## Matching Representations

## Reporting Category <br> Topic

Primary SOL

## Related SOL

## Materials

- Representation of Relationships sheet (attached)
- Envelopes
- Student whiteboards and markers


## Vocabulary

functions, tables, graphs, rules, relationships (8.14)

## Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Prior to the lesson, copy the attached Representation of Relationships sheet on cardstock-one copy of the sheet for each group of three students. Cut the cards apart, and shuffle each set of cards before putting the set into an envelope. Each envelope should contain a complete set of shuffled cards.

1. Divide the class into groups of three. Give each group a set of Representation of Relationships cards. Direct each group to match up the four different representations of each relationship.
2. Have each group come up and present one set of cards to the class, discussing the different representations and how all of them mean the same thing-i.e., the same relationship.
3. Next, give each student a whiteboard and a marker. Instruct each group of three students to decide which member will represent a relationship as an equation, which will represent it as a graph, and which will represent it as a table. Display an equation written in words (e.g., " $y$ is two more than a number." " $y$ is equal to the product of three and a number."). Have each student work individually to come up with his/her assigned representation. When students are finished, have them hold up their boards for verification.
4. Repeat the process in step 3 twice, but with different equations. Each time, have students switch the representations for which they are responsible. Make sure each student has the chance to represent relationships in all three forms.

## Assessment

- Questions
o Why is it important to know how to represent the same relationship in different ways?
- Journal/Writing Prompts
o Draw a graph to represent the equation " y is equal to four less than a number."


## Extensions and Connections (for all students)

- Give students various graphs, and have them come up with a table, equation, and words to represent the relationship shown in each graph.
- Discuss the relationship between the constant and the graph.
- Utilize interactive software and Internet resource to model graphing tables and equations.


## Strategies for Differentiation

- Copy the representation cards on different colors of cardstock so that each set is on a unique color.
- Start with easier coefficients, and then progress to fractional coefficients.
- Precede the lesson with a vocabulary check on translating equations and graphing in the coordinate plane.


## Representations of Relationships

| $y=2 x+1$ | $y$ equals twice a number, increased by one. | $\begin{array}{r} x \\ \hline-3 \\ 0 \\ 3 \end{array}$ | $\begin{array}{r} y \\ \hline-5 \\ 1 \\ 7 \end{array}$ |  |
| :---: | :---: | :---: | :---: | :---: |
| $y=x+6$ | Six more than a number is equal to $y$. | $\begin{array}{r} x \\ \hline-2 \\ -1 \\ 2 \end{array}$ | $\begin{aligned} & y \\ & \hline 4 \\ & 5 \\ & 8 \end{aligned}$ |  |
| $y=-2 x-1$ | The product of negative two and a number, minus one, is another number. | $\begin{array}{r} x \\ \hline-2 \\ -1 \\ 0 \end{array}$ | $\begin{array}{r} y \\ \hline 3 \\ 1 \\ -1 \end{array}$ |  |
| $y=4 x$ | Four times a number is $y$. | $\begin{array}{r} x \\ \hline-2 \\ 0 \\ 1 \end{array}$ | $\begin{array}{r} y \\ \hline-8 \\ 0 \\ 4 \end{array}$ |  |
| $y=3$ | $y$ is three. | $\begin{gathered} x \\ \hline 2 \\ 3 \\ 4 \end{gathered}$ | $\begin{aligned} & y \\ & \hline 3 \\ & 3 \\ & 3 \end{aligned}$ |  |

