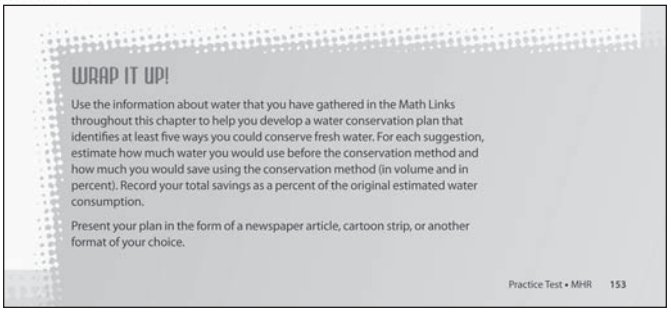
Wrap It Up!



WRAP IT UP!

Use the information about water that you have gathered in the Math Links throughout this chapter to help you develop a water conservation plan that identifies at least five ways you could conserve fresh water. For each suggestion, estimate how much water you would use before the conservation method and how much you would save using the conservation method (in volume and in percent). Record your total savings as a percent of the original estimated water consumption.

Present your plan in the form of a newspaper article, cartoon strip, or another format of your choice.

Practice Test • MHR 153

***MathLinks 8*, page 153**

Suggested Timing
80–100 minutes

Materials
- calculator

Blackline Masters
Master 1 Project Rubric
BLM 4–1 Chapter 4 Math Link Introduction
BLM 4–6 Section 4.1 Math Link
BLM 4–9 Section 4.2 Math Link
BLM 4–11 Section 4.3 Math Link
BLM 4–13 Section 4.4 Math Link
BLM 4–15 Chapter 4 Wrap It Up!

Specific Outcomes
N3 Demonstrate an understanding of percents greater than or equal to 0%.

Planning Notes

Introduce the problem and clarify the assessment criteria. Have students search through the Math Links they have completed throughout the chapter for statistics including fractions, decimals, and percents that they might use to help them develop a water conservation plan. Encourage students who need more data to research water conservation strategies using the Web Links mentioned in section 4.3 of the student resource and in this teacher's resource. Emphasize to students the importance of showing their work. Allow students to present their plan using a format of their choice.

Meeting Student Needs

- Consider allowing students to use a computer drawing program or spreadsheet software to help them complete the Wrap It Up!

Common Errors

- Some students may concentrate more on the artistic aspects of their presentation than showing the math.

R_x Discuss the assessment rubric with students before they begin. Students working in pairs or small groups may benefit from more input about how to meet the criteria, especially for showing the math.

Assessment	Supporting Learning
Assessment *of* Learning	
Wrap It Up! This chapter problem wrap-up gives students an opportunity to apply and display their knowledge of percents. It is important for students to show fluency in their ability to convert from percents to decimals and fractions. **Master 1 Project Rubric** provides a holistic descriptor that will assist you in assessing student work on this Wrap It Up! Page 197 in this TR provides notes on how to use this rubric for the Wrap It Up!	• It is important that students complete all of the Math Links to help them complete the chapter problem. • If students have not completed the Math Links earlier, you may wish to provide them with **BLM 4–1 Chapter 4 Math Link Introduction**, **BLM 4–6 Section 4.1 Math Link**, **BLM 4–9 Section 4.2 Math Link**, **BLM 4–11 Section 4.3 Math Link**, and **BLM 4–13 Section 4.4 Math Link**. • You may wish to have students use **BLM 4–15 Chapter 4 Wrap It Up!**, which provides scaffolding for the chapter problem wrap-up.

The chart below shows the **Master 1 Project Rubric** for tasks such as the Wrap It Up! and provides notes that specify how to identify the level of specific answers for the project.

Score/Level	Holistic Descriptor	Specific Question Notes
5 **(Standard of Excellence)**	❑ Applies/develops **thorough** strategies and mathematical processes making **significant** comparisons/connections that demonstrate a **comprehensive** understanding of how to develop a complete solution ❑ Procedures are **efficient and effective** and may contain a **minor mathematical error** that does not affect understanding ❑ Uses **significant** mathematical language to explain their understanding and provides **in-depth** support for their conclusion	• provides a complete and correct solution
4 **(Above Acceptable)**	❑ Applies/develops **thorough** strategies and mathematical processes for making **reasonable** comparisons/connections that demonstrate a **clear** understanding ❑ Procedures are **reasonable** and may contain a **minor mathematical error** that may hinder the understanding in one part of a complete solution ❑ Uses **appropriate** mathematical language to explain their understanding and provides **clear** support for their conclusion	• identifies five strategies with estimates expressed in volume and in percent, but the presentation lacks organization *or* communication *or* • identifies five strategies with estimates expressed in volume *or* in percent; the presentation is well done *or* • identifies four strategies with estimates expressed in volume and in percent, with a good presentation; a fifth strategy may be incorrectly reported
3 **(Meets Acceptable)**	❑ Applies/develops **relevant** strategies and mathematical processes making **some** comparisons/connections that demonstrate a **basic** understanding ❑ Procedures are **basic** and may contain a **major error or omission** ❑ Uses **common** language to explain their understanding and provides **minimal** support for their conclusion	• identifies five strategies with estimates expressed in volume *or* in percent, with or without a presentation *or* • identifies four strategies with estimates expressed in volume and in percent, with no attempt at a presentation
2 **(Below Acceptable)**	❑ Applies/develops **some relevant** mathematical processes making **minimal** comparisons/connections that lead to a **partial solution** ❑ Procedures are **basic** and may contain **several major mathematical errors** ❑ Communication is **weak**	• identifies three strategies with estimates expressed in volume and in percent *or* • identifies at least three strategies with estimates expressed in volume *or* in percent
1 **(Beginning)**	❑ Applies/develops an **initial start** that may be **partially correct** or could have led to a correct solution ❑ Communication is **weak or absent**	• identifies one or two strategies with estimates expressed in volume and in percent, with weak communication for volume *or* percent *or* • makes a correct start to one strategy

Math Games

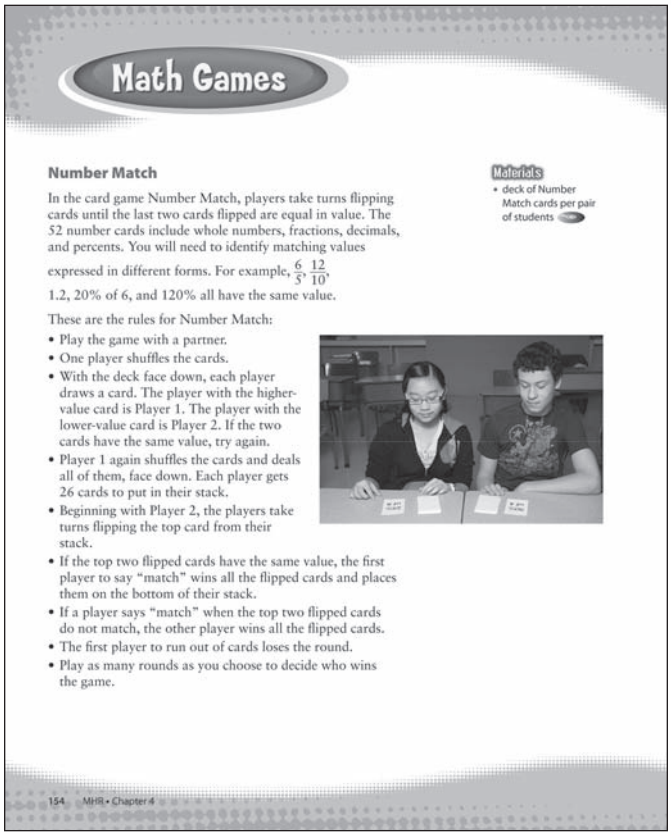
***MathLinks 8*, page 154**

Suggested Timing
15–20 minutes

Materials
- scissors
- calculator (optional)

Blackline Masters
BLM 4–16 Number Match Cards

Specific Outcomes
N3 Demonstrate an understanding of percents greater than or equal to 0%.



Math Games

Number Match

Materials
- deck of Number Match cards per pair of students

In the card game Number Match, players take turns flipping cards until the last two cards flipped are equal in value. The 52 number cards include whole numbers, fractions, decimals, and percents. You will need to identify matching values expressed in different forms. For example, $\frac{6}{5}$, $\frac{12}{10}$, 1.2, 20% of 6, and 120% all have the same value.

These are the rules for Number Match:
- Play the game with a partner.
- One player shuffles the cards.
- With the deck face down, each player draws a card. The player with the higher-value card is Player 1. The player with the lower-value card is Player 2. If the two cards have the same value, try again.
- Player 1 again shuffles the cards and deals all of them, face down. Each player gets 26 cards to put in their stack.
- Beginning with Player 2, the players take turns flipping the top card from their stack.
- If the top two flipped cards have the same value, the first player to say "match" wins all the flipped cards and places them on the bottom of their stack.
- If a player says "match" when the top two flipped cards do not match, the other player wins all the flipped cards.
- The first player to run out of cards loses the round.
- Play as many rounds as you choose to decide who wins the game.

154 MHR • Chapter 4

Planning Notes

In this game, students identify matching values in whole numbers, fractions, decimals, and percents. Photocopy **BLM 4–16 Number Match Cards** onto suitable stock paper and have students cut them out. Each group of students will need one deck of cards.

Before having students play the game, you may wish to read the directions as a class and then play a demonstration round. Pair students who have similar abilities.

Meeting Student Needs

- Consider allowing students with low math skills to make conversions using a calculator.

Assessment	Supporting Learning
Assessment *for* Learning	
Number Match Have students play the game with a partner.	• Allow students who need them to use calculators to do conversions.

Challenge in Real Life

***MathLinks 8*, page 155**

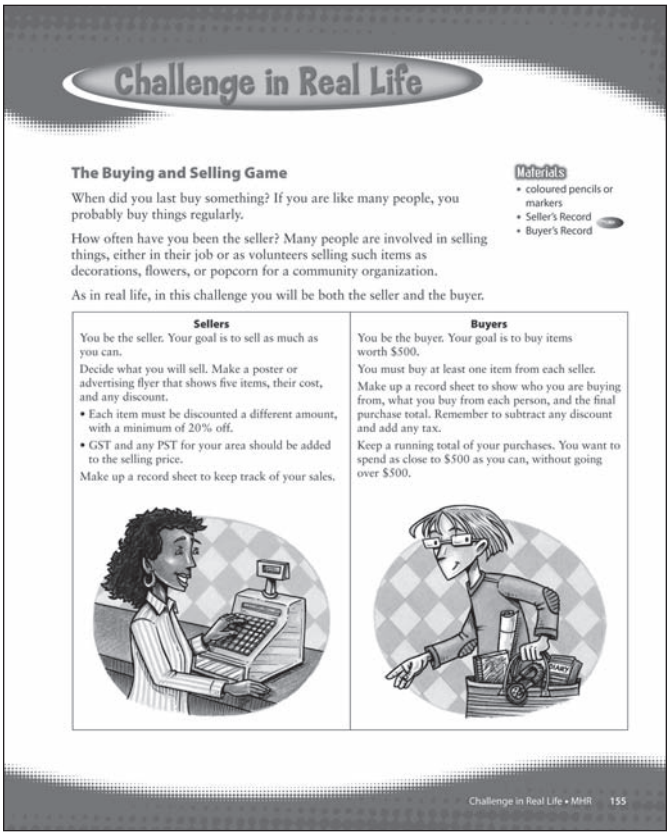
Suggested Timing
80–100 minutes

Materials
- poster paper
- coloured pencils or markers
- calculator

Blackline Masters
Master 1 Project Rubric
BLM 4–17 Buyer's Record
BLM 4–18 Seller's Record

Mathematical Processes
- ☑ Communication (C)
- ☑ Connections (CN)
- ☑ Mental Mathematics and Estimation (ME)
- ☐ Problem Solving (PS)
- ☑ Reasoning (R)
- ☑ Technology (T)
- ☐ Visualization (V)

Specific Outcomes
N3 Demonstrate an understanding of percents greater than or equal to 0%.


Challenge in Real Life

The Buying and Selling Game

When did you last buy something? If you are like many people, you probably buy things regularly.

How often have you been the seller? Many people are involved in selling things, either in their job or as volunteers selling such items as decorations, flowers, or popcorn for a community organization.

As in real life, in this challenge you will be both the seller and the buyer.

Materials
- coloured pencils or markers
- Seller's Record
- Buyer's Record

Sellers
You be the seller. Your goal is to sell as much as you can.
Decide what you will sell. Make a poster or advertising flyer that shows five items, their cost, and any discount.
- Each item must be discounted a different amount, with a minimum of 20% off.
- GST and any PST for your area should be added to the selling price.

Make up a record sheet to keep track of your sales.

Buyers
You be the buyer. Your goal is to buy items worth $500.
You must buy at least one item from each seller.
Make up a record sheet to show who you are buying from, what you buy from each person, and the final purchase total. Remember to subtract any discount and add any tax.
Keep a running total of your purchases. You want to spend as close to $500 as you can, without going over $500.

Challenge in Real Life • MHR 155

Planning Notes

You may wish to use the following steps to introduce and complete this challenge:

1. Introduce the challenge by talking about businesses and industries in which people get paid to buy and sell items. Many students will be able to relate directly to antique shops and second-hand stores. As well, buyers and sellers work in industries such as oil and gas, motor vehicles, and furniture. In fact, most stores have buyers who purchase items at wholesale prices and sellers who sell at retail prices.
2. Read through the introduction as a class. Consider dividing the class into two equal groups (sellers and buyers) for this game, and then having them switch roles during the game. Help students prepare for their role as a seller by having them decide what they will sell. Then, have them make a poster or advertising flyer that promotes five items, their cost, and discount. Emphasize that each item must be discounted a different amount, with a minimum of 20% off. Tell students to add the GST and PST (if applicable) to the selling price of each item. Make sure that students use the correct GST and PST rate.
3. After the posters are complete, review the two roles in the game.
   - Buyers must purchase up to $500 worth of items. Buyers need to keep a record of their purchases, including discount and applicable tax, using **BLM 4–17 Buyer's Record**. Suggest that students keep a running estimate of how much they have spent until they are close to $500, then double-check with complete calculations to make sure they have not gone over. In this way, students practise both estimating and calculating.
   - Sellers must sell the items on their posters. Sellers need to keep a record of their sales using **BLM 4–18 Seller's Record**.
4. Give students enough time to buy and sell. After a pre-determined period of time, have them switch roles.

5. Clarify that the task is to
- make a poster or advertising flyer that shows five items, their cost, and discount
- as a buyer,
  – purchase at least one item from each seller
  – keep track of purchases
  – spend as close as possible to $500 without exceeding the limit
- as a seller,
  – keep track of total sales
- (optional) calculate a personal score using the following scoring formula:
  Total sales from selling period – ($500 – total purchased without exceeding $500) = profit
  Note: Students who spend more than $500 cannot win the game; however, students can do very well without winning the game.

6. Review the **Master 1 Project Rubric** with students so that they will know what is expected.

Meeting Student Needs

- Consider allowing students to work with a partner.
- Encourage students to use estimation to keep track of the running total of their purchases. This will help them avoid spending more than $500. Explain that the extra column in the buyer's record sheet allows students to record their calculated total costs.
- If the school is having a fundraiser, encourage students to use the items and related prices offered in the fundraiser to make the challenge more real.

Gifted and Enrichment

- Allow students to use spreadsheet software and develop appropriate formulas to calculate the discount and taxes, and then provide a final selling price for each item.
- Challenge students to buy and sell commodities such as oil, gas, electricity, or nuclear power. Students could research deregulation where they live and investigate how the commodity is bought and sold. They could then produce an advertising flyer for a potential buyer, such as the United States.

This challenge can be used for either Assessment *for* Learning or Assessment *of* Learning.

Assessment	Supporting Learning
Assessment *for* Learning	
The Buying and Selling Game Discuss the challenge as a class. Have students provide individual posters and recording sheets.	• Consider showing students how to use a recording sheet to track sales and purchases. • Note that students are expected to play the role of both the seller and buyer during this challenge. You may wish to have them do the challenge more than once using different sales sheets.
Assessment *of* Learning	
The Buying and Selling Game Introduce the challenge to the class. Have students provide individual posters and recording sheets.	• **Master 1 Project Rubric** provides a holistic descriptor that will assist you in assessing student work on this challenge. Page 201 provides notes on how to use this rubric for the challenge. • To view student exemplars, go to www.mathlinks8.ca, access the online Teacher Centre, go to Assessment, and then follow the links.

The chart below shows the **Master 1 Project Rubric** for tasks such as the Challenge in Real Life and provides notes that specify how to identify the level of specific answers for this project.

Score/Level	Holistic Descriptor	Specific Question Notes
5 **(Standard of Excellence)**	❑ Applies/develops **thorough** strategies and mathematical processes making **significant** comparisons/connections that demonstrate a **comprehensive** understanding of how to develop a complete solution ❑ Procedures are **efficient and effective** and may contain a **minor mathematical error** that does not affect understanding ❑ Uses **significant** mathematical language to explain their understanding and provides **in-depth** support for their conclusion	• provides a complete and correct solution Note: Students will earn a 5 even if they are not the winner of the game, as long as they have met all of the criteria.
4 **(Above Acceptable)**	❑ Applies/develops **thorough** strategies and mathematical processes for making **reasonable** comparisons/connections that demonstrate a **clear** understanding ❑ Procedures are **reasonable** and may contain a **minor mathematical error** that may hinder the understanding in one part of a complete solution ❑ Uses **appropriate** mathematical language to explain their understanding and provides **clear** support for their conclusion	• provides a complete response with at most two errors in calculation *or* • provides a complete response with weak communication
3 **(Meets Acceptable)**	❑ Applies/develops **relevant** strategies and mathematical processes making **some** comparisons/connections that demonstrate a **basic** understanding ❑ Procedures are **basic** and may contain a **major error or omission** ❑ Uses **common** language to explain their understanding and provides **minimal** support for their conclusion	• provides a complete and correct seller's response; buyer's record exceeds $500 *or* • provides a complete and correct seller's response; buyer's record contains errors or omissions in calculation Note: Give a 3 to students who exceed $500 *or* do not buy from each seller.
2 **(Below Acceptable)**	❑ Applies/develops **some relevant** mathematical processes making **minimal** comparisons/connections that lead to a **partial solution** ❑ Procedures are **basic** and may contain **several major mathematical errors** ❑ Communication is **weak**	• provides an incomplete response for both the seller and the buyer with errors or omissions, and fails to meet the criteria *or* • provides an incomplete and incorrect response for both the seller and the buyer with more than two errors or omissions, and unclear records
1 **(Beginning)**	❑ Applies/develops an **initial start** that may be **partially correct** or could have led to a correct solution ❑ Communication is **weak or absent**	• makes an initial start to any one part (e.g., begins poster, lists items but no discounts)

For student exemplars, go to www.mathlinks8.ca and follow the links.