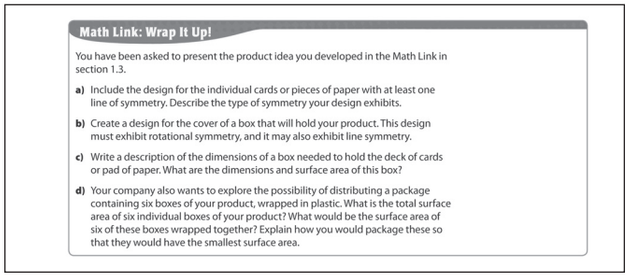
Math Link: Wrap It Up!



Math Link: Wrap It Up!

You have been asked to present the product idea you developed in the Math Link in section 1.3.

a) Include the design for the individual cards or pieces of paper with at least one line of symmetry. Describe the type of symmetry your design exhibits.

b) Create a design for the cover of a box that will hold your product. This design must exhibit rotational symmetry, and it may also exhibit line symmetry.

c) Write a description of the dimensions of a box needed to hold the deck of cards or pad of paper. What are the dimensions and surface area of this box?

d) Your company also wants to explore the possibility of distributing a package containing six boxes of your product, wrapped in plastic. What is the total surface area of six individual boxes of your product? What would be the surface area of six of these boxes wrapped together? Explain how you would package these so that they would have the smallest surface area.

***MathLinks 9*, page 39**

Suggested Timing
40–50 minutes

Materials
- poster paper, markers, and coloured pencils
- PowerPoint software (optional)

Blackline Masters
Master 1 Project Rubric
BLM 1–2 Chapter 1 Math Link Introduction
BLM 1–8 Section 1.1 Math Link
BLM 1–9 Section 1.2 Math Link
BLM 1–12 Section 1.3 Math Link
BLM 1–14 Chapter 1 Math Link: Wrap It Up!

Specific Outcomes
SS2 Determine the surface area of composite 3-D objects to solve problems.
SS5 Demonstrate an understanding of line and rotation symmetry.

Planning Notes

Introduce the problem by having each student read the description. Go over any points of confusion. Remind students that they can use the work previously produced in the chapter Math Links for parts a) to c). Most of the work here involves creating a presentation of their product idea. The presentation could be a written report, a poster, or a PowerPoint presentation. Clarify the assessment criteria.

Meeting Student Needs

- Encourage students to use their work from the chapter Math Links for parts a), b), and c).
- Encourage students to model their solution for part d) using blocks, dominoes, etc., wrapped in clear plastic.

Assessment	Supporting Learning
Assessment *of* Learning	
Math Link: Wrap It Up! This chapter problem wrap-up gives students an opportunity to demonstrate their understanding of symmetry (line and rotation) and surface area. It is important to explain their symmetries using appropriate vocabulary and to demonstrate a clear understanding of why one arrangement of six boxes has less surface area than another. **Master 1 Project Rubric** provides a holistic descriptor that will assist you in assessing student work on this Math Link: Wrap It Up! Page 39 in this TR provides notes on how to use the rubric for this Math Link: Wrap It Up!	• Consider having students review the work they have completed in the Math Links in the chapter introduction and sections 1.1, 1.2, and 1.3 before they begin. • If students have not yet completed the Math Links, you may wish to provide them with **BLM 1–2 Chapter 1 Math Link Introduction**, **BLM 1–8 Section 1.1 Math Link**, **BLM 1–10 Section 1.2 Math Link**, and **BLM 1–12 Section 1.3 Math Link**. • You may wish to have students use **BLM 1–14 Chapter 1 Math Link: 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 Note: If parts a) and b) are correct for rotational symmetry but incorrect for line symmetry and parts c) and d) are complete and correct, it remains a 5.
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	Demonstrates one of the following: • provides a complete response with weak communication or missing justification in one part of the question • provides a complete and correct response to parts b), c), and d), with an incorrect part a) and no line symmetry evident in part b)
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	Demonstrates one of the following: • correctly completes parts a) and b); communication may be weak. • provides a correct response to part c) and a significant start to part d) • provides a correct response to parts b) and c) • provides partial correct answers to all parts of the question
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**	Demonstrates one of the following: • correctly completes part a) and line symmetry only in part b) • provides a correct response to part b) • provides a correct response to part c)
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**	Demonstrates one of the following: • provides a correct part a) that may lack the explanation about how the student knows it is a line of symmetry • correctly completes one part of part b), exhibiting either rotational or line symmetry • provides a correct initial start to part c)