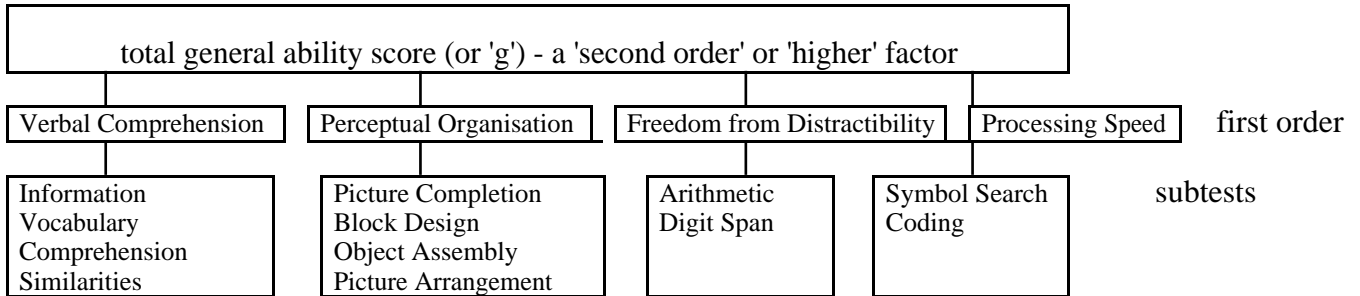
By administering the various sub-tests you can calculate

- a standard score (the 'scaled score') for each sub-scale on the WISC-III.
- a total verbal area score and a total nonverbal or performance area score.
- a total general ability score (or 'g').

- scores for various factors, 'indices' or 'first order abilities':

Factor	Sub-tests that you sum
Verbal Comprehension	Information, Similarities, Vocabulary, Comprehension
Perceptual Organisation	Picture Completion, Picture Arrangement, Block Design, Object Assembly
Freedom from Distractibility	Arithmetic, Digit Span
Processing Speed	Symbol Search, Coding

The structure of the WISC-III is as follows:



Briana's performance on the WISC III is as follows:

Verbal sub-scales	scaled score	percentile rank	descriptor
Information	7	16	low average
Similarities	7	16	low average
Arithmetic	8	25	average
Vocabulary	7	16	low average
Comprehension	11	63	average
Digit Span	11	63	average

Performance sub-scales	scaled score	percentile rank	descriptor
Picture Completion	12	75	high average
Coding	8	25	low average
Picture Arrangement	8	25	low average
Block Design	12	75	high average
Object Assembly	13	84	high average
Symbol Search	11	63	average
Mazes	10	50	average

The overall score in each area.:

Scale	Sum of scales scores	IQ index	percentile rank	95 % confidence range	descriptor
Verbal	40	89	23	83-96	low average
Performance	53	104	61	96-112	average
Full ('g')	93	95	37	90-101	average
Verbal Comprehension	32	89	23	83-96	low average
Perceptual Organisation	45	109	73	100-116	average
Freedom from Distractibility	19	98	45	89-107	average
Processing Speed	19	99	47	89-109	average

Usefulness of each type/s of score:

- the total general ability score is often not the most useful for diagnostic purposes .
 - comparing the total scaled scores for verbal and performance areas may lack validity.
 - the four factor scores are more reliable than the verbal or performance comparison .
For students with reading difficulties, their Perceptual Organisation factor score may be a better estimate of their general cognitive functioning than their Verbal Comprehension score.
- A 'rule of thumb' for deciding whether to use profile indices or verbal-performance difference - look at the extent to which the Arithmetic score differs from the average verbal score and the extent to which the

Coding score differs from the average performance score (the 'amount of scatter')- the larger the difference, the more you would be advised to use the indices.

To use the WISC III scores most effectively for diagnostic purposes, analyse patterns in the different subtests and identify the subtests that show greatest deviation- scatter or profile analyse, can suggest areas in which readers' abilities may deviate. The key questions to consider in doing this:

The key questions	How you can answer the question
Is the reader stronger in the verbal or nonverbal areas ?	Compare the total verbal and nonverbal scores.
Does reader show strength or weakness on specific subtests ?	Compare each subtest score with mean score for the area .
Is reader stronger or weaker on any of the four information processing factors on which the WISC III is based ?	Compare the four factor scores or indices.
Does reader show strength or weakness in any specific subtests for each factor ?	Compare each subtest score with the mean scaled score for the matching factor

Sattler (1998) recommends

- VIQ - PIQ > 12, 95 % possibility that difference due to information processing differences .
- compare each verbal subtest score with mean verbal scaled score and similarly for performance area. To be 95 % sure that difference is not due to chance, you need a difference between
 - 2.8 - 3.4, depending on subtest and whether you averaged 5 or 6 subtests for verbal area- use approximate difference of 3 for five verbal subtests and 3.5 for Digit Span.
 - 2.9- 4.1 depending on subtest and whether you averaged 5 or 6 subtests for performance area; use approximate difference of 3 for Block Design, 4 for Mazes and 3.5 for other subtests.
- compare the four factor scores or indices (VC, PO, FD and PS); a difference of at least 12 for most comparisons to be 95 % sure that the difference is not due to chance.
- compare each subtest score with the mean scaled score for the matching factor; you need difference of 2.6- 2.9 for verbal subtests and 2.8 - 3.5 for performance subtests to be 95 % sure the difference is not due to chance.
- compare each subtest score with the others; you need a difference of 4 for most comparisons to be 95 % sure that the difference is not due to chance.

Apply steps in order 1 to 5 or 1, 3, 2, 4 and 5. Some diagnosticians see the four factors as more reliable than comparing verbal or performance scores. For those who have reading difficulties, compare Arithmetic, Coding, Symbol Search and Digit Span scores with the verbal and performance scores. They may leave out the first two steps above and follow the steps 3, 4 and 5.

Using the WISC structure to describe different types of reading difficulties

VIQ>PIQ by >12 IQ points	sensory -motor integration, non-verbal learning disabilities, 'developmental Gerstmann Syndrome, subtype 1 auditory-linguistic, visual-spatial group
PIQ>VIQ by > 12 IQ points;	global language deficit group, 'basic phonological processing disorder' subtype 2 (visual-spatial, language disorder group
VIQ>PIQ by>12, lower FD and PS	word association deficit group
VIQ, PIQ similar + average, lower FD and PS	specific sequencing deficits group.
VIQ, PIQ similar and below average, lower FD and PS	mixed deficit group

Implications of particular verbal subtests comparisons for reading ability;

lower score on	less able to
Information	learn general knowledge, remember, use what they have learnt verbally
Similarities	recognise what is shared by verbal concepts conceptualise, how they link verbal concepts when reading
Arithmetic	retain numerical information in short term memory, use Arithmetic knowledge
Vocabulary	recall word meanings for text read, recall words for a topic, paraphrase text read silently, learn new word meanings and vocabulary items by reading
Comprehension	comprehend text, everyday phenomena and social conventions, infer and contextualise ideas read.
Digit Span	retain in short term working memory knowledge of letter cluster-sound links, read words automatically.

Implications of particular performance subtests comparisons for reading ability: lower

lower score on	less able to
Picture Completion	recognise written words or difficulty visualising intact contexts for a particular text theme
Picture Arrangement	sequence ideas read visual imagery, use illustrations in a text to infer possible sequence of ideas
Block Design	analyse written words into functional segments and use what they know about the written patterns in some words to read others
Object Assembly	integrate successive letter clusters into words, integrate a set of images into an overall context
Coding	learn the code aspects of reading
Symbol Search	represent the spatial characteristics of letters

WISC Profiles students who have reading difficulty : ACID, SCAD, CAD. To decide whether a reader's profile score (sum of the scaled scores of the subtests making up the profile) is lower than the scaled score for the other subtests

- for ACID, ACIDS and CAD, scaled scores on component subtests equal to or less than the lowest scaled scores on the other subtests.
- for the SCAD profile, $PC + PA + BD + OA - SS - C - A - D > 9$.
- ACID Profile - not unique to RD; displayed by students with other learning disabilities and ADHD. Alternative profile for girls who are dyslexic - AVID profile.
- CAD profile - genetically-based reading disabilities - 'sequential processing knowledge spatial factor (BD+OA+PC) > verbal conceptualisation (S+V+C) > sequential processing knowledge (A+DS+C).
- SCAD Profile - differentiates between 'exceptional learners', ADHD and 'normal' learners, but doesn't categorise groups of exceptional learners.

How useful are the ACID / SCAD profiles for prognosis and diagnosis ? Students with ACID, CAD or SCAD profile are more likely to have reading difficulties.

Cognitive style and reading difficulties

Cognitive styles can be grouped into two principal styles: how individuals

- process information can be described on an analytic - wholistic dimension
 - the field dependence versus independence distinction .
 - the convergent versus divergent distinction.
 - the sequential versus random processing distinction.
 - the simultaneous /successive information processing styles
- code or represent information; verbal and nonverbal imagery dimensions
 - the verbaliser versus imager or visualiser distinction ,
 - abstract versus concrete

Areas in which cognitive style affects literacy learning

Learning letter clusters for words; need to operate analytically. Global learners less likely to

- be phonemically aware
- analyse words using letter-cluster-sound strategies
- use what they know about some words to read others
- more likely to use distinctive visual features to read words.

Matching text with existing knowledge Students who have built their existing knowledge in nonverbal forms, for example, in visual imagery, to recode this into a verbal form by talking about it.

experiences ----->put ideas into sentences, main idea, restructure into network

analytic

<ul style="list-style-type: none"> • contextualise ideas read • work at detail level of text • difficulty predicting using grammar, • detect clashes in meaning at detail level • read easily imageable text better • use word analytic strategies for unfamiliar words as preferred strategy • read better when cued to talk about text first • re-read when clash in context easily imagine texts • easily recognises context for text • predict using context • read better when cued to recode • need to be reminded to paraphrase • easily convert text to actions • visual imagery 	<ul style="list-style-type: none"> • difficulty contextualising ideas, talk about them well • work at detail level of text • easy to use, predict based on grammar • detect clashes in meaning at detail level • don't differ in easy / hard to imagine text • use word analytic strategies for unfamiliar words as preferred strategy • talking about text first doesn't help reading • re-read when clash in semantics, grammar experienced, • predict using meaning • paraphrase spontaneously
<ul style="list-style-type: none"> • impulsively guess context, how it links with existing knowledge • identify main idea, topic well, may ignore detail • less able to read unfamiliar written words, difficulty linking these with word bank • guess impulsively without using language 	<ul style="list-style-type: none"> • impulsively guess context, how it links with existing knowledge • less able to recognise unfamiliar written words but easily use grammar to predict words using language of text, meaning

wholistic

• *verbal-abstract*

The Dyslexia Adult Screening Test and the Dyslexia Early Screening Test

The Dyslexia Adult Screening Test or DAST (Fawcett & Nicolson, 1998) comprises the following tasks:

- Rapid Naming; readers say the names of 20 familiar pictures as rapidly as possible
- One Minute Reading; readers read individual words as accurately and rapidly as possible.
 - Postural Stability; a clinical test of cerebellar abnormality.
- Phonemic Segmentation; readers
 - delete part of a word from spoken word
 - say spoonerisms.
- Two Minute Spelling; readers write as many dictated words as possible in 2 minutes.
- Backwards Digit Span; readers say backwards strings of up to 8 digits
- Nonsense Passage Reading; readers read passage that contains some nonsense words.
- Non-Verbal Reasoning; three tasks
 - next one in sequence
 - analogies
 - similarities and differences.
- One Minute Writing; readers copy as much writing as they can in 1 minute.
- Verbal Fluency; readers say as many words as they can in 1 minute that begin with a target letter.
- Semantic Fluency; readers say as many words as they can that are names of animals.

Each task can be used 'stand alone' or as a part of the battery of tasks. Scores, in percentile ranks are organised into 5 categories; very highly at risk, highly at risk, at risk, normal performance and well above average performance.

The Dyslexia Early Screening Test (DAST) (Nicolson & Fawcett, 1996)

The Dyslexia Early Screening Test or DEST (Fawcett & Nicolson, 1998) has two types of tasks: Diagnostic tasks

- Rapid Naming; the child says the names of 20 familiar pictures as rapidly as possible
- Bead Threading; the child threads beads for 30 sec.
 - Phonemic discrimination; the child listens for differences in spoken words.
 - Postural Stability; a clinical test of cerebellar abnormality.
- Rhyme Detection / First Letter Sound; this tests two phonological awareness skills.
- Forwards Digit Span; readers repeat strings of up to 8 digits
- Sound Order; telling the order of sounds in words.
- Shape Copying; pencil control skills.

Attainment tests

- Digit Naming.
- Letter Naming

Each task can be used 'stand alone' or as a part of the battery of tasks. Scores, in percentile ranks are organised into 5 categories; highly at risk, at risk, normal performance, above average performance and well above average performance.

The two test batteries are administered individually. Each is clearly based on contemporary research in dyslexia.

Sensory impairments

Visual perceptual abilities Behaviours that may suggest visual processing difficulties include

- readers can read text in some situations better than in others, for example
 - on a more distant board better than when it is closer (or vice versa),
 - when contrast has been altered, under different light conditions, brightness,
- readers' posture and learning behaviours when they read, for example,
 - how they position their heads
 - distance of head from text
 - head movements during reading.
 - whether they complain that the print is not clear and seems to go in and out of focus
- physiological and physical indicators of 'reading stress'
 - moisture welling up in the eyes
 - closing one eye while reading
 - physical stimulation of one eye, moves, prods eye with fingers
 - frowns frequently while reading
 - squints.
 - difficulty aligning the writing across the page
 - complaints of headaches and eye aches
 - need regular rests away from reading
 - crossed eye-hand dominance.
- irregular eye movement patterns

Auditory perceptual difficulties

- *auditory acuity*; the ability to detect, discriminate between auditory information is assessed using 'pure tone audiometry' and indicates whether a reader's hearing acuity is at a clinically normal level in each ear. Individuals hear pure tones in each ear in turn that vary in frequency (or pitch) from 250 to 8000 Hz and in loudness (or intensity) that can vary from -10 to 110 dB. The results are often shown on a graph called an audio gram.
- *auditory figure-ground* examines processing sounds in the presence of background noise for each ear. Results indicate the likelihood of whether difficulty attending to speech in a noisy environment such as a classroom might be expected
- *short term auditory memory*.
- *auditory discrimination* for speech sounds is assessed by hearing
 - words with similar sounds, for example, take, rake, lake and wake, and selecting the matching picture- Test of Auditory Discrimination
 - pairs of words that are either the same or that differ in one sound (for example, rake, wake) and deciding if they are the same - Auditory Discrimination Test (Wepman).

Sample report

Personal information

Name : Ben S
Age: 7 years 3 month

Reason for referral Ben's parents requested a learning evaluation because, although he is a fast learner, his kindergarten teacher suggested he might be gifted, he has an excellent memory and imagination, he loves experimenting and making things, he is unhappy at school, is unsuccessful academically, reports being bored and wants to be allowed to stay home from school.

- Format for assessment :** The assessment program involved an analysis of Ben's
- silent reading comprehension using Woodcock Language Proficiency Battery- Revised,
 - reading aloud prose using the Neale Analysis of Reading Ability - Revised,
 - phonological ability,
 - individual word reading on the Woodcock Language Proficiency Battery ,
 - word analysis using the Woodcock Language Proficiency Battery,
 - spelling recognition using the Peabody Individual Achievement Test- Revised,
 - spelling retrieval using the South Australian Spelling Test,
 - orthographic reading using the Orthographic Reading Test and
 - general learning ability using the Wechsler Intelligence Scale for Children 111.

Reading and spelling assessment outcomes

Reading performance: for the age range 7-3 to 7-5 years.

- individual word reading; Ben's performance for
 - automatic word reading was at the 36%ile,
 - word analysis was at the 31 %ile.
 Ben segmented words into parts (usually individual letters) and say parts of words before he read them correctly. He did not read most words automatically.
- prose reading aloud; word reading accuracy at 10th %ile, reading comprehension at 8 th %ile.
- Ben used word analysis with most 2- and 3-syllable words and segmented them into letters. He did not use the context to help him say the words.

Spelling performance;

- spelling recognition at 30th %ile; Ben took on average 2 secs to decide whether word spelt correctly.
 - for recall of spelling Ben's spelling age was 7 years 4 - 7 years 6.
- Ben periodically wrote letters and numbers reversed (particularly letters s and 2)

Creative writing Samples of Ben's expressive writing were analysed using the following criteria:

Criterion	
• Major intention of the writing is stated ?	Yes
• Ideas presented are relevant to the topic or purpose ?	Yes
• Paragraphs are well sequenced for a narrative and gradually develop a theme ?	Yes
• The writing has an identifiable opening or conclusion ?	Yes
• Redundancy of the ideas is avoided ?	Yes
• The ideas are sequenced appropriately?	Yes
• The general meaning of sentences is clear ?	Yes
• Words are selected appropriately to convey the intended meaning ?	Yes
• Sentences use appropriate verb tense, pronouns and show subject-tense agreement ?	Yes
• Sentence length is appropriate ?	Yes
• Appropriate structure; punctuation, capitalisation	Yes
• Use of grammar, writing conventions at the sentence level?	Yes
• Spelling is accurate	No

Analysis of literacy performance:

Individual word reading; The type of words read correctly and automatically had the 1:1 letter - sound mapping. Ben needed to segment words into parts (usually individual letters) and say parts of words before he could read them correctly. His reading showed the following patterns

words correct and automatic.	men, eat, fend, pen, still, ash
words read correctly after segmenting.	d-art, b-r-ai-d, dune as dun -->√, cube as cub -->√, scream as cream as -->√, send as s-end -->√, foal as f-oal -->√, stamp as st -->√, crawl as cr-aw-l -->√, spoon as sp -->√ cramp as c-r -->√

words read incorrectly	hiss as his, plate as pl-at, claim as c-l-a-i-m, boil as b-o-i-l, new as now, stripe as s-t-er / str / st, place as p-l-a-ck / plake, ace as ake, dune as dun, burst as b-u-s-t, pew as p-e-w
------------------------	---

This pattern indicates that Ben needs to

- learn most digraphs and letter cluster - sound mappings.
- learn how to segment words into larger units than individual letters, that is, to recognise letter clusters such as 'awl', 'aim', 'spl' etc.
- work on using what he knows about some words to read others, for example, he read *new* automatically but had difficulty reading *few* and *pew*. He could learn to do this.

Prose reading aloud; Ben :

- read in a semi-word by word way with little natural language fluency
- had difficulty reading most of words in the text and segmented them into letters. He said the first few letters in several words, misread others and didn't attempt to re-read or self-correct.
- did not use the context to help him read the words, had difficulty integrating letter cluster and context information.
- didn't use sentence strategies such as leaving out an unfamiliar word, reading on to the end of the sentence and then re-reading and didn't attempt to use a guess and check strategy.
- used punctuation to organize the print for all passages.
- did not seem to use comprehending strategies such as
 - listening to himself as he reads,
 - picturing what he is reading and
 - using re-reading to correct errors.
 - reminding himself to use prior knowledge to assist word recognition.

Spelling performance; Ben

- took on average 2 seconds to decide whether a word was spelt correctly.
- periodically wrote letters and numbers reversed (particularly letters s and 2)

Ben's word processing difficulty in reading words and recognising the correct spelling of words is consistent with difficulties learning letter clusters larger than individual letters. This was particularly obvious for digraphs. He is not using what he knows about some words to read others.

Explain the literacy difficulty

Phonemic abilities. Ben

- segmented words of up to 5 sounds into individual sounds.
- blended sounds automatically into words
- deleted correctly sounds from 1-syllable words.

This suggests that Ben's word reading difficulty is not due to phonemic processing difficulties

General learning ability Ben's general ability was assessed using the Wechsler Intelligence Scale for Children (WISC III).

<u>Sub-scale</u>	<u>level</u>
Recalling verbal general knowledge and information	superior
Reasoning how two verbal concepts are similar	superior
Solving arithmetic word problems	superior
Describing the meanings of words, vocabulary	superior
Explaining various social phenomena and conventions	superior
Retaining information in short term auditory memory	superior

Performance (nonverbal) tests

Recognising missing features from visual information	superior
Arranging pictures to tell a story	superior
Arranging blocks to make a spatial design	superior
Arranging parts of an object to make an object	superior
Learning an arbitrary visual code	superior

Ben displayed overall verbal and non-verbal reasoning ability in the superior range.

Earlier perceptual processing difficulties. Ben's parents reported that he has experienced intermittent hearing loss.

Approach to learning Discussion with Ben and his parents indicated that Ben

- learns quickly and readily, recalls ideas easily and can learn at a sophisticated cognitive level.
- becomes bored and frustrated when the learning pace is too slow. He reports needing fewer repetitions of and less exposure to an idea in order to learn it.
- is curious to learn and motivated to 'want to know; he is 'self-driven' and motivated.
- reports that he learns spontaneously without directed teaching, prefers to manage and direct his learning on occasions and values being able to ask questions that extend his knowledge. He finds it hard to learn when his learning is totally directed and his curiosity is not challenged.
- can recognise and use patterns and relationships at an advanced level and put ideas together in unexpected ways. He can reason analytically and synthetically in complex ways.
- sets high self-standards and goals for himself and on occasions may judge himself harshly.
- is being interested in consequences and may see consequences that his peers tend not to see.

Nature of Reading Difficulty The assessment suggests that Ben's word processing difficulty reading words and spelling can be attributed to difficulties learning letter clusters larger than individual letters. These difficulties are not attributable to

- short term auditory sequential memory difficulties.
- coding difficulties.
- phonemic processing difficulties.
- verbal reasoning difficulties.

Recommendations for improving Ben's learning efficiency. Ben needs a literacy support programme that helps him to improve

- his range of reading comprehension strategies and
- his ability to recognise word patterns, including spelling patterns

Teaching reading comprehending strategies. Ben can learn to use the following comprehending strategies:

Preparing to read strategies; before reading Ben can practise deciding

- his purpose for reading
- the likely theme of the text
- what he already knows about the topic, the words that might come up
- how he will read.

While-reading strategies; Ben can practise

- organising the print into 'digestible bits, deciding where to pause.
- listening to himself as he reads.
- pausing, making a picture of what has been read.
- putting himself "into the context" of the print
- asking "What has this told me? Did it make sense?" and decide whether to re-read.
- thinking ahead, predicting what might happen next.

After-reading strategies; after reading, Ben needs to practise

- showing what he has understood in various ways.
- responding emotionally to the print; how did he like it / was it interesting ?
- reviewing "the reading 'actions' that seemed to work for him while he read.
- identifying key ideas and encoding them in long-term memory.
- adding new words and meanings to his vocabulary.

Recommendations for improving Ben's word reading knowledge:

- work on the phonological structure of the words .
- read each word.
- transfer the letter patterns to prose
- discusses what he knows now about the ew pattern.
- discusses his knowledge of letter clusters and words.

- include long-term memory retrieval strategies in his teaching.

Summary The foregoing assessment has outlined Ben's learning difficulties as they impact on his literacy learning. The recommended activities in this report are intended to help him to improve his skills in this area. I would be happy to discuss these outcomes and implications further.

John Munro (Dr)

Criteria for writing an assessment

Clarify the individuals for whom the assessment is intended, adjust the jargon, language used

- educational staff
- parents / students
- psychologists
- external professionals

Review background information from referral source, relevant demographic information

Outline purposes of assessment to child and parent

Describe observations of child's behaviour, behavioural observations during assessment

- ease of engagement / level of rapport
- level of co-operation
- affect-anxiety /depression
- unusual behavioural signs
- initiative / spontaneity
- abnormal motor / sensory problems
- dominant hand
- language /attention / memory at interview

Test findings

- general intellectual capacity
- intellectual strengths and weaknesses
- attention / working memory