

Making Butter From Cream: Is Shaking Really Necessary?

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Pour cream into a plastic container. Add a tight lid and shake the container vigorously for about 7 minutes. The cream will turn to butter and buttermilk

Is this an **experiment** or a **demonstration**?



You get butter, but have you **tested** that shaking is essential?

Right Hand:

- Air
- Light
- Plastic
- -----
- Time
- Temperature



Left Hand

- Air
- Light
- Plastic
- **SHAKING**
- Time
- Temperature

What other things was the cream exposed to besides shaking? How many possible explanations can you think of for turning cream into butter?



Shaking?



Time?



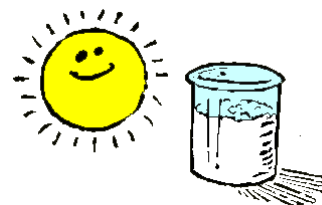
Heat?



Air?



Plastic?



Light?



Any other explanations, besides shaking?

How can you **test** these guesses? These Multiple Competing Hypotheses?

Compete and **Compare**, Head to Head, Side by Side



Take two vessels of cream; hold one in one hand, the other in the other hand and shake only one for about 7 minutes.



Is this an **experiment** or a **demonstration**?



If **both** turn to butter, what do you **conclude**?

If **neither** turns to butter, what can you **conclude**?

If only the shaken one turns to butter, have you shown shaking is the key?

Have you shown that other explanations aren't the key?

Have you shown other factors aren't needed to turn cream into butter?

