Grades 8-9

Lesson 2 | Intro to Evaluating Systems of Equations

This lesson bridges the representations and gameplay strategies that students develop while playing *Lure of the Labyrinth: Vending Machine* to more formal algebraic equations and mathematical problem solving.

	Common Core State Standards
Level 2 'Manager's Lounge'	Evaluating Systems of Equations • *8.EE.C*: Analyze and solve linear equations and pairs of simultaneous linear equations. • *HSA-REI.C*: Solve systems of equations

Materials

- Print out ***Activities 1 & 2*** (below). Make enough copies for groups of 2 students.
- Scratch paper for students to write on.

Lesson Plan

1. **Intro**: Briefly recap students' takeaways from discussing the strategies they had used in Lesson 1. Introduce this activity: students will practice applying what they learned to a few pair activities.
2. **Arrange student groups**: Arrange students into groups of 2. Give students scratch paper to write on.
3. **Activity 1**: Have students work in their pairs to complete ***Activity 1***
   (Answers: 1. blue = 5, green = 4; 2. blue = 4, pink = 3; 3. pink = 5, green = 9)
4. **Activity 2**: Repeat this activity using ***Activity 2***. In this activity, the coins have been replaced with letter variables. B is used for the blue eye, G for the green eye, and P for the pink eye. In the last problem, an additional variable, R, is used.
   (Answers: 1. B = 2, G = 4, P = 6; 2. B = 5, G = 1, P = 4; 3. B = 2, G = 3, P = 6, R = 1)
5. **Class discussion**: Regroup the class. Ask a few student groups to share out what strategies they tried, and what worked. Have students compare the strategies they used with the Activities to the strategies they used in the game.

Differentiation Suggestions

- If students complete the activity quickly, they can complete ***Activity 3: EXTENSION*** as a challenge.

Follow-up

- You can ask students to solve the ***Real-World Connection*** problem, which introduces a scenario using real coins. (*Answer: burger price = $3, soda price = $2)*

Activity 1

1.  +  +  = 13

    +  +  = 14

    = _____  = _____

2.  +  +  = 11

    +  +  = 10

    = _____  = _____

3.  +  +  = 19

    +  +  = 23

    = _____  = _____

Activity 2

1. B + B + B = 6
   G + B + G = 10
   P + G + G = 14
   P + G + B = 12
   B = ____ G = ____ P = ____

2. B + B + G = 11
   G + G + B = 7
   G + G + P = 6
   P + G + B = 10
   B = ____ G = ____ P = ____

3. P + G + G = 12
   G + P + B = 11
   B + B + G = 7
   G + P + R = 10
   B = ____ G = ____ P = ____ R = ____

Activity 3: EXTENSION

1. B + B + G = 10
   B + B + P = 13
   B + P + G = 11
   G + G + R = 7
   B = ____ G = ____ P = ____ R = ____

2. G + P + P = 11
   B + P + P = 9
   G + B + B = 17
   B + B + R = 14
   B = ____ G = ____ P = ____ R = ____

3. P + G + B = 20
   P + B + B = 23
   P + G + G = 17
   B + P + R = 19
   B = ____ G = ____ P = ____ R = ____

   Challenge: Write an expression that produces a final value of 14.

Real-World Connection

Jack went to Burger Barn on Monday and purchased 2 burgers and 1 soda for $8. On Tuesday, he returned and bought 1 burger and 2 sodas for $7.

How much was each burger and each soda?