

Title: Shall I Double Up or Keep the Million?

Author:

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(I have seen this activity in many different forms throughout the years. I do not know who the originator was, but it has millions of problem solving scenarios.)

Activity overview

If you were given the opportunity to be given a permanent monthly salary of 1,000,000 for 30 days of work or a salary beginning with a penny on day one and doubling each day for 30 days which would you choose?

Concepts

Use spreadsheets to model real world linear relationships.

NYS Standards:

Algebra R.1: Use physical objects, diagrams, charts, tables, graphs, symbols, equations or objects using technology as representations of mathematical concepts

A.R.3: Using representations as a tool for exploring and understanding mathematical ideas.

Classroom management tips

*The class can be divided into the Million Dollar Group and the Penny Group
It should be presented as a self-discovery type of activity.*

Shall I Double Up or Keep the Million?

Katherine Staltare

Grade level: Secondary

Subject: Mathematics

Time required: 45 to 90 minutes

Activity:

You have been given the opportunity to be paid a salary for a month's worth of work. Your options are \$1,000,000 or have your salary doubled each day, beginning with a penny on day one.

Let's investigate using a spreadsheet and a weekly overall average salary analysis.

Design a spreadsheet setting up the title cells to be:

Cell A: Day 1, 2, 3...

Cell B: Pay for Day1, 2,3...

Cell C: Total Pay:

1.1	RAD AUTO REAL					
<i>day</i>	B	C	D	E	F	G
1						
2						
3						
4						
5						
<i>day</i>						

1.1	RAD AUTO REAL					
A (...)	<i>pay</i>	C	D	E	F	G
1						
2						
3						
4						
5						
<i>pay</i>						

1.1	RAD AUTO REAL					
A (...)	B (...)	<i>total</i>	D	E	F	G
1						
2						
3						
4						
5						
<i>total</i>						

Let's analyze our total salary for each business each week, a 5 day cycle..

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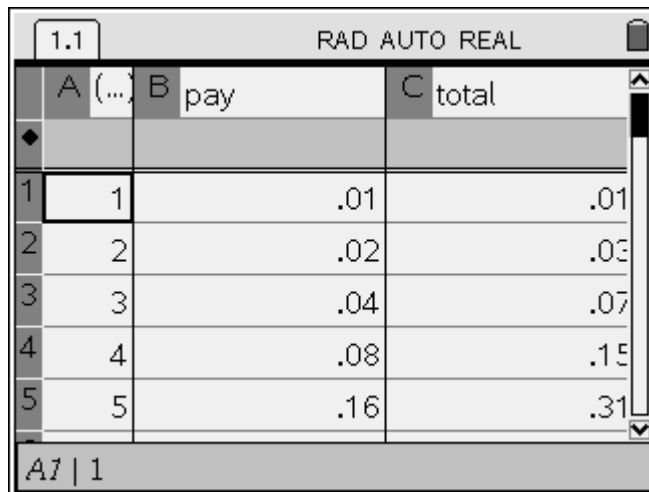
Subject: Mathematics

Time required: 45 to 90 minutes

Week 1

After 5 days

A total of 31 cents or about 6 cents per day (actually 6.2 cents)



The screenshot shows a spreadsheet window titled "1.1 RAD AUTO REAL". The spreadsheet has three columns: "A (...)", "B pay", and "C total". The data is as follows:

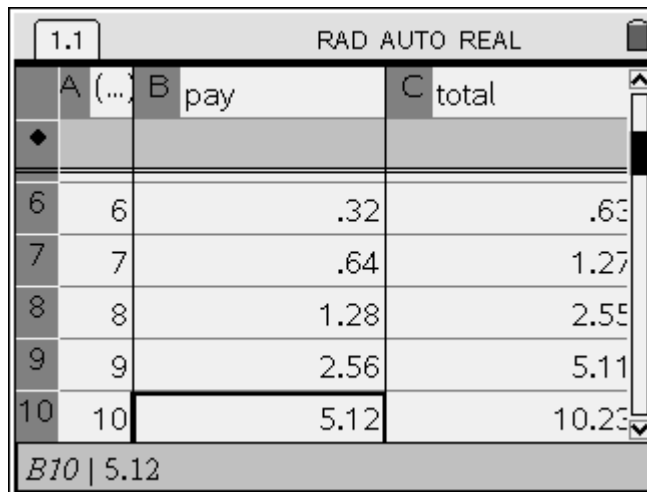
	A (...)	B pay	C total
1	1	.01	.01
2	2	.02	.03
3	3	.04	.07
4	4	.08	.15
5	5	.16	.31

The status bar at the bottom shows "A7 | 1".

Week 2

After 10 days:

A total of \$10.23 or an overall average of \$1.023 a day.



The screenshot shows a spreadsheet window titled "1.1 RAD AUTO REAL". The spreadsheet has three columns: "A (...)", "B pay", and "C total". The data is as follows:

	A (...)	B pay	C total
6	6	.32	.63
7	7	.64	1.27
8	8	1.28	2.55
9	9	2.56	5.11
10	10	5.12	10.23

The status bar at the bottom shows "B10 | 5.12".

Week 3

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 Subject: Mathematics

Time required: 45 to 90 minutes

After 15 days:

A total of \$ 327.67 or an overall average of \$21.8447 per day

	A (...)	B pay	C total
11	11	10.24	20.47
12	12	20.48	40.95
13	13	40.96	81.91
14	14	81.92	163.83
15	15	163.84	327.67

B11 | 10.24

Week 4

After 20 days

:

A total of \$10,485.75 or an overall average of \$524.288 per day

	A (...)	B pay	C total
16	16	327.68	655.35
17	17	655.36	1310.71
18	18	1310.72	2621.43
19	19	2621.44	5242.87
20	20	5242.88	10485.75

B20 | 5242.88

Week 5

After 25 days:

A total of \$335,544.31 or an overall average of \$1,3421.8 per day!

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Time required: 45 to 90 minutes

	A (...)	B pay	C total
21	21	10485.76	20971.51
22	22	20971.51	41943.03
23	23	4193.04	83886.07
24	24	83886.08	167772.15
25	25	167772.16	335544.31

B25 | 167772.16

Week 6

After 30 days a total weekly payout of \$10737418.23 or an overall average of \$ 35,7914 per day!

	A (...)	B pay	C total
26	26	335544.32	671088.63
27	27	671088.64	1342177.27
28	28	1342177.28	2684354.55
29	29	2684354.56	5368709.11
30	30	5368709.12	10737418.23

B30 | 5368709.12

The PennyTeam Wins!