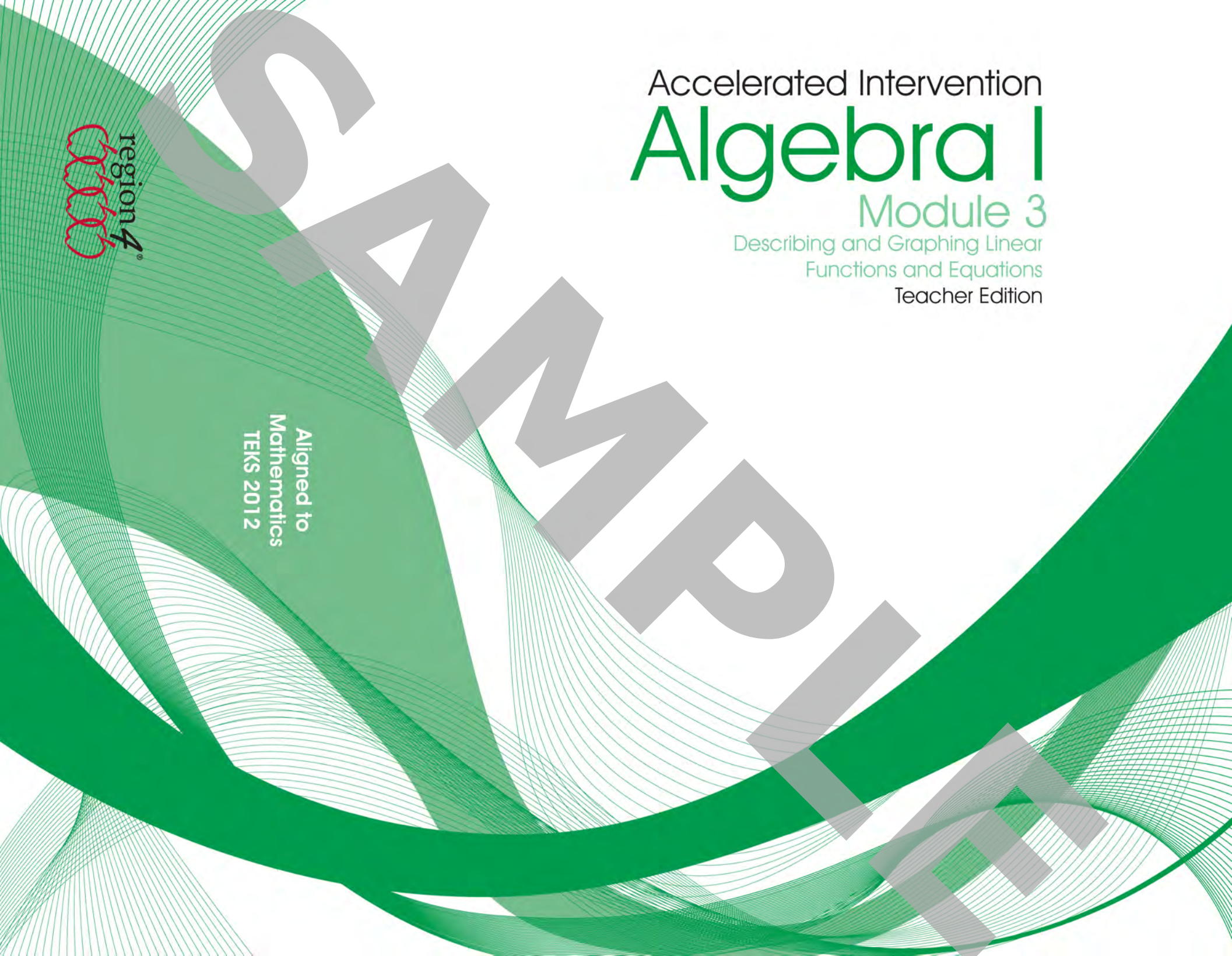
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Aligned to
Mathematics
TEKS 2012
Accelerated Intervention
Algebra I
Module 3
Describing and Graphing Linear
Functions and Equations
Teacher Edition
SAMPLE

Accelerated Intervention, Algebra I

Module 3

Describing and Graphing Linear Functions and Equations

Teacher Edition

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Region 4 Education Service Center supports student achievement by providing educational products and services that focus on excellence, service, and children.

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Table of Contents

What Is *Accelerated Intervention, Algebra I?*

1. A resource that serves as an intervention for students who have not been successful on STAAR®, Algebra I

2. An intervention resource that provides opportunities for rigorous mathematical conversations while providing supports for students at varying levels of readiness

3. An intervention resource that engages students through strategies including cooperative learning, card sorts or matching, and analysis of student work

4. An intervention resource that provides an opportunity for students to track their progress with analysis of strengths and areas to improve within a culminating lesson

5. An intervention resource of classroom-ready 5E lessons. The Engage phase of each lesson consists of a student-centered activity that either bridges from students' prior knowledge or encourages interest in deeper exploration of the concepts in the lesson. The Explore phase of each lesson provides students with an opportunity to "do mathematics" and begin to formulate ideas and conjectures. In the Explain phase of each lesson, students formalize the mathematical ideas from the Explore phase with a focus on academic vocabulary, as well as procedures related to the concepts. The Elaborate phase of each lesson allows students to apply or extend their understanding of the concepts in the lesson with additional practice problems. The Evaluate phase consists of four selected-response or griddable items that can be used to assess student understanding. Skills focus activities have been included for students who need additional practice.

Each lesson supports multiple student expectations. These are listed at the beginning of each lesson and are labeled as readiness or supporting.

Analyzing Data

TEKS

A.2 The student applies the mathematical process standards when using properties of linear functions to write and represent in multiple ways, with and without technology, linear equations, inequalities, and systems of equations.

(A) The student is expected to determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities. ***Readiness Standard***

(C) The student is expected to write linear equations in two variables given a table of values, a graph, and a verbal description. ***Readiness Standard***

A.4 The student applies the mathematical process standards to formulate statistical relationships and evaluate their reasonableness based on real-world data.

(A) The student is expected to calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association. ***Supporting Standard***

(B) The student is expected to compare and contrast association and causation in real-world problems. ***Supporting Standard***

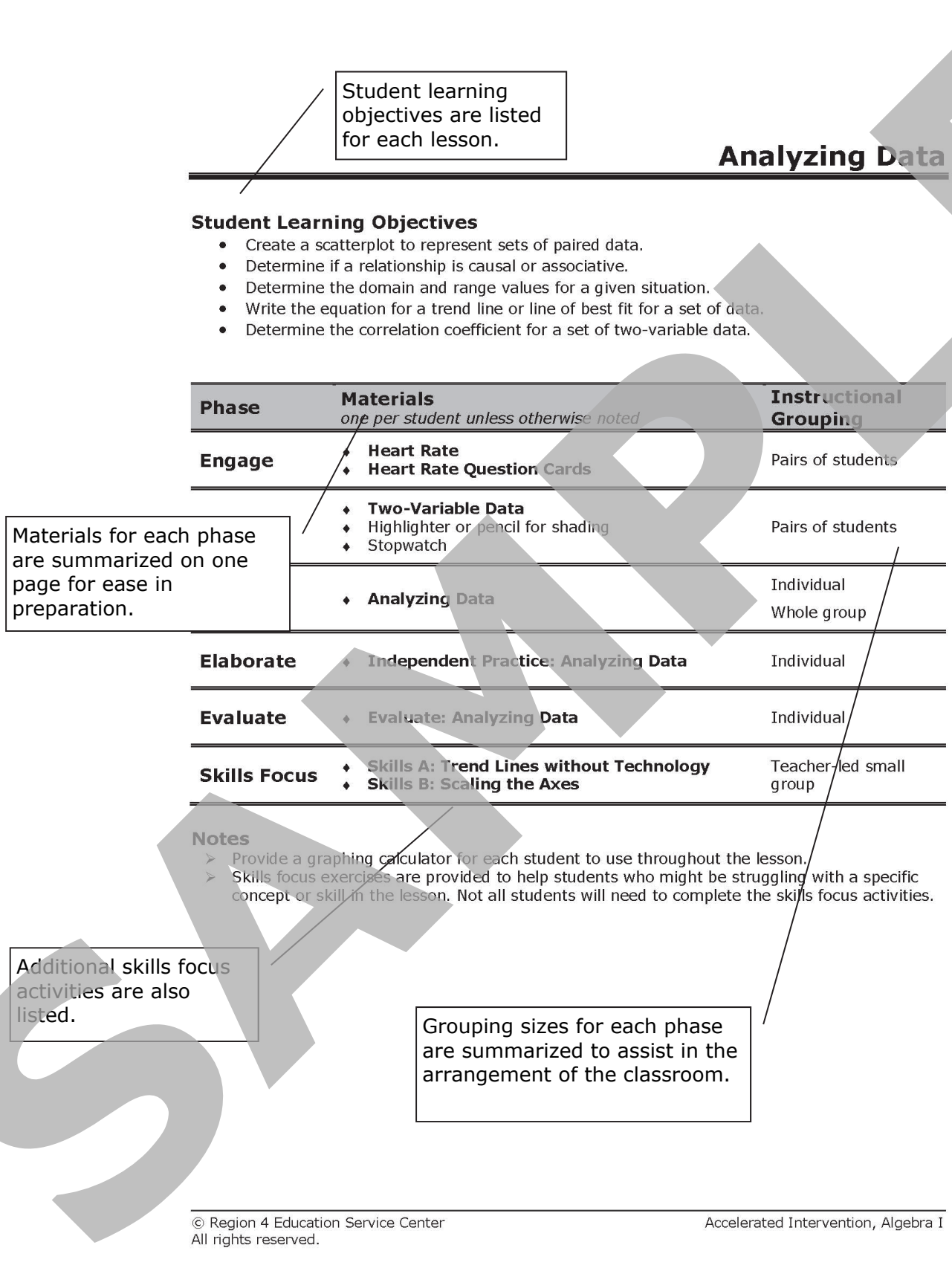
(C) The student is expected to write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems. ***Supporting Standard***

STAAR® Reporting Category

2 Describing and Graphing Linear Functions, Equations, and Inequalities
The student will demonstrate an understanding of how to describe and graph linear functions, equations, and inequalities.

3 Writing and Solving Linear Functions, Equations, and Inequalities
The student will demonstrate an understanding of how to write and solve linear functions, equations, and inequalities.

Each lesson identifies the reporting categories addressed within the lesson.



Student learning objectives are listed for each lesson.

Analyzing Data

Student Learning Objectives

- Create a scatterplot to represent sets of paired data.
- Determine if a relationship is causal or associative.
- Determine the domain and range values for a given situation.
- Write the equation for a trend line or line of best fit for a set of data.
- Determine the correlation coefficient for a set of two-variable data.

Phase	Materials *one per student unless otherwise noted*	Instructional Grouping
Engage	♦ **Heart Rate** ♦ **Heart Rate Question Cards**	Pairs of students
	♦ **Two-Variable Data** ♦ Highlighter or pencil for shading ♦ Stopwatch	Pairs of students
	♦ **Analyzing Data**	Individual Whole group
Elaborate	♦ **Independent Practice: Analyzing Data**	Individual
Evaluate	♦ **Evaluate: Analyzing Data**	Individual
Skills Focus	♦ **Skills A: Trend Lines without Technology** ♦ **Skills B: Scaling the Axes**	Teacher-led small group

Materials for each phase are summarized on one page for ease in preparation.

Notes

- Provide a graphing calculator for each student to use throughout the lesson.
- Skills focus exercises are provided to help students who might be struggling with a specific concept or skill in the lesson. Not all students will need to complete the skills focus activities.

Additional skills focus activities are also listed.

Grouping sizes for each phase are summarized to assist in the arrangement of the classroom.

Analyzing Data

Engage

1. Prompt students to cut out the **Heart Rate Question Cards**. Have students shuffle the cards and place them face down on the desk.

2. Prompt students to choose who will be Partner A and who will be Partner B. Prompt Partner A to randomly choose a card and read it aloud. Prompt students to discuss the answer to the question.

3. mpt Partner A to attach the card to **Heart Rate** and record the answer he or she ussed with his or her partner.

4. mpt Partner B to choose a card and read it aloud, repeating steps 2 and 3. Continue in manner until all of the cards have been used.

5. ou ask the following discussion questions, use a structured pair-share strategy. An mple follows. Prompt Partner A to respond and give his or her answer to Partner B for 20 onds without interruption. Prompt Partner B to respond during 10 seconds of nterrupted response time. During this time, Partner B should report the important parts of ner A's response. For the next question, prompt Partner B to talk and give his or her wer to Partner A for 20 seconds without interruption. Prompt Partner A to respond during seconds of uninterrupted response time. During this time, Partner A should report the ortant parts of Partner B's response. After each question, identify one or two pairs to e what they discussed.

6. Use the discussion questions to debrief the activity.

Discussion Questions

- **Do you think it is easier to see a relationship between two quantities in a table or in a graph? Why?**
- **What are the domain and range values for this situation? Why?**
- **What does the ordered pair (1, 75) mean in this situation?**
- **What did you predict her heart rate to be 5.5 minutes after exercising? How did you determine your prediction?**

Teach

Listen For . . .

- *Use of vocabulary such as domain, paired values, relationships, and range.*
- *Understanding that the graph is comparing heart rate to elapsed time.*
- *Understanding that the ordered pair (1, 75) represents that after 1 minute has passed, Mrs. Smith's heart rate is 75 beats per minute.*
- *Connections between representations when justifying predictions.*

Each phase includes detailed directions to implement the activity. Titles of activity masters and student pages are printed in bold for ease of reference.

Each phase includes discussion questions to guide class discussion for that particular phase.

Rather than a specific answer to each discussion question, what to listen for is listed in the *Listen For . . .* section.

Analyzing Data

Listen For . . .

- *Use of vocabulary such as correlation, domain, and range.*
- *Description of the relationships that exist between quantities, including association.*

Evaluate

1. Distribute a copy of **Evaluate: Analyzing Data** to each student.
2. Prompt students to complete **Evaluate: Analyzing Data** independently.
3. Upon completion of **Evaluate: Analyzing Data**, use the following error analysis to assess student understanding of the concepts and procedures the class addressed in the lesson and provide additional support as needed.

Answer Key and Error Analysis for Evaluate: Analyzing Data

Question Number	Correct Answer	Reporting Category	TEKS	Conceptual Error			Procedural Error			Guess
1	D	2	A(4)(B)	A	B	C				
2	C	3	A(2)(A)	A	B	D				
3	A	3	A(2)(C)	B	C	D				
4	C	3	A(4)(C)	A	B	D				

Each selected-response item is labeled with the STAAR® reporting category and student expectation. Incorrect answer choices are classified according to type.

Name: _____ Date: _____

4 A high school charges $5 for an admission ticket to a football game. The total revenue is a function of the number of tickets sold. Which of the following statements is true?

A The relationship between the total revenue and the number of tickets sold is a causal one because an increase in total revenue causes an increase in the number of tickets sold.

B The relationship between the total revenue and the number of tickets sold is a causal one because an increase in the number of tickets sold causes an increase in the revenue.

C The relationship between the total revenue and the number of tickets sold is an associative one because an increase in the number of tickets sold does not cause an increase in the revenue.

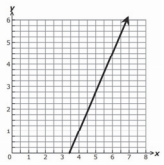
D The relationship between the total revenue and the number of tickets sold is a negative one because as the number of tickets sold increases, the revenue decreases.

5 Which of the linear functions can be represented by $3x - 4y = 24$?

I.

x	y
−5	−9.75
−2	−7.5
5	−2.25
8	0
10	1.5

II.



A I and II only
B II and III only
C I and III only
D I, II and III

Accelerated Intervention, Algebra 1

Ten selected-response items are provided to assess student understanding in the cumulative lesson, and the Elaborate phase has been omitted in order to provide additional time to assess student understanding.

Name: _____ Date: _____

Functions and Their Representations Inventory Probe

Circle the number (1-5) that describes how comfortable you are with the concepts addressed in this module.

	I am not comfortable with this and need additional help.				I am comfortable with this and can explain it to others.
Identify domains and ranges of linear functions.	1	2	3	4	5
Determine if a relationship is causal or associative.	1	2	3	4	5
Determine if a relationship represents a function or not.	1	2	3	4	5
Use a functional relationship to answer questions in a real-world situation.	1	2	3	4	5
Determine specific function values.	1	2	3	4	5
ze/scatterplots.	1	2	3	4	5
ate the correlation coefficient for a data and interpret it as a measure strength of an association.	1	2	3	4	5
sent relationships using models, tables, graphs, diagrams, verbal descriptions, and equations.	1	2	3	4	5
Make decisions, predictions, and critical judgments in problem situations.	1	2	3	4	5
Determine a trend line or a line of best fit for a set of data.	1	2	3	4	5
Use a line of best fit to make predictions about real-world data.	1	2	3	4	5

Each cumulative lesson includes an Inventory Probe for students to assess student understanding of the concepts in this module.

Accelerated Intervention, Algebra 1