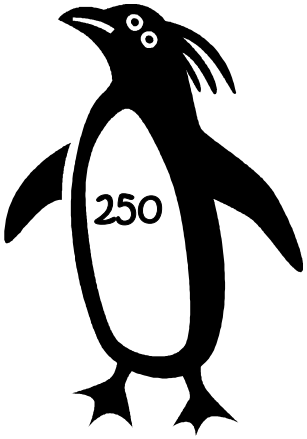
Name: _____ Date: _____

Penguin Delivery



In the book **365 Penguins**, the family received a new penguin each day. They received their first penguin on January 1st and this pattern continued throughout this non-leap year.

- How many penguins did the family have on the last day of June?
- On what day did the family receive its 250th penguin?

Use numbers, words, pictures, and/or tables to explain your best mathematical thinking.

Name: Possible Solution Date: _____

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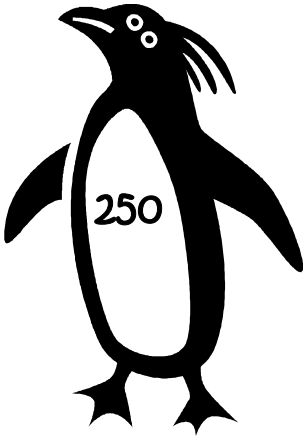

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- I have to find out how many days are in January, February, March, April, May and June.
- January has 31 days, February has 28 days when it's not a leap year, March has 31 days , April has 30 days, May has 31 days and June has 30 days.
- 31 + 28 + 31 + 30 + 31 +30 days = 181 days
- the family got a penguin every day so that's 181 penguins
- ANSWER: The family had 181 penguins on the last day of June.

- I have to find the 250th day because the family would get the 250th penguin on the 250th day.
- I know the family had 181 penguins on the last day of June, so I'll continue from there.
- July has 31 days so 181 + 31 = 212 days
- August has 31 days so 212 + 31 = 243 days.
- I need 7 more days so the 250th day will be in September on the 7th day of the month..
- ANSWER: The family received its 250th penguin on Sept. 7th.

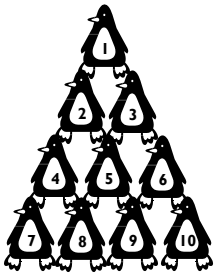
Name: _____ Date: _____

Penguin Formation

In the book **365 Penguins**, Dad tries all kinds of mathematical arrangements of the different number of penguins. He arranged them in 4 sets of 15 with each set arranged in a triangular formation like the picture on the right. But, this was not to last, because penguin #61 arrived quickly.

Suppose Dad decided to arrange the 61 penguins in <u>one</u> large triangular formation.

- Can 61 penguins make a perfect triangular formation (all the rows filled)?
- If not, how many more penguins does Dad need before this new idea will work?



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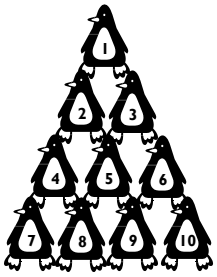

Use numbers, words, pictures, and/or tables to explain your best mathematical thinking.

- I have to find out how many rows 61 penguins will make.
- I start adding up the rows starting with the top.
- 1 + 2 + 3 + 4 + 5 = 15 penguins so I need a lot more!
- 15 + 6 + 7 + 8 + 9 + 10 = 55 penguins so I have 10 rows filled.
- I only have 6 more penguins to put in the 11th row so it won't be filled.
- ANSWER: 61 penguins cannot make a perfect triangular formation because the bottom (11th) row will not be filled.

- The 11th row needs 11 penguins to fill it. I only have 6 so Dad needs 5 more penguins to make a perfect triangular formation.
- ANSWER: Dad needs 5 more penguins (66 in all) to make this idea work.

Name:_____ Date:_____

Penguin Parade

The penguins marched in the annual penguin parade. There was one penguin in the first row, two penguins in the second row and three penguins in the third row. If this pattern continued through the tenth row, how many penguins marched in the parade?

Challenge: Last year, penguins marched in the same pattern. There were more penguins last year and they made 15 full rows. How many penguins marched in last year's parade?

Name: Answer Key Date:_____

Penguin Parade

The penguins marched in the annual penguin parade. There was one penguin in the first row, two penguins in the second row and three penguins in the third row. If this pattern continued through the tenth row, how many penguins marched in the parade?

PLAN: I need to find out how many penguins were in all 10 rows so I made a table to show each row, how many penguins were in that row and how many penguins there were altogether.

Row	No. penguins in row	Total penguins
1	1	1
2	2	3
3	3	6
4	4	10
5	5	15
6	6	21
7	7	28
8	8	36
9	9	45
10	10	55

ANSWER: The table shows that there were 55 penguins marching in the parade if there were 10 full rows.

Challenge: Last year, penguins marched in the same pattern. There were more penguins last year and they made 15 full rows. How many penguins marched in last year's parade? Answer on back of this paper.

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PLAN: Extend the table to include 15 rows.

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2	2	3
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5	5	15
6	6	21
7	7	28
8	8	36
9	9	45
10	10	55
11	11	66
12	12	78
13	13	91
14	14	105
15	15	120

ANSWER: The table clearly shows that 120 penguins marched in last year's parade if there were 15 full rows.