CELF®
PRESCHOOL 2

Clinical Evaluation of Language Fundamentals
Preschool – SECOND EDITION

Growth Scores and Growth Charts

PEARSON

Growth Scores

Growth scores provide an equal interval scale from which you can quantify small improvements in the language skills of a child with a moderate to severe language impairment. CELF Preschool–2 provides growth scores for each subtest that provides a scaled score, with the exception of Word Classes–Total.* You can use growth scores for the following purposes:

- Track a child's language skills development from age 3 through 6,
- Determine if the child has mastered additional language skills since a previous administration of CELF Preschool–2, and/or
- Measure the efficacy of an intervention program that has been implemented for a child.

The advantage of using growth scores rather than scaled scores to assess improvement in a child's language ability is that growth scores provide a quantifiable measure of a child's gains in language ability, even if the amount of change is small. That is, growth scores provide an estimate of language ability independent of a child's peer group. The scores increase as the child demonstrates new abilities. In comparison, scaled scores provide information about a child relative to his or her peers at a given time, so his or her scaled scores may remain relatively unchanged; as the child gains new language skills, his peers are also gaining new language skills.

Developing Growth Scores

Growth scores were derived for each subtest by mapping the raw scores to corresponding growth scores using an item response theory (IRT) model (Hambleton, Swaminathan, & Rogers, 1991). Winsteps 3.31 (Linacre, 2005) was used to calculate ability scores (thetas) according to the 1-parameter logistic model. These ability scores were then rescaled to form the growth scores, with a range of 100–900, a theoretical mean of 500, and a standard deviation of 100 for each subtest.

**Note.* Item-level scores are the foundation of item response theory (IRT) analysis, the basis of growth scores; because Word Classes–Total does not have item-level scores, growth scores cannot be generated.

Hambleton,. R. K. H., Swaminathan, H., & Rogers, H. J. (1991). *Fundamentals of item response theory.* Newbury Park, CA: Sage.

Linacre, J. M. (2005). *WINSTEPS Rasch measurement computer program.* Chicago: Winsteps.com

Interpreting Growth Scores

You can record the growth score from the first administration of CELF Preschool–2 on the growth chart. This allows you to compare the child's language development against those of children who are developing language typically. As you complete successive assessments, you can record the growth scores for each test administration on the same growth chart. This enables you to compare scores and examine changes between assessments. When comparing the scores from two administrations, three patterns are possible: the growth score from the test administered most recently increases, is approximately the same, or decreases.

Scores Increase

In some cases, you will find that the growth scores increase across repeated testing sessions. Growth scores increase when the child earns additional raw score points on a subtest. Score increases, even small increases, can usually be attributed to refinement or mastery of language skills that the child did not demonstrate during the previous test administration.

However, when interpreting the results of testing, keep in mind that there are reasons other than mastery of additional language skills for an increase in raw scores.

- The child could have been shy, sick, tired, distracted, or frustrated during the first test administration and did not perform at his or her best, so the earlier test results may not have reflected the child's true language skills.
- The child might have guessed the correct response to one or more multiple-choice test items, which would result in a higher raw score.

Scores Stay About the Same

Sometimes a child's growth score changes very little. Possible reasons include:

- The child may have been tested too soon after the previous test administration to have experienced change. That is, the child may not have been receiving services for a sufficient length of time for change to occur as a result of intervention (e.g., the child is only in the fourth week of an eight-week intervention program).
- The child might be experiencing a developmental plateau for certain types of language skills, which is not uncommon for children to encounter at some points along the developmental continuum. When this is the case, you may not see progress for certain types of skills. For example, acquisition of morphological markers does not proceed at a continuous pace. If the child's difficulties are primarily in acquiring morphological markers, he or she may be tested at an age at which there are no CELF Preschool–2 items to capture morphological development.

Scores Decrease

In some cases, growth scores decrease from previous testing for a variety of reasons.

- The child may be sick, tired, frustrated, or distracted during the second test session. In which case, the child is not demonstrating a best performance, and it would be erroneous to interpret a lower score as evidence that the child is losing language skills.

- Declining growth scores may reflect the characteristics of a disorder exhibited by the child. For example, some children identified with autism spectrum disorder may master early language milestones (e.g., learn to say their first words at 12–15 months) but then regress (e.g., may stop talking).
- The child may have a progressive or degenerative condition in which he or she loses previously acquired language skills. A child who has suffered a traumatic event (e.g., head injury) or illness (e.g., meningitis or sudden onset of a seizure disorder) may also lose language skills previously acquired.

Recording Growth Scores and Plotting Growth Charts

The growth table and growth charts included may be downloaded for you to use to convert subtest raw scores to growth scores. The growth charts depict growth curves of the children included in the CELF Preschool–2 normative sample. The growth charts provide a visual representation of the child's language abilities, in reference to percentile rank, that may be helpful when reporting progress to parents.

Step 1. Completing the Demographic Information

Select the appropriate growth chart for the selected subtest. Complete the child's demographic information (i.e., name, sex), test date, and the child's chronological age at the time of testing.

Step 2. Converting Subtest Raw Score to Growth Score

Refer to the growth score table to convert a subtest raw score to a growth score. Locate the child's subtest raw score in the columns on either side of the table. Read across the row to the growth score in the corresponding subtest column. Record the growth score in the space labeled Growth Score on the growth chart.

Step 3. Plotting Growth Scores

You can plot growth scores on the growth chart. Locate the child's age along the horizontal axis and read up the column to the corresponding growth score. Place an X at the point where the child's age and growth score intersect.

Note. Each point on the horizontal axis (Child's age) corresponds with a 6-month age range, reflecting how the sample data were collected. For example, the first point on the horizontal axis represents the age range 3:0–3:5, the second point represents the age range 3:6–3:11, and the last point represents the age range 6:6–6:11. The child's score can only be plotted for that age range as a discrete point. That is, if a child is age 3 years 4 months, plot the child's score referencing the first point (representing 3:0–3:5) on the horizontal axis. Do not plot the child's score based on a hypothetical location between the first point (representing 3:0–3:5) and second point (representing 3:6–3:11). See the following figure for an example of a completed growth chart.

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Name: Child Z

Sex: ☒ F ☐ M Grade PK School School Z

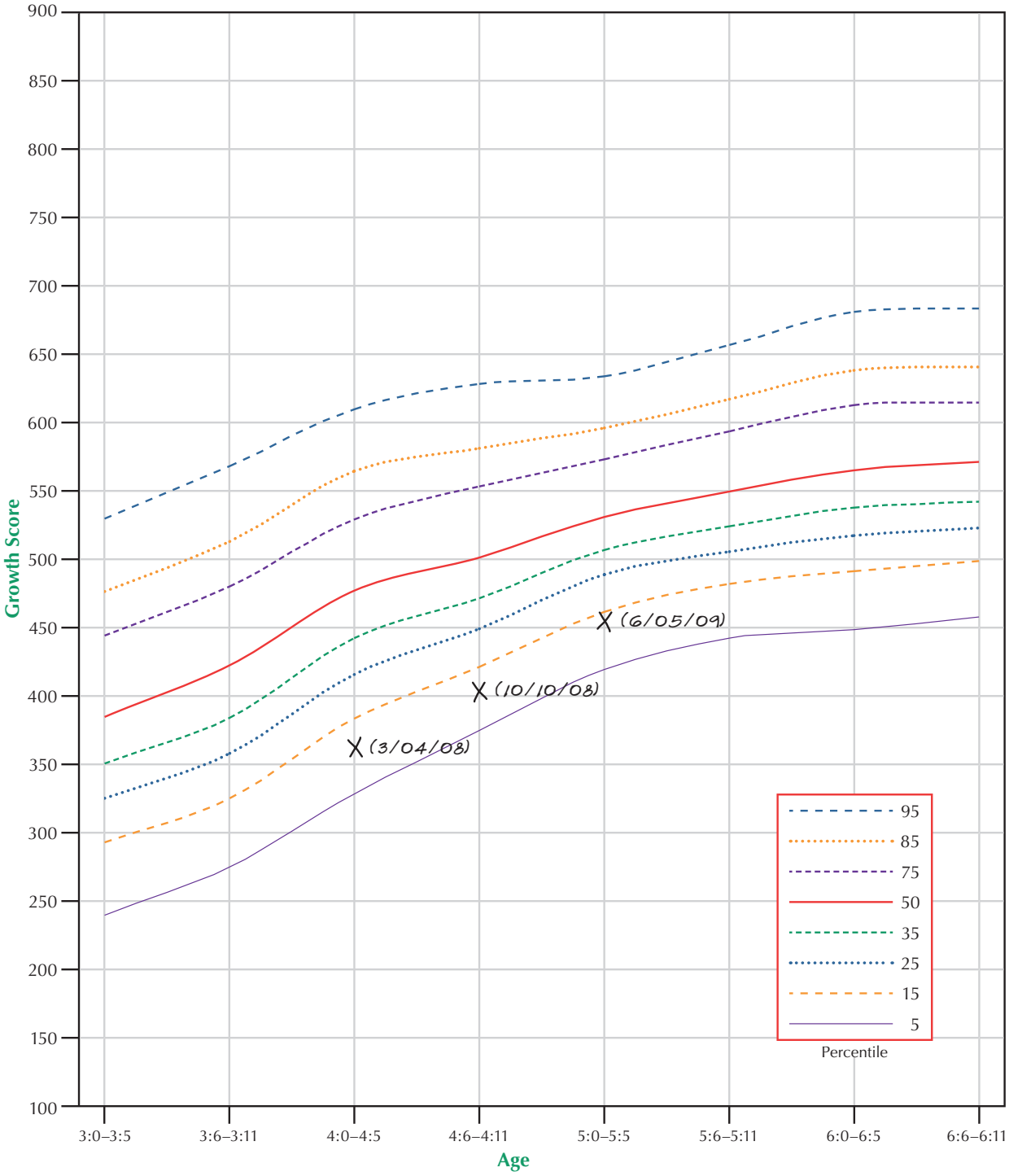
Test Date: 3/04/08 Age 4:0 Growth Score 366

Test Date: 10/10/08 Age 4:8 Growth Score 402

Test Date: 6/05/09 Age 5:4 Growth Score 456

Test Date: _____ Age _____ Growth Score _____

Recalling Sentences Growth Chart



Completed Growth Chart

Case Study

Child A, Female, Age 6 years 9 months

Child A is a first grader who is diagnosed with a moderate language disorder. She is receiving speech-language services from her school SLP. In addition, Child A's parents pay for her to receive therapy from a SLP in private practice. Child A's parents' medical insurance company is requesting evidence to support Child A's continued need for speech-language therapy and that her language skills are improving.

Background Information

The following background information was gathered from available reports and conversations with Child A's parents and teacher.

Family: Child A lives with both her parents and 4-year-old brother. Child A's father is a computer programmer. Her mother does not work outside of the home.

Health and development: Child A's mother reports a normal pregnancy and delivery. Child A was a healthy baby and continues to enjoy good health. She achieved developmental milestones during expected time frames, except for speech and language. Child A spoke her first word at age 3 years.

School: Child A began preschool when she was 4 years old. Upon entering preschool, Child A was diagnosed with a language delay and began receiving speech and language services. Currently in first grade, she continues to receive speech and language services in school. She is also receiving speech and language services from an SLP in private practice. Her teacher reports that Child A struggles to perform at the same level as her classmates, but she is making slow, steady progress.

Current Assessment Procedures

Child A was administered CELF Preschool–2 on April 19, 2009.

Level 1. Determining if There is a Disorder

Child A's Core Language score is 77 (confidence interval is 68 to 86 at 90% level), and the percentile rank is 6. This indicates performance in the low range (confidence interval scores range from very low to average).

Level 2. Describing the Nature of the Disorder

Child A's Receptive Language index score of 69 (confidence interval of 60 to 78), with a percentile rank of 2, is in the very low range of performance (confidence interval range is very low to borderline). Child A's Expressive Language index score of 75 (confidence level of 68 to 82), with a percentile rank of 5, is in the low range of performance (confidence interval range is very low to borderline). The difference of 6 points between the Receptive Language and Expressive Language index scores is not significant.

Child A's Language Content index score of 69 (confidence interval of 62 to 76), with a percentile rank of 2, is in the very low range of performance (confidence interval range is very low to low). Child A's Language Structure index score of 73 (confidence level of 65 to 81), with a percentile rank of 4, is in the low range of performance (confidence interval range is very low to borderline). The four-point difference between the Language Content and Language Structure index scores is not significant.

Level 4. Evaluating Language in Context

Both Child A's parents and classroom teacher completed the Pragmatics Profile. Child A's score of 78 on the Pragmatics Profile met the criterion of ≥72. However, Child A's parents and teacher have concerns about her reluctance to express her ideas. Child A knows that she has difficulty producing longer complex grammatical sentences, so she often does not participate in class discussions. In addition, Child A frequently misunderstands instructions but is hesitant to ask for help when she is confused.

Nonstandardized Assessment Procedures

Interview with parents: Child A's parents report that she is in her third year of speech-language therapy (first year of private therapy). Her parents report that Child A has made tremendous progress. As a very young child, Child A communicated through gestures, not speaking words until she was three. Within the first six months of receiving speech-language therapy, Child A acquired a speaking vocabulary of 50–75 words, and began combining words. With the support of speech-language therapy, Child A began attaching word endings (e.g., progressive *-ing*, plural *–s*), and forming four- to five-word sentences. Child A's parents feel that her language skills are at about the same level as her 4-year-old brother.

Telephone interview with teacher: Child A's teacher reports that Child A is a quiet child who tries very hard to keep up with her classmates. She takes a long time to complete her assignments because she wants to make sure they are completed neatly and accurately.

Assessment Results and Interpretation

Standard Scores

At this time, Child A's standard scores on CELF Preschool–2 indicate that she continues to have a receptive and expressive language disorder. Language Content and Language Structure index scores indicate that her word knowledge and morphology and syntax skills still lag behind those of her peers.

Comparison of Child A's current scores with her previous scores suggest that Child A may have gained language skills and has definitely not lost language skills. However, her standing, relative to other children her age, has changed very little. This may be because as Child A is gaining language skills, her peers are acquiring new language skills as well.

Table 1 Child A's Standard Scores

	At Age 5:1	At Age 6:9
	Test Date: 8/20/07	Test Date: 4/19/09
Core Language Score	77	77
Receptive Language index	71	69
Expressive Language index	75	75
Language Content index	71	69
Language Structure index	75	73

Growth Scores

The scores from the most current administration of CELF Preschool–2 indicate that Child A has improved her skills in word knowledge, and morphology and syntax. Child A's scaled scores have generally not changed from the previous test administration; scaled score differences for all subtests are within +/-1 point between test administrations at 8/20/07 and 4/19/09. However, growth scores for all subtests have increased, indicating that Child A has gained skills.

Table 2 Child A's Growth Scores

	At Age 5:1			At Age 6:9		
	Test Date: 8/20/07			Test Date: 4/19/09		
	Raw Score	Scaled Score	Growth Score	Raw Score	Scaled Score	Growth Score
Sentence Structure	11	6	423	17	6	516
Word Structure	11	6	421	14	5	463
Expressive Vocabulary	15	6	432	24	7	505
Concepts & Following Directions	8	5	419	11	4	462
Recalling Sentences	8	5	416	13	5	464
Word Classes-Receptive	9	5	331	15	5	436
Word Classes-Expressive	2	5	342	6	4	416

Factors to Consider in Developing Recommendations for Child A

Child A's current test results indicate that she continues to demonstrate a receptive and expressive language disorder. A comparison of Child A's previous and current standard score results indicate that she has not been able to "catch up" her language skills to those of same age peers; however, a comparison of her previous and current growth score results indicate that she is making progress and continuing to develop language skills. She demonstrates an improved understanding and use of morphology and syntax rules, and her vocabulary and word knowledge have increased.

Child A would continue to benefit from therapy.

Growth Score Equivalents Corresponding to CELF Preschool–2 Subtest Raw Scores

Raw Score	Subtest								Raw Score
							WC		
	SS	WS	EV	CD	RS	BC	Rec	Exp	
40			728						40
39			698						39
38			675						38
37			650		693				37
36			630		672				36
35			614		649				35
34			600		632				34
33			587		618				33
32			576		607				32
31			564		596				31
30			555		587				30
29			546		577				29
28			537		569				28
27			529		561				27
26			521		554				26
25			512		546				25
24		688	505		539				24
23		647	498		532				23
22	670	609	489	697	524				22
21	629	580	482	654	518				21
20	591	557	473	619	511		607	659	20
19	560	538	466	593	505		558	621	19
18	536	521	458	570	499	634	519	592	18
17	516	506	449	552	491	586	485	567	17
16	499	491	441	535	485	541	459	548	16
15	483	476	432	519	479	504	436	532	15
14	468	463	423	505	471	477	415	517	14
13	452	449	413	489	464	456	397	503	13
12	438	436	403	476	456	435	380	490	12
11	423	421	392	462	448	418	363	478	11
10	409	408	380	448	438	400	347	466	10
9	394	392	368	433	428	384	331	454	9
8	378	377	355	419	416	367	316	442	8
7	361	359	341	404	402	349	300	429	7
6	342	341	325	387	385	331	283	416	6
5	292	295	289	347	341	289	245	385	5
4	292	295	289	347	341	289	245	385	4
3	258	266	267	322	313	263	223	367	3
2	214	230	240	291	277	229	193	342	2
1	164	184	200	250	247	187	158	314	1
0	108	136	164	196	209	139	112	276	0

Note. SS = Sentence Structure, WS = Word Structure, EV = Expressive Vocabulary, CD = Concepts & Following Directions, RS = Recalling Sentences, BC = Basic Concepts, WC–Rec = Word Classes–Receptive, WC–Exp = Word Classes–Expressive

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Test Date: _____ Age _____ Growth Score _____

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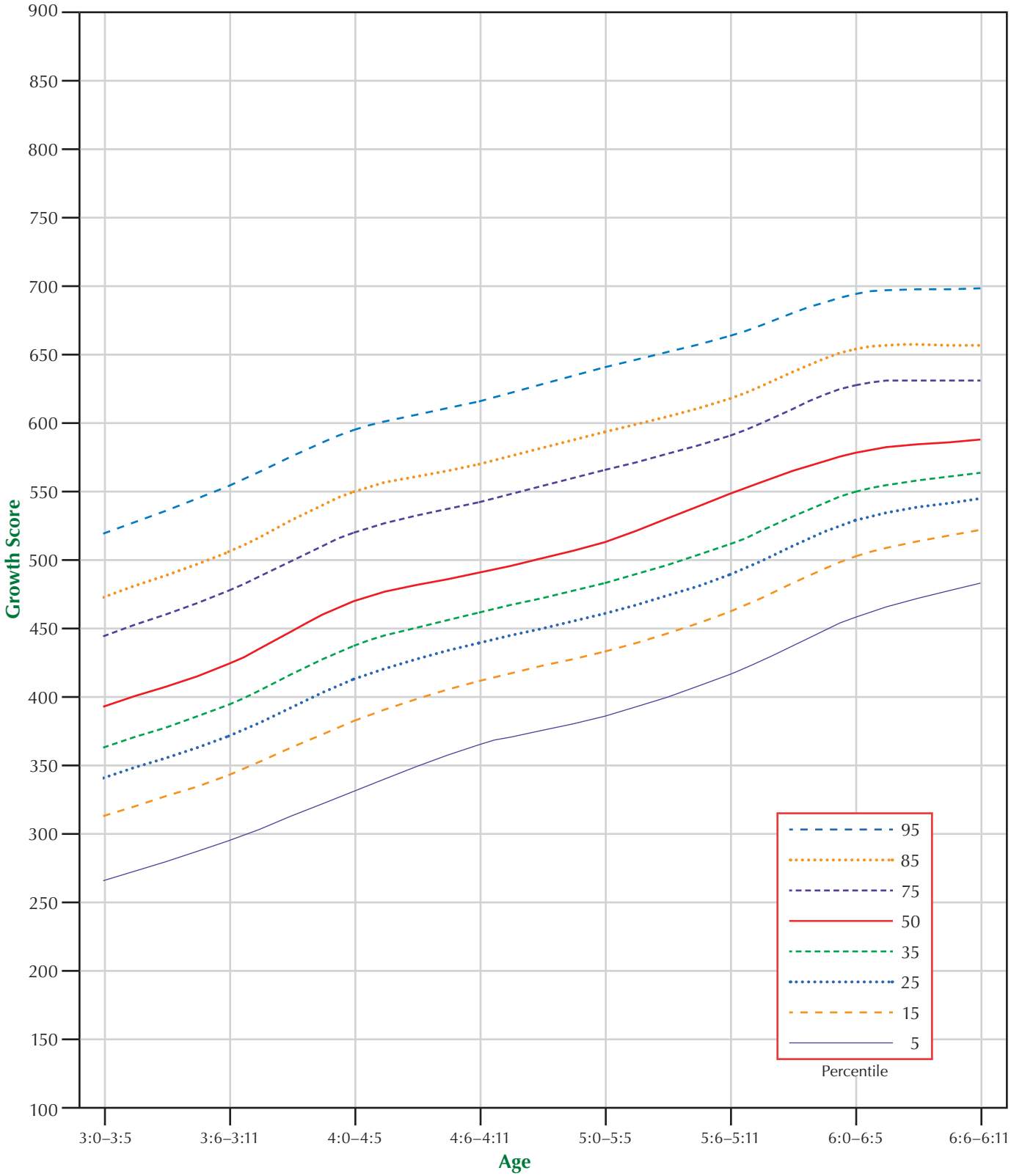
Sentence Structure Growth Chart



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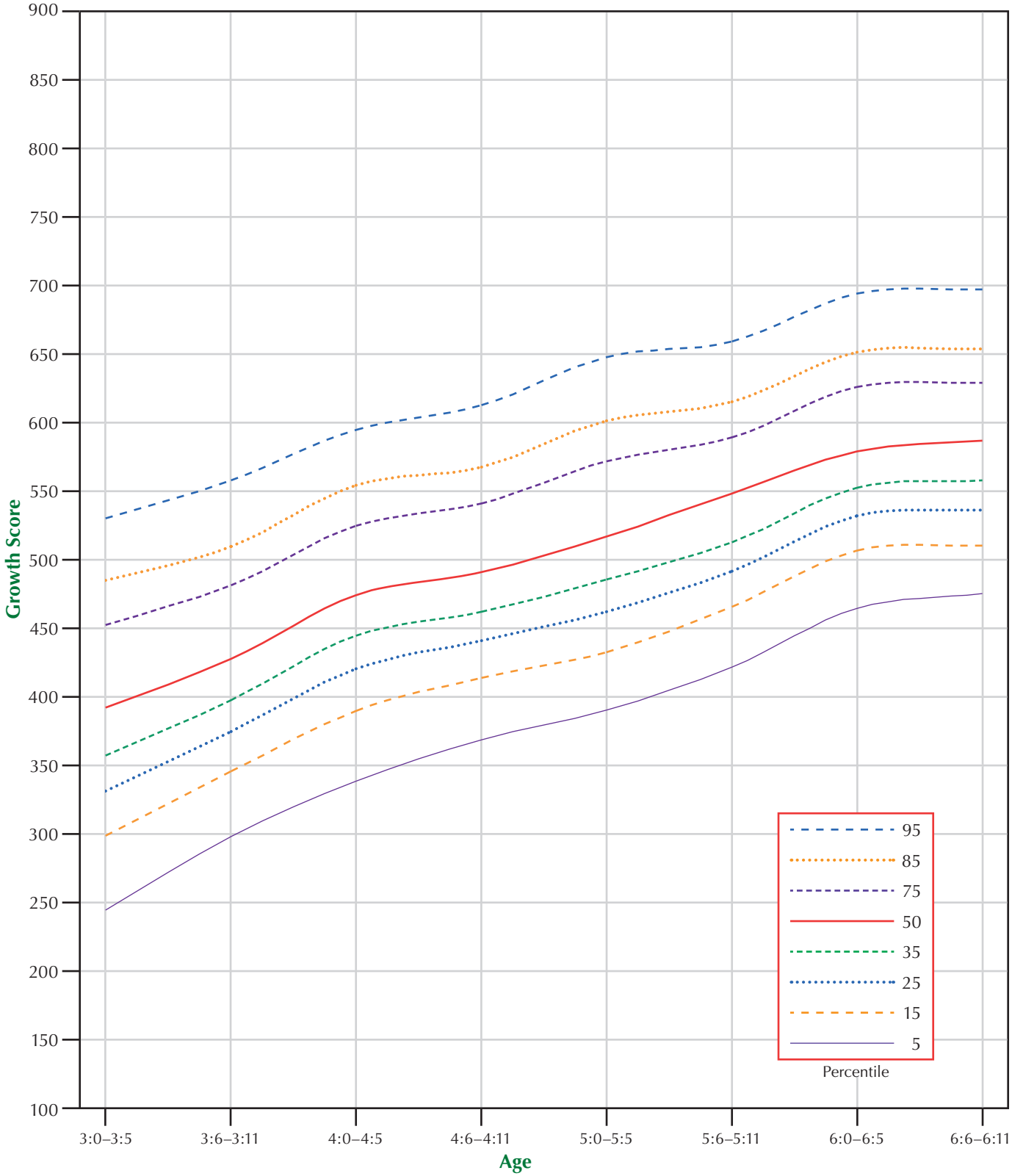
Word Structure Growth Chart



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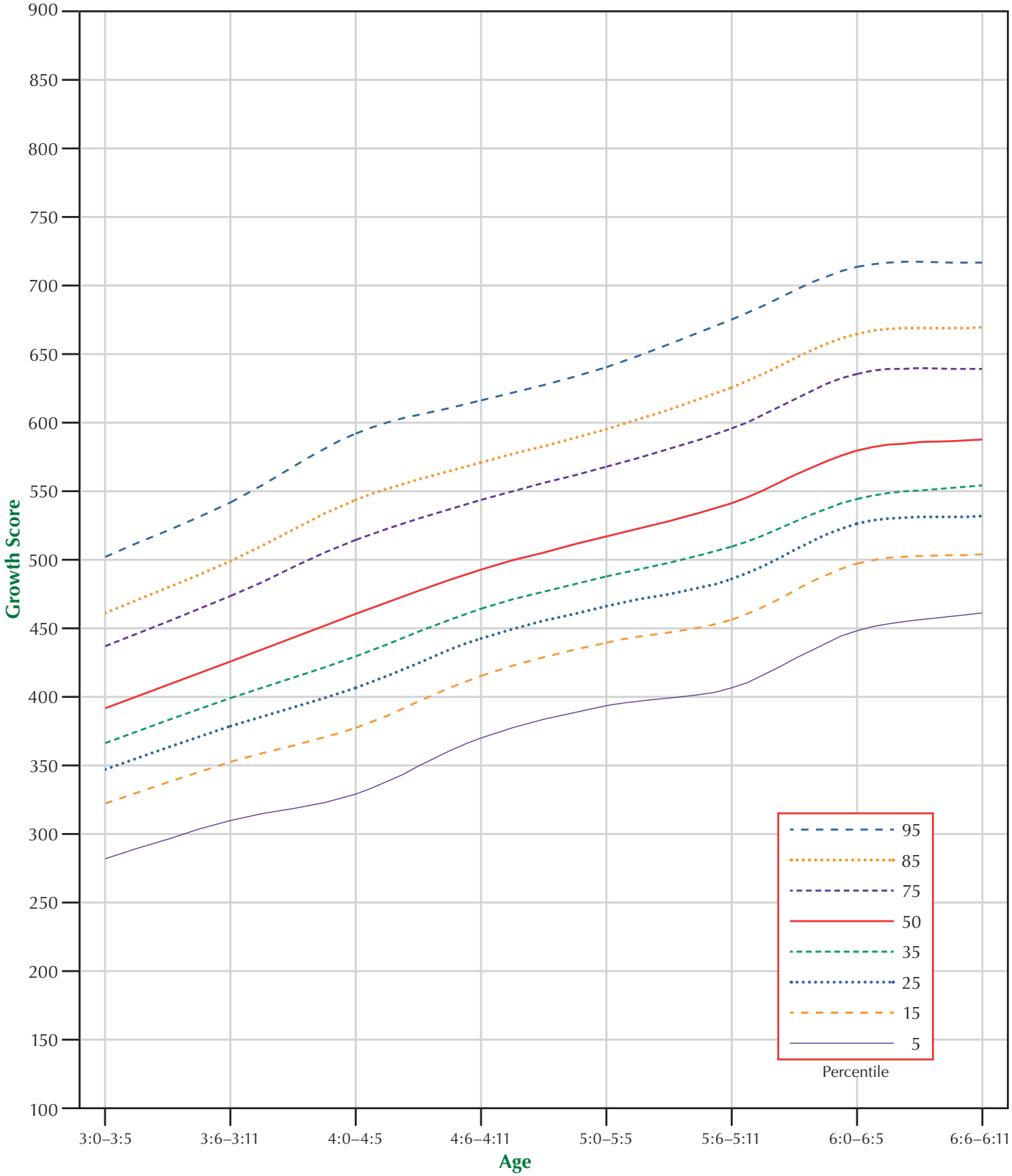
Test Date: _____ Age _____ Growth Score _____

Test Date: _____ Age _____ Growth Score _____

Expressive Vocabulary Growth Chart



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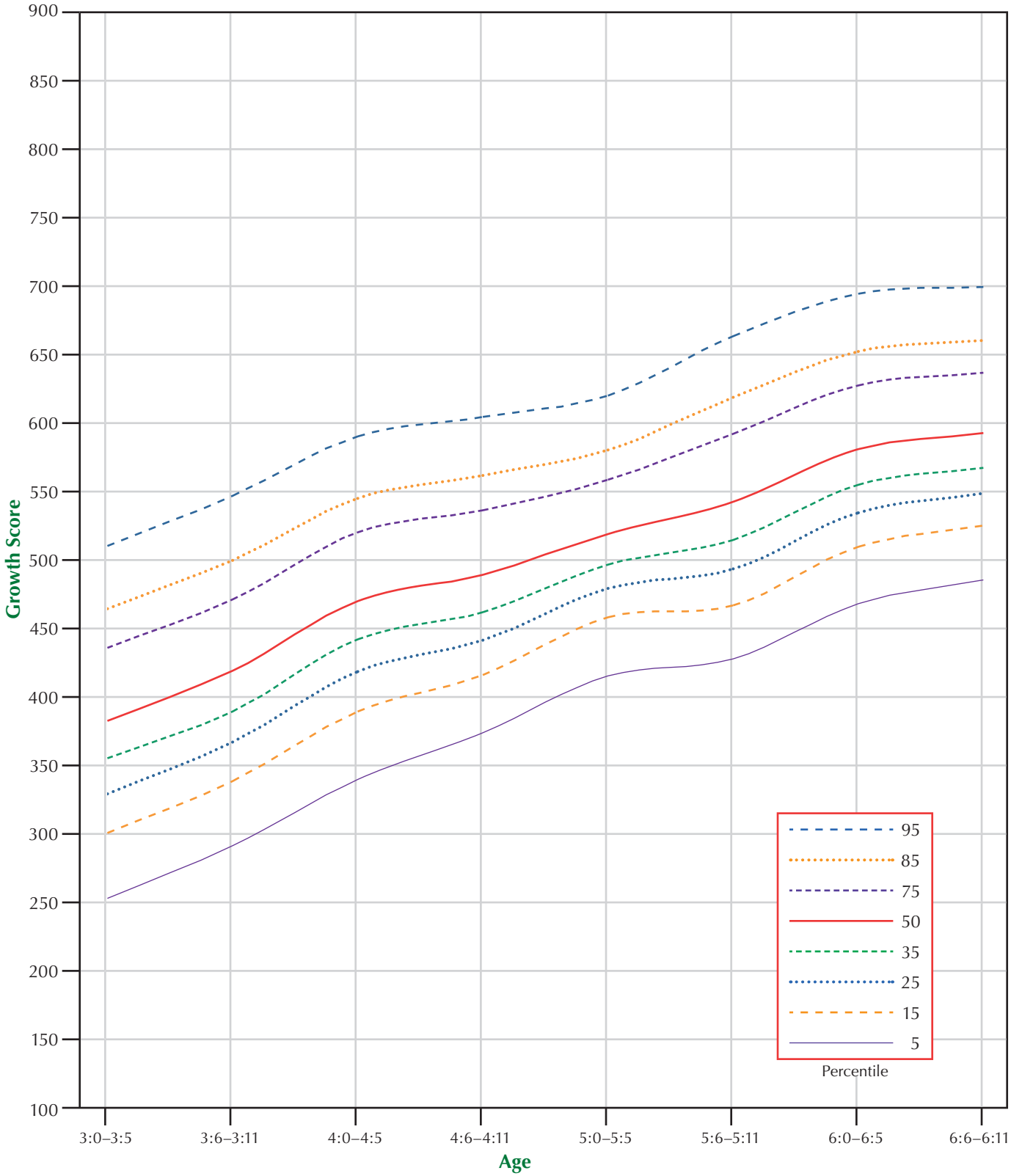
Concepts & Following Directions Growth Chart



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Test Date: _____ Age _____ Growth Score _____

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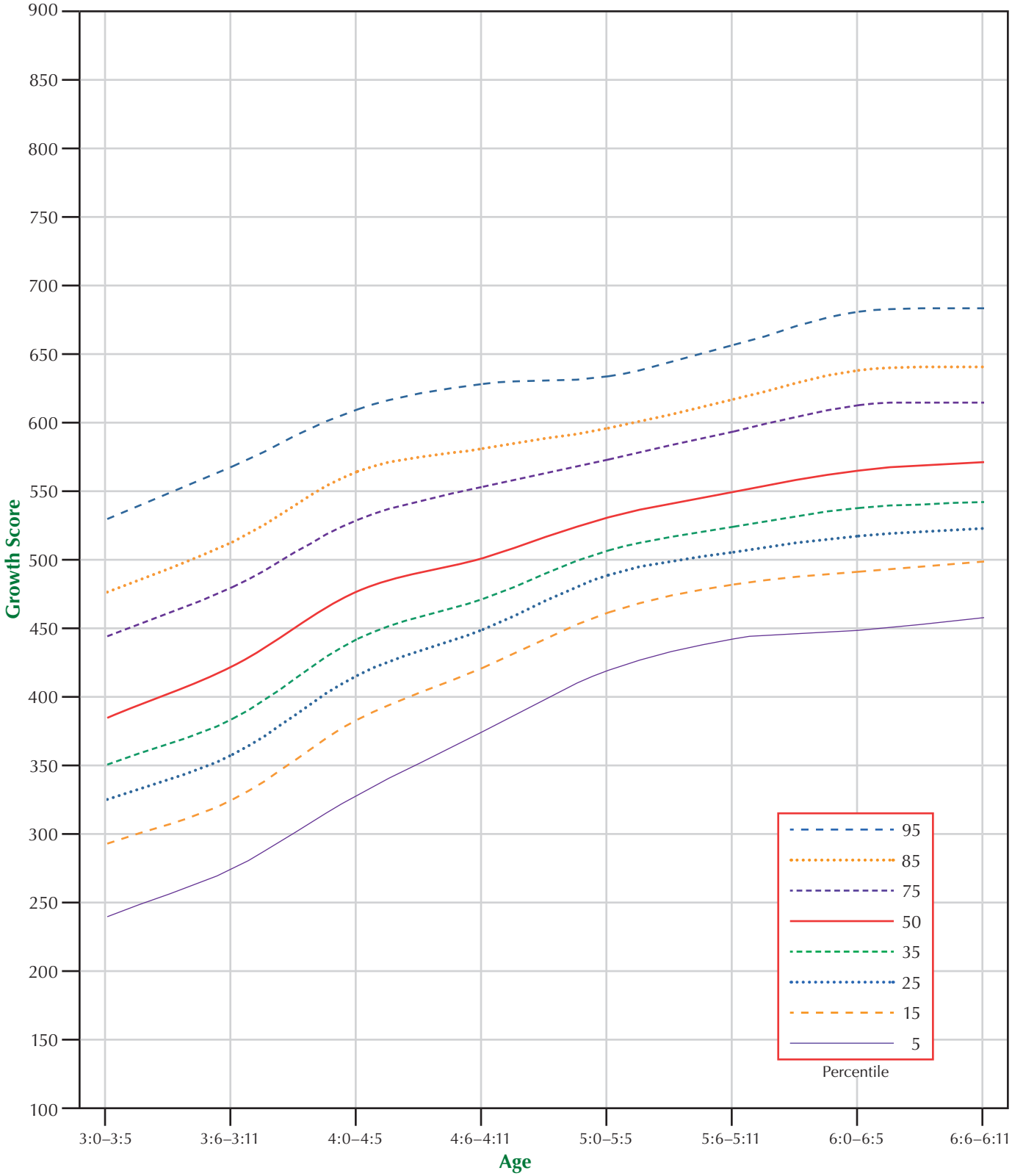
Test Date: _____ Age _____ Growth Score _____

Test Date: _____ Age _____ Growth Score _____

Recalling Sentences Growth Chart



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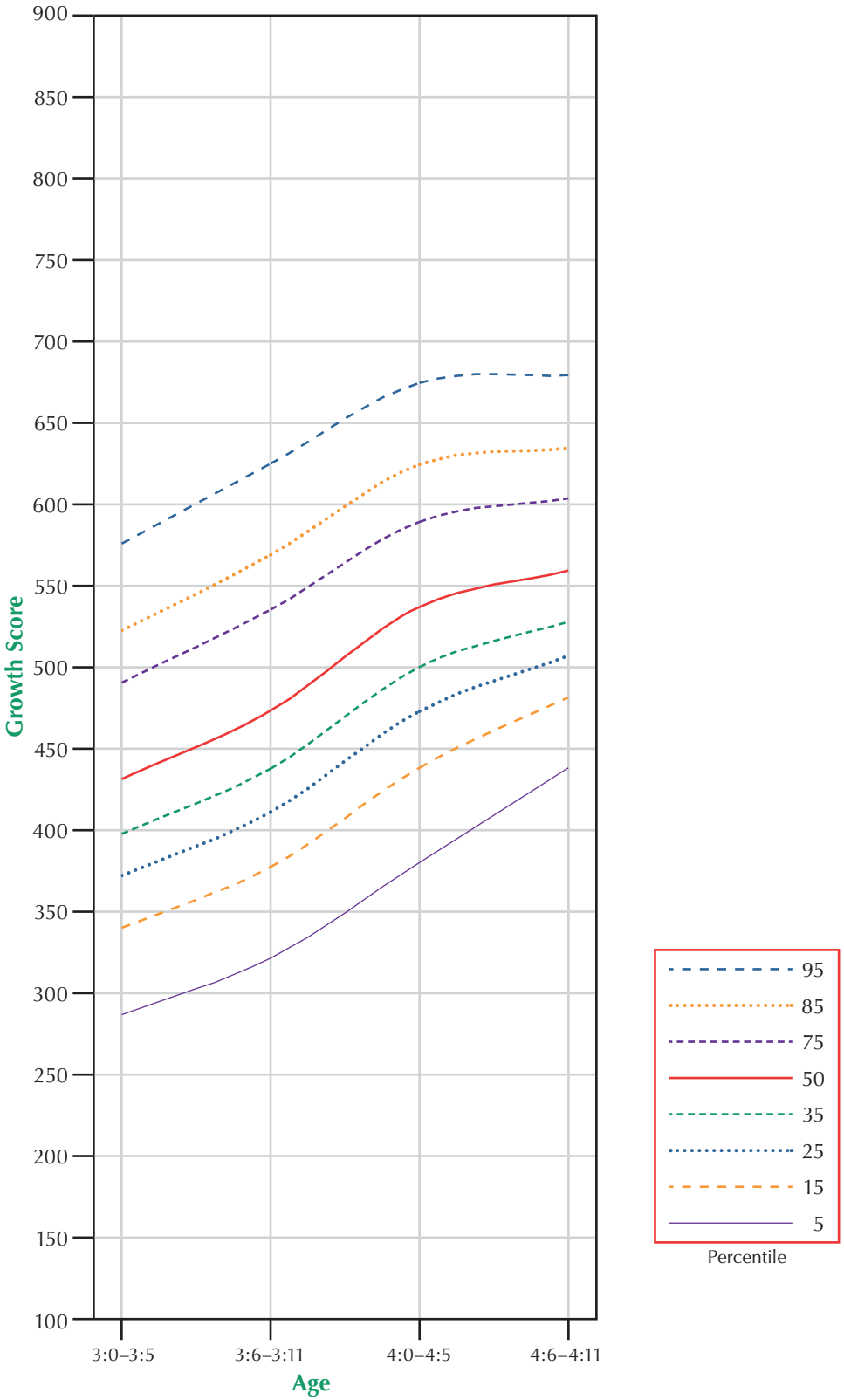
Basic Concepts Growth Chart



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Test Date: _____ Age _____ Growth Score _____

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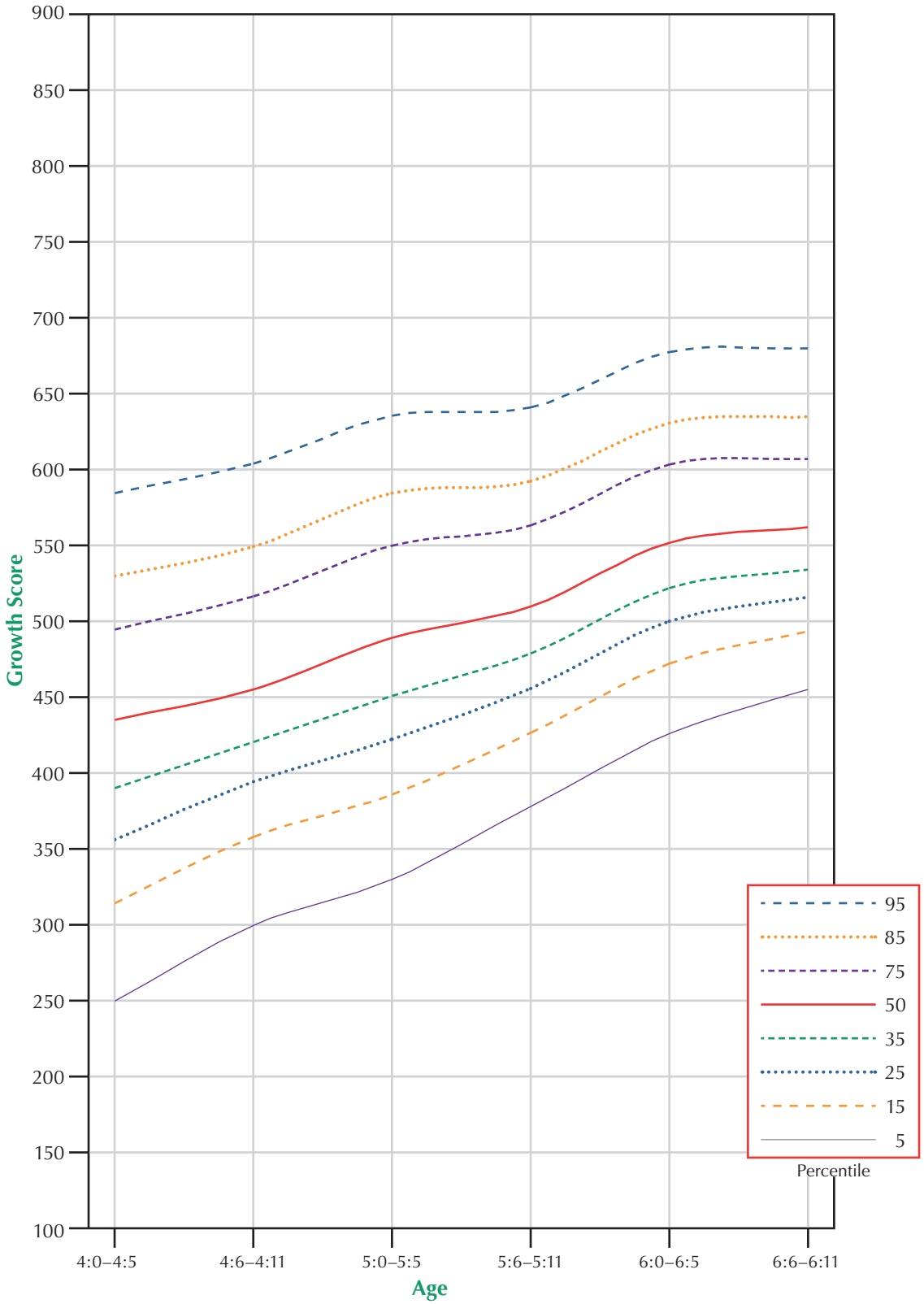
Test Date: _____ Age _____ Growth Score _____

Word Classes–Receptive Growth Chart



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Test Date: _____ Age _____ Growth Score _____

Word Classes–Expressive Growth Chart