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SHAKING CREAM INTO BUTTER

SHAKING A JAR OF CREAM

A jar of cream, a tight lid, and a few minutes of hard shaking is all it takes. At first the cream sloshes. Then the sloshing goes quiet and the jar feels heavy, because the cream has thickened. Keep going and something thuds inside: a pale yellow LUMP rolling in a thin, cloudy LIQUID. The lump is butter. The liquid is BUTTERMILK. People have made it this way for thousands of years, and the old word for that shaking is CHURNING.

SPELL Spell: LIQUID

LIQUID

SPELL Spell: LUMP

LUMP

KNOWN What is the old word for shaking cream in a jar until butter forms?

CHURNING

KNOWN What is the thin, cloudy drink left behind that the pale yellow lump rolls around in?

BUTTERMILK

OPEN The sloshing goes quiet right before the lump appears. What would you want to check first when the jar goes quiet?

Open response - use practitioner judgment

DROPS IN A THIN SKIN

Cream looks smooth, but it is mostly water with millions of tiny drops of fat floating in it. A MIXTURE where fat drops stay spread through water is an emulsion. Each drop is a globule, and every globule is wrapped in a thin SKIN called a MEMBRANE that keeps it from sticking to its neighbors. Shaking slams the globules together hard enough to tear those membranes. Bare fat meets bare fat, the drops clump, and the clumps grow into GRAINS you can see.

SPELL Spell: SKIN

SKIN

SPELL Spell: MIXTURE

MIXTURE

KNOWN Each fat drop is wrapped in a thin covering that keeps it from sticking to its neighbors. What is that covering called?

MEMBRANE

KNOWN Once the coverings tear, bare fat sticks to bare fat until the clumps are big enough to see. What are those clumps of butter fat called?

GRAINS

OPEN If nobody ever shook the cream, what do you think the fat drops would do?

Open response - use practitioner judgment

MATH Butter is about 80 percent fat. What percent of butter is not fat?

20

AIR, FOAM, AND COLD FAT

The change is not instant, and it does not work with just any MILK. Shaking first TRAPS air inside the cream. Fat globules crowd around the tiny bubbles and build a stiff FOAM. That foam is whipped cream. Only after it collapses do butter grains appear. The cream must also be cool, so that some of the fat stays in hard crystals. Those hard edges help tear the membranes open. Skim milk has too little fat to work. Heavy cream is about 36 percent fat.

SPELL Spell: TRAPS

TRAPS

SPELL Spell: MILK

MILK

KNOWN Fat crowds around the trapped air bubbles and builds a stiff, airy mass. What is that stiff, airy mass called?

FOAM

OPEN What would you expect to happen to cream that is too warm when someone shakes it?

Open response - use practitioner judgment

WASHING THE BUTTER

You can try this at home with a clean jar, cold heavy cream, and patience. Once the lump forms, pour off the buttermilk. Then squeeze the butter under cold running water until the water runs clear. Butter makers call that step **WASHING**, and it matters. Any buttermilk left inside will sour, and the butter will spoil within days. Save the buttermilk you poured off for **PANCAKES**. What you spread on your **TOAST** tomorrow morning began exactly like the jar in your hands.

SPELL Spell: **TOAST**

TOAST

SPELL Spell: **PANCAKES**

PANCAKES

KNOWN Butter makers squeeze fresh butter under cold running water until the water runs clear. What is that step called?

WASHING

OPEN If you made butter in a jar, what would you want to spread it on first?

Open response - use practitioner judgment