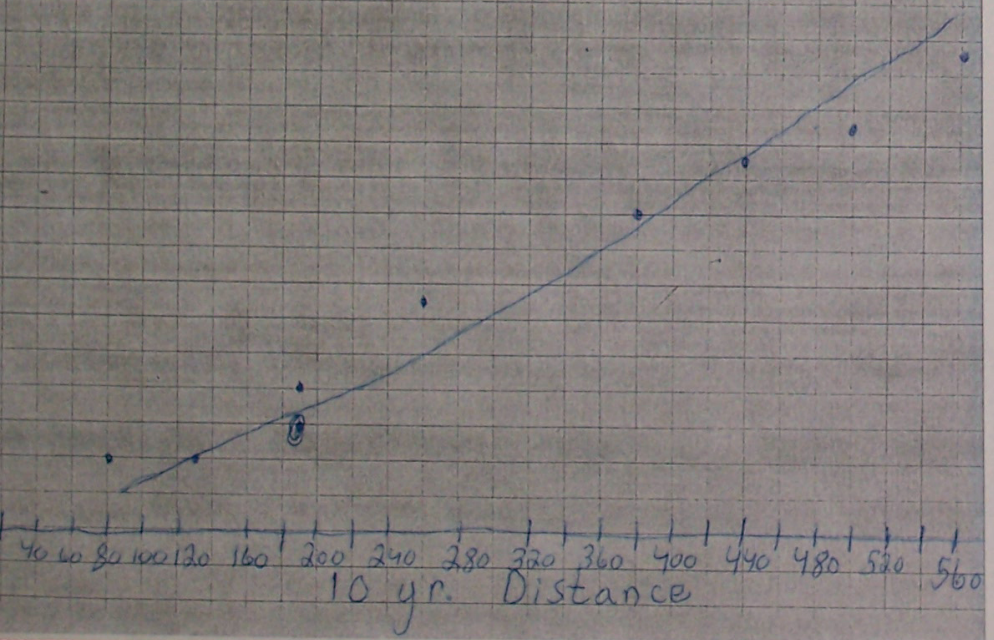
Bang Lab

tter	B	C	D	E	F	G	H	I
t measurement.	40	90	110	130	200	230	270	290
yr. measurement	80	130	190	260	380	440	500	560
stance increase	40	40	80	130	180	210	230	270
te of increase	4	4	8	13	18	21	23	27
edicted distance after 20 yrs.	120	170	270	390	560	650	730	830
yr measurement	120	200	240	400	490	630	730	810
error	0%	15%	12.5	2.5	14.3	3.2	0%	2.5



BALLOON 'BIG BANG' LAB RUBRIC

Student Name: _____

CATEGORY	10	8	6	4
Classroom conduct/ teamwork	Cooperatively worked w/partner in a focused manner to complete lab. Sought clarification through careful reading, followed by appropriate questions.	Worked cooperatively with partner but did not complete equal amount of work. Asked a few questions w/out reading. Generally stayed on task.	Contributed minimally to lab exercises (passive observer riding on coattails). Commonly asked questions for clarification w/out 1st reading the lab. Commonly off task.	Was confrontational w/partner or did not participate. Majority of time spent on tasks other than the lab.
Table	Clean, easy-to-read, complete table presented with appropriate labels for rows and columns. Calculations made correctly.	Fairly clean, relatively easy-to-read, mostly complete table presented with appropriate labels for rows and columns. Most calculations correct.	Basic data presented, lacking neatness/clarity. Mistakes frequently made on calculations.	Table missing or largely incomplete.
Graph	Axes are clearly labeled and increments are appropriate. Data points are correctly plotted and a best-fit line is correctly drawn. Graph paper is used.	Few missing labels or incorrect data points. Data increments generally make good sense. Best-fit line may be incorrect. Graph paper used.	Several missing labels, many incorrect data points, or incorrect increments. Graph is sloppy or graph paper is not used.	No graph was completed or a very poor graph was drawn, not on graph paper, and labels/data/best-fit line are missing.
Analytical questions	Thorough and correct answers are given for all questions.	Relatively thorough and generally correct answers provided to majority of questions.	Piecemeal or incorrect answers given to several questions.	Answers do not address questions or were not completed.

38/40 Very clear presentation of data + good analysis.

10. deviation = $\frac{30}{200} \times 100 = 15\%$

$\frac{30}{240} \times 100 = 12.5\%$

$\frac{10}{400} \times 100 = 2.5\%$

$\frac{70}{490} \times 100 = 14.3\%$

$\frac{20}{630} \times 100 = 3.2\%$

$\frac{20}{810} \times 100 = 2.5\%$

Questions

1. Slope = $\frac{2}{3}$ This represents that the points on the balloon are expanding as you blow up the balloon.
2. Yes it does.
3. Yes they would. They would because the moon could be closer to the center of expansion than Mars.
4. The center of expansion would be at point A.
5. The center of expansion for our universe would be wherever the Big Bang took place.