

Name _____ Date _____ Period _____

What Is a Light-Year?

1. Record the distance you walk, at a normal pace, in 10 sec.

- A. Trial 1 _____ m
- B. Trial 2 _____ m
- C. Trial 3 _____ m

2. Find the average distances for your trials by adding the values from A, B, and C and dividing by the number of values, which in this case is 3.

D. Average distance _____ m

3. Calculate the speed (distance over time) of your travel by dividing the distance traveled (m) over the time (10 sec)

E. Your speed _____ m/sec

4. How much distance will you travel in 1 minute at your current speed? Calculate the distance traveled in 1 min by multiplying your speed (E) by the number of seconds in a minute (60 sec/min).

F. Your distance traveled per minute _____ m

5. How much distance will you travel in 1 hour at your current speed? Calculate the distance traveled in 1 hr by multiplying the distance traveled per minute (F) by the number of minutes in an hour (60 min/hour).

G. Your distance traveled per hour _____ m

6. How much distance will you travel in one day? Calculate the distance traveled in 1 day by multiplying the distance traveled per hour (G) by the number of hours in a day (24 hr/day).

H. Your distance traveled per day _____ m

7. How much distance in meters will you travel in one year? Calculate the distance traveled in 1 year by multiplying the distance traveled per day (H) by the number of days in a year (365 days/yr).

I. Your distance traveled per year _____ m

8. Calculate how many kilometers you could travel in 1 year by dividing the answer from question #7 by 1000, since there are 1000 meters in a kilometer.

J. Your walking distance traveled per year is _____ km

Congratulations, you just calculated a new way of measuring distance, is called Walk-Years

9. If you were to go to China or Australia, will it be more practical to measure the distance in walking steps, or in walking years? Which one would be more practical? Why?

NOW LETS SEE HOW DISTANCE CAN BE MEASURED WITH LIGHT-YEARS, INSTEAD OF KM

10. The speed of light is about 300,000,000 m/sec. What is the distance light travels in 1 sec in km?

K. _____ km

11. Calculate the distance light travels in 1 min in km.

L. _____ km

12. Calculate the distance light travels in 1 hr. in km.

M. _____ km

13. Calculate the distance light travels in 1 day in km.

N. _____ km

14. Calculate the distance light travels in 1 yr. in km.

O. _____ km

15. Calculate how much faster light travels compared to your walking speed by subtracting the distance light travels in 1 yr (O) from your walking distance traveled per year (J).

Hint: subtract the answer for question #13 – Answer for question #8

Q. _____ times faster

16. Calculate how many years it would take you to walk a distance of 1 light-year.

R. _____ yrs. Hint: divide the answer from question #13

17. What do scientist and astronomers measure with light years?

18. Why do you think astronomers use light-years instead of kilometers to measure distances in the universe?