## Unit 2 Lesson 13: Proofs about Parallelograms

### 1 Notice and Wonder: Diagonals (Warm up)

#### Student Task Statement

Here is parallelogram and rectangle . What do you notice? What do you wonder?



### 2 The Diagonals of a Parallelogram

#### Student Task Statement

Conjecture: The diagonals of a parallelogram bisect each other.

1. Use the tools available to convince yourself the conjecture is true.
2. Convince your partner that the conjecture is true for any parallelogram. Can the 2 of you think of different ways to convince each other?
3. What information is needed to prove that the diagonals of a parallelogram bisect each other?
4. Prove that segment bisects segment , and that segment bisects segment .

### 3 Work Backwards to Prove

#### Student Task Statement



Given: is a parallelogram with parallel to and parallel to . Diagonal is congruent to diagonal .

Prove: is a rectangle (angles  and are right angles).

With your partner, you will work backwards from the statement to the proof until you feel confident that you can prove that is a rectangle using only the given information.

Start with this sentence: I would know is a rectangle if I knew .
Then take turns saying this sentence: I would know [what my partner just said] if I knew .

Write down what you each say. If you get to a statement and get stuck, go back to an earlier statement and try to take a different path.

#### Activity Synthesis





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