

Day 1 Lesson**Inv. 1.1 NUMBER TRICK RECORDING SHEET**

A

Words	Choose a Number	What it looks like with algebra pieces	
1) Choose a special number			
2) Add five			
3) Double it (Multiply by 2)			
4) Subtract 4			
5) Divide by 2			
6) Subtract your special number			

B

Words	Choose a Number	What it looks like with algebra pieces	
1) Choose a special number			
2) Triple it (Multiply by three)			
3) Add 6			
4) Divide by 3			
5) Subtract 2			

Name_____

Date_____

Day 1 Homework**1.1 Number Tricks****Directions: Fill in the first two columns.**

A

Words	Choose a Number	What it looks like with algebra pieces	
1) Pick a special number			
2) Add two			
3) Multiply by 3			
4) Add your special number			
5) Subtract 2			
6) Divide by 4			
7) Subtract 1			

B

Words	Choose a Number	What it looks like with algebra pieces	
1) Pick a special number			
2) Double it			
3) Add one more than your special number			
4) Double that			
5) Add 10			
6) Divide by 6			
7) Subtract your special number			

Day 3 Warm Up

Inv. 1.3 Numbers, algebra pieces and expressions

Name _____

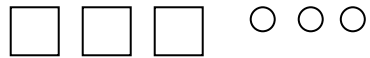
Date _____

Words	Choose a Number	What it looks like with algebra pieces	Algebraic Expression
1) Pick a special number			
2) Triple it (Multiply by 3)			
3) Add 8			
4) Add your special number			
5) Divide by 2			
6) Subtract 2 times your special number			

Day 4 Warm Up

Inv. 1.4 Different operations on one value

If the number resulting from one of the steps of a number trick is represented by



What would represent:

- 1. The result of subtracting three from this number?**
- 2. The result of dividing this number by three?**
- 3. The result of adding the original number to this number?**
- 4. The next larger number?**

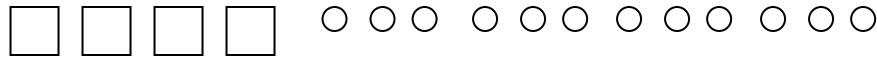
Use both the algebra pieces and algebraic expressions for your answers.

*** Overhead or student page**

Inv. 1.5 Making up your own number tricks

Use algebra pieces and/or algebraic expressions to help you find the correct answers.

1. What operations can you do to this resulting number? Choose all that apply.



- a) divide by two**
- b) divide by three**
- c) divide by four**
- d) divide by five**
- e) divide by six**
- f) all of the above**
- g) none of the above**

2. If you added one more than the special number to this resulting number, what would it look like with boxes and dots? What operations could you do to it?



- a) divide by two**
- b) divide by three**
- c) divide by four**
- d) divide by five**
- e) divide by six**
- f) all of the above**
- g) none of the above**

***Overhead or student page**

Name_____

Date_____

Make up your own Number Trick (Use squares and dots)

Words	Choose a Number	What it looks like with pictures	Algebraic Expression
1)			
2)			
3)			
4)			
5)			
6)			
7)			
8)			

Day 2 Lesson

2.1 Pattern of “T’s

Name: _____

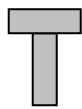


Figure 1

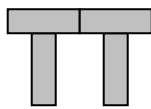


Figure 2

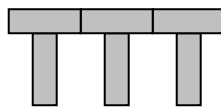


Figure 3

Figure 4

Figure 5

Use the pattern above to answer the following questions.

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

Fig. #	# of T's
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

3. How many T's would you need to build figure 10? Figure 20? Figure 50?

10th _____

20th _____

50th _____

4. Describe the pattern in words.

5. Write a rule for the pattern.

Extension question:

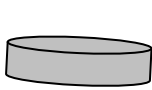
If you had a figure with exactly 100 T's, which figure number would it be? Explain how you know that.

Optional question: Use the table to make a coordinate graph.

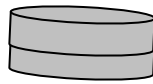
Day 2 Homework

2.1 Penny Stacks

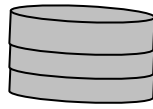
Name: _____



Stack 1



Stack 2



Stack 3

Stack 4

Stack 5

Use the pattern above to answer the following questions.

1. Make a sketch of the next two stacks in the pattern.																								
2. Complete the table. <table border="1"> <thead> <tr> <th>Fig. #</th> <th># of Pennies</th> </tr> </thead> <tbody> <tr><td>1</td><td></td></tr> <tr><td>2</td><td></td></tr> <tr><td>3</td><td></td></tr> <tr><td>4</td><td></td></tr> <tr><td>5</td><td></td></tr> <tr><td>6</td><td></td></tr> <tr><td>10</td><td></td></tr> <tr><td>20</td><td></td></tr> <tr><td>50</td><td></td></tr> <tr><td>n</td><td></td></tr> </tbody> </table>		Fig. #	# of Pennies	1		2		3		4		5		6		10		20		50		n		3. How many pennies would you need to build figure 10? Figure 20? Figure 50? 10th _____ 20th _____ 50th _____
Fig. #	# of Pennies																							
1																								
2																								
3																								
4																								
5																								
6																								
10																								
20																								
50																								
n																								
4. Describe the pattern in words.		5. Write a rule for the pattern.																						

Extension question:

If you had a stack with exactly 200 pennies, which stack number would it be? Explain how you know that.

Day 3 Lesson

2.2 Toothpick 'T's

Name: _____

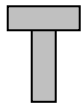


Figure 1

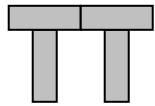


Figure 2

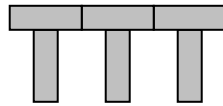


Figure 3

Figure 4

Figure 5

Each "T" is built with two toothpicks.

Use the pattern above to answer the following questions.

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

Fig. #	# of toothpicks
1	
2	
3	
4	
5	
6	
10	
20	
50	
n	

3. How many toothpicks would you need to build figure 10? Figure 20? Figure 50?

10th _____

20th _____

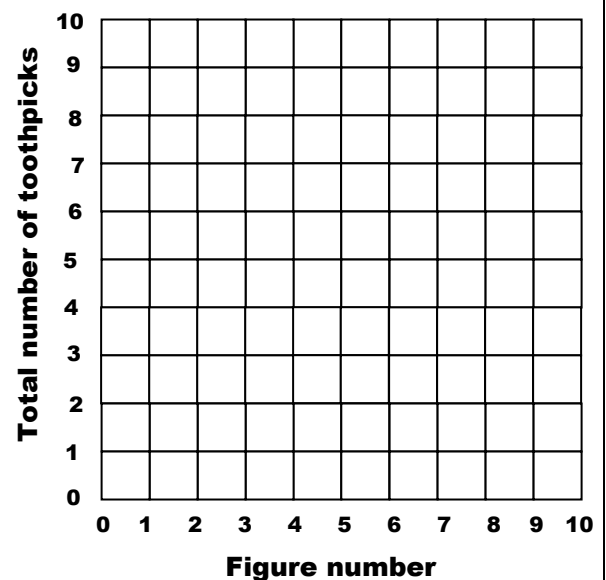
50th _____

4. Describe the pattern in words.

5. Write a rule for the pattern.

Extension question: If you had a figure with exactly 100 T's, which figure number would it be? Explain how you know that.

6. Use the table to make a coordinate graph.



Day 3 Homework

2.2 Penny Legs

Name: _____

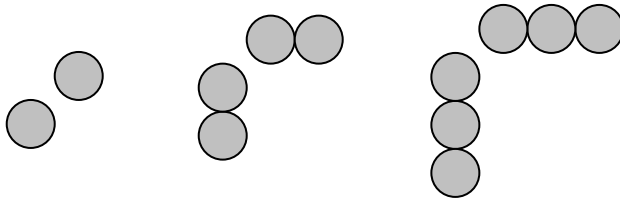


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

Fig. #	# of Pennies
1	
2	
3	
4	
5	
6	
10	
25	
47	
n	

3. How many pennies would you need to build figure 10? Figure 25? Figure 47?

10th _____

25th _____

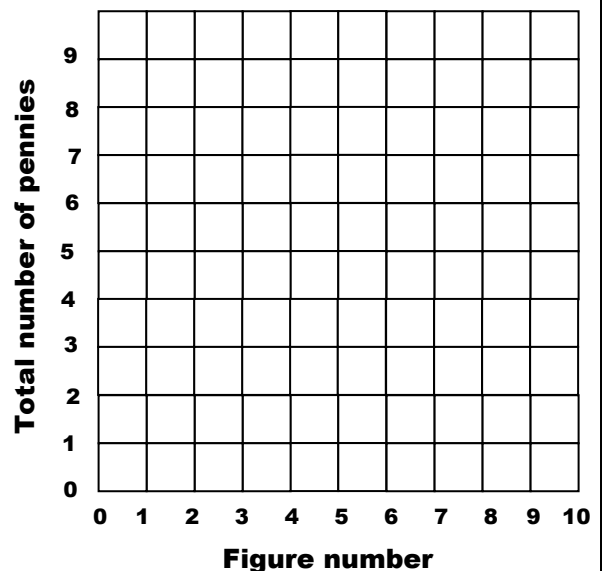
47th _____

4. Describe the pattern in words.

5. Write a rule for the pattern.

Extension question: If you had a figure with exactly 242 pennies, which figure number would it be? Explain how you know that.

6. Use the table to make a coordinate graph.



Day 4 Lesson

2.3 Penny L's

Name: _____

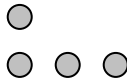


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Use the pattern above to answer the following questions.

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

Fig. #	# of Pennies
1	
2	
3	
4	
5	
6	
10	
28	
52	
n	

3. How many pennies would you need to build figure 10? Figure 28? Figure 52?

10th _____

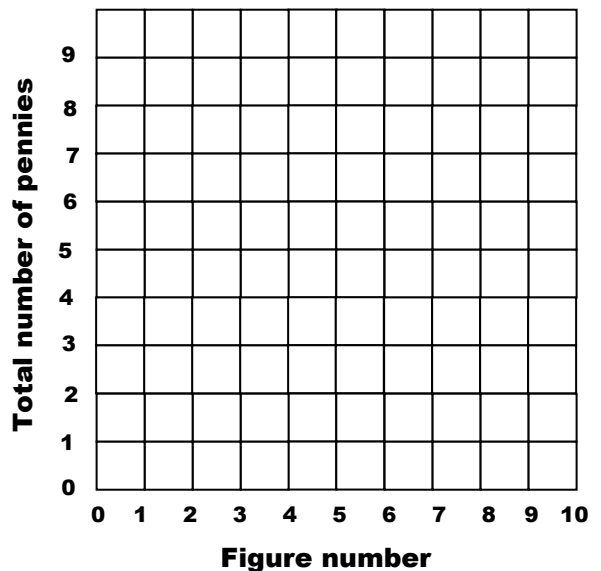
28th _____

52nd _____

4. Describe the pattern in words.

5. Write a rule for the pattern.

6. Use the table to make a coordinate graph.



Extension question: If you had a figure with exactly 100 pennies, which figure number would it be? Explain your thinking.

Day 4 Homework

2.3 Crouching Dog, Hidden Pattern

Name: _____

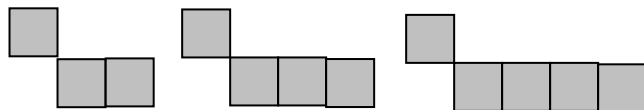


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Use the pattern above to answer the following questions.

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

Fig. #	# of tiles
1	
2	
3	
4	
5	
6	
12	
40	
56	
n	

3. How many tiles would you need to build figure 12? Figure 40? Figure 56?

12th _____

40th _____

56th _____

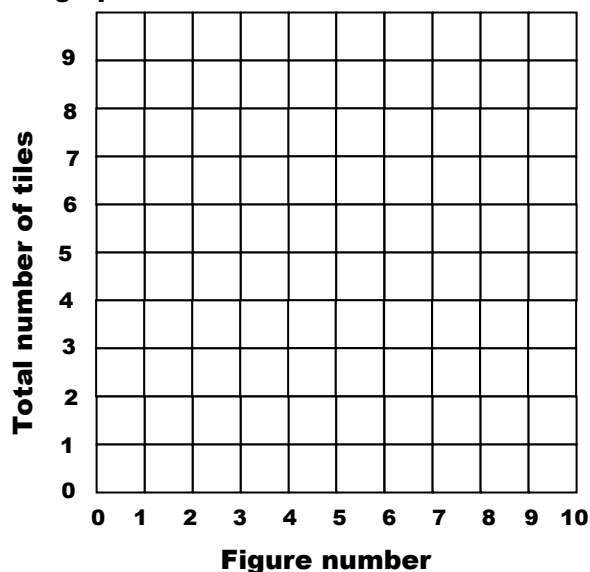
4. Describe the pattern in words.

5. Write a rule for the pattern.

Extension question:

If you had a figure with exactly 100 tiles, which figure number would it be? Explain your thinking.

6. Use the table to make a coordinate graph.



Day 7 Lesson

2.4 Penny Triangles

Name: _____

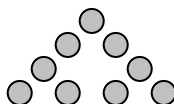
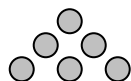


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5
Show multiple representations of the pattern above to answer the following questions.

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

Fig. #	# of pennies
1	
2	
3	
4	
5	
6	
15	
35	
60	
n	

3. How many pennies would you need to build figure 15? Figure 35? Figure 60?

15th _____

35th _____

60th _____

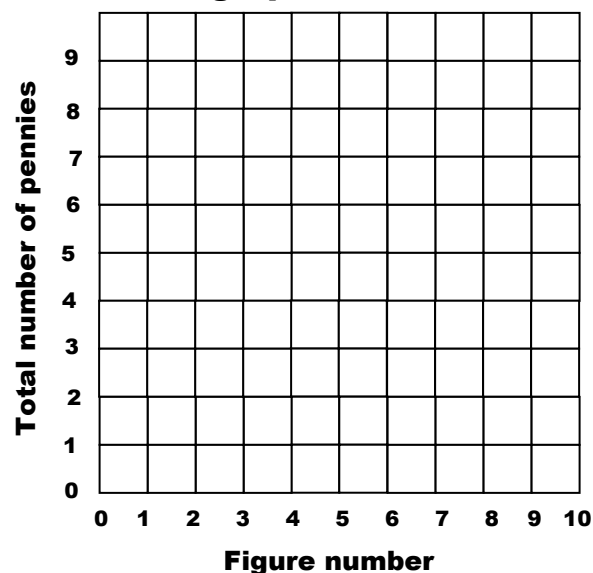
4. Describe the pattern in words.

5. Write a rule for the pattern.

Extension question:

If you had a figure with exactly 99 pennies, which figure number would it be?

6. Use the table to make a coordinate graph.



Day 7 Homework

2.4 Penny Y's

Name: _____

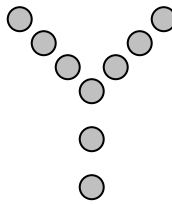
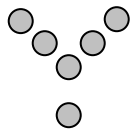


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Show multiple representations of the pattern above to answer the following questions.

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

Fig. #	# of pennies
1	
2	
3	
4	
5	
6	
15	
35	
60	
1n	

3. How many pennies would you need to build figure 15? Figure 35? Figure 60?

15th _____

35th _____

60th _____

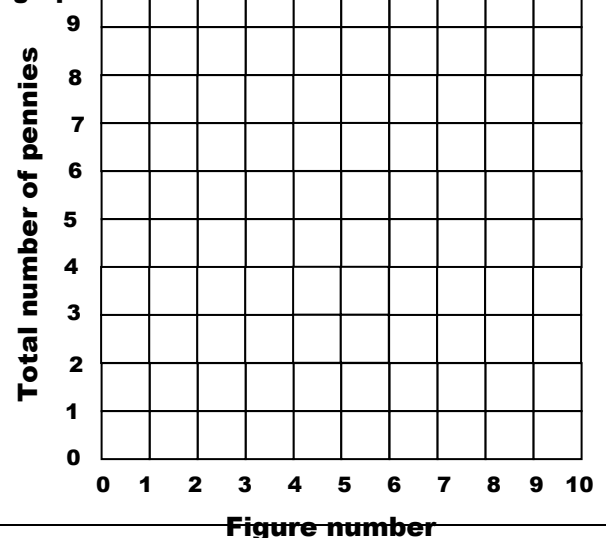
4. Describe the pattern in words.

5. Write a rule for the pattern.

Extension question:

If you had a figure with exactly 189 pennies, which figure number would it be? Explain your thinking.

6. Use the table to make a coordinate graph.



Day 8 Lesson

2.5 L Tiles

Name: _____

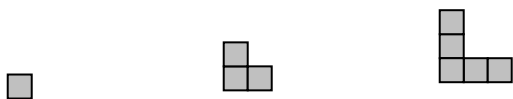


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Show multiple representations (words, table, graph, and rule) of the pattern above.

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

3. How many tiles would you need to build figure 18? Figure 20? Figure 72?

18th _____

20th _____

72nd _____

nth _____

4. Describe the pattern in words.

5. Write a rule for the pattern.

Extension question:

If you had a figure with exactly 201 tiles, which figure number would it be? Explain your thinking.

6. Use the table to make a coordinate graph.

Day 8 Homework

2.5 L-Tiles 2

Name: _____



Figure 1

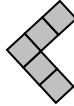


Figure 2

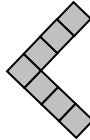


Figure 3

Show multiple representations (words, table, graph, and rule) of the pattern above.

1. Make a sketch of the next two figures in the pattern.

2. Complete the table.

3. How many tiles would you need to build figure 12? Figure 36? Figure 45?

12th _____

36th _____

45th _____

nth _____

4. Describe the pattern in words.

5. Write a rule for the pattern.

Extension question:

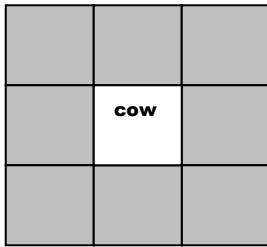
If you had a figure with exactly 201 tiles, which figure number would it be? Explain your thinking.

6. Use the table to make a coordinate graph.

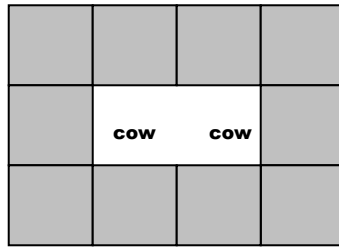
Day 9 Lesson

2.6 Cow Pens

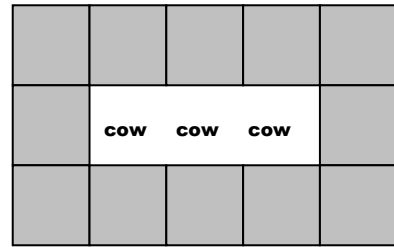
Name: _____



Cow Pen 1

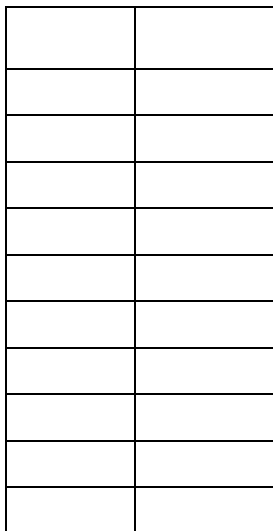


Cow Pen 2



Cow Pen 3

1. Make a sketch of the next two figures in the pattern.
2. Show multiple representations of the pattern above.



How many tiles would you need to build figure 15?
Figure 30? Figure 50?

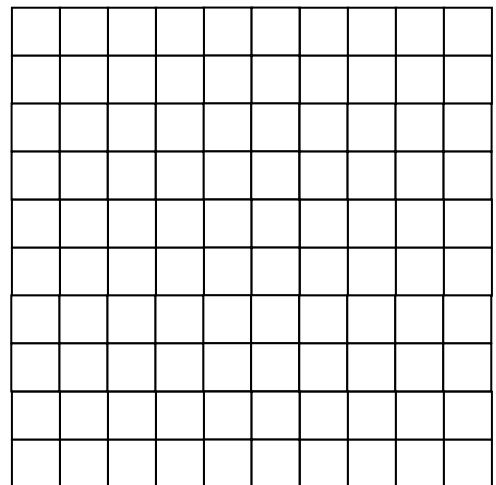
15th _____

30th _____

50th _____

nth _____

Extension question:
If you had a figure with exactly 202 tiles, which figure number would it be? Explain your thinking.



Day 9 Homework

2.6 No Y-ning

Name: _____

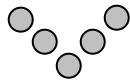


Figure 1

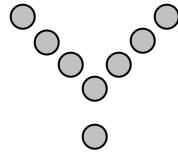


Figure 2

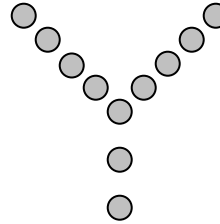


Figure 3

1. Make a sketch of the next two figures in the pattern.
2. Show multiple representations of the pattern above.

How many pennies would you need to build figure 20? Figure 40? Figure 75?

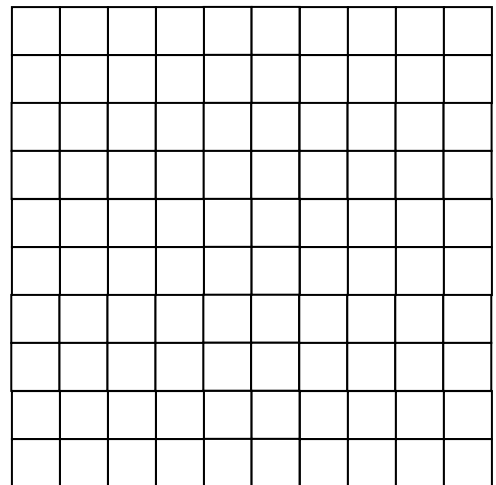
20th _____

40th _____

75th _____

nth _____

Extension question:
If you had a figure with exactly 104 pennies (dots), which figure would it be? Explain your thinking.



Day 10 Lesson

2.7 Tile Stacks

Name: _____

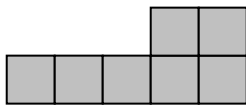


Figure 1

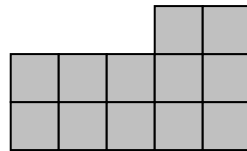


Figure 2

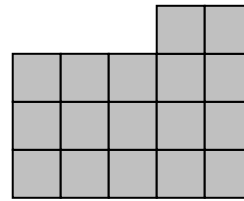


Figure 3

1. Make a sketch of the next two figures in the pattern.
2. Show multiple representations of the pattern above.

**How many tiles would you need to build figure 10?
Figure 20? Figure 50?**

10th _____

20th _____

50th _____

nth _____

Extension question:
If you had a figure with exactly 302 tiles, which figure number would it be? Explain your thinking.

Day 10 Homework

2.7 Bricks

Name: _____

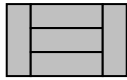


Figure 1



Figure 2

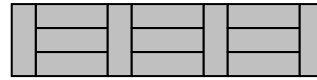
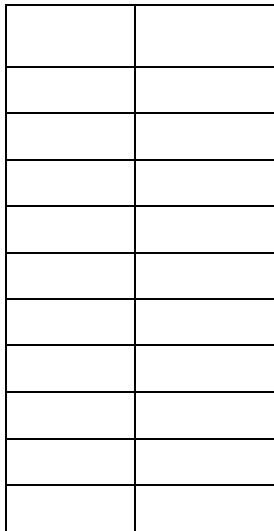


Figure 3

1. Make a sketch of the next two figures in the pattern.
2. Show multiple representations of the pattern above.



How many bricks would you need to build figure 21?
Figure 42? Figure 50?

21st _____

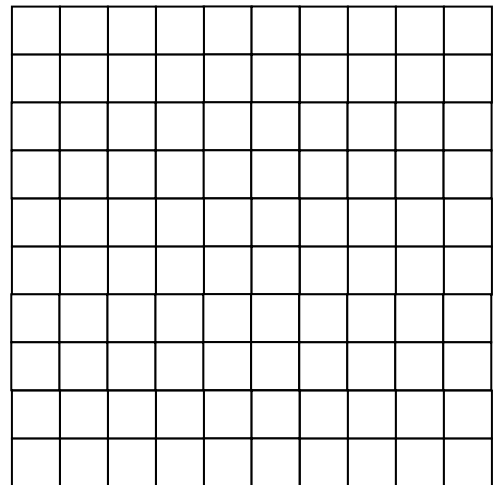
42nd _____

50th _____

nth _____

Extension question:

If you had a figure with exactly 301 bricks, which figure number would it be? Explain your thinking.



Day 6 Homework
Inv 3.1 Backtracking

Name: _____

Backtrack to find the starting number (n). SHOW each backtracking step to earn credit.

A)

$$\boxed{n} \xrightarrow{+2} \boxed{} \xrightarrow{-5} \boxed{} \xrightarrow{+3} \boxed{14}$$

← ← ←

B)

$$\boxed{n} \xrightarrow{-3} \boxed{} \xrightarrow{\times 5} \boxed{} \xrightarrow{+3} \boxed{23}$$

← ← ←

C)

$$\boxed{n} \xrightarrow{+2} \boxed{} \xrightarrow{\div 3} \boxed{} \xrightarrow{+1} \boxed{7}$$

← ← ←

D)

$$\boxed{n} \xrightarrow{+8} \boxed{} \xrightarrow{-4} \boxed{} \xrightarrow{\times 5} \boxed{20}$$

← ← ←

E)

$$\boxed{n} \xrightarrow{+6} \boxed{} \xrightarrow{\div 4} \boxed{} \xrightarrow{-7} \boxed{2}$$

← ← ←

Day 8 Warm Up

Investigation 3.3 From Backtracking to Algebraic Equations

Name: _____

Use Backtracking to find “n”, showing your work. Then write the equation in proper algebraic form.

A.

	$\times 2$		$+ 3$		$- 5$	
$\boxed{n}$	$\rightarrow$	$\square$	$\rightarrow$	$\square$	$\rightarrow$	$\boxed{16}$
	$\leftarrow$		$\leftarrow$		$\leftarrow$	

ALGEBRA:

B.

	$\times 7$		$\div 3$		$- 4$	
$\boxed{n}$	$\rightarrow$	$\square$	$\rightarrow$	$\square$	$\rightarrow$	$\boxed{10}$
	$\leftarrow$		$\leftarrow$		$\leftarrow$	

ALGEBRA:

C.

	$- 3$		$\times 3$		$\div 9$	
$\boxed{n}$	$\rightarrow$	$\square$	$\rightarrow$	$\square$	$\rightarrow$	$\boxed{1}$
	$\leftarrow$		$\leftarrow$		$\leftarrow$	

ALGEBRA:

D.

	$\times 2$		$+ 7$		$\times 5$		$\div 3$	
$\boxed{n}$	$\rightarrow$	$\square$	$\rightarrow$	$\square$	$\rightarrow$	$\square$	$\rightarrow$	$\boxed{15}$
	$\leftarrow$		$\leftarrow$		$\leftarrow$		$\leftarrow$	

ALGEBRA:

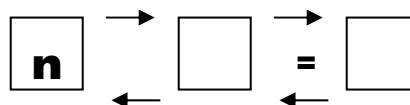
Day 9 Warm Up

Investigation 3.4 From Algebraic Symbols to the Backtracking Model

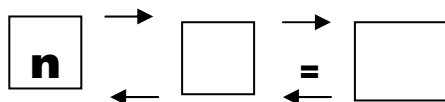
Name: _____

A. Given the algebraic equation for each problem, use Backtracking to find “n”, showing each backtracking step.

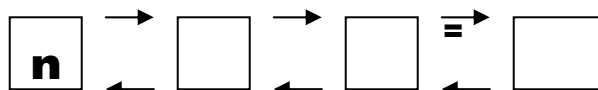
1. **ALGEBRA:** $2n - 3 = 13$



2. **ALGEBRA:** $7(n + 4) = 56$



3. **ALGEBRA:** $2n \div 2 + 4 = 10$



B. Build and complete backtracking models for the equations below, showing all steps to find “n”.

4. **ALGEBRA:** $2n - 3 = 18$

5. **ALGEBRA:** $6n + 4 = 7$

Day 10 Warm Up**Investigation 3.5 Backtracking: Putting it all Together**

Name: _____

Use backtracking diagrams to work out the secret number (n) in each of the following:

1) $3(2n - 3) = 21$

2) $\frac{7n - 2}{10} = 4$

3) $\frac{n - 1}{3} + 5 = 16$

Build backtracking models for each equation below, and use them to find 'n'. Show all the backtracking steps!

4) $2(n + 3) = 16$

5) $\frac{n - 3}{2} + 6 = 11$

6) $\frac{6n - 1}{5} = 1$

Day 15 Warm Up

Additional Practice: Backtracking

Name: _____

Use Backtracking to find “n”, showing your work. Then write the equation in proper algebraic form.

A. $\begin{array}{c} \xrightarrow{\times 5} \\ \boxed{n} \end{array} \begin{array}{c} \xrightarrow{-10} \\ \boxed{} \end{array} \begin{array}{c} \xrightarrow{+8} \\ \boxed{} \end{array} = \boxed{18}$

ALGEBRA:

B. $\begin{array}{c} \xrightarrow{+6} \\ \boxed{n} \end{array} \begin{array}{c} \xrightarrow{\times 2} \\ \boxed{} \end{array} \begin{array}{c} \xrightarrow{+10} \\ \boxed{} \end{array} = \boxed{26}$

ALGEBRA:

C. $\begin{array}{c} \xrightarrow{+10} \\ \boxed{n} \end{array} \begin{array}{c} \xrightarrow{\times 2} \\ \boxed{} \end{array} \begin{array}{c} \xrightarrow{-4} \\ \boxed{} \end{array} = \boxed{36}$

ALGEBRA:

D. $\begin{array}{c} \xrightarrow{-2} \\ \boxed{n} \end{array} \begin{array}{c} \xrightarrow{+20} \\ \boxed{} \end{array} \begin{array}{c} \xrightarrow{\times 2} \\ \boxed{} \end{array} = \boxed{50}$

ALGEBRA:

E. $\begin{array}{c} \xrightarrow{\times 10} \\ \boxed{n} \end{array} \begin{array}{c} \xrightarrow{-5} \\ \boxed{} \end{array} \begin{array}{c} \xrightarrow{\div 5} \\ \boxed{} \end{array} = \boxed{5}$

ALGEBRA:

Day 11 Warm Up
Bowl-A-Fact

