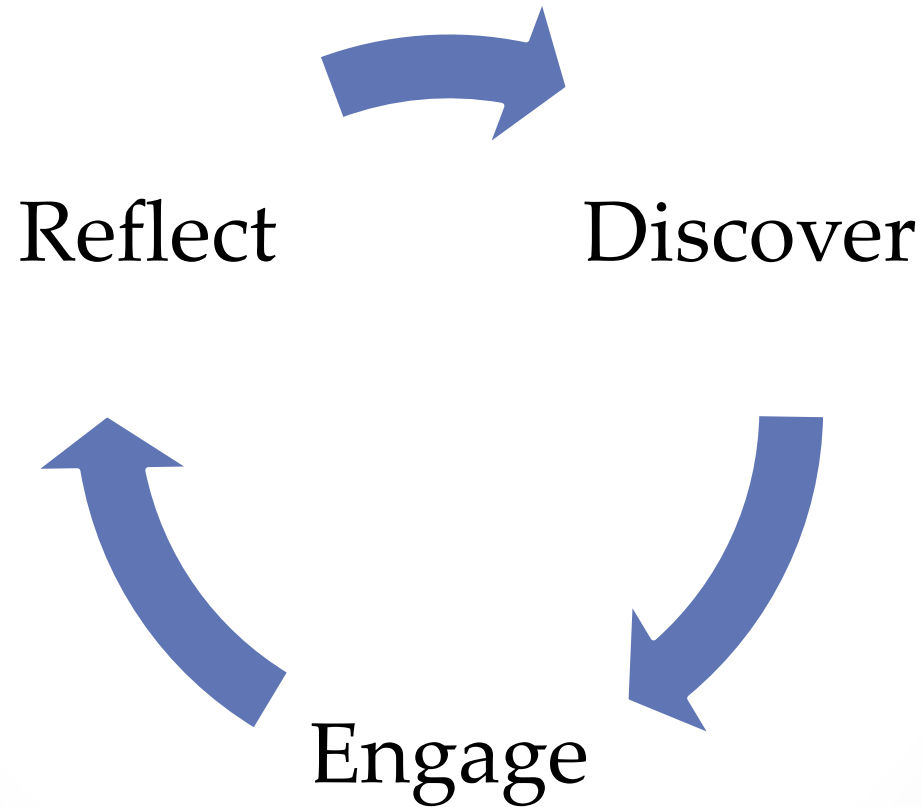


# Incorporating Discovery in Developmental Mathematics

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# Cycles of Learning



# Discover

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# Discover

- Can Developmental Math students really discover this material?
- I'm not looking for my students to discover independently.
- I do want my students to participate in the discovery.



# Discover

- As I teach I try to lead the discovery.
- Involve students
- Collaborate, not dictate
- Help students to develop that “little voice”

# Discovery

The Reversal

- Multiply

$$(x + 8)(x + 5)$$

$$(x - 6)(x - 9)$$

$$(x + 2)(x - 6)$$

$$(x + 10)(x - 4)$$

- Multiply

$$(x + 8)(x + 5) = x^2 + 13x + 40$$

$$(x - 6)(x - 9) = x^2 - 15x + 54$$

$$(x + 2)(x - 6) = x^2 - 4x - 12$$

$$(x + 10)(x - 4) = x^2 + 6x - 40$$



- What did I multiply to get an answer of

$$x^2 + 15x + 54$$

- After covering ...

$$2x^5 (3x^4 - 7x^3 + 5)$$

- Ask ...

$$3x^2 (?) = 6x^4 + 9x^3 - 33x^2$$

$$?(x^2 - 5x - 12) = 8x^5 - 40x^4 - 96x^3$$

$$?(?) = 6x^4 + 15x^3 + 27x^2$$

- After covering ...

## Graphing Square Root Functions

- Ask ...

Here's a graph. What's the function?



- After covering ...

## Solving Quadratic Equations By Factoring

- Ask ...

Here's a solution set.  
What's the equation?

- After covering ...

## Your Turn

- Ask ...

# Discovery

“Wolfram | Alpha” Style

- Problem: Simplify  $\frac{x^2 + 10x + 21}{x^2 + 5x - 14}$

- Answer:  $\frac{x + 3}{x - 2}$

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• Problem:  
Simplify  $\frac{x^2 + 8x + 15}{x^2 - x - 12} \cdot \frac{x^2 - 16}{x^2 + 12x + 35}$

• Answer:  $\frac{x + 4}{x + 7}$

•

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- Problem: Simplify 
$$\frac{8x^7 - 28x^5 + 4x^2}{4x^2}$$

- Answer:  $2x^5 - 7x^3 + 1$

- 

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- Problem:

Your Turn

- Answer:

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# Discovery

Properties of Graphs

Desmos.com

Graphing Parabolas

# Discovery

Properties of Graphs

Desmos.com

Translations (h & k)

# Discovery

Flipping the Classroom

Simplifying Radical Expressions

# Discovery

Flipping the Classroom

Graphing Absolute Value Functions

# Summary

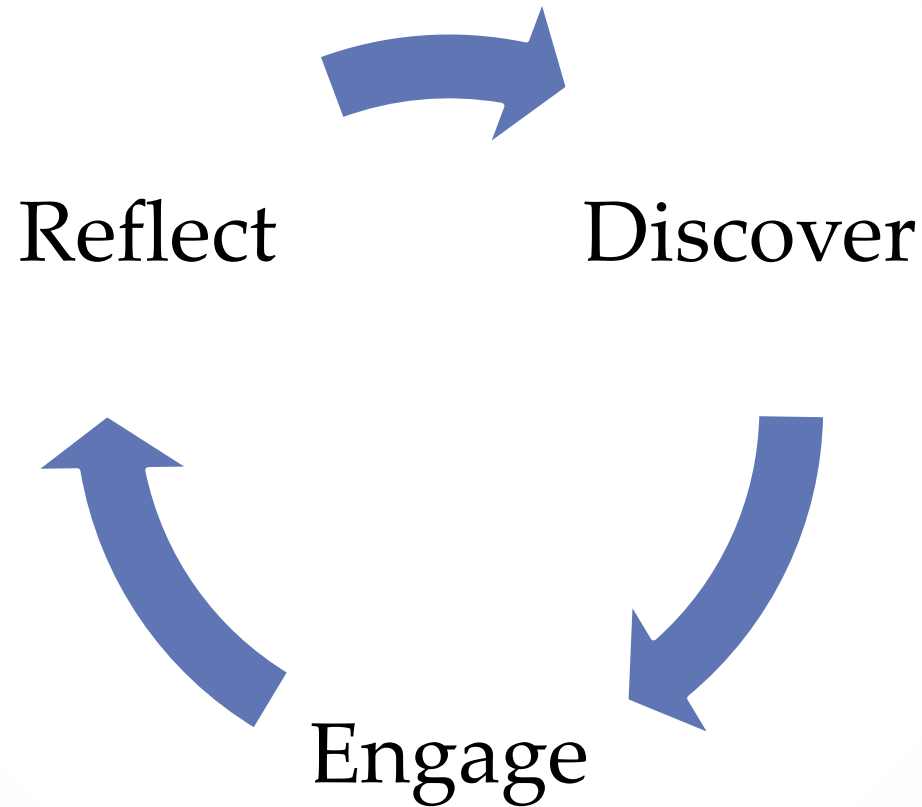
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# True Learning

- I believe that true learning only occurs when students are allowed to participate in the discovery of procedures and problem solving strategies, rather than being handed a recipe of steps to follow.



# Cycles of Learning



# Feedback

Questions? Comments?

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