Grades 6-7 Lesson Plan

Lesson 2 | Intro to Evaluating Algebraic 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
Game Level 1 'Break Room'	Intro to Evaluating Algebraic Equations ● *6.EE.A.2*: Write, read, and evaluate expressions in which letters stand for numbers. ● *6.EE.B*: Reason about and solve one-variable equations. ● *7.EE.B*: Solve real-life and mathematical problems using numerical and algebraic equations.

Materials

- Print out ***Clue Cards: Sets 1-3*** (below). Make enough copies for groups of 4 students to share.
- 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 group activities.
2. **Arrange student groups**: Arrange students into groups of 4. Give students scratch paper to write on.
3. **Activity 1**: Hand out ***Clue Cards: Set 1*** to each group. Each student will be responsible for one of the clue cards. The group will work together, using the clues to determine the values of the three coins. *(Answers to Set 1: blue = 4, green = 1, pink = 2)*
4. **Activities 2-3**: Repeat this activity using ***Clue Cards: Set 2*** and ***Clue Cards: Set 3***. *(Answers to Set 2: blue = 6, green = 7, pink = 9; Set 3: blue = 7, green = 4, pink = 6)*
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 Clue Cards to the strategies they used in the game.

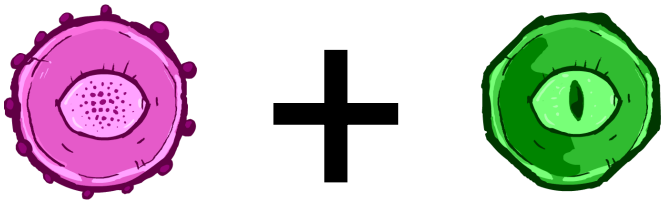
Differentiation Suggestions

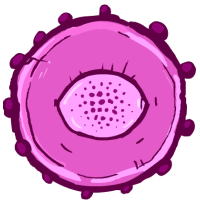
- If students complete the activity quickly, they can try to solve ***Clue Cards: EXTENSION*** as a challenge.
- If students are having difficulty with the puzzles, they can use the ***Coin Counter*** Cut-Outs as a support. Students can use the counters to "guess and check," then "evaluate" the expressions on their clue cards by showing that each expression results in the number of counters corresponding to the given value.

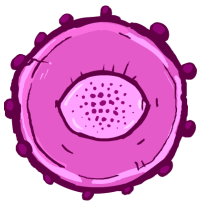
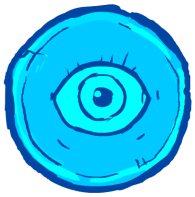
Follow-up

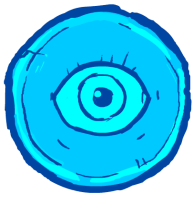
- You can ask students to complete the ***Exit Ticket*** at the end of class. *(Answers: 1. 35; 2. 27; 3. B)*
- You can ask students to solve the ***Real-World Connection*** problems, which introduce scenarios using real coins. *Answers:*
    a. *1 dime and 1 penny*
    b. *Possible answers include: 3 quarters, 2 nickels, 1 penny; 2 quarters, 3 dimes, 1 nickel, 1 penny; 8 dimes, 1 nickel, 1 penny*
    c. *Possible answers include: 8 dimes, 1 nickel, 1 penny; 5 dimes, 6 nickels, 1 penny; 86 pennies*

Clue Cards: Set 1

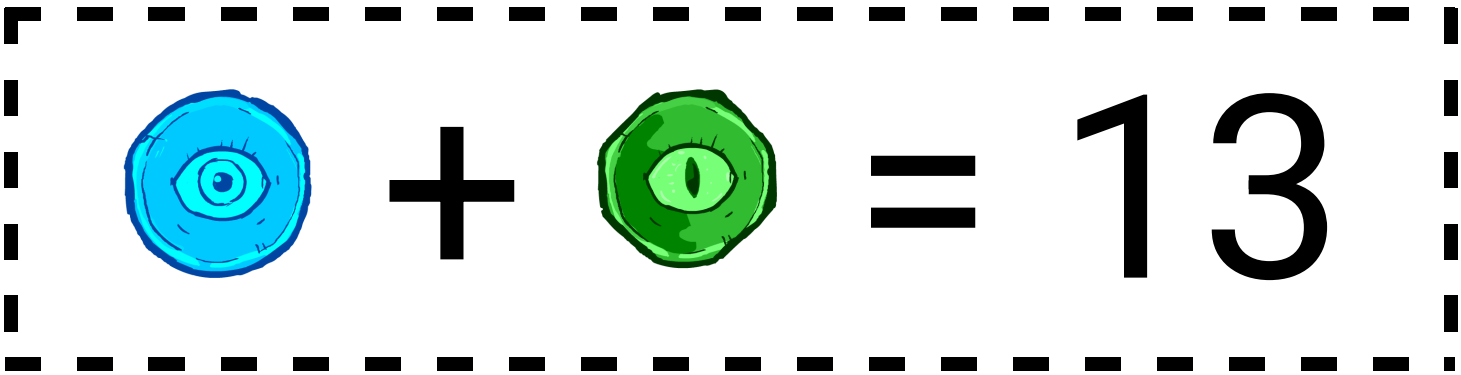
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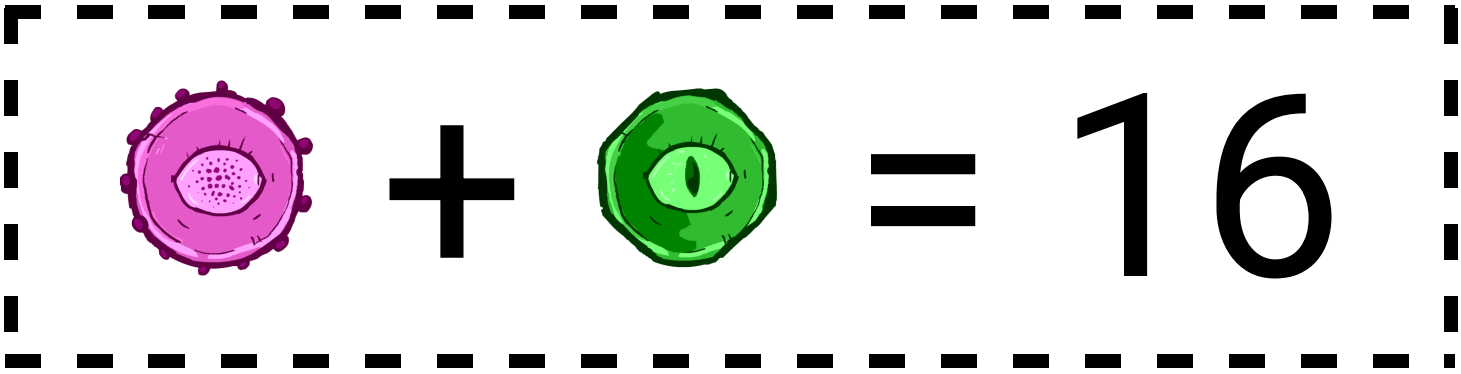
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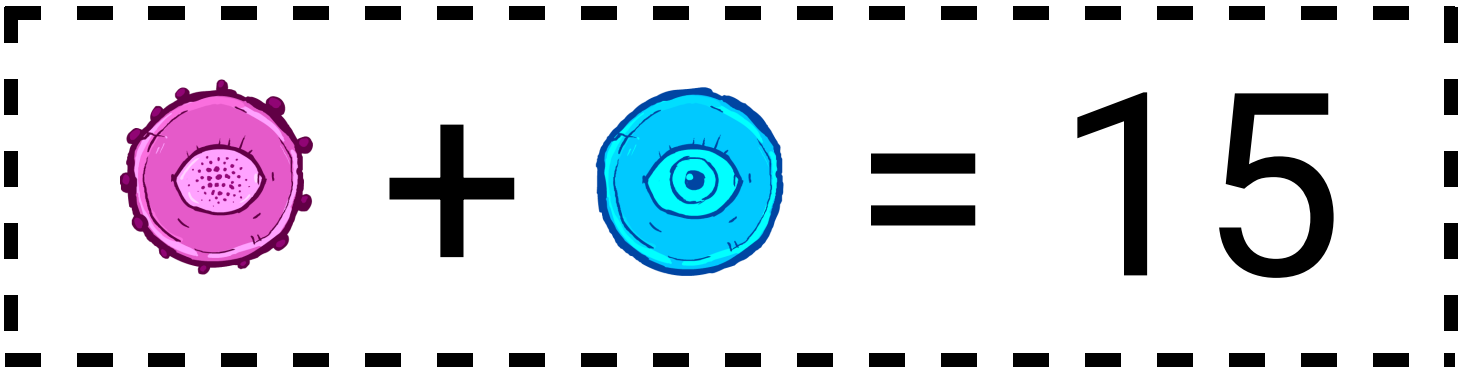
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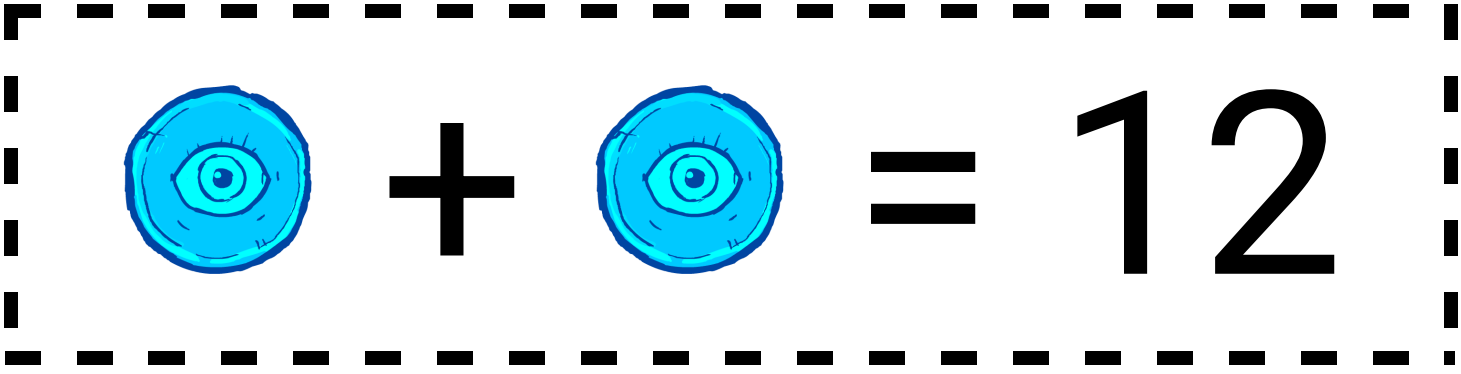
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Clue Cards: Set 2

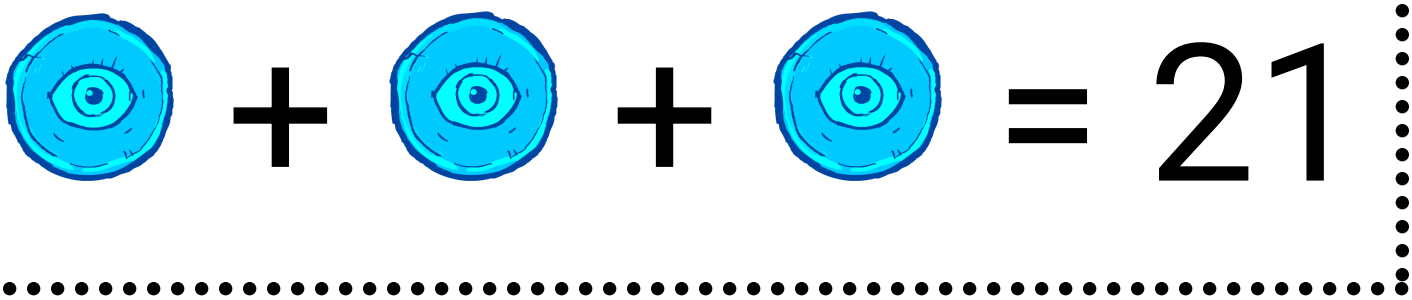


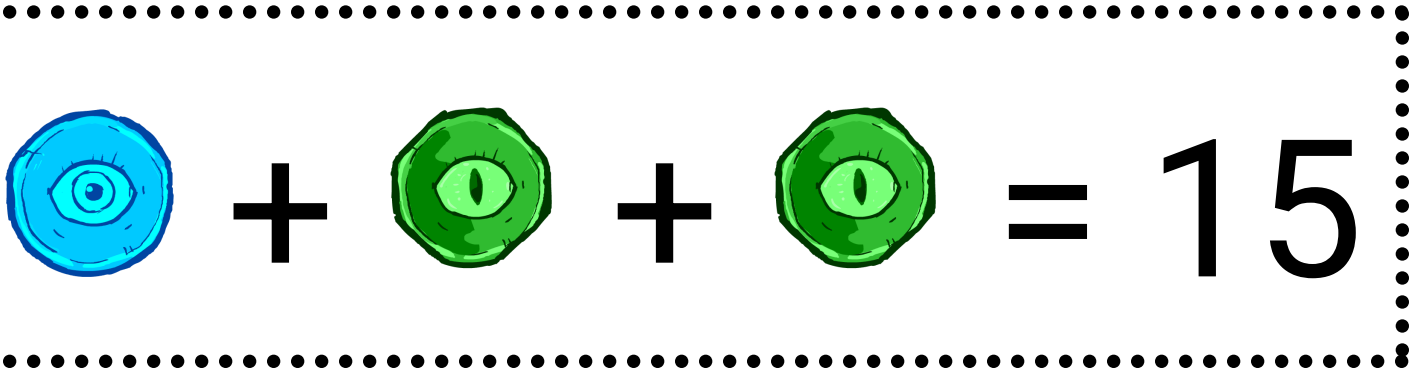


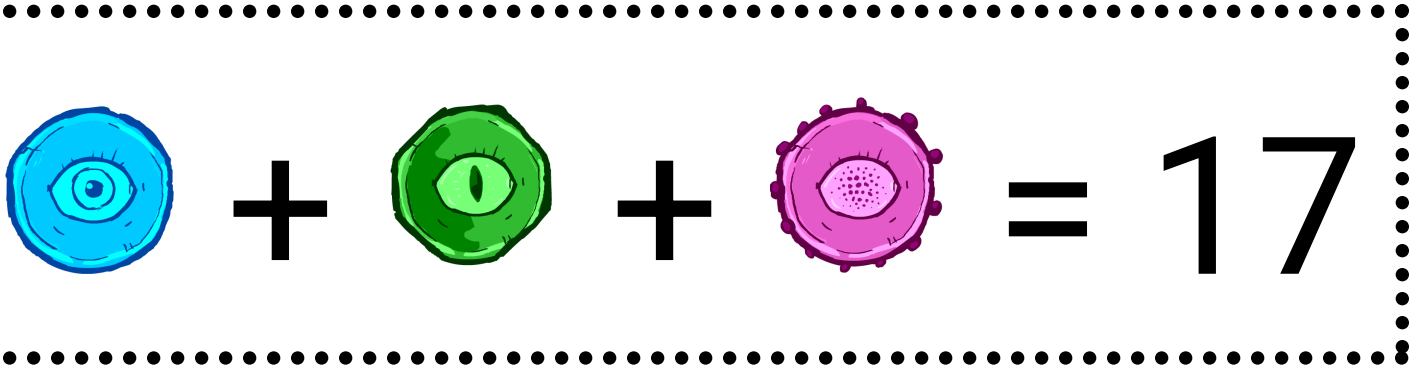


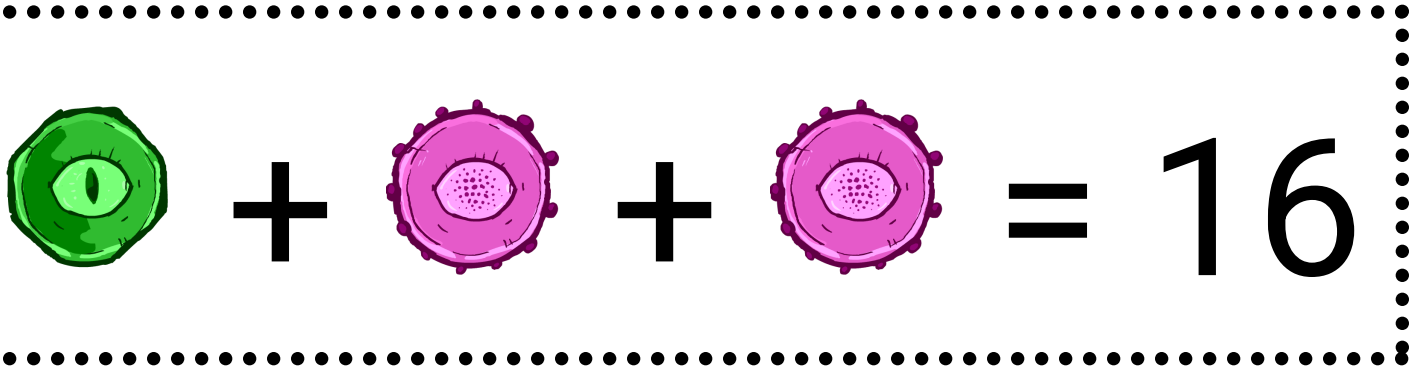


Clue Cards: Set 3

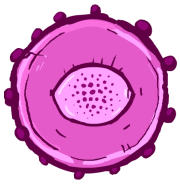


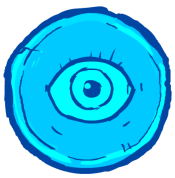


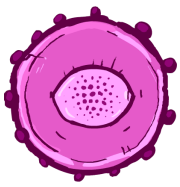
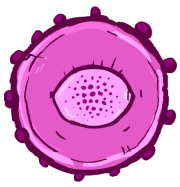
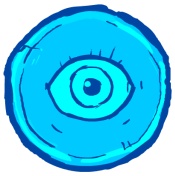


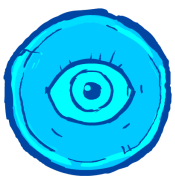
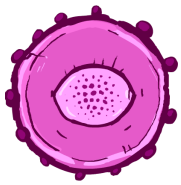


Clue Cards: EXTENSION

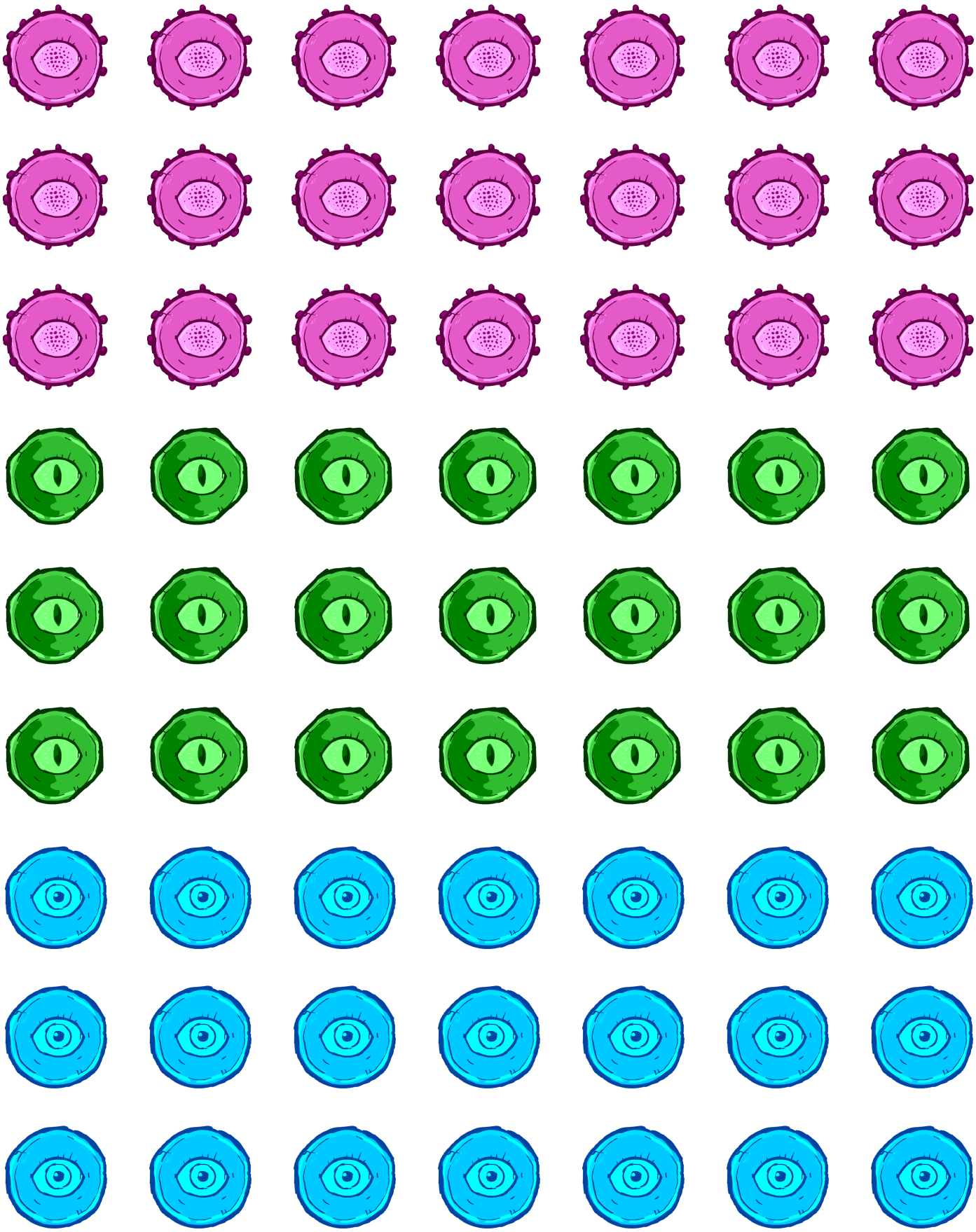
 +  +  = 26

 +  +  = 23

 +  +  = 21

 +  +  = 22

Coin Counter Cut-Outs



Exit Ticket

1. What is the value of the expression $8x + 3$ when x is 4?

2. If $a = 5$, evaluate the expression $8 + 3a$.

3. If the expression $p + q + q$ has a value of 5, which of the following could be the values of p and q?

    a. $p = 1$ and $q = 5$

    b. $p = 1$ and $q = 2$

    c. $p = 2$ and $q = 1$

    d. $p = 3$ and $q = 2$

Real-World Connection

You are working as a cashier. You need to give a customer $0.86. The customer asked for 3 quarters for the vending machine.

a. What other coins should you give them? Use as few coins as possible.

b. What are the other possible combinations for the number and type of coins you could give the customer in this scenario?

c. In this scenario, if you do not have any QUARTERS, what are the possibilities for giving change?