Shaping the Future of STEM

DNA INVESTIGATION at home

Side 1

The genes that determine our traits are inherited from our biological parents. Use the chart below to record characteristic traits you share with other members of your family or your household.

TRAIT	YOUR TRAITS	FAMILY MEMBER #1	FAMILY MEMBER #2	FAMILY MEMBER #3	FAMILY MEMBER #4
Dark or light hair color					
Curly or straight hair					
Widow's peak or straight hairline					
Earlobes free or attached					
Dark or light eye color					
Tongue roller or not					
Dimples or not					
High convex or straight/ concave nose					
Hitchhiker's thumb or not					

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Side 2

MATERIALS

- HAND LENS OR SIMPLE MICROSCOPE
- IODINE

ITEMS TO TEST

- SALT/SUGAR/FLOUR/STARCHES/SPICES
- ONION/POTATO/OTHER VEGGIES
- BORAX/TALCUM POWDER/CORN STARCH POWDER/BATH SALTS/SMEAR LIPSTICK/EYE MAKEUP

THE TINY WORLD AROUND US

One way Abbott scientists study and identify materials is by looking at them under a microscope or magnifying glass. Try the following activities at home to study the world that is usually too small to see with your unaided eyes.

With a hand lens or simple microscope, look at any of the items listed below. The world will look very different with only a little magnification: 5–10x magnification, with a hand magnifier will do to start. Pour some of the following powders on a paper towel or a glass slide, if you have one. Then look at them and try to draw what you see. Don't be afraid to fill a page with each drawing. If your drawings are too small, you won't be able to add the details.

IN THE KITCHEN

Take a look at salt, sugar, flour, starches and spices. Examine the thin layer of an onion or some thin sections of other vegetables. Add a drop of iodine (available from the drugstore) to packaged cornstarch, flour or a slice of potato. The starch particles will turn blue or black. Look for plant structures still visible in some spices. From the bathroom, examine borax, talcum powder, corn starch powder or bath salts. Add iodine to baby powder to determine if it is starch based. Try to draw the well-formed crystals in these products. Smear lipstick or eye makeup on a glass slide and check them for metal particles. Use a strong light source and observe if shiny particles are present.

IN THE GARDEN

Examine any leaves and pollens you can find; these will change with the seasons. Using tweezers, pull off the top surface layer from leaves (epidermis layer) and examine for "stomates" or tiny pores; broccoli has puzzle-shaped cells. Take cross-sections of leaves and stems using a single edge razor blade. Examine seeds, such as dandelion fluff, milkweed or cottonwood fluff. Examine bugs: ants, flies or butterflies—especially how they compare to their wing surface. Note, these should probably be examined dry.

IN THE HOUSE

Shred a piece of tissue or paper towel; look at the individual fibers. Compare them to fabrics. Examine sewing thread. Look at animal or human hairs. Are they rough or smooth? Are they twisted or woven? Can you see dyes in fabrics or printed photos?

Some samples work best dry. Some will be most visible with a low-power microscope. If a microscope is available to you, place small amounts of a sample on the glass slide and cover them with a cover glass. Add a drop or two of liquid to the edge of the cover slip to immerse the sample. You can use water, rubbing alcohol, or glycerin. You can spread the sample by putting very light pressure on the cover slip with a clean, flat eraser.

Keep a journal of what you find and make drawings of what you see. Compare them to the drawings or photographs you find in books. Can you identify substances based on your drawings? The only limit for things to examine under the microscope is your own imagination. Look around you—imagine looking at everything under a microscope.