Measuring the Reliability of the Early Expository Comprehension Assessment, Revised 3rd Edition

Garrett Frane Wilkes
Brigham Young University

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Measuring the Reliability of the Early Expository Comprehension Assessment,
Revised 3rd Edition

Garrett Frane Wilkes

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Master of Science

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Department of Communication Disorders
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ABSTRACT

Measuring the Reliability of the Early Expository Comprehension Assessment, Revised 3rd Edition

Garrett Frane Wilkes
Department of Communication Disorders, BYU
Master of Science

During the past several years, the Common Core State Standards has created a greater demand for students in public schools to comprehend and analyze expository text. In order to prepare students for work with expository text, beginning with kindergarten, more emphasis and standards have become prevalent in preschool classrooms as well. The *Early Expository Comprehension Assessment, Revised 3rd Edition* (EECA R-3) was developed to aid preschool teachers in determining what aspects of expository text a student understands, including recognition of different structure types. This study with the EECA R-3 extends previous studies using earlier iterations of the assessment. One hundred and eight children, between 3 and 5 years of age, from eight Title I classrooms and two private university preschool classrooms were administered two forms of the EECA R-3 to determine its reliability. A Many Facets Rasch Model was used to determine the reliability of the EECA R-3’s test items on both forms. Results indicate that the EECA R-3 is a reliable measurement tool. Problematic items from the previous iteration of the EECA were addressed. New problematic items were acknowledged with suggestions to change instruction or scoring on said items.

Keywords: expository text, comprehension, assessment, early childhood
ACKNOWLEDGEMENTS

I want to thank my thesis chair and advisors, Dr. Culatta, Dr. Hall-Kenyon, and Dr. Fujiki for all their advice and support for completing this project. I also want to thank MaryBeth Robertson and Stacey Christianson for their collaboration and insights, without which I could not have completed this project. Finally, I want to thank my wife, my parents, and every teacher and professor who have supported me throughout my education years, both early and recent. I hope to give back to the education community with my work.
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DESCRIPTION OF THESIS STRUCTURE


Appendix A is a list of all the test items in the Early Expository Comprehension Assessment, Revised 3rd Edition (EECA R-3). Appendix B is a list of all the changes made from previous iterations to make the EECA R-3. Appendices C and D are the protocol sheets for Forms A and B of the EECA R-3, respectively. Appendices E and F are the scoring sheets for Forms A and B of the EECA R-3, respectively. Appendix G is a list of all test item difficulty scores gained from the many-facet partial-credit Rasch model analysis. Appendix H is a list of all ability score thresholds for all test items also gained from the many-facet partial-credit Rasch model analysis.
CHAPTER 1

Introduction

Expository text is connected discourse designed to instruct, educate, or persuade a reader concerning a specific topic (Guillaume, 1998). It differs from a narrative text in its authorial intent, structure, and types of vocabulary. Expository text presents information to the reader in several possible structures (e.g., description or compare/contrast), while narrative text describes a story with one basic structure (i.e., character development and plot structure; Duke, Bennett-Armstead, & Roberts, 2003; Hall, Sabey, & McClellan, 2005; Pappas, 1993). As outlined in the Common Core State Standards, instruction for students from kindergarten to 12th grade is guided by performance standards on specific skills in reading expository texts, including identifying its structure, describing the information given in illustrations and figures, and delineating main ideas or arguments from informational text (Neuman & Wright, 2013).

Previous research has shown that young children at kindergarten level can understand expository texts and benefit from exposure to them (Duke & Kays, 1998); and Common Core State Standards convey expectations for kindergarten students to begin learning from such texts. In anticipation for kindergarten, current preschool standards are designed to prepare students for interactions with expository texts, including learning new vocabulary and understanding the information conveyed in illustrations and graphical representations (National Governors Association, 2010). Culatta, Hall-Kenyon, and Black (2010) established that preschool children could understand and benefit from exposure to expository texts.

Statement of the Problem

Despite the increasing emphasis on expository texts in early grades and the growing research supporting the fact that preschool students can learn from and benefit from exposure to
expository texts, there were no current published assessments that could help teachers evaluate a preschool student’s understanding of an expository text (Hall, Markham, & Culatta, 2005). In response to this lack of a tool, in 2005 Hall, Markham, and Culatta developed the Early Expository Comprehension Assessment (EECA) to determine how well preschool-aged children could understand the ideas conveyed in an expository text and follow the structure in which the information in the text is organized. They found the EECA to be a reliable assessment for children between the ages of 4 and 5 years old. Further iterations of the EECA added additional expository text structures, as well as digitized the assessment (Harding, 2014; McDonald, 2016; Christianson, 2017). The current version, based on previous recommendations, was named the Early Expository Comprehension Assessment, Revised 3rd Edition (EECA R-3). A reliability analysis was necessary to determine if the test could be a reliable tool for teachers to administer to their preschool students and if any problematic test items should be revised before distributing the tool to teachers.

Statement of Purpose

The purpose of this study was to implement the changes to the test recommended by McDonald (2016) and Christianson (2017) and administer the EECA R-3 to determine its reliability. Determining the EECA R-3’s reliability and addressing any problematic items will allow the assessment to be used consistently by preschool teachers to ascertain students’ skills in comprehending expository texts and identify students who may have particular difficulty with expository comprehension tasks.

Research Hypotheses

This study addressed the following research hypotheses:

1. The EECA R-3 will be shown to be a reliable assessment tool.
2. The EECA R-3 will resolve reliability and difficulty issues found with individual problematic items from previous iterations of the assessment.
CHAPTER 2

Review of Literature

In order to create a reliable assessment on the comprehension of expository texts, knowledge on the characteristics of an expository text should be established. This review will address the nature of expository texts and then address practices and standards surrounding expository texts.

Nature of Expository Texts

To properly design, revise, and evaluate an assessment based on comprehension of expository texts, developers must first understand the nature of expository texts and identify key characteristics in terms of purpose, content, and structure.

**Purpose.** An expository text’s purpose is best described when compared to narrative text, a genre commonly seen among school-age children. The intended purpose of a narrative and an expository text differ significantly. A narrative text is intended to tell a story whereas an expository text is intended to deliver knowledge or persuade readers to accept an opinion using factual evidence that supports that opinion (Duke, 2000; Hall, Sabey, & McClellan, 2005; Mantzicopoulos & Patrick, 2011). The purposes of expository texts are closely related to the way the text is organized. Expository texts serve to a) state problems and offer solutions, b) compare and contrast ideas, c) describe or convey information related to a topic, d) specify a sequence of steps in which events occur, and e) convey cause and effect relationships.

**Content.** While a narrative text’s content typically concerns itself with a goal-directed social situation, expository text deals with real information. Furthermore, while narrative text is rich in emotional language, using vocabulary closer to the language a student encounters in their everyday life experiences that is related to characters’ thoughts and actions, an expository text
conveys information that is not centralized on characters but instead focuses on a process of the natural or social world. The language incorporated in an expository text tends to be decontextualized – that is, removed in time or space to the child’s life experiences (Hall, Sabey, & McClellan, 2005). The content can not only be conveyed by the text itself but also by the accompanying illustrations included in the text. Narrative texts for preschool-age children usually have stylized drawings and illustrations of characters, events, or settings; expository texts, on the other hand, tend to use photographs, graphs, and charts to accompany its ideas and highlight details.

**Text structures.** In order to facilitate comprehension and ease reader demands, a text employs a specific structure that can be used to determine how the ideas relate to each other. Again, a comparison with narrative text structures can help highlight key characteristics of expository text structures. Narrative texts use a story grammar structure in order to convey goal-directed episodes that characters experience. Expository texts, on the other hand, use a variety of different structures in order to convey how the text’s ideas relate to each other (Duke & Kays, 1998; Moss, 1997; Pappas, 1991). They create this structure by using key words as signal devices as well as implementing figures and graphical representations to accompany these key words. Englert and Hiebert (1984) and Meyer and Freedle (1984) have established and described a select number of common structures expository texts form to organize their ideas, the ones used in this study being a) description, b) compare/contrast, c) problem/solution, and d) sequence.

A descriptive text involves listing off attributes of a specific topic. Examples of a descriptive text include a text describing a gorilla’s physical features, eating habits, habitat, and social behaviors, or a text taking cross-sections of an engine to explain how all the parts work
together. A descriptive text will use signal devices such as *this is, that is*, and prepositions that describe objects in relation to the subject. Descriptive texts tend to use photographs, illustrations, and labels to highlight specific details that the text describes.

A compare/contrast text involves enumerating the similarities and differences between two different subjects. Examples of compare/contrast texts could be those that differentiate between insects and spiders or demonstrate how the hot Sahara desert is both similar and different from the cold Antarctica desert. A compare/contrast text will use signal devices such as “similarly,” “however,” and “on the other hand.” Venn diagrams and column lists are graphical representations that are conducive to being used with compare/contrast texts.

A problem/solution text involves describing the problems a subject would encounter and the ways the problems are solved. Examples of problem/solution texts include a text that describes the events of the Apollo 13 crisis or a text that reveals the various problems police officers encounter and the ways they resolve them. A problem/solution text will use signal devices such as “solve,” “fix,” and “take care of.” Column lists and arrow charts can be used to highlight the concepts taught in problem/solution texts.

A sequence text involves describing events or processes as they develop over time. Examples of sequence texts include presenting the series of battles in the Civil War or describing the life cycle of a butterfly. A sequence text will use signal devices such as, “first,” “next,” and “finally.” Flow charts and timelines are often the graphical representations used in sequence texts.

Past studies have concluded that explicitly teaching students to recognize expository text structure increases their ability to comprehend and recall details from the text (Akhondi, Malayeri, & Samad, 2011; Hebert, Bohaty & Nelson, 2016). Once a reader recognizes an
informational text’s structure, the reader can then predict how the text will unfold. Learning a text’s structure can create a mental framework for the reader to “fill in” with the ideas of the text. A core feature of this study is to apply previous research into the EECA R-3 by dividing portions of the text according to different expository text structures and determine which text structures and key features the child could comprehend. Providing the teacher a baseline of what the child currently understands can help frame what next to teach and expose a child to in the classroom.

**Current Practices and Standards in Education Regarding Expository Texts**

Understanding the history and current practices of the use of expository texts in classrooms can help understanding the role the EECA R-3 will play in those classrooms. Historically, narratives have been used significantly more than expository texts in early grade classrooms (Duke, 2000). Educators initially assumed that children would be more interested in and benefit from narrative texts as they learned to read. However, these practices did not agree with later school demands that students read expository texts. Beyond the 3rd grade, the emphasis in schools shift from learning to read to using their reading skills to acquire new knowledge (Duke & Kays, 1998). Shifting a student from the familiar narrative texts to the unfamiliar expository texts, created what some educators called a “4th Grade Slump” due to students struggling to shift from using primarily one text type to another (Chall, Jacobs, & Baldwin, 1990).

Starting in the early 21st century, and continuing with the advent of Common Core State Standards (CCSS), expository texts received increasingly more importance in early grade school classrooms than in previous years. More classrooms began teaching strategies for understanding expository texts earlier in order to help prepare children for later school demands (Duke, 2000; Hebert, Bohaty, Nelson & Brown, 2016; Ness, 2011). Duke and Kays (1998) discovered that
children as young as kindergarten can learn content from expository texts, as well as increase their desire to seek knowledge through reading more expository texts. Even preschool-aged children can benefit from exposure to expository texts (Culatta, Hall-Kenyon, and Black, 2010).

Assessment of Expository Text Comprehension

With the increase in demand and use of expository texts comes an increase in need for proper assessments on student comprehension of such texts. Teachers often feel unsure on how to properly incorporate expository texts into early school grade classrooms. (Mantzicopoulos & Patrick, 2011; Ness, 2011; Neuman & Roskos, 2012; Pappas, 1991). Creating a reliable assessment would allow teachers to better understand the skills needed to comprehend expository texts and factors needed to control in the process of teaching those skills. In recent history, comprehension of expository text has not been addressed on its own, but expository comprehension tasks have been incorporated into tests that address overall literacy and language skills. One such test is the Qualitative Reading Inventory, 6th Edition (QRI-6). The QRI-6 is designed to assess understanding of expository texts in the science and social science areas for children from grades 4 through 12. Another tool is the Concepts of Comprehension Assessment (COCA) that evaluates expository text comprehension in for first and second grade students (Witmer, Duke, Billman, & Betts, 2014). As beneficial as these assessments may be for assisting school-age children, no such assessment exists for preschool-aged children.
CHAPTER 3

Method

The purpose of this study was to design a child-friendly assessment for preschool teachers to use to provide descriptive information about their students’ understanding of various types of expository texts. While this study was part of a larger project that evaluated multiple psychometric properties of the EECA R-3, the focus of this study was on the reliability of the EECA R-3.

Participants

Participants for this study were drawn from both public and private preschool programs. Seventy children participated from suburban Title I public school preschool classrooms between the ages of three to five years. In addition, 38 children from two private university preschool classrooms between the ages of three to five years participated, making a total of 108 participants. While nine of the participants from both settings were English Language Learners (ELL), their teachers screened the children prior to the study beginning whether or not the participants had enough English proficiency to contribute to the study.

Measures

The measures included in the study consisted of the Early Expository Comprehension Assessment, Revised 3rd Edition (EECA R-3). The EECA R-3 was designed to examine preschool comprehension of various expository texts that differed according to structure (description, compare/contrast, problem/solution, and sequence). The EECA R-3 was a digitized assessment to be delivered on an iPad with an audio recording of a woman presenting the text, giving instructions, and asking assessment questions. Each expository text was accompanied by
the audio recording establishing a contextual reason to read the text, i.e., reading the text to help certain fictional children learn about various topics.

Requirements to identify text components. The EECA R-3 consisted of five different tasks, including identifying the purpose of a text, and identifying the elements of four different expository text structures: descriptive, compare/contrast, problem/solution, and sequence.

Purpose of a text. This task entailed discerning a narrative text from an expository one. The EECA presented pictures of two different books and asked the student what book they would choose should they want to read a story about a make-believe giraffe or elephant. It then instructed the student to tell the administrator why they chose the book they selected. Due to the nature of the question having a one in two chance of being guessed correctly, the EECA also included a follow-up question about whether or not a real giraffe or elephant could speak or go to school. The EECA then delivered a similar set of questions, only asking which book they would pick if they wanted to learn about real giraffes or elephants.

Elements of a descriptive passage of text. This task assessed students on identifying descriptive expository text and matching text with a figure exemplifying said text. The EECA first gave limited discourse about either a giraffe or an elephant and instructed the student to select the picture that demonstrates the text. This task repeated a second time with a second set of pictures. Then the EECA instructed the student to describe to the administrator a new picture of a giraffe or elephant in their own words. Finally, the EECA instructed the student to tap on a series of labels on various body parts of a giraffe or elephant.

Elements of a compare/contrast passage of text. This task determined a student’s ability to compare similarities and differences in a text. The EECA gave a short expository text comparing the similarities and differences of either frogs and lizards or rabbits and hamsters. The
text highlighted its organization by using words such as *same* and *different*. The EECA then instructed the student to retell what they learned about the passage and presented a chart where the students labeled the similarities and differences between the two animals. After completing the chart, the EECA presented the chart filled out correctly and instructed the student to retell again how the animals are similar and different in their own words.

**Elements of a problem/solution passage of text.** This task determined a student’s ability to relate problems and their solutions in a text. The EECA gave a short expository text about either doctors or firefighters, describing the problems they encounter and the solutions they use to fix the problems. The text divided the text using terms such as *problem, fix, and solve*. The EECA then instructed students to retell what they learned about the passage and presented a chart where they label the problems the professionals faced and solutions to those problems. After completing the chart, the EECA presented the chart filled out correctly and instructed the student to retell again the problems and solutions in their own words.

**Elements of a sequence passage of text.** This task determined a student’s ability to decipher the stages of a sequence in a text. The EECA gave a short expository text about how either beans or tadpoles grow. The text divided the growth into four stages using terms such as *first, next, after that, and finally*. The EECA then instructed students to retell what they learned about the developmental sequence in their own words. Then the EECA presented a chart where the students labeled the steps of the sequence. After completing the chart, the EECA presented the chart filled out correctly and instructed students to retell again the steps of the sequence in their own words.

**Development of the EECA R-3.** Drs. Hall and Culatta first created *The Early Expository Comprehension Assessment* (EECA) in 2005 (Hall, Markham, & Culatta, 2005). The tool
originally consisted of a compare/contrast text comprehension task where the student would retell information learned from the text and organize that information onto a graphical representation using pictures. Observations were made to determine if the student used similar signal devices as the key text to show the text’s structure. A later edition of the EECA developed by Harding in 2014 added a text purpose task (narrative vs. expository) and a problem/solution text comprehension task similar to the previous compare/contrast comprehension task. Another iteration was developed by McDonald in 2016 and was given the name Early Expository Comprehension Assessment, Revised 2nd Edition (EECA R-2). This edition added a sequence text comprehension task and digitized the assessment onto an iPad in order to better facilitate the mapping tasks. Furthermore, the EECA R-2 used a narrator that introduced each task, read the expository texts out loud, and presented the test items. This narrator was created with a picture of a young girl and a prerecorded woman’s voice. McDonald in her study found the EECA R-2 to be valid and reliable with some recommendations to change scoring and administration on certain problematic test items. A pilot study by Christianson (2017) was conducted at a private university preschool with 12 participants and 6 test administrators in order to report qualitative and quantitative data about participants’ test scores and administrators’ impressions of the EECA R-2. Christianson found the need to revise certain aspects of the EECA R-2, including changing a graphic and rerecording the woman’s voice narration to be more engaging to the participants. (See Appendix A for a detailed list of revisions and Appendix B for a listing of the current EECA-R-3 test items.) The instrument was changed according to McDonald’s and Christianson’s recommendations and renamed the EECA R-3, the edition used in this study. Like the EECA R-2, this edition was administered on an iPad, where the students’ responses were recorded both digitally and on a written protocol sheet.
Procedures

Before data collection occurred, permission was obtained through the university IRB, the participating school district, and the principals of each school. Afterward the preschool teachers were contacted via email and invited to participate in the study. Participating teachers were given consent forms for parents to sign allowing their child to participate in the study.

Examiner training. Nine BYU undergraduate students and two graduate students were hired to be test administrators. The graduate students and a BYU faculty member trained the undergraduate test administrators on administering the Test of Story Comprehension (TSC) subtest of the Narrative Language Measures (NLM) and both forms of the EECA. The protocol for test administration included scripted prompts for each of the test components (see Test Protocol in Appendices C & D). A separate scoring sheet was developed by the graduate students to facilitate data collection for the administrators (see Appendices E & F). All administrators practiced administering the test to each other. They were also taught how to make audio recordings of each session and how to store the data they collected.

Test order and test administration. Test administration began after the pilot study was completed and its recommendations were implemented (Christianson, 2017). Each participant took part in three assessment sessions: the TSC subtest of the NLM to provide external validity, and two versions of the EECA (Form A and Form B). The TSC subtest took approximately five to ten minutes to administer, while both forms of the EECA took approximately 15 to 20 minutes each to administer. Administrators were instructed that there should be between a 20-minute and a 2-week gap between administration of either EECA form to the same participant. The participant was first administered the TSC subtest of the NLM, followed by both forms of the EECA in a randomized order. As two administrators were assigned to a single preschool
classroom, eight possible administration combinations were possible for administering the EECA’s two forms in that classroom (see Table 1). An administration schedule randomized all eight combinations in order to prevent administrator or form order from becoming compounding variables.

As both forms of the EECA were administered on an iPad, the iPad digitally recorded some of the participants’ answers and scored them automatically. In addition, all responses were recorded on a written protocol that was later scored manually. These protocols included space for the administrator to write the children’s responses to the open-ended questions for later scoring. The administrator also audio recorded each testing session for later review of vague or lengthy responses. Several testing sessions were videotaped to ensure uniformity of test administration across administrators. Additional written consent from parents was obtained before the children were video recorded.

Table 1

*Possible Administration Orders* (Harding, 2014)

<table>
<thead>
<tr>
<th>Student</th>
<th>First</th>
<th>Second</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Version</td>
<td>Examiner</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>1</td>
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<td>6</td>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>B</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>B</td>
<td>2</td>
</tr>
</tbody>
</table>
Scoring. Scoring procedures followed a protocol that was created previously for McDonald’s study (2016) and then revised by Christianson (2017) to match the changes in the EECA R-3 (see Appendices E and F for the details on the EECA R-3 scoring protocols). Questions on the EECA R-3 were either dichotomous (the children could only score a “correct” (1 point) or an “incorrect” (0 points), or polytomous (the children could score a range of points from 0 to 4). Two graduate students and one undergraduate student were trained on scoring, hence termed raters, who then rated the participants’ responses. Because several polytomous questions were subjective in nature and created a possibility of unequal scoring by raters, inter-rater reliability was established between the raters to an average of 94% across ten protocols, following which responses were rated independently.

Data analysis. The present study used elements from item response theory (IRT) design and the Rasch model (Lord & Novick, 1968; Rasch, 1960) to determine the reliability of assessment items. The IRT and Rasch model designs differ from classical test theory (CTT). In CTT design, scores of a participant are interpreted in comparison to a normative sample. In IRT and Rasch model design, a participant’s test scores are compared directly with the difficulty level of the instrument’s items, set on a logit scale. The logit scale is an equal-interval scale, with 0 as the mean and 1 as the standard deviation (Baylor et al., 2011).

In this study, the many-facet partial credit Rasch model evaluated the reliability of the EECA R-3, assigning each student an ability score and each test item a difficulty score on a logit scale. A threshold parameter is used in the model, which is the logit at which the participant has an equal probability of obtaining one score to its adjacent score. Reliable test items were expected to show higher threshold parameters with higher scores, meaning students with higher
ability scores were likely to score higher on test items, and vice versa. Both forms of the EECA R-3 were given a mean difficulty rating on the logit scale, and compared if one form was significantly more difficult than the other. In addition, a reliability estimate was given, which compared true variance to the observed variance for the facets in question, namely form, test item, participant, administrator, and rater.

The basic Rasch model determined the probability of a participant achieving a correct response, according to the function of the participant’s ability and the question’s difficulty. The basic Rasch model could only determine probabilities for dichotomous questions. Because the EECA contained polytomous questions, a basic Rasch model did not provide an adequate analysis. A partial-credit Rasch model examined the threshold parameter where a participant had an equal chance of obtaining a score (i.e., the participant scored a “2” on a question) to the adjacent score possible (i.e., obtaining a score of “1” or “3”) from the question (see Figure 1). As there are other multiple variables, or *facets*, that could affect the reliability of the assessment, these were analyzed as part of the study; thus a many-facet partial credit Rasch model was employed. The computer software WINSTEPS version 3.91.2 was used to conduct the many-facets partial credit Rasch model analysis.
Figure 1. Illustration of how the probability of achieving a specific score is influenced by the student's ability score; as ability level increases, probability of achieving a higher score increases.
CHAPTER 4

Results

The purpose of this study was to evaluate the reliability of the EECA R-3, the early expository instrument with items that were revised based on previous recommendations (Christianson, 2017; McDonald, 2016). The following sections discussed facet reliability estimates, form statistics, and item statistics.

Overview

Test items were assigned difficulty ratings and placed on the logit scale to have a mean of 0. Test items ranged in difficulty score from -2.5 logits with item 21 on Form A (A21) to 1.87 logits with item 20 on Form B (B20), meaning Item A21 was the easiest and Item B20 was the hardest (see Appendix A). Standard deviation for the test items was 1.11 logits. Student ability results ranged from -4.58 to -0.48. Students nearer the low end would be expected to score fewer points on average, while students on the higher end would be expected to score more points on average. The mean student ability resulted in -1.66 logits with a standard deviation of 0.71 logits.

Reliability Estimates

WINSTEPS produced reliability estimates, which compared the rate of true or expected variance with the observed variance. Estimate values were placed on a scale from 0 to 1, with 0 marking low reliability rating and 1 marking high reliability rating. Each facet resulted in high reliability estimates. The person facet resulted in a .91 reliability rating, meaning the ratings were reliable for the students. Should the tests be administered again to a similar group of students and scored by a similar group of raters, the results would most likely be the same. Both the form facet and the item facet resulted in a .98 reliability rating, meaning that the difficulty rating estimates obtained for both individual items and the test forms would be similarly
reproduced in studies with analogous participants and raters. *Administrator* and *rater* were disqualified to be analyzed as facets due to disconnected subsets. Meaning, not every level of those particular variables interacted with each student to make a reliable analysis. In other words, while each student received each form of the test, and received each individual test item, they were not exposed to every administrator or every rater. Therefore, the program found disconnected subsets and disqualified those variables for the reliability analysis.

**Form Statistics**

WINSTEPS produced the form statistics seen in Table 2, which assigned the forms a difficulty rating on the average among all their items. Both forms featured 29 identical items that assessed the same aspects of expository language, and differed only by the internal content of their respective texts.

<table>
<thead>
<tr>
<th>Form</th>
<th>Participants (N)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>108</td>
<td>0.03</td>
<td>1.16</td>
</tr>
<tr>
<td>B</td>
<td>108</td>
<td>0.03</td>
<td>0.98</td>
</tr>
</tbody>
</table>

The mean difficulty rating for Form A resulted in 0.03 on the logit scale, with a standard deviation of 1.16; and the mean difficulty rating for Form B resulted in -0.03 on the logit scale, with a standard deviation of 0.98. The results indicated that a marginal difference was detected between forms, with Form A being slightly more difficult than Form B. In addition, the Rasch model analysis concluded that the difference between forms was not statistically significant, with
\( t(55) = 0.22, p = 0.829 \). Either form could be used with a given participant without any change expected between results on the average.

**Item Statistics**

Item statistics were reported as difficulty measure statistics and threshold measures, as shown in detail in Appendices G and H, respectively. Threshold measures marked the ability level on the logit scale where the probability of receiving one score was the same as receiving the adjacent score (see Figure 1). The first threshold represented the ability score where there was an equal probability between scoring a 0 and a 1. An ability score below that threshold signified a higher probability to score a 0 on that item, while an ability score above that threshold signified a higher probability to score a 1 on that item. The second threshold represented the ability score where there was an equal probability between scoring a 1 and a 2, the third threshold represented an equal probability between scoring a 2 and a 3, and the fourth threshold represented an equal probability between scoring a 3 and a 4. Dichotomous items had only two possible scores and therefore only contained the first threshold. Some polytomous items (labeled as trichotomous) had three possible scores, thereby contained the first and second thresholds. The remainder of the polytomous items had five possible scores and contained all four thresholds. It is important to note, however, that on some polytomous items no student scored a 4, and therefore the fourth threshold on some polytomous items were omitted.

Using threshold measures, the items were evaluated on how reliably they separate students with low ability scores from students with high ability scores. Assessment items were expected to show increasing thresholds with increasing ability scores with some distribution overlap. For example, for Item A26 (retelling Form A’s sequence text with a map of the text’s concepts as a visual aid), the first threshold resulted at an ability score of -1.63 logits, with each
following threshold steadily increasing on the logit scale. The second fell at -1.57, the third at -1.48, and the fourth at -0.98. Problematic items, on the other hand, crossed or confused threshold progression and contained wider distribution overlaps in probability. Item A16 was one such problematic item. Item A16 (retelling the compare and contrast text from Form A with a completed map of the text’s concepts as a visual aid), resulted in its second and third thresholds at -1.48 and -1.52 logits, respectively. According to the results of Item A16, students with reduced ability score had a higher probability to score higher on the item than a student with a higher ability score, the opposite of what was expected. Eight total test items were found to have problematic threshold ability scores like with Item A16, as shown in Table 3.

Table 3

*Problematic Items*

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5</td>
<td>Trichotomous</td>
<td>Labeling graphic, descriptive text</td>
</tr>
<tr>
<td>A9</td>
<td>Trichotomous</td>
<td>Labeling graphic, descriptive text</td>
</tr>
<tr>
<td>A16</td>
<td>Polytomous</td>
<td>Retell compare/contrast, with map</td>
</tr>
<tr>
<td>A18</td>
<td>Polytomous</td>
<td>Retell problem/solution</td>
</tr>
<tr>
<td>B12</td>
<td>Trichotomous</td>
<td>Labeling graphic, descriptive text</td>
</tr>
<tr>
<td>B13</td>
<td>Polytomous</td>
<td>Retell compare/contrast</td>
</tr>
<tr>
<td>B21</td>
<td>Polytomous</td>
<td>Retell problem/solution, with map</td>
</tr>
<tr>
<td>B26</td>
<td>Polytomous</td>
<td>Retell sequence, with map</td>
</tr>
</tbody>
</table>

All problematic items were either trichotomous or polytomous items of either three possible scores (trichotomous) or five. Items A5, A9, and B12 involved the labeling of a graphic in a descriptive text, making a total of 3 out of 14 labeling graphic items were problematic. Items
A18, B13, and B21 involved retelling their respective texts without a map or representation of the text as a visual aid; Items A16 and B26 involved retelling their respective texts with a text map visual aid. A total of 5 out of 12 retell tasks were problematic. All four expository text structures (i.e., descriptive, compare/contrast, problem/solution, and sequence) from the assessment were represented in the problematic items.
CHAPTER 5

Discussion

With the increasing use of expository texts in preschool and early elementary school settings, teachers would benefit from assessment tools that determine how well students understand expository text (Hall, Markham & Culatta, 2005). This study undertook a Rasch model analysis to determine the reliability of the EECA R-3, an assessment tool meant to evaluate preschool-age students’ understanding of various expository text structures.

As found in the previous chapter and in the previous study with the EECA R-2, (McDonald, 2016), the EECA R-3 was determined to be reliable. The EECA R-3 could be reliably used with preschool students to determine their knowledge of basic expository text structures, including descriptive, compare/contrast, problem/solution, and sequence texts. In addition, students could reliably demonstrate their abilities in terms of determining a text’s purpose, showing understanding of a text’s description and graphics, mapping a text’s structure, retelling a text’s content, and using key words in a text meant to show the text’s structure. The EECA R-3 implemented changes that were recommended to address problematic items on the previous iteration, the EECA R-2 (McDonald, 2016). This study conducted a follow-up on past problematic items, as well as an analysis of current problematic items.

Comparison to EECA R-2: Recommendations

McDonald (2016) conducted a Rasch model analysis study of the EECA R-2 and made several recommendations that formed the basis of this current study. This study followed-up on McDonald’s recommendations and compared current results with previous results. Any changes and revisions to recommendations for preschool classroom instruction were noted.
**Compare/contrast retell task.** McDonald’s (2016) study found that the compare/contrast retell task was the most difficult for the preschool students. Englert and Hiebert (1984) stated that compare/contrast was a more complex structure than the other expository structures and a less familiar structure to students. McDonald recommended that this task be evaluated again on its relative difficulty compared to other tasks (i.e., description, problem/solution, and sequence texts) and that more emphasis should be made by teachers in classroom instruction on compare/contrast to help students recognize this more challenging structure and demonstrate comprehension of compare/contrast tasks.

In this study the compare/contrast retell task (i.e., Items A13 and B13, see Appendix A) scored 0.04 and 0.09 logits, respectively, near the mean of item difficulty. On initial review it appears that the results of this study contradict the findings of McDonald’s (2016) study. However, the items that determine if students could use the key words of the compare/contrast text in the retell (i.e., Items A14 and B14) scored 1.61 and 1.41 logits, respectively. These items ranked as the 2nd and 5th most difficult test items in the assessment and agreed with McDonald’s findings. Interestingly enough, the same task for the compare/contrast text that used a map of the text’s structure as a visual aid (i.e., items A17 and B17) scored 0.58 and 0.66 logits, respectively, and showed a significant decrease in item difficulty. These findings supported the notion that mapping techniques could be effective as part of the instruction on text structure to reduce the initial difficulty of the task for students (Hall, Sabey & McClellan, 2005).

**Items related to genre and text purpose.** McDonald (2016), in her study, found the items where students determined a text’s purpose (i.e., difference between fiction and nonfiction books) were problematic for students. Students generally create meaning from a narrative text differently than from an expository text (Read, Reutzel & Fawson, 2008), and, therefore, it could
be beneficial for teachers to directly instruct students to differentiate fictional from nonfictional genre. McDonald concluded that the item was problematic due to its scoring on partial credit that could mask a student’s true understanding of text purpose and recommended that the scoring for the items be changed to dichotomous ones in order for scoring to better demonstrate the students’ ability to determine a text’s purpose.

In this study the text purpose items were divided into two sections: a) a dichotomous item (i.e., Items A1ac, B1ac, A2ac and B2ac, see Appendix A) where students chose the correct text and answered a yes/no question concerning the fictional or nonfictional nature of the text’s supposed content; and b) a partial-credit item (i.e., Items A1b, B1b, A2b and B2b) that asked students to state why they picked the book they selected. Students received full credit for an explicit answer regarding fiction or reality and partial credit for a response that implied understanding of fiction vs. reality (i.e., “because it’s a cartoon,” or “because it’s a photo”). The dichotomous items’ difficulty scores ranged from 1.52 to 0.85 logits with a mean of 1.12 logits, while the partial credit items’ difficulty scores ranged from 1.17 to 0.6 logits with a mean of 0.88 logits. These findings suggested that the dichotomous items were slightly more difficult than the partial credit items. Both series of items supported the notion that determining fiction from nonfiction is an emerging skill in preschool-aged children that could be affected by their developing ability to distinguish fantasy from reality (Sharon & Woolley, 2004). Students could benefit from direct classroom instruction on the differences between narrative and expository texts in order to better comprehend the two text genres.

**Graphical item.** McDonald (2016) found in her study that graphical item five proved to be problematic for students. In the task students were shown a graphic and instructed to describe what they saw. Graphics aid in making meaning from a text and are therefore key for supporting
McDonald (2016) remarked that students would state relevant items in the picture but miss the relevant information from the graphic. McDonald suggested two possible explanations: a) the graphic was unclear and should be changed, or b) the students may not be aware of what to attend to in the graphic and, therefore, may benefit from direct instruction on how to read an expository text’s graphics.

In this study, the graphic for Item A5 (see Appendix A) was changed to a different picture relevant to the descriptive text’s overall content. Item A5’s difficulty score was -1.7 logits, making it the 5th easiest test item in terms of relative difficulty. It was concluded in this study that the graphic used earlier in the EECA R-2 was unclear for students, and using a different graphic changed its difficulty significantly. Direct classroom instruction on how to derive meaning from an expository text’s graphics could still be beneficial, but perhaps not as necessary as suggested in McDonald’s (2016) study.

**Text structure items.** McDonald (2016) in her study found the mapping tasks for text structures proved difficult for students across the different types of text structures. As stated earlier, attention to text structure has been shown to increase comprehension of expository texts and is a foundation for how the EECA R-3’s test items are organized (Hall, Markham & Culatta, 2005). McDonald suggested that these items are difficult for students because they require students to attend to structure and then recall it. In McDonald’s study, students received partial credit for these items, meaning even if they did not understand the text’s structure, they could receive some credit for simply moving pictures into boxes randomly. McDonald recommended changing the scoring of the mapping items to be dichotomous, where all elements of the map had to be correct to score a point. She did express caution, however, that the all-or-none nature of a mapping task may be too difficult for students.
In this study, all mapping tasks (i.e., Items A15, A20, A25, B15, B20 and B25, see Appendix A) were changed to a dichotomous scoring. Students only received a point if all elements of the map were placed correctly. The difficulty scores of these items varied from B20’s difficulty score of 1.87 logits (the most difficult assessment item) to B15’s difficulty score of 0.63 logits. The mean difficulty score for all the mapping items was 1.17 logits with a standard deviation of 0.48 logits. Despite the variation, this study concluded that the mapping items were on average difficult for the students. The data supported McDonald’s (2016) suggestions that direct classroom instruction on mapping text structures could be beneficial for students to improve their comprehension of expository texts.

**Analysis of Current Study’s Problematic Items**

While this study made significant changes from the previous study that either mitigated or supported previous concerns (McDonald, 2016), this study found problematic items of its own. These problematic items; A5, A9, B12, A16, A18, B13, B21, and B26 (see Table 3 and Appendix A); did not correlate higher student ability score with increased probability to score higher on the items. An analysis was made of these problematic items by reviewing the tool’s design for these questions, including their practical significance, and by recommending changes in future iterations.

**Labeling graphics of the descriptive text.** Three items; A5, A9, and B12; were found to be problematic during the analysis. Items A9 and B12 showed a decrease in ability threshold between probabilities in scoring a 1 and scoring a 2, while Item A5 showed a decrease in ability threshold between probabilities in scoring a 0 and scoring a 1. As stated earlier, graphics play an important role in aiding comprehension of an expository text by illustrating key words and by visualizing concepts (Norman, 2010). A total of 14 assessment items used a graphic of an animal
referred to in the descriptive texts (for Form A, a giraffe, and for Form B, an elephant), with lines and word labels to the various body parts of the animal. Students were instructed to point to the label of the body part, receiving full credit if they tapped the correct word label, partial credit if they tapped the correct line or the correct body part on the picture, and no credit if they tapped on an incorrect label or body part. The source of this lack of correspondence between increased student ability and increased threshold could have originated with how the student was trained at the beginning of the assessment, and therefore, how students understood the nature of the task. The student was trained at the beginning of the test to tap on a graphic of a preschool-aged girl and to move her to an empty space for practice before using the skill on test items. While other test items required the student to tap on a graphic to answer (i.e., the mapping tasks), the label task required the children to tap on the word label, not the picture itself, to receive full credit. Therefore, it is possible that children who had higher ability scores misunderstood the instruction and tapped on the body part and received partial credit. Another factor that could have influenced the results is the scoring of the tasks, where a student received partial credit for emerging knowledge of graphic use in texts but missed the use of labels on an expository text graphic. Direct classroom instruction on expository text graphics, specifically labels and how they are used, could help students improve their performance in deriving meaning from graphics.

In future studies, giving explicit instruction on what a label is or highlighting a written word on an example graphic could help a student differentiate the label from the word. Students could benefit from seeing that words are connected to graphics when being trained on how the assessment works.

**Retelling tasks.** The remaining five problematic items; A16, A18, B13, B21, and B26; were retell tasks in which the student was instructed to tell the examiner what they learned from
the expository text. Two of the items, A18 and B13, involved retelling immediately following the reading of the text without any map as a visual aid. Scoring was based on how many elements from the text the student used in the retell. This task assessed how a student could form a mental map of the text’s structure with the use of only key word signal devices. The other three items; A16, B21, and B26; involved having students retelling what they learned in the text with the map of the text’s structure made available that they had just finished making. Scoring was based on how many boxes in the map they referred to in the retell. This task assessed how a student could utilize a visual aid to gain an emerging understanding of the text’s structure. As stated previously, McDonald (2016) in her study labeled a retell task of the compare/contrast text problematic due to its difficulty. This study found the retell tasks fell near the mean on the difficulty score logit scale; however, they were problematic in this study due to the fact that students’ ability thresholds did not correlate with increasing scores. On all five problematic items, the ability thresholds decreased between probabilities of scoring a 2 and scoring a 3. The source of this discrepancy could have been due to the fact that while the two tasks assessed different skills, the delivery of students’ knowledge was so similar that potentially the tasks interfered with one another. With the compare/contrast text, problem/solution text, and the sequence text, the student would be expected, after making their first retell, to include all relevant information in the second retell, even if that would entail the student including redundant information from the first retell. The task instructions did not contain any stipulation that the student should be redundant, however. Students with high ability scores may have included information in first retell that they omitted in the second to avoid such redundancy. Conversely, students that had otherwise low ability scores would perform low on the first retell but would improve due to the map as a visual aid in the second retell. Finally, it is important to
note that because these questions were open-ended responses, and that the rater facet could not be included in the reliability analysis, it is possible that the inconsistent ability thresholds were due to differences in the raters.

In future studies the two retell tasks could be scored together and students could be given a composite retell score that may better reflect both recalling the text and summarizing the text’s main ideas. Alternatively, the scoring could be changed so the student that included a concept in the first retell would automatically be scored for it in the second retell, as the student would have no need for a visual aid to understand that aspect of the text. Therefore, students that showed an understanding of a text’s concepts in the first recall would not be penalized for not stating redundant material in the second.

Summary

As expository texts have become increasingly used in early elementary school settings, preschool classrooms have become an ideal place to introduce concepts regarding how to derive information from expository text, including learning an expository text’s structure and its key words used to highlight that structure. (Akhondi et al., 2011; Culatta et al., 2010). Early exposure would benefit the children in preparing for increasing encounters across grade levels (Guillame, 1998) and scholastic success.

The EECA R-3 was proven to be reliable in past studies (Harding, 2014; McDonald, 2016) and was again in this study shown to be a reliable tool for preschool teachers to use to determine their students’ abilities in understanding key aspects of expository texts, including understanding a text’s genre and purpose, understanding a text’s structure, recognizing key words used to show a text’s structure, and retelling key concepts from the text. The purpose of this study was successful in addressing previous concerns and recommendations (Christianson,
2017; McDonald, 2016); however, new problematic areas were discovered during the course of this study. Another iteration could be created to better support teachers in properly assessing their students’ comprehension. Addressing the recommendations stated previously would improve the assessment’s scoring to reflect the students’ true abilities. Teachers would better be able to use the EECA R-3 as a model to find aspects of expository texts to include in classroom instruction.
References


## APPENDIX A

EECA R-3 List of Assessment Items

### EECA R-3 List of Assessment Items

<table>
<thead>
<tr>
<th>Form A Items</th>
<th>Form B Items</th>
<th>Test Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1ac, A1b</td>
<td>B1ac, B1b</td>
<td>Identifying fiction</td>
</tr>
<tr>
<td>A2ac, A2b</td>
<td>B2ac, B2b</td>
<td>Identifying non-fiction</td>
</tr>
<tr>
<td>A3</td>
<td>B3</td>
<td>Matching picture to text</td>
</tr>
<tr>
<td>A4</td>
<td>B4</td>
<td>Matching picture to text</td>
</tr>
<tr>
<td>A5</td>
<td>B5</td>
<td>Identifying graphic</td>
</tr>
<tr>
<td>A6</td>
<td>B6</td>
<td>Identifying Label</td>
</tr>
<tr>
<td>A7</td>
<td>B7</td>
<td>Identifying Label</td>
</tr>
<tr>
<td>A8</td>
<td>B8</td>
<td>Identifying Label</td>
</tr>
<tr>
<td>A9</td>
<td>B9</td>
<td>Identifying Label</td>
</tr>
<tr>
<td>A10</td>
<td>B10</td>
<td>Identifying Label</td>
</tr>
<tr>
<td>A11</td>
<td>B11</td>
<td>Identifying Label</td>
</tr>
<tr>
<td>A12</td>
<td>B12</td>
<td>Identifying Label</td>
</tr>
<tr>
<td>A13</td>
<td>B13</td>
<td>Retelling Compare/ contrast passage (unaided)</td>
</tr>
<tr>
<td>A14</td>
<td>B14</td>
<td>Using signal devices in Item 13</td>
</tr>
<tr>
<td>A15</td>
<td>B15</td>
<td>Mapping compare/contrast passage</td>
</tr>
<tr>
<td>A16</td>
<td>B16</td>
<td>Retelling compare/ contrast with map and prompts</td>
</tr>
<tr>
<td>A17</td>
<td>B17</td>
<td>Using signal devices in Item 16</td>
</tr>
<tr>
<td>A18</td>
<td>B18</td>
<td>Retelling problem solution passage (unaided)</td>
</tr>
<tr>
<td>A19</td>
<td>B19</td>
<td>Using signal devices in item 18</td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>A20</td>
<td>B20</td>
<td>Mapping problem/ solution passage</td>
</tr>
<tr>
<td>A21</td>
<td>B21</td>
<td>Retelling problem/ solution with map and prompts</td>
</tr>
<tr>
<td>A22</td>
<td>B22</td>
<td>Using of signal devices in item 21</td>
</tr>
<tr>
<td>A23</td>
<td>B23</td>
<td>Retelling sequence passage (unaided)</td>
</tr>
<tr>
<td>A24</td>
<td>B24</td>
<td>Using signal devices in item 23</td>
</tr>
<tr>
<td>A25</td>
<td>B25</td>
<td>Mapping sequence passage</td>
</tr>
<tr>
<td>A26</td>
<td>B26</td>
<td>Retelling sequence with map and prompts</td>
</tr>
<tr>
<td>A27</td>
<td>B27</td>
<td>Using signal devices in item 26</td>
</tr>
</tbody>
</table>
APPENDIX B

List of Changes to the EECA R-3 Protocol

- Added a question to the identifying fiction/non-fiction section
- Changed in Version A, picture of giraffe from mother with nursing baby to giraffe drinking water
- Changed the wording for the prompts to fill out the maps
- Changed the mapping scoring to be dichotomous
- Changed the prompts for the retell using the maps (split up questions for back up prompts instead of giving them all to every student).
### APPENDIX C

EECA R-3 Protocol, Form A

<table>
<thead>
<tr>
<th>Purpose Task (Items 1 &amp; 2)</th>
<th>Description Task (Items 3 – 12)</th>
</tr>
</thead>
</table>

#### Purpose Task (Items 1 & 2)

(5/90) V: Which book should I choose if I wanted to read a pretend, make-believe story about giraffes? Tap on the book that I should choose.

(IF NR), E: If I want to read a pretend, make-believe story about giraffes, which book should I choose?

1a. Fiction (*) Non-Fiction (0) NR (0)

(7/90) V: Here is the book you chose. Tell the person sitting next to you why you chose that book.

(IF NR), E: Why did you choose that book?

1b. Stated (2) Implied (1) Incorrect (0) NR (0)

E: If you looked at a pretend book about giraffes, could the giraffes in the story go to school and sing songs?

(F NR), repeat

1c. Yes (*) No (0) NR (0)

* Correct for 1a. & 1c. = 1 Total

(9/90) V: Which book should I choose if I wanted to read about real giraffes, about where they live and what they eat? Tap on the book that I should choose.

(IF NR), E: If I want to read about where real giraffes live and what they eat, which book should I choose?

2a. Fiction (0) Non-Fiction (*) NR (0)

(11/90) V: Here is the book you chose. Tell the person sitting next to you why you chose that book.

(IF NR), E: Why did you choose that book?

2b. Stated (2) Implied (1) Incorrect (0) NR (0)

E: If you looked at a book about real giraffes, could the giraffes in the story go to school and sing songs?

2c. Yes (0) No (*) NR (0)

* Correct for 2a. & 2c. = 1 Total

#### Description Task (Items 3 – 12)

(13/90) V: Giraffes use their long necks to reach leaves at the top of trees. Tap on the picture that goes with what I just read.

(IF NR), repeat

3. Correct (1) Incorrect (0) NR (0)

(14/90) V: Giraffes can sleep standing up. Tap on the picture that goes with what I just read.

(IF NR), repeat

4. Correct (1) Incorrect (0) NR (0)

(15/90) V: Tell the person sitting next to you what is happening in this picture.

(IF NR), E: What is happening in this picture?

5. Stated (2) In Picture (1) Irrelevant (0) NR (0)

(17/90) V: Tap on the label that says horn.

6. Word (2) Line/Picture (1) Incorrect (0) NR (0)

(18/90) V: Tap on the label that says tongue.

7. Word (2) Line/Picture (1) Incorrect (0) NR (0)

(19/90) V: Tap on the label that says legs.

8. Word (2) Line/Picture (1) Incorrect (0) NR (0)

(20/90) V: Tap on the label that says ear.

9. Word (2) Line/Picture (1) Incorrect (0) NR (0)

(21/90) V: Tap on the label that says tail.

10. Word (2) Line/Picture (1) Incorrect (0) NR (0)

(22/90) V: Tap on the label that says eye.

11. Word (2) Line/Picture (1) Incorrect (0) NR (0)

(23/90) V: Tap on the label that says neck.

12. Word (2) Line/Picture (1) Incorrect (0) NR (0)

**If NR, repeat

**Total Purpose Task (Items 1 & 2): /6

**Total Description Task (Items 3 – 12): /18

---

*Text conventions:*

- **V:** Voice Narration / Prompt
- **NR:** No Response
- **E:** Examiner Prompt
- **Text (#):** Answer (score)
- **#/?:** Slide Number
- **#x:** Item / Question Number
<table>
<thead>
<tr>
<th>Compare Task (Items 13 – 17)</th>
<th>Solution Task (Items 18 – 22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. V: Here is my friend Anna. Tell her what you learned about lizards and frogs. (Once finished) E: Anything else? [once] (If NR) E: What did you learn about lizards and frogs? 13.</td>
<td>19. (59/90) V: What is one problem firefighters take care of? Tap on the picture that shows one problem that firefighters take care of, and then tap on the yellow box. ** 20a. Fire/Cat (*) Incorrect (0) NR (0)</td>
</tr>
<tr>
<td>If the child asks what is in the picture, tell them.</td>
<td>19. (60/90) V: How do firefighters fix that problem? Tap on the picture that shows how firefighters fix that problem, and then tap on the yellow box. ** 20b. Water/Ladder (*) Incorrect (0) NR (0)</td>
</tr>
<tr>
<td>15a. Crickets (*) Incorrect (0) NR (0)</td>
<td>20c. Fire/Cat (*) Incorrect (0) NR (0)</td>
</tr>
<tr>
<td>15b. Crickets (*) Incorrect (0) NR (0)</td>
<td>(61/90) V: What is another problem firefighters take care of? Tap on the picture that shows another problem that firefighters take care of, and then tap on the yellow box. ** 20d. Water/Ladder (*) Incorrect (0) NR (0)</td>
</tr>
<tr>
<td>15c. Sand (*) Incorrect (0) NR (0)</td>
<td>** [If NR] repeat and point to the blank box</td>
</tr>
<tr>
<td>15d. Water (*) Incorrect (0) NR (0)</td>
<td>*Correct for 20a. – 20d. = (1 Total)</td>
</tr>
<tr>
<td>** [If NR], repeat and point to the blank box</td>
<td>** [If NR], repeat and point to the blank box</td>
</tr>
<tr>
<td>*Correct for 15a. = 15d. = 1 (Total)</td>
<td>*Correct for 20a. – 20d. = (1 Total)</td>
</tr>
<tr>
<td>(44/90) V: Look at the chart and tell the person sitting next to you how lizards and frogs are the same, and how they are different. (Once finished) E: Anything else? [once] (If NR) E: repeat (If NR again) E: [cover lower half of the chart] What did you learn from this part of the chart? [repeat with upper half] 16.</td>
<td>(65/90) V: Look at the chart, and tell the person sitting next to you about two problems firefighters help with, and what they do to help fix them. (Once finished) E: Anything else? [once] (If NR) E: repeat (If NR again) E: [cover lower half of the chart] What did you learn from this part of the chart? [repeat with upper half] 21.</td>
</tr>
<tr>
<td>17.</td>
<td>22.</td>
</tr>
<tr>
<td>TOTAL COMPARE TASK</td>
<td>TOTAL SOLUTION TASK</td>
</tr>
<tr>
<td>Items 13 – 17:</td>
<td>Items 18 – 22:</td>
</tr>
<tr>
<td>/11</td>
<td>/11</td>
</tr>
</tbody>
</table>
### Sequence Task (Items 23 – 27)

<table>
<thead>
<tr>
<th>Item</th>
<th>Question / Instructions</th>
</tr>
</thead>
</table>
| 23a  | V: Here is my friend Sam. Tell him what you learned about beans.  
(If NR), E: What did you learn about beans?  
(Once finished), F: Anything else? [once] | 23. |
| 25a  | V: What happens first when beans grow? Tap on the picture that shows what happens first when beans grow,  
and then tap on the yellow box."**  
25a. Seeds (*) Incorrect (0) NR (0) |
| 25b  | V: What happens next when beans grow? Tap on the picture that shows what happens next when beans grow,  
and then tap on the yellow box."**  
25b. Shoot (*) Incorrect (0) NR (0) |
| 25c  | V: What happens last when beans grow? Tap on the picture that shows what happens last when beans grow,  
and then tap on the yellow box."**  
25c. Leaves (*) Incorrect (0) NR (0) |
| 25d  | V: Look at the chart and tell the person sitting next to you how beans go from being a seed to becoming a bean.  
(If NR) E: repeat  
(If NR again) E: [point to each box of the chart] What did you learn from this part of the chart?  

| TOTAL SEQUENCE TASK (Items 23 – 27): | /11 |
### APPENDIX D

EECA R-3 Protocol, Form B

<table>
<thead>
<tr>
<th>Purpose Task (Items 1 &amp; 2)</th>
<th>Description Task (Items 3 – 12)</th>
</tr>
</thead>
</table>
| (5/90) V: Which book should I choose if I wanted to read a pretend, make-believe story about elephants? Tap on the book that I should choose.  
(IF NR), E: If I want to read a pretend, make-believe story about elephants, which book should I choose?  
1a. Fiction (*) Non-Fiction (0) NR (0) | (13/90) V: An elephant uses its trunk to squirt water on its body to keep cool. Tap on the picture that goes with what I just read.  
(IF NR), repeat  
3. Correct (1) Incorrect (0) NR (0) |
| (7/90) V: Here is the book you chose. Tell the person sitting next to you why you chose that book.  
(IF NR), E: Why did you choose that book?  
1b. Stated (2) Implied (1) Incorrect (0) NR (0) | (16/90) V: Elephants can swim. They keep their trunk above water to breathe. Tap on the picture that goes with what I just read.  
(IF NR), repeat  
4. Correct (1) Incorrect (0) NR (0) |
| E: If you looked at a pretend book about elephants, could the elephants in the story bake a cake for their friend?  
(IF NR), repeat  
1c. Yes (*) No (0) NR (0)  
* Correct for 1a. & 1c. = (1 Total) | (15/90) V: Tell the person sitting next to you what is happening in this picture.  
(IF NR), E: What is happening in this picture?  
5. Stated (2) In Picture (1) Irrelevant (0) NR (0) |
| (9/90) V: Which book should I choose if I wanted to read about where real elephants live and about what they eat? Tap on the book that I should choose.  
(IF NR), E: If I want to read about where real elephants live and what they eat, which book should I choose?  
2a. Fiction (0) Non-Fiction (*) NR (0) | (17/90) V: Tap on the label that says trunk.**  
6. Word (2) Line/Picture (1) Incorrect (0) NR (0) |
| (21/90) V: Here is the book you chose. Tell the person sitting next to you why you chose that book.  
(IF NR), E: Why did you choose that book?  
2b. Stated (2) Implied (1) Incorrect (0) NR (0) | (18/90) V: Tap on the label that says skin.**  
7. Word (2) Line/Picture (1) Incorrect (0) NR (0) |
| E: If you looked at a book about real elephants, could the elephants in the story bake a cake for their friend?  
2c. Yes (0) No (*) NR (0)  
* Correct for 2a. & 2c. = (1 Total) | (19/90) V: Tap on the label that says eye.**  
8. Word (2) Line/Picture (1) Incorrect (0) NR (0) |
| TOTAL PURPOSE TASK (Items 1 & 2): /6 | (20/90) V: Tap on the label that says foot.**  
9. Word (2) Line/Picture (1) Incorrect (0) NR (0) |
| | (21/90) V: Tap on the label that says ear.**  
10. Word (2) Line/Picture (1) Incorrect (0) NR (0) |
| | (22/90) V: Tap on the label that says tail.**  
11. Word (2) Line/Picture (1) Incorrect (0) NR (0) |
| | (23/90) V: Tap on the label that says mouth.**  
12. Word (2) Line/Picture (1) Incorrect (0) NR (0) |
<p>| | ** If NR, repeat |
| | TOTAL DESCRIPTION TASK (Items 3 – 12): /18 |</p>
<table>
<thead>
<tr>
<th>Compare Task (Items 13 – 17)</th>
<th>Solution Task (Items 18 – 22)</th>
</tr>
</thead>
</table>
| *(36/90)* V: *Here is my friend Anna. Tell her what you learned about rabbits and hamsters.*  
(if NR), E: *What did you learn about rabbits and hamsters?*  
(Once finished), E: *Anything else? [once]*  
13. | *(57/90)* V: *Here is my friend Carlos. Tell him what you learned about doctors.*  
(If NR), E: *What did you learn about doctors?*  
(Once finished), E: *Anything else? [once]*  
18. |
| 14. | 19. |
| *(38/90)* V: *What do rabbits eat? Tap on the picture that shows what rabbits eat, and then tap on the yellow box.*  
15a. Grass (*) Incorrect (0) NR (0) | *(59/90)* V: *What is one problem doctors take care of? Tap on the picture that shows one problem that doctors take care of, and then tap on the yellow box.*  
20a. Bone/Earache (*) Incorrect (0) NR (0) |
| *(39/90)* V: *What do hamsters eat? Tap on the picture that shows what hamsters eat, and then tap on the yellow box.*  
15b. Seeds (*) Incorrect (0) NR (0) | *(60/90)* V: *How do doctors fix that problem? Tap on the picture that shows how doctors fix that problem, and then tap on the yellow box.*  
20b. Cast/Medicine (*) Incorrect (0) NR (0) |
| *(40/90)* V: *What do rabbits sleep on? Tap on the picture that shows what rabbits sleep on, and then tap on the yellow box.*  
15c. Wood Flakes (*) Incorrect (0) NR (0) | *(61/90)* V: *What is another problem doctors take care of? Tap on the picture that shows another problem that doctors take care of, and then tap on the yellow box.*  
20c. Bone/Earache (*) Incorrect (0) NR (0) |
| *(41/90)* V: *What do hamsters sleep on? Tap on the picture that shows what hamsters sleep on, and then tap on the yellow box.*  
15d. Wood Flakes (*) Incorrect (0) NR (0) | *(62/90)* V: *How do doctors fix that problem? Tap on the picture that shows how doctors fix that problem, and then tap on the yellow box.*  
20d. Cast/Medicine (*) Incorrect (0) NR (0) |
| **(If NR), repeat and point to the blank box  
*Correct for 15a. – 15d. = (1 Total)** | **(If NR), repeat and point to the blank box  
*Correct for 20a. – 20d. = (1 Total)** |
| *(44/90)* V: *Look at the chart and tell the person sitting next to you how rabbits and hamsters are the same, and how they are different.*  
(if NR) E: repeat  
(if NR again) E: [cover lower half of the chart] What did you learn from this part of the chart? [repeat with upper half]  
(Once finished) E: *Anything else? [once]*  
16. | *(65/90)* V: *Look at the chart, and tell the person sitting next to you about two problems doctors help with, and what they do to they fix them.*  
(If NR) E: repeat  
(If NR again) E: [cover lower half of the chart] What did you learn from this part of the chart? [repeat with upper half]  
(Once finished) E: *Anything else? [once]*  
21. |
<p>| 17. | 22. |
| TOTAL COMPARE TASK (Items 13 – 17): /11 | TOTAL SOLUTION TASK (Items 18 – 22): /11 |
| (66 &amp; 67 have blank audio files, skip to 68) |</p>
<table>
<thead>
<tr>
<th>Sequence Task (Items 23 – 27)</th>
<th>SCORING</th>
</tr>
</thead>
<tbody>
<tr>
<td>(78/90) V: Here is my friend Sam. Tell him what you learned about how frogs grow. (if NR), E: What did you learn about frogs? (Once finished), E: Anything else? [once] 23.</td>
<td>Form B: Student Name:</td>
</tr>
<tr>
<td></td>
<td>Date: Teacher Name:</td>
</tr>
<tr>
<td>24.</td>
<td>Purpose Task: /6</td>
</tr>
<tr>
<td></td>
<td>Description Task: /18</td>
</tr>
<tr>
<td></td>
<td>Compare Task: /11</td>
</tr>
<tr>
<td></td>
<td>Solution Task: /11</td>
</tr>
<tr>
<td></td>
<td>Sequence Task: /11</td>
</tr>
<tr>
<td></td>
<td>TOTAL RAW SCORE: /57</td>
</tr>
<tr>
<td></td>
<td>Notes &amp; Comments:</td>
</tr>
<tr>
<td>(80/90) V: What happens first when frogs grow? Tap on the picture that shows what happens first when frogs grow, and then tap on the yellow box.** 25a. Eggs (*) Incorrect (0) NR (0)</td>
<td></td>
</tr>
<tr>
<td>(81/90) V: What happens next when frogs grow? Tap on the picture that shows what happens next when frogs grow, and then tap on the yellow box.** 25b. Tadpoles (*) Incorrect (0) NR (0)</td>
<td></td>
</tr>
<tr>
<td>(82/90) V: What happens after that when frogs grow? Tap on the picture that shows what happens after that when frogs grow, and then tap on the yellow box.** 25c. Young Frogs (*) Incorrect (0) NR (0)</td>
<td></td>
</tr>
<tr>
<td>(83/90) V: What happens last when frogs grow? Tap on the picture that shows what happens last when frogs grow, and then tap on the yellow box.** 25d. Adult Frogs (*) Incorrect (0) NR (0)</td>
<td></td>
</tr>
<tr>
<td>**(if NR), repeat and point to the blank box *Correct for 25a. – 25d. = [1 Total]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(86/90) V: Look at the chart and tell the person sitting next to you how frogs go from being a egg to a frog. (if NR) E: repeat. (if NR again) E: [point to each box of the chart] What did you learn from this part of the chart? (Once finished), E: Anything else? [once] 26.</td>
</tr>
<tr>
<td></td>
<td>27.</td>
</tr>
<tr>
<td></td>
<td>(87 &amp; 88 have blank audio files, skip to 89)</td>
</tr>
<tr>
<td></td>
<td>TOTAL SEQUENCE TASK (items 23 – 27): /11</td>
</tr>
</tbody>
</table>
Giraffe Text

1a. Which book should I choose if I want to read a pretend, make-believe story about giraffes? Point to the book that I should choose.
   Correct Answer: Fiction  (look at 1c for how this part is graded)
   Incorrect: Non-Fiction/ No response

1b. Tell the person sitting next to you why you chose that book.
   Correct answer: The picture of the giraffe is pretend.
   The correct answer is stated ___________________________ 2 points  
   e.g., Because it was pretend
   It’s a pretend one – just like she said
   Because it isn’t real

   Correct answer is implied ___________________________ 1 point
   e.g., Because it’s a kids one
   It makes you believe … like your dreams
   Cause it has hearts on the side

   Correct answer is not stated or implied/NR ___________________________ 0 point
   e.g., Because I like that one
   Because it’s a giraffe

1c. If you looked at a pretend book about giraffes, could the giraffes in the story go to school and sing songs?
   Correct Answer: Yes

   Correct answer for 1a + 1c ___________________________ 1 point

2a. Which book should I choose if I want to read about where real giraffes live and what they eat?
   Correct Answer: Nonfiction  (look at 2c for how this part is graded)
   Incorrect: Fiction/ No response

2b. Tell the person sitting next to you why you chose that book.
   Correct answer: The picture of the giraffe is real.

   Correct answer is stated ___________________________ 2 points
   e.g., Because it’s a real giraffe
   Because it’s a story about a real giraffe
Correct answer is implied 1 point
e.g., I wanted to see where they live
So people can learn about animals
It tells you where giraffe lives and what they eat.

Correct answer is not implied or stated/ NR 0 points
e.g., Because animals they eat. They play with their swings and go to their grandmas.
Because I like the book

3. Giraffes use their long necks to reach leaves at the top of trees. Tap on the picture that goes with what I just read.

<table>
<thead>
<tr>
<th>Yes</th>
<th>1 point</th>
</tr>
</thead>
<tbody>
<tr>
<td>No / No response</td>
<td>0 points</td>
</tr>
</tbody>
</table>

4. Giraffes can sleep standing up. Point to the picture that goes with what I just read.

<table>
<thead>
<tr>
<th>Yes</th>
<th>1 point</th>
</tr>
</thead>
<tbody>
<tr>
<td>No / No response</td>
<td>0 points</td>
</tr>
</tbody>
</table>

5. Tell the person next to you what is happening in this picture.
Correct answer: The giraffe is drinking water

Correct answer is stated 2 points
e.g., The giraffe is drinking

Something is stated that is in the picture 1 point
but is not the correct answer
e.g., He has a long neck.
There’s water.
Giraffe is standing in the mud.

The correct answer is not implied or stated/ NR 0 points
e.g., He’s cute.
He’s dancing.

6-12. Point to the label that says …

Word 2 points
Line / Item 1 point
Incorrect / No response 0 points

13. Here is my friend Anna. Tell her what you learned about lizards and frogs:
No information from the text or no response 0 points

e.g., 1 is black and white and is different. And they play like this (jumped)

1-2 pieces of information from the text 1 points
e.g., You have to take care of them. That they are different. Don’t have the same tank.

3-4 pieces of information from the text 2 points

e.g., I learned about frogs eat crickets and lizards eat crickets. And they are different. To take care of lizard, need a home with sand. To take care of a frog, need to get them food and get them the home with grass & rocks.

They eat bugs. And they’re different. One needs sand. One needs water.

They need different things in tanks. Frogs need rocks and lizards need sand and it can climb mountains.

5-9 pieces of information from the text 3 points

e.g., Frogs and lizards are pets and you can hold them. You keep them in a tank. They eat crickets. Lizards need sand. Frogs need water.

10+ pieces of information from the text 4 points

e.g., Lizards and frogs make cool pets. Lizards and frogs eat the same things. They eat crickets. You can buy crickets at the pet store. In some ways pet lizards and frogs are different. Lizards and frogs need different things in their tank. Lizards need a warm tank with sand. Frogs are different. Frogs need a tank with water and rocks”

14. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)

If they use a key word

e.g., same, different, similar, both, alike, however, but

OR

If they talk about similarities or differences together

e.g., I learned about frogs eat crickets and lizards eat crickets. One needs sand, one needs water. They eat crickets.

The following would NOT get a point:

You have to take care of them
They eat crickets
They live in a tank
15. Give 1 point if every picture is in the correct box (max 1 pt.):

<table>
<thead>
<tr>
<th>Lizards</th>
<th>Frogs</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do they eat?</td>
<td></td>
</tr>
<tr>
<td>What do they need in their tank?</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: the responses to the following question could be split over the main question and the two back-up questions.

16. Use the chart to tell the person sitting next to you how lizards and frogs are the same and how they are different. Give 1 point for every piece of information they talk about from the map (max 4 points)

Refer to 0 boxes from map. 0 points

e.g., They’re green.

They eat.

Refer to 1 box from map. 1 point

e.g., They need sand.

Refer to 2 boxes from map. 2 points

e.g., They eat the same food.

Refer to 3 boxes from map. 3 points

e.g., They eat crickets. Have water and rocks.

Refer to 4 boxes from map. 4 points

e.g., One lives in water and the other needs sand. Both of them eat crickets.

They eat the same things and live in different things.

They have different tanks. They eat the same things. One of them needs sand and the other needs rocks.
NOTE: If a child points to each picture correctly in response to the questions, rather than describe what’s happening, please highlight the box on the scoring sheet in blue.

17. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)
   If they use a key word
   e.g., same, different, similar, both, alike, however, but

   OR

   They talk about similarities or differences together
   e.g., I learned about frogs eat crickets and lizards eat crickets.
         One needs sand. One needs water.
         They eat crickets. Have water and rocks.

   The following would NOT get a point:
   Lizards like crickets.

Firefighters Text

18. Here is my friend Carlos. Tell him what you learned about firefighters. (max 4 pts)
No information from the text or no response __________________________ 0 points

   e.g., They do a good job
         They help everything

   1-2 pieces of information from the text __________________________ 1 points
   e.g., Spray water and getting cats out of the tree

   The cat got stuck on the tree and the firefighters got the kitty cat down the tree

   3-4 pieces of information from the text __________________________ 2 points
   e.g., They save cars, houses, cats … They have a cool job.

   I learned about firefighters drive a red truck. They get the cat out of the tree. They save people.
They help animals & people be safe and they take out fire and rescue your cat or dog.

By getting the house fired and by the cat got stuck in the tree, and by the car caught fire.

Firefighters can drive in their red car. They are brave. They help people and animals. They fix problems.

5-9 pieces of information from the text 3 points

e.g., So, firefighters. If you have a house on fire they can fix it. If you have a tree on fire they can fix it. If you have a car on fire they can fix it. If you have a cat stuck in a tree they can get it down with a ladder.

10+ pieces of information from the text 4 points

e.g., “Firefighters drive a red fire truck. They wear special clothes. They do a very important job. Firefighters put out fires. Have you ever seen something on fire? A car can catch on fire. A tree can catch on fire. Even a house can catch on fire. A house on fire is a big problem. The firefighters will fix the problem. The firefighters will spray water on the fire. This water will stop the fire and fix the problem. Sometimes a cat gets stuck in a tall tree. This is a problem. Firefighters can fix the problem. They can use the ladder on the fire truck. A firefighter will climb up the ladder and get the cat out of the tree. This will solve the problem. Firefighters work hard to fix problems. They are brave. They help keep people and animals safe.”

19. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)

If they use a key word

  e.g., problem, solution, solve, fix

OR

If they talk about problems/solutions together

  e.g.: They can fire everything and they can stop the fire
  The cat got stuck on the tree and the firefighters got the kitty cat down the tree.

The following would NOT get a point:
  They put out fire – they use hose
  Use ladder to get kittens from tree
  They spray the water and save pets
  They help animals and people be safe and they take out fire and rescue your cat or dog.
20. Give 1 point for every picture in the correct box. (max 4 points)
NOTE: The rows could be switched around (fire and water picture on the bottom and cat and ladder picture on the top)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Firehouse]</td>
<td>![Firefighter]</td>
</tr>
<tr>
<td>![Cat]</td>
<td>![Ladder]</td>
</tr>
</tbody>
</table>

NOTE: the responses to the following question could be split over the main question and the two back-up questions.
21. Tell the person sitting next to you the problems firefighters take care of and how they fix them. Give 1 point for every piece of information they talk about from the map (max 4 points)

- Refer to 0 boxes from map: 0 points
  e.g., The house one.

- Refer to 1 box from map: 1 point
  e.g., The house on fire.

- Refer to 2 boxes from map: 2 points
  e.g., When the cat got stuck in the tree and when house caught fire, went and fixed problem.

- Refer to 3 boxes from map: 3 points
  e.g., Firefighters they help. Put the water on it and help the cat to get out of the tree. And then the house was fired and they put water on it and it don’t get fired.


- Refer to 4 boxes from map: 4 points
  e.g., FF can help with burning house and putting water. Helping the cat with a ladder.
They can spray water out to get the fire out of the house. They could climb up a ladder and get a cat out.

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what’s happening, please highlight the box on the scoring sheet in blue.

22. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)

   If they use a key word
   e.g., problem, solution, solve, fix

   OR

   If they talk about the problem and solution together
   e.g.: Firefighters can help with burning house and putting water. 
       Cat stuck in tree --> use ladder to get cat 
       House gets on fire and do hose 
       They get water for when fire is on house they get it 
       Cats get stuck in a tree and firefighters get a ladder and help them. 
       To take out fire, need water. 
       To take cat out of tree, you need a ladder.

The following would NOT get a point:
They take care of cats.
They spray water in a hose
Helping the cat with a ladder
Fire House. Kitty cat in the tree. Putting water. Saving the cat

Beans Text

23. Here is my friend Sam. Tell him what you learned about beans. (max 4 points)

No information from the text or no response 0 points

1-2 pieces of information from the text 1 point

   e.g., Me pull out a plant and leaves will grow on it. That what will grow first. 
       Then it will grow bigger and bigger.

3-4 pieces of information form the text 2 points

   e.g., They need water to grow and so you plant them in the dirt.

   Beans grow from a stalkling. Beans get bigger. Stalkings suck up water.
5-9 pieces of information from the text __________________ 3 points

e.g., To get beans, they grow. Need water to make them grow.

Put it in the dirt and they can grow. Then it’s ready to pick up.

by planting the beans and the sun and then by picked up the beans when the beans grow

10+ pieces of information from the text __________________ 4 points

e.g., First the bean seed will start to grow roots. The roots will grow down into the dirt. The roots are like tiny straws. They suck up water from the dirt. The water helps the bean seed to grow. Next the bean seed grows a shoot. The shoot pokes up out of the dirt into the air. The shoot is also called the stem. Then leaves will start to grow on the stem. The bean plant needs sun and water to grow. Later beans will start to grow on the plant. Finally, the beans will be big. They will be ready to pick.”

24. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)

If they use a key word

e.g., first, then, next, after, later, last, finally

OR

If they talk about what happens in sequence

e.g., By planting the beans and the sun and by picked up the beans when the beans grow.

You plant a seed. Roots grow. You water the seed. It will grow leaves.

The following would NOT get a point:

Beans they need water to grow and so you plant them in the dirt.
To get beans, they grow. Need sun and water to make them grow.

25. Give 1 point if every picture is in the correct box:

(max 1 point)

NOTE: the responses to the following question could be split over the main question and the two back-up questions.
26. Use the chart to tell the person sitting next to you how beans go from a seed to becoming a bean. Give 1 point for every piece of information they talk about from the map (max 4 points)

Refer to 0 boxes from chart __________________________ 0 points
  e.g., First they get planted, need water. Then they grow.

Refer to 1 box from chart __________________________ 1 point
  e.g., You put a seed in, then you watch it. Then it start to grow. Then it grows more.
       Then you get the beans.
       1 point

Refer to 2 boxes from chart __________________________ 2 points
  e.g., You plant it and give water and sun. The bean grows and turns into a plant.
       Finally beans grow off.
       Cause they put a lot of water. They were little (points at bean seeds). Looks like a plant (points at sprout).

Refer to 3 boxes from chart __________________________ 3 points

Refer to 4 boxes from chart __________________________ 4 points
  e.g., They have roots. They go up. Then leaves. Then flowers and beans.

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what’s happening, please highlight the box on the scoring sheet in blue.

27. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)
   If they use a key word
   e.g.: first, then, next, after, later, last, finally

   OR

   If they talk about bean growth in the correct sequence
   e.g.: You put the seed and it grows out and gets bigger and drinks water and then you have some beans.
         You need to put beans in and then they grow.
         They have roots. They go up. Then leaves. Then flowers and beans. They were little. Looks like a plant. It was growing a lot. Plant. Ready to pick up.
The following would NOT get a point:
By planting the flowers and by the sun and by growing and by picking them and by growing and by drinking the water.
APPENDIX F
EECA R-3 Scoring Guide, Form B

Elephant Text

1a. Which book should I choose if I want to read a pretend, make-believe story about elephants? Point to the book that I should choose.
Correct Answer: Fiction (look at 1c for how this part is graded) Incorrect answer: Nonfiction/No response

1b. Tell the person sitting next to you why you chose that book.
Correct answer: The picture of the elephant is pretend.

The correct answer is stated __________________________ 2 points
e.g., Because it was pretend
Because I love to watch movies from the pretend ones
Because it isn’t real

Correct answer is implied __________________________ 1 point
e.g., Because it is holding a flower
Because the elephant is blue

Correct answer is not stated or implied/NR __________ 0 points
e.g., Because I like elephants
Because I read it
Because elephants are cool

1c. If you looked at a pretend book about elephants, could the elephants in the story bake a cake for their friend?
Correct Answer: Yes

Correct answer for 1a + 1c __________________________ 1 point

2a. Which book should I choose if I want to read about where real elephants live and what they eat?
Correction Answer: Nonfiction (look at 2c for how this part is graded) Incorrect answer: Fiction/No response

2b. Tell the person sitting next to you why you chose that book.
Correct answer: The picture of the elephant is real.

Correct answer is stated __________________________ 2 points
e.g., Because they’re real elephants
Because real elephants eat grass
Correct answer is implied ____________________________ 1 point
  e.g., Because I saw elephants at a zoo
  Because it tells us where they live and what they eat
  Because she said what elephants eat

Correct answer is not implied or stated/NR __________ 0 points
  e.g., Because I like elephants
  Because I read it
  Because elephants are cool

2c. If you looked at a book about real elephants, could the elephants in the book bake a cake for their friend?
Correct Answer: No

Correct answer for 2a + 2c ____________________________ 1 point

3. An elephant uses its trunk to squirt water on its body to keep cool. Point to the picture that goes with what I just read.
Yes ____________________________ 1 point
No / No response ____________________________ 0 points

4. Elephants can swim. They keep their trunk above water to breathe. Point to the picture that goes with what I just read.
Yes ____________________________ 1 point
No / No response ____________________________ 0 points

5. Tell the person next to you what is happening in this picture.
Correct answer: The elephant uses its trunk to eat.

Correct answer is stated ____________________________ 2 points
  e.g., He’s eating.

Something is stated that is in the picture ____________________________ 1 point
  but is not the correct answer.
  e.g., The elephant is standing in the flowers.
  He has big ears.

The correct answer is not implied or stated/ NR ____________________________ 0 points
  e.g., He’s lost.
  He’s walking.
  The elephant’s cute.

6-12. Point to the label that says …
Word ____________________________ 2 points
Line/item ____________________________ 1 point
Pet Rabbits and Hamsters text

13. Here is my friend Anna. Tell her what you learned about rabbits and hamsters:

No information from the text or no response 0 points

e.g., They eat.

1-2 pieces of information from the text 1 points

e.g., They eat food and grass and they sleep in the house.

They live in … They sleep in … Rabbits eat grass. Rabbits are different and hamsters are different too.

3-4 pieces of information from the text 2 points

e.g., You can take care of them. Rabbits eat grass and hamsters eat seeds and they are fun pets.

They eat grass and nuts and peanuts … hamsters eat nuts. They live in same beds

5-9 pieces of information from the text 3 points

e.g., Rabbits eat grass and hay and hamsters eat nuts and seeds and they both like the same kind of bed. In some ways they are different.

10+ pieces of information from the text 4 points

e.g., “Rabbits and hamsters make fun pets. You can buy them at the pet store. In some ways rabbits and hamsters are the same. Rabbits and hamsters can sleep on the same type of bed. They sleep on wood flakes. In other ways rabbits and hamsters are different. Rabbits and hamsters eat different things. Rabbits eat hay and grass. Hamsters are different. Hamsters eat seeds and nuts.

14. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)

If they use a key word

e.g., same, different, similar, both, alike, however, but

OR

If they talk about similarities or differences together

e.g., Rabbits eat grass and hamsters eat something else.
Rabbits eat hay and grass. Hamsters eat seeds and nuts.
They sleep on woodflakes.
The following would NOT get a point:
They eat food and grass.

15. Give 1 point if every picture is in the correct box:
(max 1 point)

<table>
<thead>
<tr>
<th>Rabbits</th>
<th>Hamsters</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="grass" alt="What do they eat?" /></td>
<td><img src="mattress" alt="What do they sleep on?" /></td>
</tr>
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</table>

NOTE: the responses to the following question could be split over the main question and the two back-up questions.

16. Use the chart to tell the person sitting next to you how rabbits and hamsters are the same and how they are different. Give 1 point for every piece of information they talk about from the map (max 4 points)

Refer to 0 boxes from map 0 points

e.g., That one’s black and that one is different. There’s a big bunny mom …
A lot of grass then they grow.

They eat.

Refer to 1 box from map 1 point

e.g., They eat grass.

Refer to 2 boxes from map 2 points

e.g., Eat different food.
Rabbits eat some grass and then hamsters eat some those (points to seeds)

Refer to 3 boxes from map 3 points
e.g., They eat grass and sleep on the same stuff.

Refer to 4 boxes from map 4 points

They eat grass and nuts and peanuts. Hamsters eat nuts. They live in same beds.

They sleep in the same things and eat different things.

Hamsters are different because they eat seeds. Bunnies eat grass. That’s why they are different. They both sleep in … I can’t remember the word.

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what’s happening, please highlight the box on the scoring sheet in blue.

17. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)
   If they use a key word
   e.g., same, different, similar, both, alike, however, but

   OR

   They talk about similarities or differences together
   e.g., Rabbits eat grass. Hamsters eat seeds.

   One needs sand, one needs water.

   They sleep on woodflakes.

   The following would NOT get a point:
   They eat.

   Hamsters eat nuts.

Doctors Text

18. Here is my friend Carlos. Tell him what you learned about doctors. (max 4 pts)
   No information from the text or no response 0 points

   e.g., They do a good job.

   They help everything.

   1-2 pieces of information from the text 1 points

   e.g., There’s hard and they take care of ears.
They wear very special costumes.

They help you feel better.

3-4 pieces of information from the text _______________ 2 points

e.g., They work so hard and when somebody gets hurt they fix the problem. They go to the hospital.

They go to the hospital and fix people’s bones and help people’s ears. They work very hard.

They eat medicine. Sometimes feet/hands/head broken. They get casts.

Doctors are very nice and if you have your leg or your ear hurts or your arm broke and if you have broken thing, they’ll do something. If your ear hurts or if sick, they will be super helpful and careful.

5-9 pieces of information from the text _______________ 3 points

10+ pieces of information from the text _______________ 4 points

e.g., Doctors work in a hospital. They wear special clothes. They do a very important job. Doctors help people get better. Have you ever been sick? Did you have a cold? Did you have red spots on your body? Did you break a bone? Breaking a bone in your body is a big problem. It might be your leg, or your arm, or your finger. The doctor will fix the problem. The doctor will set the bone straight and put it in a cast. This will help the bone grow back together. Sometimes your ears might hurt. This is a problem. The doctor can fix the problem. The doctor will give you some medicine. This will solve the problem. Doctors work hard to fix problems. They are very helpful. They take care of people.

19. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)

If they use a key word

  e.g., problem, solution, solve, fix

OR

If they talk about problems/solutions together

  e.g., If you have a hurting ear they will give you medicine.

  They give you a cast when you break your elbow.

  If you have a broken thing, they’ll do something.
The following would NOT get a point:
They give you medicine.
They make you feel better.
They help when your ear hurts.

20. Give 1 point if every picture is in the correct box:
(max 1 point)
NOTE: The rows could be switched around (ear and medicine on top and arm and cast on bottom)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
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</thead>
<tbody>
<tr>
<td>![Arm and cast]</td>
<td>![Ear and medicine]</td>
</tr>
</tbody>
</table>

NOTE: the responses to the following question could be split over the main question and the back-up questions.

21. Tell the person sitting next to you the problems doctors take care of and how they fix them.

Give 1 point for every piece of information they talk about from the map (max 4 points)

Refer to 0 boxes from map ___________________________ 0 points

e.g., They’re fixing with this and they’re fixing with this.

Refer to 0 boxes from map ___________________________ 1 point

e.g., She hurt her ears.

Refer to 2 boxes from map ___________________________ 2 points

e.g., They give them some medicine and then when they’re sick and when they break their bones.

When someone breaks a bone, they can put one of those things.
Refer to 3 boxes from map __________________________ 3 points

e.g.,  They breaked a bone and hurting ears and medicine.
So, how they fix if you have a broken bone, give them medicine. If you have an itchy ear, give them medicine.

Refer to 4 boxes from map __________________________ 4 points

e.g.,  They fix them when somebody hurts their ear. Give them medicine. If you break your bone we can put something in it.


When you hurt your ear and then they fix the problem. And then they break their bones and they gave them something like that (cast) and give them medicine.

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what’s happening, please highlight the box on the scoring sheet in blue.

22. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)
   If they use a key word
   e.g.,  problem, solution, solve, fix

   OR

   If they talk about a problem/solution together.
   e.g.,  When someone breaks a bone, they can put one of those things.

   They put a cast when they broke a bone.


   The following would NOT get a point:
   They give medicine.
   They help you feel better.

How Frogs Grow Text

23. Here is my friend Sam. Tell him what you learned about how frogs grow. (max 4 points)
   No information from the text or no response ___________________ 0 points
They hatch.

Because they grow and then they grow all day into … and then they grow.

They grow. Tadpoles. They drink water. They tail. They friends w/ fishes.

They lay eggs in the water. They turn into tadpoles and they get legs and they become a frog.

They jump in the water and they put their eggs in the water and they’re baby frogs. Then they get stronger.

They hatch. Frogs are black. Look like fish. They grow old. Their legs are strong and they can jump on rocks.

Lays eggs and then turn into something else. Have small legs and dots and they swim.

First an adult frog lays eggs. The eggs look like small black dots. The eggs are covered in something that feels like jelly. The frog will put the eggs in water. Next the eggs hatch. Out come tadpoles. Tadpoles are small and black. They look a bit like fish. Tadpoles swim with their tail. Then the tadpoles start to grow small legs. The tadpole becomes a baby frog. Finally, the baby frog will get big. It will become an adult frog. The frog’s legs will be strong. The frog will be able to jump on rocks and swim in the water.

Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)
If they used a key word
e.g., first, then, next, after, later, last, finally

OR

If they talked about what happens in a sequence
e.g., They lay eggs in the water. They turn into tadpoles and they get legs

They hatch. Frogs are black. Look like fish. They grow old.
The following would NOT get a point:
They grow big.
They grow. Tadpoles. They drink water. They tail. They friends w/ fishes.

25. Give 1 point if every picture is in the correct box:
(max 1 point)

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<th>first</th>
<th>next</th>
<th>then</th>
<th>finally</th>
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<td>🐸青蛙</td>
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NOTE: the responses to the following question could be split over the main question and the back-up questions.

26. Use the chart to tell the person sitting next to you how frogs go from being an egg to a frog.
Give 1 point for every piece of information they talk about from the map (max 4 points)

Refer to 0 boxes from chart 0 points
e.g., Frogs have strong legs and they jump high.

Refer to 1 boxes from chart 1 point
 e.g., Egg first. They go in eggs. I already did those things.
 Put eggs in the water. They grow big like this. Those are – they’re want to go in the water and play over there.

Refer to 2 boxes from chart 2 points
 e.g., Be they’re do eggs in the water and then they are baby frogs and then they get stronger and they jump in the water.

Refer to 3 boxes from chart 3 points
 e.g., Goes like eggs but black, they grow and look like fish. They grow with legs, and then grow skin and have strong legs and that’s it.
 They first started hatching and got in the water. First started hatching. Put them in water. They get legs. Then they turn into adult.

Refer to 4 boxes from chart 4 points
 e.g., The frogs lay eggs and they turn to tadpoles and they start growing legs and they become a frog.

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what’s happening, please highlight the box on the scoring sheet in blue.
27. Give 1 point if there is evidence that the student paid attention to the structure (max 1 point)
If they use a key word
  e.g., first, then, next, after, later, last, finally

OR

If they talk about frog growth in the correct sequence
  e.g.: The frogs lay eggs and they turn to tadpoles and they start growing legs and they become a frog.

  Eggs in water turn into tadpoles and grow legs.
  Put eggs in the water. They grow big like this.

The following would NOT get a point:
  They grow strong legs and like to jump.
APPENDIX G

Test Item Difficulty Scores

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## APPENDIX H

### Threshold Measures

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