

How does Nelson Mathematics 10 help teachers assess and evaluate student achievement?

Nelson Mathematics 10 offers many assessment opportunities, including:

- Highlighted questions with support for assessing the Knowledge/Understanding, Thinking/Inquiry/Problem Solving, Communication, and Application categories of the Achievement Chart
- Performance Tasks
- Challenge Problems

Our Teacher Resource includes:

- Dedicated section on assessment
- Generic rubrics for assessing Knowledge/Understanding, Thinking/Inquiry/Problem Solving, Communication, and Application
- Generic rubric for assessing the *Chapter Problem*
- Specific rubric for assessing each *Challenge*
- Sample Chapter Tests and Solutions
- Assessment suggestions linked to Achievement Chart and Learning Skills

Computerized Test Bank

- Contains over 2000 multiple choice, true/false, short answer and extended answer questions
- 30 end-of-chapter questions linked to the Achievement Chart categories

Specific questions within each **Practise, Apply, Solve** section are linked to the Achievement Chart categories and highlighted with blue headings: **Knowledge/Understanding; Communication; Application; and Thinking/Inquiry/Problem Solving.** The questions provide a good opportunity to assess these areas of the achievement chart. They are single examples of questions that focus student abilities in these areas. Assessment Guidelines with links to the Achievement Chart, along with management and usage suggestions are provided in the *Teacher Resource*.

Knowledge and Understanding Question

Communication Question

Practise, Apply, Solve 1.7

- Solve each linear system. Use graphing technology.
 - (a) $y = 4x - 1$ (b) $y = -x + 8$ (c) $y = 2x + 9$ (d) $y = 3x + 6$
 - $y = 3x + 4$ $y = 2x - 7$ $y = 2x - 1$ $y = 5x - 4$
 - (e) $y = x$ (f) $y = 4x + 8$ (g) $y = 2x - 7$ (h) $y = 2x + 6$
 - $y = 2$ $y = x + 1$ $y = 4x - 19$ $y = 5x - 2$
- Determine the point of intersection for each pair of equations.
 - (a) $x - 15y = 3$ (b) $4x + 9y = 8x$
 - $3x + 5y = 4$ $4x - 2y = 3y$
 - (c) $2x + 5y = 19$ (d) $3x + y = 5$
 - $3x + y = 3$ $x - 2y = 11$
 - (e) $3x - 2y = -8$ (f) $x - 3y = -2$
 - $y - 7 = 3x$ $2x + y = 8$
- Solve.
 - (a) $2x + 3y = -1$ (b) $x + 4y = -5$
 - $2x - 3y = 4$ $2y - 3x = 5$
 - (c) $\frac{1}{2}x + 2y = -1$ (d) $\frac{1}{3}x + \frac{1}{2}y = 8$
 - $2x + 3y = -4$ $2x - y = 14$
 - (e) $1.9x - 3.3 = 2.8y$ (f) $2.4x - 2y = 3.2$
 - $4.1y + 5.2x - 8.3 = 0$ $1.6x + 1.2y = 3.2$
- Communication:** Write a paragraph explaining the advantages of solving a linear system using graphing technology instead of drawing a graph by hand.
- Knowledge and Understanding:** Movies To Go rents videos for \$5 each and has no membership fee. Videostars rents videos for \$4.50 each and has a \$10 membership fee.
 - (a) Write an equation for each store's rental charges.
 - (b) Graph both equations on the same axes and find the point of intersection.
 - (c) Interpret the meaning of the point of intersection.
 - (d) What advice would you give someone trying to decide which video store to use?
- To send a letter from any city in Ontario to any other city in Ontario, Trillium Express charges \$5, plus \$1/kg for the same service. Day by Day Delivery charges \$3.50, plus \$1.25/kg.
 - (a) Write equations to model this situation.
 - (b) Graph both equations on the same set of axes.
 - (c) What does the point of intersection mean in this situation?
 - (d) When does Trillium Express cost less than Day by Day Delivery? cost more?
- The total cost to print a book includes a printer setup fee and a charge for each book printed.
 - The cost to print 1000 books is \$29 175.
 - The cost to print 2000 books is \$57 675.
 - How much is the setup fee?
- Sanjay wants to earn extra money for college. Because he likes baking, he decides to sell chocolate chip cookies on campus. The cost to start his business is \$120 and each cookie costs 10¢ to make. He will sell the cookies for 50¢ each.
 - (a) Determine the equation that represents his costs.
 - (b) Determine the equation that represents his revenue.
 - (c) Graph both equations on the same set of axes.
 - (d) What does the point of intersection mean in this case?
 - (e) Determine if Sanjay makes a profit or loses money if he sells
 - 4. 200 cookies (b) 300 cookies (d) 500 cookies
- Refer to question 8. The cost of chocolate increases, so the cost of making cookies increases to 15¢ per cookie.
 - (a) Can Sanjay still make a profit if he does not increase his selling price? Explain.
 - (b) How will this appear on your graph?
 - (c) What should he charge to maintain the same break-even point?
- A truck rental agency offers two daily rental plans.
 - Plan 1: \$63 per day, with unlimited mileage.
 - Plan 2: \$30 per day, plus 20¢/km.
 - (a) Under what conditions is plan 1 better for someone renting a truck?
 - (b) Under what conditions is plan 2 better?
- Explain how you can use the TI-83 Plus to accurately determine the point of intersection of two graphed lines. Is this technique better than repeated guessing?

Thinking, Inquiry, Problem Solving Question

Application Question

- A cellular phone company offers two service plans. Budget plan: \$20 per month, 30 mins of free time, and a charge of \$0.50/min. Pre plan: \$30 per month, no free minutes, and a charge of \$0.25/min.
 - (a) If C represents the monthly cost and m represents the number of minutes used each month, determine an equation for each plan.
 - (b) When does the Pre plan cost less than the Budget plan?
 - (c) When does the Budget plan cost less than the Pre plan?
- Use graphing technology to solve the linear system developed from questions 7 to 13 in Practice, Apply, Solve 1.7 on page 322.
- Maria left Kingston driving at 80 km/h on highway 401. Linda followed 2 h later, driving in the same direction at 100 km/h. How far down the road will Linda pass Maria?
- Application:** The sides of a triangle appear to be formed by the line $y = 3x$ and the line $y = -x + 7$. Find the area of the triangle.
 - (a) What type of triangle is formed by $x - 2y = -6$, $x + 6y = -6$, and $3x + 2y = 14$?
 - (b) Determine the coordinates of the vertices of the triangle.
- Confirm or deny: The vertices of the triangle formed by $2x + 6y = -39$, $4x + y = 18$, and $x + 2y = 1$ appear to form an isosceles triangle.
- Thinking, Inquiry, Problem Solving:** Show your work for the problem. A tornado followed a path plotted by the weather office as $2x - y = 5$. At the same time, the center of a thunderstorm is on the path given by $y = -x + 4$. These towns have the coordinates shown.
 - Delta (-4, 2) • Mayville (7, 9)
 - Everett (8, -3) • Norwich (2, 0)
 - Walton (-1, 5) • Verona (8, 8)
 - Marler (3, 5) • Ramo (3, 1)
 Which towns will experience:
 - (a) a thunderstorm only?
 - (b) a tornado only?
 - (c) a thunderstorm and a tornado?
 - (d) clear weather?
- To use a locker at Champlain College you can pay either \$50 per year or \$6.25 per month.
 - (a) Graph this situation using a linear system.
 - (b) How many months per year do you have to use the locker to make it worth paying the yearly rate?
- Check Your Understanding: List all the steps you would take with the graphing technology of your choice to find the point where $y = 5x - 6$ and $y = -3x + 9$ intersect. Include all keystrokes and buttons.

Check Your Understanding questions, highlighted by green heading, encourage students to self-check their understanding of the main ideas of a chapter. Answers are provided in the text. Teachers may also use these questions to monitor student understanding.

Achievement Chart – Grade 9-10 Mathematics

Categories	50-59% (Level 1)	60-69% (Level 2)	70-79% (Level 3)	80-100% (Level 4)
Knowledge/Understanding • understanding of concepts • performing algorithm	The student: • demonstrates limited understanding of concepts • performs only simple algorithms accurately by hand and using technology	• demonstrates some understanding of concepts • performs algorithms with inconsistent accuracy by hand, mentally, and using technology	• demonstrates considerable understanding of concepts • performs algorithms accurately by hand, mentally, and using technology	• demonstrates thorough understanding of concepts • selects the most efficient algorithm and performs it accurately by hand, mentally, and using technology
Thinking/Inquiry/Problem Solving • reasoning • applying the steps of an inquiry/problem-solving process (e.g. formulating questions, selecting strategies, resources, technology, and tools; representing in mathematical form; interpreting information and forming conclusions; reflecting on reasonableness of results)	The student: • follows simple mathematical arguments • applies the steps of an inquiry/problem solving process with limited effectiveness	• follows arguments of moderate complexity and makes simple arguments • applies the steps of an inquiry/problem solving process with moderate effectiveness	• follows arguments of considerable complexity, judges the validity of arguments, and makes complex arguments of some complexity • applies the steps of an inquiry/problem solving process with considerable effectiveness	• follows complex arguments, judges the validity of arguments, and makes complex arguments • applies the steps of an inquiry/problem solving process with a high degree of effectiveness and poses extending questions
Communication • communicating reasoning orally, in written, and graphically • use of mathematical language, symbols, visuals, and conventions	The student: • communicates with limited clarity and limited justification of reasoning • infrequently uses mathematical language, symbols, visuals, and conventions correctly	• communicates with some clarity and some justification of reasoning • uses mathematical language, symbols, visuals, and conventions correctly some of the time	• communicates clearly and considerable justification of reasoning • uses mathematical language, symbols, visuals, and conventions correctly most of the time	• communicates concisely with a high degree of clarity and full justification of reasoning • routinely uses mathematical language, symbols, visuals, and conventions correctly and efficiently
Application • applying concepts and procedures relating to familiar and unfamiliar settings	The student: • applies concepts and procedures to solve simple problems relating to familiar settings	• applies concepts and procedures to solve problems of some complexity relating to familiar settings	• applies concepts and procedures to solve complex problems relating to familiar settings; recognizes major mathematical concepts and procedures relating to applications in unfamiliar settings	• applies concepts and procedures to solve complex problems relating to familiar and unfamiliar settings