

# Educational Objectives for Variables

In playing the Math Snacks/Magic Spell/Superheroes/Swipe Night game, **the user will...**

1. Use a variable as a **symbol that represents** a set **quantity**. (The quantity may change, which is why you use a variable.)

*For example:*

Let  $n = \square$ , where you can build a tower out of  $3n$ ,  $4n$ , etc. You can also change the size of the shape.

*Development Notes: If we use this, could be a mini game*

2. Given a **set expression**, **change the value of a single variable**, to get the desired result/answer.

*For example:*

$$a = 4$$

select platform height from  $2a-4$ ,  $2a+1$ , and  $a+1$

(user assigns  $a$  value to change platform height)

3. Given a **set variable**, **change or select an expression**.

*For example:*

$$a = 4$$

starting platform height =  $2a$

new platform height = \_\_\_\_\_

(in terms of  $a$ )

(user writes or selects expressions to adjust platform height based on  $a = 4$ )

4. Change the value of a single variable, to see the **relationship between expressions that share that variable**.

*For example:*

Platforms that share 1 variable

Blue platform height =  $a + 1$

Green platform height =  $a - 1$

(user changes  $b$ , and notices that the difference between platform heights is always 2)

5. Change **one or both variables** in **expressions that equal each other**. In doing so, they define *one variable in terms of another*

*For example:*

We want Blue platform height = Green platform height

Blue platform height =  $2a$

Green platform height =  $b+1$

Thus, we want  $2a = b+1$

(user changes either value of  $a$  or  $b$ , or both)

*Development Notes: Could be good to correlate the variables, such as weight to height for catapults, or height to height in platforms, or height to number of blocks.*

6. **Change one variable by changing another variable**. One variable depends on another variable.

*For example:*  
Platform height =  $2a$   
 $a = 3b$

(user changes value of  $b$  to change platform height)

*Development Notes: **MAY NOT USE.** Will integrate only if it feels doable in the game.*