Here is a map of part of Downtown Salt Lake City. You are starting at the corner of 11th Ave. and D St. (on the star).

a. If you walk East to 1 St., South to 7th Ave., West to D St. and then North to your starting point, how many blocks will you have walked in total? Describe the shape of your path.

b. Draw and describe in words at least two different ways that you can walk exactly 8 blocks and end up where you started.
c. Jessica said the path she took on her walk enclosed a polygon that had an area of 6 square blocks. Draw some possible shapes that her walk could have taken. Was her path necessarily rectangular?

**IM Commentary**

The purpose of this task is for students to apply the calculation of distances on a coordinate plane to a real life context (6.G.3). Though explicit coordinates are not given in the problem, the reasoning behind finding the side lengths of the rectangles in the plane is present and this activity could prepare for formalizing of this with the Cartesian coordinate plane later on. The teacher could also have students put a Cartesian coordinate system on the map. The could, for example, choose (0,0) for the starting point of the walk and then describe the path using coordinates, putting appropriate integer coordinates at each street intersection.

The task affords students the opportunity to reason abstractly and quantitatively (MP2) as they map out routes and then describe in words (and possibly coordinates) their location. Students could also make use of structure (MP7) to find shortcuts to part (b) and then reason about part (c). For part (c), students could also share out different solutions and critique each other's reasoning on whether their path forms a polygon that has the correct area in square blocks (MP3).

To support students working on this task, it could be useful to provide colored pencils for the routes in parts (a), (b), & (c). Alternatively, the map could be printed and slid into plastic sleeves and students could draw various routes with expo or vis a vis markers.

An initial conversation may need to happen around directions (north being "up" as indicated in the drawing). The students may note that the "blocks" are not perfect squares but the term "block" is used to define how far a person can walk on one side of the street without crossing any other streets and how it applies to the north-south and east-west directions even though they aren't perfect squares. Some students may think to walk down one side of the street and then cross, then walk back on the other side of the street. This scenario should still be considered an out and back path because they are on the same block as described above.
a. You will have walked 5 blocks West, 4 blocks South, 5 blocks East and 4 blocks North for a total of 18 blocks. This is shown below. You start at the star and then go around the boundary of the rectangle in the clockwise direction.

b. Solutions will vary, but here are a few options:
i. Walk east 2 blocks to F St, south 2 blocks to 9th Ave., west 2 blocks to D st. and then 2 blocks north to the starting point: this path follows the square in the picture above.

ii. Walk 1 block west to C St., 3 blocks south to 8th ave., 1 blocks east to D st. and then 3 blocks North to the starting point: this path follows the rectangle in the picture above.

iii. Walk around 1 square block twice.

iv. Walk 4 blocks east on 11th avenue and then turn around and walk 4 blocks back to the west.

c. Below is an example of a rectangular route that meets the criteria. There are many non-rectangular paths that enclose an area of 6 square blocks: L-shaped regions, cross-shaped regions, etc.