

Everyone can participate in these puzzles, compare notes, and share solutions. *Enjoy!*

Powerful Pennies

Some people think that a penny does not have much value in today's economy. This month's Family Math puzzle will show you the power of the penny, with a little help from math.

Imagine you are offered several choices in how you can be paid for doing your chores or your part-time job over the next 30 days. Each option includes getting a raise each day.

Which option do you think would make you richest by the end of the month?

Before calculating your potential riches, read and think about the three options. Predict which option you think will be the best.

Will the same option be the best for the whole month? Test your theory by calculating your riches after one week, two weeks, and three weeks. Round to whole pennies.

Option 1

You will receive one penny on the first day. Starting on day two, you will receive twice as many pennies as you did the day before.

- Day 1: You will receive 1 penny.
- Day 2: You will receive 2 pennies.
- Day 3: You will receive 4 pennies.

Option 2

You will receive 10 pennies on the first day. Starting on day two, you will receive an additional 10 more pennies than you did the day before.

- Day 1: You will receive 10 pennies.
- Day 2: You will receive 20 pennies.
- Day 3: You will receive 30 pennies.

Option 3

You will receive 100 pennies on the first day. Starting on day two, you will receive 50% more pennies than you did the day before.

- Day 1: You will receive 100 pennies.
- Day 2: You will receive 150 pennies.
- Day 3: You will receive 225 pennies.

Powerful Pennies Answers

Option 1 (starting with one penny) will make you the richest at the end of 30 days. It will give you a total of \$10,737,418.23.

Total Number of Pennies

Option	Week 1	Week 2	Week 3
1	127 pennies worth \$1.27	16,383 pennies worth \$163.83	2,097,151 pennies worth \$20,971.51
2	280 pennies worth \$2.80	1,050 pennies worth \$10.50	2,310 pennies worth \$23.10
3	3,217 pennies worth \$32.17	58,187 pennies worth \$581.87	997,378 pennies worth \$9,973.78

Option	After 30 Days
1	1,073,741,823 pennies worth \$10,737,418.23
2	4,650 pennies worth \$46.50
3	38,350,013 pennies worth \$38,500.13

Option 1

Day	Pennies Earned	Total Pennies	Total Dollars
1	1	1	\$0.01
2	2	3	\$0.03
3	4	7	\$0.07
4	8	15	\$0.15
5	16	31	\$0.31
6	32	63	\$0.63
7	64	127	\$1.27
8	128	255	\$2.55
9	256	511	\$5.11
10	512	1,023	\$10.23
11	1,024	2,047	\$20.47
12	2,048	4,095	\$40.95
13	4,096	8,191	\$81.91
14	8,192	16,383	\$163.83
15	16,384	32,767	\$327.67
16	32,768	65,535	\$655.35
17	65,536	131,071	\$1,310.71
18	131,072	262,143	\$2,621.43
19	262,144	524,287	\$5,242.87
20	524,288	1,048,575	\$10,485.75
21	1,048,576	2,097,151	\$20,971.51
22	2,097,152	4,194,303	\$41,943.03
23	4,194,304	8,388,607	\$83,886.07
24	8,388,608	16,777,215	\$167,772.15
25	16,777,216	33,554,431	\$335,544.31
26	33,554,432	67,108,863	\$671,088.63
27	67,108,864	134,217,727	\$1,342,177.27
28	134,217,728	268,435,455	\$2,684,354.55
29	268,435,456	536,870,911	\$5,368,709.11
30	536,870,912	1,073,741,823	\$10,737,418.23

Option 2

Day	Pennies Earned	Total Pennies	Total Dollars
1	10	10	\$0.10
2	20	30	\$0.30
3	30	60	\$0.60
4	40	100	\$1.00
5	50	150	\$1.50
6	60	210	\$2.10
7	70	280	\$2.80
8	80	360	\$3.60
9	90	450	\$4.50
10	100	550	\$5.50
11	110	660	\$6.60
12	120	780	\$7.80
13	130	910	\$9.10
14	140	1,050	\$10.50
15	150	1,200	\$12.00
16	160	1,360	\$13.60
17	170	1,530	\$15.30
18	180	1,710	\$17.10
19	190	1,900	\$19.00
20	200	2,100	\$21.00
21	210	2,310	\$23.10
22	220	2,530	\$25.30
23	230	2,760	\$27.60
24	240	3,000	\$30.00
25	250	3,250	\$32.50
26	260	3,510	\$35.10
27	270	3,780	\$37.80
28	280	4,060	\$40.60
29	290	4,350	\$43.50
30	300	4,650	\$46.50

Option 3

Day	Pennies Earned	Total Pennies	Total Dollars
1	100	100	\$1.00
2	150	250	\$2.50
3	225	475	\$4.75
4	338	813	\$8.13
5	506	1,319	\$13.19
6	759	2,078	\$20.78
7	1,139	3,217	\$32.17
8	1,709	4,926	\$49.26
9	2,563	7,489	\$74.89
10	3,844	11,333	\$113.33
11	5,767	17,100	\$171.00
12	8,650	25,750	\$257.50
13	12,975	38,725	\$387.25
14	19,462	58,187	\$581.87
15	29,193	87,380	\$873.80
16	43,789	131,169	\$1,311.69
17	65,684	196,853	\$1,968.53
18	98,526	295,379	\$2,953.79
19	147,789	443,168	\$4,431.68
20	221,684	664,852	\$6,648.52
21	332,526	997,378	\$9,973.78
22	498,789	1,496,167	\$14,961.67
23	748,183	2,244,350	\$22,443.50
24	1,122,274	3,366,624	\$33,666.24
25	1,683,411	5,050,035	\$50,500.35
26	2,525,117	7,575,152	\$75,751.52
27	3,787,675	11,362,827	\$113,628.27
28	5,681,513	17,044,340	\$170,443.40
29	8,522,269	25,566,609	\$255,666.09
30	12,783,404	38,350,013	\$383,500.13