



MEASURE UP

A nanometer is a billionth of a meter.

Materials

- Ruler
- Pencil
- Paper

Procedure

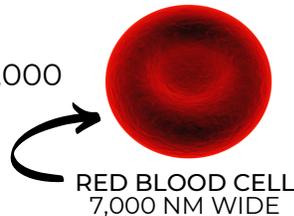
- Take your pencil and trace your hand on a sheet of paper.
- Now take your ruler and measure your traced hand in centimeters. How many centimeters tall is your hand? How many centimeters wide?
- To convert your measurements to nanometers, write a zero after your number and then write million next to that. One centimeter equals 10 million nanometers!
- After converting your hand measurements into nanometers, do you think your hand is really big? Or is a nanometer really small?

Results

Saying your hand is a couple million nanometers wide sounds really impressive, but it doesn't mean that your hand is really big—it means that a nanometer is super small!

Here are some other ways to think about how small a nanometer is:

- One meter is a billion nanometers. So a kid that measures a little over 3 feet tall (about 1 meter) is one billion nanometers tall!
- The ridges in your fingerprints are around 250,000 nanometers wide.
- A strand of your hair is around 75,000 nanometers wide.
- One red blood cell is around 7,000 nanometers wide.
- Your fingernails grow one nanometer every second.



Why?

A nanometer is a billionth of a meter. That's really, really tiny! Nanometers are used to measure things that are too small to see. It takes a lot of nanometers to measure something relatively big, like your body.

Nanoscale science focuses on anything between 1-100 nanometers in size. In the field of nanotechnology, scientists and engineers make tiny devices and new materials, like faster computer chips, new medicines to treat diseases like cancer, and thin, flexible solar panels to capture energy from the sun. Scientists use special tools and equipment to work with nanometer-sized things—regular tools are too big!