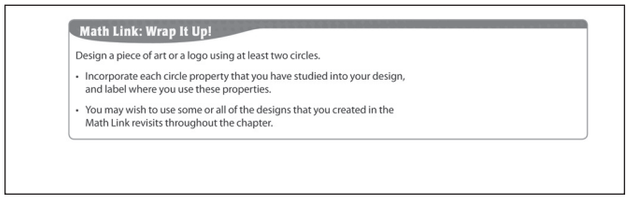
Math Link: Wrap It Up!



***MathLinks 9*, page 407**

Suggested Timing
40–50 minutes

Materials
- compass
- protractor
- ruler
- grid paper
- coloured pencils or markers

Blackline Masters
Master 1 Project Rubric
Master 8 Centimetre Grid Paper
Master 9 0.5 Centimetre Grid Paper
BLM 10–1 Chapter 10 Math Link Introduction
BLM 10–6 Section 10.1 Math Link
BLM 10–8 Section 10.2 Math Link
BLM 10–11 Section 10.3 Math Link
BLM 10–14 Chapter 10 Math Link: Wrap It Up!

Specific Outcomes
SS1 Solve problems and justify the solution strategy using circle properties including:
- the perpendicular from the centre of a circle to a chord bisects the chord
- the measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc
- the inscribed angles subtended by the same arc are congruent
- a tangent to a circle is perpendicular to the radius at the point of tangency.

Planning Notes

Introduce the design problem and emphasize the need for students to be accurate with their drawings. Have students decide if their design will be a piece of artwork or a logo for a company. Students should revisit their creations from earlier Math Links to help them incorporate the circle properties into their design.

Students need to ensure that they have a least one example of each circle property included in their design. Students should include a second copy of their design with appropriate angles and measurements included. These measurements can be included in a table with a legend for the design. The name of the property should be clearly stated within the table.

Meeting Student Needs

- Some students may benefit from using a geometry software program to help them with the measurements.

Common Errors

- Some students may not be careful enough in their measuring and drawing.

R_x Ensure that students are using protractors, compasses, and rulers. Students might use a geometry software program to assist them with the measurements.

- Students may get confused about which properties need to be included.

R_x Go over the assessment rubric with students prior to them beginning their independent work.

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 the circle properties that have been covered in this chapter. It is important for students to be able to apply these properties to determine unknown angles and dimensions and to be able to verify these through measurement. **Master 1 Project Rubric** provides a holistic descriptor that will assist you in assessing student work on this Math Link: Wrap It Up! Page 548 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 sections 10.1, 10.2, and 10.3 before they begin. • Students may wish to use grid paper to create their design. Provide them with **Master 8 Centimetre Grid Paper** and **Master 9 0.5 Centimetre Grid Paper**. • If students have not yet completed the Math Links, you may wish to provide them with **BLM 10–1 Chapter 10 Math Link Introduction**, **BLM 10–6 Section 10.1 Math Link**, **BLM 10–8 Section 10.2 Math Link**, and **BLM 10–11 Section 10.3 Math Link**. • You may wish to have students use **BLM 10–14 Chapter 10 Math Link: Wrap It Up!**, which provides scaffolding for the chapter problem wrap-up.

The chart below shows **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 response that may contain a minor error that does not hinder the understanding of the problem
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 and correct solution covering all circle properties based on only one circle in the drawing • provides a complete response with weak or absent communication; fails to address or identify one of the properties used in the design • provides a complete response with one property omission, but labelling is present
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: • shows an understanding of tangent lines and their application to radii and chords • shows an understanding of inscribed angles, central angles, and perpendicular bisectors of chords • provides a partial correct response 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: • begins to show some understanding of tangent lines, angles, or chords but fails to carry the concept through to model all outcomes taught • shows a correct and complete understanding of inscribed and central angles, or bisector of chords
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 an initial correct understanding of angles, chords, or tangents to a circle