AFM at Home

Have you ever wondered how scientists are able to see really tiny things? One of the instruments that scientists use is called AFM, or Atomic Force Microscopy (because it is a microscope that is used to look at atoms!). A typical setup would look something like the image below, where the machine that takes pictures is on the left and a computer is attached on the right. There is one problem though - we can't take pictures using regular light because the things we are looking at are so small! Instead, scientists use really tiny needles to trace the surface of the sample, and they are able to feel what shape the sample has.

In this activity, you will use a design made of cheerios to understand how these machines are able to take images of small things by feeling! Parents are encouraged to help set up the activity and supervise the use of the hot glue gun.

Activity steps:
1. Take a cardboard box and cut a flap off of the box.
2. On the flap of the box, draw a design.
3. Using the hot glue gun, attach the cheerios to your design.
4. Once the hot glue is done drying, blindfold your friend.
5. Help your friend feel your design with their hand.
6. After they have felt the design, have your friend draw what they think they are feeling.
7. Compare the picture they drew to your design. How similar (or different) are they?

Supplies:
- Bandana
- Cardstock or paper
- Cardboard
- Hot glue gun
- Cheerios or other small object
- Pencil

This project is similar to what scientists use to see really small things - except instead of using their hand, they use a tiny needle and can get pictures of individual atoms! This type of imaging is really important to scientists studying nanotechnology as it allows them to see things that normally aren’t visible with regular microscopes.