The Best Paycheck Deal

You were just offered a new job and your boss offers you two plans to choose from for how you can get paid:

PLAN 1: $1,000 each week for a month (30 days)

PLAN 2: You receive one penny for accepting the job. On the first day of the month your money is doubled and you receive two pennies.   Each day after that you receive double the amount of pennies you got the day before. For example, day 2 you get 4 pennies, day 3 you get 8 pennies, and so forth for 30 days.

PART 1:
1) Find out which plan pays more after 1 month and be prepared to demonstrate how you can be sure.
2) Find a way to easily determine how many pennies you would get on any particular day of the month.
3) If you know how to use variables and algebraic formulas, make a formula showing how many pennies you would receive on any particular day. Let A represent the amount of pennies you would receive and let n represent the day of the month.

PROCESS: (STRATEGY/HINTS):
1) Start by making a calendar with the days of the month. Below each date write the amount of pennies you get on that day. **Start by doing this for the first two weeks of the month.**
2) Look for a pattern between the date and the number of pennies on that day.
3) To help find a pattern, write the prime factorization for the penny amount for each day.
Use exponential notation in your factorization.
4) Write your rule as a formula using A and n.
5) Find out how much money you would get on the 30th of the month.

WRITE THE FORMULA OR VERBAL EXPLANATION HERE:

PART 2--Counting Pennies the Easy Way

Use the method you just created in class to answer the following questions:

Find the amount of pennies you would receive on the following days of the month:

1) 17th   2) 23rd   3) 28th

The following problems will require you to use a guess and check method.
You need to determine what day of the month it is based on the amount of pennies you received.

3) On what day of the month will you receive 128 pennies?

4) On what day of the month will you receive 32,768 pennies?