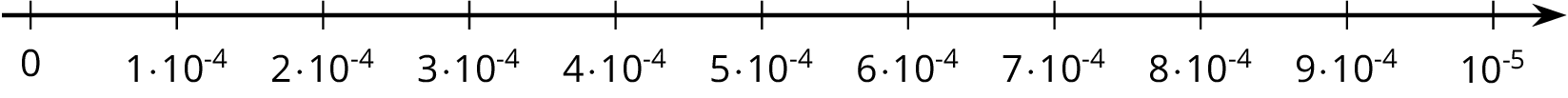
## Lesson 11: Representing Small Numbers on the Number Line

Let’s visualize small numbers on the number line using powers of 10.

### 11.1: Small Numbers on a Number Line

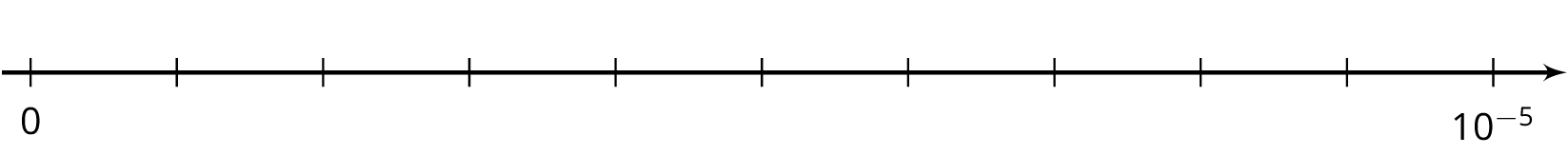
Kiran drew this number line.



Andre said, “That doesn’t look right to me.”

Explain why Kiran is correct or explain how he can fix the number line.

### 11.2: Comparing Small Numbers on a Number Line

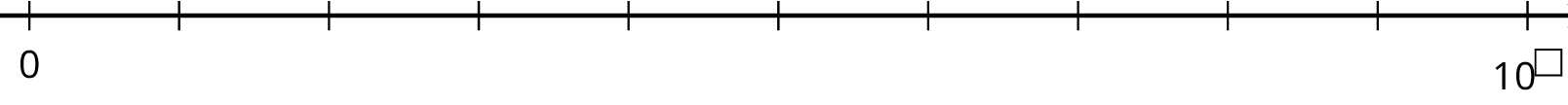
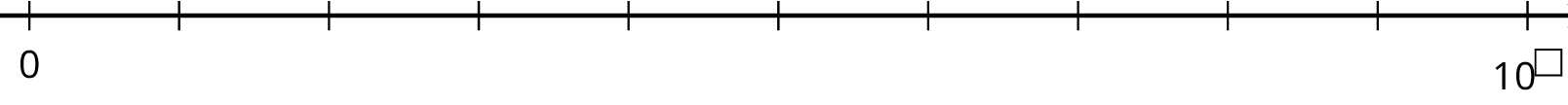


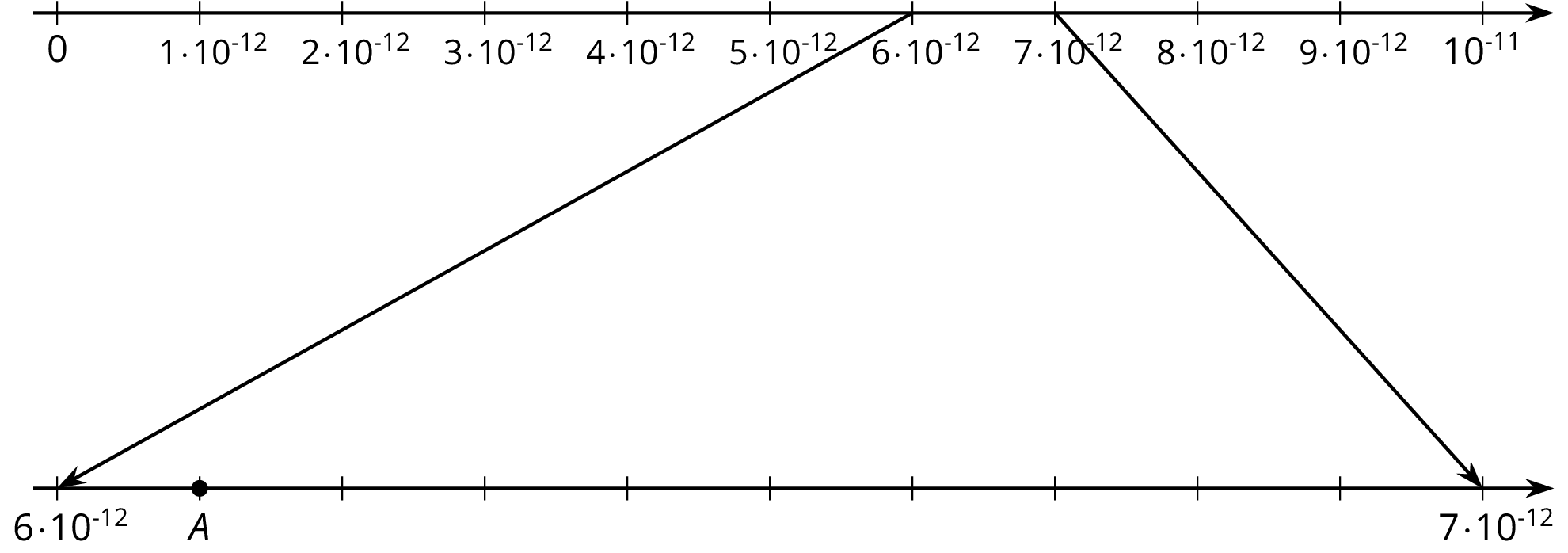
1. Label the tick marks on the number line.
2. Plot the following numbers on the number line:

* A.
* B.
* C.
* D.

1. Which is larger, or ? Estimate how many times larger.
2. Which is larger, or ? Estimate how many times larger.

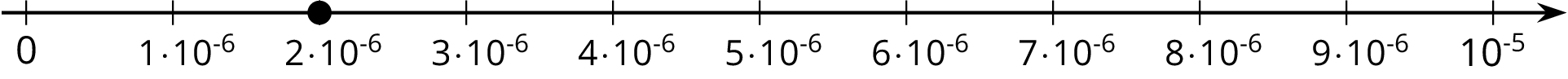
### 11.3: Atomic Scale

1. The radius of an electron is about 0.0000000000003 cm.
   1. Write this number as a multiple of a power of 10.
   2. Decide what power of 10 to put on the right side of this number line and label it.
   3. Label each tick mark as a multiple of a power of 10.
   * 
   1. Plot the radius of the electron in centimeters on the number line.
2. The mass of a proton is about 0.0000000000000000000000017 grams.
   1. Write this number as a multiple of a power of 10.
   2. Decide what power of 10 to put on the right side of this number line and label it.
   3. Label each tick mark as a multiple of a power of 10.
   * 
   1. Plot the mass of the proton in grams on the number line.
3. Point on the zoomed-in number line describes the wavelength of a certain X-ray in meters.

* 
  1. Write the wavelength of the X-ray as a multiple of a power of 10.
  2. Write the wavelength of the X-ray as a decimal.

### Lesson 11 Summary

The width of a bacterium cell is about meters. If we want to plot this on a number line, we need to find which two powers of 10 it lies between. We can see that is a multiple of . So our number line will be labeled with multiples of



Note that the right side is labeled

The power of ten on the right side of the number line is always *greater* than the power on the left. This is true for powers with positive or negative exponents.



© CC BY Open Up Resources. Adaptations CC BY IM.