Part II – For the Teacher

Curriculum Areas

Problem 1 – Measurement; Number Sense and Numeration
Problem 2 – Number Sense and Numeration
Problem 3 – Number Sense and Numeration
Problem 4 – Measurement; Geometry and Spatial Sense
Problem 5 – Patterning and Algebra; Number Sense and Numeration
Problem 6 – Patterning and Algebra; Probability and Data Management

Hints and Suggestions

Problem 1
Hint 1 – Remember: 60 minutes = 1 hour.

* Suggestion: * You may wish to make available some clock faces (borrow from a primary class).

Problem 2
Hint 1 – How can you make a chart or a table to organize the information?
(Answer: Label the columns for the day, the amount for that day, and the accumulated total.)

* Suggestion: * Ask the students to make a hypothesis first. You may wish to have play money available.

Problem 3
Hint 1 – Could the 12 hits be 4 small bottles and 8 large bottles for a win? What about 7 small and 5 large?
Hint 2 – What is the minimum number of points needed to win (if she hits 5 small bottles and 6 large bottles)?

Problem 4
*Suggestion:* You may wish to supply graph or dot paper.

Problem 5
Hint 1 – Who takes the shortest time to get to the rink? Who takes the longest?
Hint 2 – If you guess Indira takes 10 minutes, how long will each of the others take?
Hint 3 – Ali and Indira's combined time is less than 30 minutes.

Problem 6
Hint 1 – You may wish to begin with a simpler problem with only four towns to help students organize their thinking.
Hint 2 – How many choices does she have when leaving A? When leaving the second town?

* Suggestion:* Since students are working in groups for this problem, different students could organize the counting for different initial steps (i.e., A → B, A → C, A → D, A → E) Students can use a tree to organize their counting; it is not necessary to write out all four steps, as they each give the same number of routes.
Solutions and Notes

Problem 1
Mackenzie should get up at 7:50 am; she usually gets up at 8:00 am.

Problem 2
a) Wei gets $6.35 from the ‘daily double’ allowance, versus $10.00 from the flat rate.
b) He gets $820.15 versus $50.00 over the two-week period. Note that students need only do the first few days of the second week to see what will happen.

Problem 3
Since Genevieve must hit at least 5 small bottles and 6 large bottles to win, the only combinations that need to be checked are 5 small and 7 large (which gives 5 x 25 + 7 x 15 = 230 points), and 6 small bottles and 6 large bottles (which gives 6 x 25 + 6 x 15 = 240 points). Since she only got 220 points, she did not win the rabbit. Alternatively, note that the winning combination of 5 small and 6 large bottles gives 215 points. Since Genevieve’s total was 220 points, neither a small nor large bottle could be her 12th hit, so she didn’t win.

Problem 4
a) There are five possible fields: 1 x 100, 2 x 50, 4 x 25, 5 x 20, and 10 x 10. A field 1 or 2 meters wide is probably not sensible, since the cows would have difficulty turning around.
b) The square 10m x 10m field has the smallest perimeter (40 m).

Extension: There are six possible fields: 1 x 200, 2 x 100, 4 x 50, 5 x 40, 8 x 25, 10 x 20. The smallest perimeter is 60m, for the 10 x 20 field, which is rectangular.

Problem 5
Ali takes 18 minutes, Juan takes 37 minutes, and Indira takes 9 minutes.

Problem 6
a) Drawing the figure and joining the towns gives 10 roads.
b) One way to organize the counting of possible routes is to use a tree. For example, if her first stop is town B, the six possible routes are:

![Tree Diagram]

There are four such trees, giving a total of 24 possible routes.
c) Use the trees (or tables) constructed for b), and eliminate any routes that go from B to E or E to B; this eliminates 12 routes, leaving 12.