

Situational Problem

- **To develop Competency 1:** Solves a situational problem

Old Into New

To make it convenient for people to recycle glass, plastic, metal, and paper, recycling collection bins are to be placed near your school. You have been asked to design the collection bins and their arrangement and to draw what the bins and their arrangement would look like when viewed from above.

? How can you design and arrange recycling collection bins to meet the given criteria?

Your task is to design collection bins for recycling glass, plastic, metal, and paper, while meeting the following conditions:

- There must be a separate collection bin for each of the recyclable materials.
- The top view of each bin must be either a polygon or a complex shape with only straight edges (no circular parts).
- There will be more paper recycled than any of the other materials, so the collection bin for paper must be larger than the others.
- The group of collection bins will be surrounded by a fence, which must also have only straight edges. The fence will have a gate to allow access to the bins.
- There is enough fencing (including the gate) to enclose an area with a perimeter of 40 m, but to save on costs, the amount of fencing used should be minimized.
- The area under the collection bins will be reinforced with concrete, and there is only enough concrete to cover an area of 50 m².
- The concrete can only be poured in a rectangular form.
- After the bins have been placed on the poured concrete, no more than 20 m² of the poured concrete should remain uncovered by bins.

Name: _____ Date: _____

A. Think of a plan

What do you plan to do to complete this task? What ideas, strategies, and steps do you plan?

Name: _____ Date: _____

B. Carry out your plan

Use the space provided to draw the collection bin arrangement, as viewed from above. (It may be helpful to use grid paper to sketch your ideas first.)



C. Evaluate your plan

Now that you have a solution, you know whether your plan helped you. Did you follow your plan? While you chose the shapes and sizes for each of the collection bins, did you change your strategies and/or steps?

D. Evaluate your solution

How much fencing will be used to enclose the area with the recycling collection bins? What area will be covered by concrete? Of the concrete that is poured for the base, what area will not be covered by the collection bins? Could you have used less fencing and/or concrete? Explain.

Evaluation Criteria Checklist

- You have determined the size of the rectangular base on which the concrete will be poured so that the area is no more than 50 m² and the perimeter no greater than 40 m.
- You have designed four collection bins, using polygons or complex shapes with straight edges.
- You have designed the bin for paper to be larger than the other bins.