Quadratic Function Match c

Connect the Navigator computer to a data projector or Smart Board. Students will write functions to match the teacher graphs.

Teacher: **Begin Class** and using a calculator, Log In as Teacher
Students: Log In to Class
Teacher: Open **Activity Center**
                  Go to **File**, **Load**, **Load Activity Settings** and select *Activity Fcn Match 5*
                  Start Activity

Students: Enter **Activity Center**
                  Student (and Teacher) calculators will display: Y1=
                                                                           Y2=
                                                                           Y3=
                                                                           Y4=
                                                                           Y5=

Teacher: From the *teacher calculator* type **Y1= $(x - 2)^2 + 3$** and **Send**.

                  Allow students a moment to view the graph (hand-sketch the graph). Then from the *computer*:

                                                              Pause Activity
                                                              Extensions
                                                              Quick Poll
                                                              Poll Prompt

                  Submit **Open Response** question(s) similar to:

                       Describe some characteristic(s) of this function.
                       What is the domain of the function?
                       What is the range of the function?
                       Identify any intercepts.
                       How is this function different from those considered in the previous two activities (*Quadratic Function Matches a and b*)?

                       Remind students that they may need to **Alpha Lock** in order to type what they intend and that they have a maximum of 20 characters – be brief.
                       Ask students to **Send** their responses.

                  After each Quick Poll question, select **Stop Poll**. Look at **Poll Summary** and discuss student responses.

                  Exit **Quick Poll** and **Resume Activity**.

Students: Write a function in Y1 to match the graph on the screen. Students may resubmit the function until they find a match.

Teacher: After students have matched the function, clear all activity data:

> **Stop Activity**
> **Edit**
> **Clear Activity Data**
> **Start Activity**

Type and **Send** the equations using the *teacher calculator*:

$$Y1 = (x - 2)^2 + 3$$
$$Y2 = (x - 2)^2 - 3$$

Teacher: After students have matched the function, clear all activity data:

> **Stop Activity**
> **Edit**
> **Clear Activity Data**
> **Start Activity**

Type and **Send** the equations using the *teacher calculator*:

$$Y1 = (x - 2)^2 + 3$$
$$Y2 = (x - 2)^2 - 3$$
$$Y3 = (x + 4)^2 + 3$$

Ask students to quickly sketch the graphs (graphs may not be totally visible when **Quick Poll** is open). From the *computer*:

> **Pause Activity**
> **Extensions**
> **Quick Poll**
> **Poll Prompt**

Submit **Open Response** question(s) similar to:

How are the three functions the same or different?
How are these functions the same or different from the functions in the *Linear Function Matches*?
How are the functions the same or different from functions in *Quadratic Function Matches a and b*?
Do these three functions have the same domain? Explain.
Do these three functions have the same range? Explain.

After each Quick Poll question, select **Stop Poll**. Look at **Poll Summary** and discuss student responses.

Exit **Quick Poll** and then **Resume Activity.**

Students:　　Write a function to match the function in Y3.

Teacher:　　After students have matched the function clear all activity data:

> **Stop Activity**
> **Edit**
> **Clear Activity Data**
> **Start Activity**

Type and **Send** the equations using the *teacher calculator*:

$$Y1 = (x - 2)^2 + 3$$
$$Y2 = (x - 2)^2 - 3$$
$$Y3 = (x + 4)^2 + 3$$

Teacher:　　Challenge students to write similar functions in Y4 and Y5 such that one of the functions will have its vertex in the third quadrant and the other will simply invert one of the three functions.

Resume Activity

After student submissions **Pause Activity** and discuss any surprises students encountered and how they dealt with them. Are all student submissions the same two functions? Why or why not?

Stop Activity
Edit
Clear Activity Data

Reflect
Ask students to write a reflection on the mathematics of this exploration. Use this as a journal entry, notebook entry or an exit slip. How do you write a quadratic function so that you can control the horizontal translation or horizontal shift and the vertical translation or vertical shift? What is a common characteristic of each algebraic representation of this family of functions? How is the algebraic representation of these functions the same as or different from those in *Quadratic Matches a and b*? What is the effect of this difference on the function graphs?

Important Housekeeping Notes:
The screen will become cluttered with student submissions and resubmissions. Use the computer to delete some incorrect submissions:

Select the graph to delete
Delete
Enter

Alternate method to eliminate screen clutter:
This alternative way to manage the clutter was used twice in this activity; clear all activity data:

Stop Activity
Edit
Clear Activity Data
Start Activity

Retype the teacher equations.