

# 2024 MATH CREDIT-BY-EXAM EVALUATION



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# INTRODUCTION AND CONTEXT

## Math Acceleration Opportunities for Students in 4th -8th Grades

Northwest ISD provides math acceleration through Credit-by-Exam (CBE) opportunities, offered each summer. To ensure students receive timely results, Northwest developed math CBEs for fourth through eighth grades. Participation has varied slightly, with 221 students engaging in these assessments in 2023 and 211 students participating in 2024. This report highlights the development, administration, and outcomes of these assessments, including validity and reliability analyses.

Key findings in the report include:

- 211 students participated in 4th-8th Math Credit-by-Exams.
- 45% scored 70% or higher.
- 18% scored 80% or higher.
- 3% scored 90% or higher.
- Average score: 66.7%, median score: 68%.

Assessments are reliable, valid, and aligned with TEKS.

# 45%

Students that scored 70% or higher.

# RELIABLE

Cronbach's Alpha  $\geq 0.70$  across grades.

# Valid

Pearson R  $\geq 0.5$ , confirming accurate measurement.

## **Authority and Requirements for District-Developed Exams**

Texas Administrative Code (TAC), [§74.24\(c\)\(2\)](#), provides districts the authority to create their own tests. The tests must meet the following criteria:

- Covers and aligns with all accessible Texas Essential Knowledge and Skills (TEKS) for the course.
- Has not been published or publicly available.
- Administered under standardized and secure conditions.
- Ensure validity by evaluating test scores measure what the TEKS that they intend to measure.
- Ensure reliability of test by evaluating if results are consistent across testing conditions.
- Publish an annual public report, including:
  - the test development process.
  - a statement certifying that the examination meets the criteria above.
  - the number of students who took each examination.
  - the number of students who scored 70% or above.
  - the number of students who scored 80% or above; and
  - the average score

## **Test Development and Alignment**

Northwest ISD's Mathematics Curriculum and Instruction team led by Melayne Griffith and Jaime Garcia developed each assessment based on TEA's Texas Essential Knowledge and Skills (TEKS) blueprint documents for each grade level. Each exam is constructed and aligned with all assessable TEKS. These exams are meticulously aligned with all assessable TEKS, encompassing Readiness, Supporting, and Process standards specific to each grade level. Additionally, the team ensured that each question addresses the necessary level of rigor, depth, and complexity for demonstrating mastery at the respective grade level by referencing the language of each Student Expectation (SE).

## **Test Administration and Security**

Credit-by-Exams are not publicly disclosed. Questions on each exam are unique to Northwest ISD and have not been used by any other entity.

Tests are administered in standardized environments where students have up to three hours to complete the test. Students are in secure rooms and monitored under the same conditions as other standardized assessments, such as the STAAR, CogAT, and PSAT.

## **Content Validity Study**

In 2024, Northwest ISD partnered with Van Solen and Associates to review the tests for content validity. The analysis confirmed strong alignment between test content and TEKS standards, indicating that the exams effectively measure the intended knowledge and skills.

## Reliability Analysis

Reliability measures the consistency of test results. For Credit-by-Exams reliability analysis, Cronbach's Alpha coefficients were calculated for each grade level. A Cronbach's Alpha value closer to 1.0 indicates higher reliability.

Cronbach's Alpha	Level of Reliability
More than 0.90	Excellent, Very Highly Reliable
0.80-0.89	Highly Reliable
0.70-0.79	Reliable
0.60-0.69	Questionable
0.5-0.59	Poor
Less than 0.59	Unacceptable

**2024 Reliability Results:** All reliability measures for the 2024 school year fall within the range of reliable to very highly reliable.

Reliability (Chron Bach Alpha)	2021	2022	2023	2024
4th Math CBE	0.84	0.87	0.80	0.82
5th Math CBE	0.67	0.77	0.78	0.77
6th Math CBE	0.87	0.91	0.97	0.83
7th Math CBE	0.83	0.91	0.78	0.70
8th Math CBE	NA	0.88	0.87	0.86

## Validity Analysis

Validity assesses whether test scores accurately reflect the intended knowledge and skills. Pearson correlation coefficients (Pearson R) were used to evaluate validity, with values closer to 1.0 indicating stronger validity.

Pearson R Levels	Strength of Association
<b>0.7 to 1.0</b>	Very High Correlation
<b>0.5 to 0.7</b>	High Correlation
<b>0.3 to 0.5</b>	Medium Correlation
<b>0.0 to 0.3</b>	Low Correlation

**2024 Validity Results:** All CBEs demonstrated high to very high correlation.

Validity (Pearson R Coefficient)	2021	2022	2023	2024
<i>4th Math CBE</i>	0.6	0.7	0.7	0.7
<i>5th Math CBE</i>	0.5	0.8	0.7	0.6
<i>6th Math CBE</i>	0.7	0.6	0.6	0.7
<i>7th Math CBE</i>	0.5	0.6	0.5	0.9
<i>8th Math CBE</i>	0.7	0.6	0.6	0.7

## Student Performance Data (2024 & 2023)

The tables below break down student performances on each assessment by grade level:

2024 ALL Math CBE	Number tested	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th Math CBE	67	25	10	1	65.0%	66%	13.4
5th Math CBE	87	57	32	8	72.8%	74%	13.8
6th Math CBE	4	3	2	0	76.0%	80%	14.2
7th Math CBE	4	1	0	0	57.0%	54%	9.5
8th Math CBE	49	20	7	1	65.4%	68%	13.3

2023 ALL Math CBE	Number tested	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th Math CBE	48	18	6	0	64.5%	63.0%	13.8
5th Math CBE	101	59	45	11	71.9%	72.0%	13.9
6th Math CBE	12	6	4	1	70.2%	69.0%	12.7
7th Math CBE	11	6	3	1	69.2%	73.0%	15.6
8th Math CBE	49	19	12	2	63.2%	62.0%	16.7

2024 Eco Dis Math CBE	Number tested	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th	4	1	0	0	62.3%	58.5%	10.4
5th	6	4	3	1	66.9%	63%	20.3
6th	2	2	1	0	82.0%	82%	8.5
7th	2	0	0	0	54.0%	54%	5.7
8th	7	1	0	0	58.6%	60%	12.4

2023 Eco Dis Math CBE	Number tested	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th	5	2	0	0	64.6%	64.3%	11.9
5th	9	4	2	2	63.7%	63.0%	16.2
6th	2	2	1	0	76.0%	76.0%	5.7
7th	3	2	1	0	69.3%	74.0%	13.6
8th	3	1	0	0	47.0%	50.0%	18.1

2024 LEP Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th	1	1	1	0	61.8%	59.5%	9.2
5th	9	7	4	1	76.9%	79%	11.4
6th	0	NA	NA	NA	NA	NA	NA
7th	2	0	0	0	54.0%	54%	5.7
8th	8	3	2	0	61.0%	59%	17.5

2024 LEP Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th	1	1	1	0	61.8%	59.5%	9.2
5th	9	7	4	1	76.9%	79%	11.4
6th	0	NA	NA	NA	NA	NA	NA
7th	2	0	0	0	54.0%	54%	5.7
8th	8	3	2	0	61.0%	59%	17.5

2024 Special Ed Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th	6	2	0	0	63.7%	65%	7.4
5th	3	1	0	0	59.7%	67%	17.2
6th	0	NA	NA	NA	NA	NA	NA
7th	0	NA	NA	NA	NA	NA	NA
8th	2	0	0	0	63.0%	63%	NA

2023 Special Ed Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th	1	0	0	0	62	62	NA
5th	6	4	2	0	73.8%	72.0%	10.5
6th	0	NA	NA	NA	NA	NA	NA
7th	0	NA	NA	NA	NA	NA	NA
8th	3	2	0	0	61.3%	72.0%	23.9

2024 GT Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th	52	24	10	1	68.2%	67%	12.3
5th	68	50	29	21	75.2%	77%	13.0
6th	3	3	2	0	82.7%	84%	6.1
7th	0	NA	NA	NA	NA	NA	NA
8th	23	12	6	4	69.7%	70%	12.6

2023 GT Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
4th	38	14	6	0	64.7%	64.0%	13.8
5th	90	57	33	11	73.9%	74.0%	12.8
6th	10	6	4	1	72.4%	75.0%	12.4
7th	5	4	2	0	76.0%	74.0%	7.1
8th	33	18	12	2	68.1%	72.0%	16.7

2024 4th Grade by Race Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	19	7	3	0	65.0%	66%	12.7
Black	7	4	2	0	72.0%	72%	10.7
Hispanic	10	3	1	0	60.6%	58.5%	15.4
Native American	2	1	1	0	74.5%	74.5%	9.2
Two or More Races	1	1	0	0	72.0%	NA	0
White	28	9	3	1	63.9%	63%	13.8

2023 4th Grade by Race Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	5	3	3	0	69.4%	81.0%	20.7
Black	3	0	0	0	49.0%	47.0%	3.5
Hispanic	10	5	1	0	67.9%	69.0%	14.4
Two or More Races	3	2	1	0	70.7%	74.0%	16.3
White	27	8	3	0	63.6%	62.0%	12.1

2024 5th Grade by Race Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	21	17	11	4	79.1%	81	9.8
Black	1	0	0	0	56.0%	56	0
Hispanic	11	5	3	0	69.0%	64	13.13
Native American	1	0	0	0	58.0%	NA	0
Two or More Races	1	0	0	0	56.0%	NA	0
White	52	35	18	4	71.9%	74	14.3

2023 5th Grade by Race Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	20	15	14	8	81.0%	86.0%	13.6
Black	9	6	4	1	75.7%	79.0%	18.2
Hispanic	11	3	1	0	61.6%	65.0%	11.6
Two or More Races	4	3	3	0	70.8%	83.5%	27.3
White	57	32	11	1	69.7%	70.0%	10.7

2024 6th Grade Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	4	3	2	0	76.0%	80%	14.2

2023 6th Grade Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	2	2	1	0	76.0%	76.0%	8.9
Black	2	0	0	0	59.0%	59.0%	9.9
Hispanic	3	2	1	0	74.7%	78.0%	7.6
White	5	2	2	1	69.6%	60.0%	17.0

2024 7th Grade Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	1	0	0	0	NA	NA	NA
Black	1	0	0	0	NA	NA	NA
Two or More Races	1	1	0	0	NA	NA	NA
White	1	0	0	0	NA	NA	NA

2023 7th Grade Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	3	2	1	1	68.0%	74.0%	25.5
Black	2	0	0	0	54.0%	54.0%	0.0
Hispanic	1	0	0	0	NA	NA	NA
White	4	4	2	0	78.0%	77.0%	6.3

2024 8th Grade Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	17	8	5	1	68.6%	68%	14.9
Hispanic	2	0	0	0	40.0%	40%	5.7
Two or More	2	0	0	0	63.0%	63%	7.1
White	16	12	2	0	53.0%	54.0%	11.7

2023 8th Grade Math CBE	Number	Number at 70% or higher	Number at 80% or higher	Number at 90% of Higher	Overall Average	Median Score	Standard Deviation
Asian	12	5	3	2	64.3%	64.0%	19.5
Black	7	2	1	0	57.4%	50.0%	14.9
Hispanic	8	3	2	0	62.3%	63.0%	11.7
Two or More	1	1	1	0	NA	NA	NA
White	21	8	5	0	62.8%	62.0%	17.7

## **Conclusion**

Northwest ISD's Credit-by-Exam program continues to provide students with valuable opportunities for math acceleration. Reliability and validity analyses confirm that the CBEs are well-aligned with Texas Essential Knowledge and Skills (TEKS) and consistently measure student knowledge. Moving forward, Northwest ISD will use these insights to refine test development and ensure continued success in supporting students' academic growth.

