

Wacky Water World: Teacher Notes



Sunshine State Standards

MA.A.3.3.2

MA.D.1.3.1

MA.E.1.3.1

MA.E.1.3.3

MA.E.3.3.1



Math Abilities

Conceptual Knowledge

Linear Equations

Graphing Calculators

Interpret Data

Procedural Knowledge

$y = mx + b$

Graphing Linear Equations

Graphing Calculator Commands

Make Predictions



Process Standards

Problem Solving

Reasoning

Communication

Connections

Representation



Hook

It is Saturday and the new water theme park has just opened. You and your friends are making plans to attend. You check the plans at the ticket counter, and since you have a limited amount of money, you want the best buy.



Group Arrangement

Students work individually or in pairs



Tools

Graphing Calculator



Procedure

Study the two plans below and then decide which plan you will recommend to your friends.

Plan A

\$ 5.00 admission

\$ 1.00 per ride

Plan B

\$ 10.00 admission

\$.50 per ride

Which plan will you recommend? _____

Why? (be specific and write complete sentences)

Calculate the total cost under both plans for riding 0, 1, 2, 3, 4, 5, and 6 rides. Do this without a calculator.

Plan A		Plan B	
Rides	Total Cost	Rides	Total Cost
0		0	
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	

Describe how to find the total cost of going under Plan A and riding any number of rides.

The total cost will equal _____ plus _____ times the number of rides.

Describe how to find the cost using symbols only!

Use Y to equal the total cost and X to equal the number of rides.

$$Y = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}X$$

Describe how to find the total cost of going under Plan B and riding any number of rides.

The total cost will equal _____ plus _____ times the number of rides.

Describe how to find the cost using symbols only!

Use Y to equal the total cost and X to equal the number of rides.

$$Y = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}X$$

Now use the graphing calculator to see the graphs of the equations that you have written.

Press [Y=] and type in your equation for Plan A next to Y1 =.

Press [ENTER] and type in your Plan B equation next to Y2 =.

Press [ZOOM] 6 to see the graphs of the equations.

Press [ZOOM] 8 [ENTER] to see the equations in an integer window.

Now press [TRACE] and use the arrow keys to trace along the equations. The left and right arrow keys trace along a graph and the up and down arrow keys change the graph that is being traced. If you do not see an equation at the top left corner of the screen, press [2nd] [ZOOM], highlight ExprOn, and press [ENTER]. Press [GRAPH] to see the lines. The equation tells you which graph you are currently tracing, Plan A is Y1 and Plan B is Y2.

Trace along the appropriate line and answer the following questions using your graphs.

1. If I ride 9 rides under Plan A, it will cost _____.
2. If I ride 9 rides under Plan B, it will cost _____.
3. If I ride 30 rides under Plan A, it will cost _____.
4. If I ride 30 rides under Plan B, it will cost _____.
5. If I spent \$15 under plan A, how many rides did I ride? _____
6. If I spent \$20 under plan B, how many rides did I ride? _____
7. When would it cost the same under both plans?

8. Explain what you see on the graph that shows you this.

9. When would it cost more under Plan A?

10. Explain what you see on the graph that helps you to determine this.

11. When would it cost less under Plan A?

12. Explain what you see on the graph that helps you to determine this.

13. Comparing the graphs of Plan A and B, which of the lines is steeper and what does this mean as it relates to the total cost?

14. Predict what the line would look like if you graphed the following situations:

- a. a plan that has no admission price and each ride is \$3.00

- b. a plan that has \$25 admission price and no charge for the rides

- c. a plan that has \$5 admission price for 3 free rides, then \$1 for each additional ride



Math Connection

As a result of this activity, students will learn how a system of equations can be used to find the best use of information to make decisions in real world situations.