Connecting the Dots: Piggies and Pools

A Develop Understanding Task

1. My little sister, Savannah, is three years old and has a piggy bank
that she wants to fill. She started with five pennies and each day when I come home
from school, she is excited when I give her three pennies that are left over from my
lunch money. How much money will Savannah have after 10 days? How many days
will it take for her to have at least $1.50? Justify your answer with a mathematical
model of the problem situation.

2. Our family has a small pool for relaxing in the summer that holds 1500 gallons of water.
I decided to fill the pool for the summer. When I had 5 gallons of water in the pool, I
decided that I didn't want to stand outside and watch the pool fill, so I wanted to figure
out how long it would take so that I could leave, but come back to turn off the water at
the right time. I checked the flow on the hose and found that it was filling the pool at a
rate of 2 gallons every 5 minutes. How many gallons of water will be in the pool after
50 minutes? How many minutes will it take to fill the pool? Justify your answer with a
mathematical model of the problem situation.

3. I'm more sophisticated than my little sister. I save my money in a bank account that
pays me 3% interest on the money in the account at the end of each month. (If I take
my money out before the end of the month, I don't earn any interest for the month.) I
started the account with $50 that I got for my birthday. How much money will I have in
the account at the end of 10 months? How many months will it take to have at least
$100? Justify your answer with a mathematical model of the problem situation.

4. At the end of the summer, I decide to drain the swimming pool. I noticed that it drains
faster when there is more water in the pool. That was interesting to me, so I decided to
measure the rate at which it drains. I found that it was draining at a rate of 3% every 5
minutes. How many gallons are left in the pool after 50 minutes? About how many
minutes will it take to have less than 1000 gallons in the pool? Justify your answer with
a mathematical model of the problem situation.

5. Compare problems 1 and 3. What similarities do you see? What differences do you
notice?

6. Compare problems 1 and 2. What similarities do you see? What differences do you
notice?

7. Compare problems 3 and 4. What similarities do you see? What differences do you
notice?