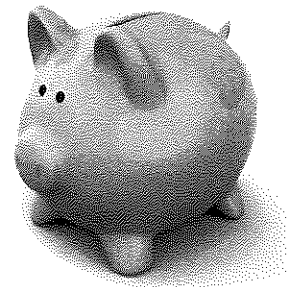


## 2.1 Connecting the Dots: Piggies and Pools

### *A Develop Understanding Task*



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1. My little sister, Savannah, is three years old. She 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. Use a table, a graph, and an equation to create a mathematical model for the number of pennies in the piggy bank on day  $n$ .
  
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 had 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 minute. Use a table, a graph, and an equation to create a mathematical model for the number of gallons of water in the pool at  $t$  minutes.

3. I'm more sophisticated than my little sister so 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. Use a table, a graph, and an equation to create a mathematical model of the amount of money I will have in the account after  $m$  months.
4. At the end of the summer, I decide to drain the 1500 gallon 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 3% was draining out of the pool every minute. Use a table, a graph, and an equation to create a mathematical model of the gallons of water in the pool at  $t$  minutes.

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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?

**READY, SET, GO!**

Name \_\_\_\_\_

Period \_\_\_\_\_

Date \_\_\_\_\_

**READY**

Topic: Recognizing arithmetic and geometric sequences

**Predict the next 2 terms in the sequence. State whether the sequence is arithmetic, geometric, or neither. Justify your answer.**

1. 4, -20, 100, -500, ...
2. 3, 5, 8, 12, ...
3. 64, 48, 36, 27, ...
4. 1.5, 0.75, 0, -0.75, ...
5. 40, 10,  $\frac{5}{2}$ ,  $\frac{5}{8}$ , ...
6. 1, 11, 111, 1111, ...
7. -3.6, -5.4, -8.1, -12.15, ...
8. -64, -47, -30, -13, ...
9. Create a predictable sequence of at least 4 numbers that is NOT arithmetic or geometric.

**SET**

Topic: Discrete and continuous relationships

**Identify whether the following statements represent a *discrete* or a *continuous* relationship.**

10. The hair on your head grows  $\frac{1}{2}$  inch per month.
11. For every ton of paper that is recycled, 17 trees are saved.
12. Approximately 3.24 billion gallons of water flow over Niagara Falls daily.
13. The average person laughs 15 times per day.
14. The city of Buenos Aires adds 6,000 tons of trash to its landfills every day.
15. During the Great Depression, stock market prices fell 75%.

**GO**

Topic: Solving one-step equations

Either find or use the unit rate for each of the questions below.

16. Apples are on sale at the market 4 pounds for \$2.00. What is the price (in cents) for one pound?
17. Three apples weigh about a pound. About how much would one apple cost?  
 (Round to the nearest cent.)
18. One dozen eggs cost \$1.98. How much does 1 egg cost? (Round to the nearest cent.)
19. One dozen eggs cost \$1.98. If the charge at the register for only eggs, without tax, was \$11.88, how many dozen were purchased?
20. Best Buy Shoes had a back to school special. The total bill for four pairs of shoes came to \$69.24 (before tax.) What was the average price for each pair of shoes?
21. If you only purchased 1 pair of shoes at Best Buy Shoes instead of the four described in problem 20, how much would you have paid, based on the average price?

**Solve for x. Show your work.**

22.  $6x = 72$

23.  $4x = 200$

24.  $3x = 50$

25.  $12x = 25.80$

26.  $\frac{1}{2}x = 17.31$

27.  $4x = 69.24$

28.  $12x = 198$

29.  $1.98x = 11.88$

30.  $\frac{1}{4}x = 2$

31. Some of the problems 22 – 30 could represent the work you did to answer questions 16 – 21. Write the number of the equation next to the story it represents.