

Worksheet #1

Exercise 1: How many times do you think you can fold a piece of paper in half?

Exercise 2: After answering the question above, take a piece of paper, and see how many times you can fold it in half. Write your answer here:

Exercise 3: What happens to the height of the paper each time you fold it in half?

Exercise 4: Write out the following powers of 2.

$$2^0 =$$

$$2^1 =$$

$$2^2 =$$

$$2^3 =$$

$$2^4 =$$

$$2^5 =$$

$$2^6 =$$

$$2^7 =$$

$$2^8 =$$

$$2^9 =$$

$$2^{10} =$$

$$2^{11} =$$

⋮

$$2^{20} = 1,048,576$$

⋮

$$2^{100} = 1,267,650,600,228,229,401,496,703,205,376$$

Exercise 5: A piece of paper is 0.1 mm thick.

If we folded a piece of paper in half 10 times how thick would it be?

If we folded a piece of paper in half 20 times how thick would it be?

If we folded a piece of paper in half 50 times how thick would it be?

If we folded a piece of paper in half 100 times how thick would it be?

In each answer, if it is over 1,000 millimeters, rewrite it in terms of meters. If it is over 1,000 meters, rewrite it in terms of kilometers. (Remember that we have $1 \text{ m} = 1,000 \text{ mm}$ and $1 \text{ km} = 1,000 \text{ m}$.)

To help you get a sense of the sizes in Exercise 5, here are some references:

Height of a coffee cup: 100 mm

Length of Football Field (including end zones): 100 m

Distance from the Earth to the Sun: 150,000,000 km

Size of Universe: 10^{23} km