Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

UNIT 8 LESSON 1

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| AIM: | SWBAT solve area problems with rectangles |

**THINK ABOUT IT!**

Mr. Boyer is creating a rectangular garden outside of his house that has an area of 18 square units. Using the grid below, draw all the possible gardens that he can create with whole number dimensions. Fill out the table below for each of the figures you drew.

|  |  |  |
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| **Area** **(**in square units**)** | **Dimensions** | **Perimeter (**in units**)** |
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Mr. Boyer believes that no matter which garden he chooses, the perimeter will be the same. Do you agree or disagree?” Explain.

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**Test the Conjecture**

*Test the Conjecture #1)* The area of a rectangle is 7 square meters. The length and width of the rectangle are unknown. What set of possible whole number dimensions yield the shortest perimeter?

*Test the Conjecture #2)* The area of a rectangle is 48 square feet. The length and width of the rectangle are unknown. What set of possible whole number dimensions yield the largest perimeter?

Conjecture

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| Rectangles with the same \_\_\_\_\_\_\_\_ can have different \_\_\_\_\_\_\_\_\_\_\_ |

**PARTNER PRACTICE**

* **CFS for top quality work**
	+ Problem is annotated
	+ Model is drawn accurately and labeled
	+ Table is created with necessary headings
	+ All calculations are shown /Answer statement is provided

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| *Bachelor Level* |

1. Draw all the possible rectangles with whole number dimensions given the area: 12 sq. units



What are all the possible dimensions for rectangles that have an area of 12 square units?

Which dimensions will make the rectangle with the shortest perimeter? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The rectangle below has an area of 24 square units. Which set of dimensions are **not** possible? Select all that apply.



1. 1 unit by 24 units
2. 4 units by 6 units
3. 9 units by 3 units
4. 2 units by 12 units
5. 2 units by 10 units

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| *Master Level* |

1. Ali wants to create a garden in her backyard and protect it from animals getting in an eating her vegetables. Ali wants to buy the least amount of fencing possible to surround a 40 square foot plot of land and thinks that she should use the dimensions 2 by 20 to accomplish this. Do you agree or disagree with her claim? Explain why below.

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**INDEPENDENT PRACTICE**

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| *Bachelor Level* |

1. John wants to draw a rectangle with an area of 16 square units and the shortest possible perimeter. What whole number dimensions will yield the shortest perimeter?
* **CFS for top quality work**
	+ Problem is annotated
	+ Model is drawn accurately and labeled
	+ Table is created with necessary headings
	+ All calculations are shown /Answer statement is provided

1. Jamaal wants to create as many rectangles as possible with an area of 13 square units. How many different rectangles can he make with whole number dimensions? Which will have the largest perimeter? Smallest? Explain.
* **CFS for top quality work**
	+ Problem is annotated
	+ Model is drawn accurately and labeled
	+ Table is created with necessary headings
	+ All calculations are shown /Answer statement is provided

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| *Master Level* |

1. Mr. Cameron is trying to design a playground with an area of 56 square meters. He wants to put fencing around the playground to keep stray dogs out at night, but doesn’t want a playground with a large perimeter. Which whole number dimensions should he use?
2. Farmer McCall is building a fence around a plot of land with whole number dimensions that has an area of 40 square yards. Fencing costs $4.50 per foot. What is the least amount of money he could spend to enclose the entire plot of land?

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| *PhD Level* |

1. Amanda wants to create a rectangular fence around her yard for her dog. She has 24 feet of fencing and wants to create the largest area she can for her dog to play using whole number dimensions. What should the dimensions be?

* **CFS for top quality work**
	+ Problem is annotated
	+ Model is drawn accurately and labeled
	+ Table is created with necessary headings
	+ All calculations are shown /Answer statement is provided

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EXIT TICKET**

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| Self-assessment | I mastered the learning objective today. | I am almost there.  | Need more practice and feedback. |
| Teacher feedback | You mastered the learning objective today. | You are almost there.  | You need more practice and feedback. |

1. Alex is creating a sandbox with an area of 32 square feet.

Part A: Determine all of the possible whole number dimensions for his sandbox.

Part B: Which set of dimensions will allow him to use the least amount of wood around the perimeter of the box? How do you know?

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