Exponential vs. Linear Modeling Project

Imagine that you are 4 years old (Year 0). A rich aunt and uncle decide to help provide for your future. They give you a choice:

Option 1: $1000 a year until you are 21; or

Option 2: $1 this year, $2 next year, $4 the next year, and so on, doubling the amount each year until you are 21.

Complete the tables on the following pages. Then make a scatter plots for each gift situation on graph paper, and fit a line or a curve to each scatter plot. Put years on the horizontal axis, and put total money received on the vertical axis. Clearly label the axes, and use a consistent scaling on each axis. (You may choose to enter the data into Excel and have the software make 2 scatter plots for 4 extra credit points.)

Study the tables and graphs and answer the following questions:

1. Which option would you choose and why?

2. How much money would you have when you are 21 if you choose

   Option 1? Option 2?

3. If you received money for 10 years, which option would give you the most money? Use details in your explanation.

4. If you received money for 15 years, which option would give you the most money? Use details in your explanation.

5. How would you classify Option 1 — linear or exponential? _____

   Write an equation showing the relationship between total money received (T) and number of years (n).

   T = _____

6. How would you classify Option 2 — linear or exponential? _____

Write an equation showing the relationship between total money received (T) and number of years (n).

T = _____

Option 1

Year, n	Money Given	Total Money Received, T
0	1000	1000
1	1000	2000
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		

Option 2

Year, n	Money Given	Total Money Received, T
0	1	1
1	2	3
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		