

Name:

Butter Investigation

Milk Type	Cups of Milk	Cups of Butter (predicted)	Ratio of Liquid to Solid (predicted)	Cups of Butter (Measured)	Ratio of Liquid to Solid (Measured)
Cream	1				
Half and Half	1				
Whole	1				
2%	1				

1. Make a prediction of how much butter each milk will make. Record your predictions in the table.
2. For your milk type, predict how much time shaking it will take for the butter to separate from the buttermilk? Will it even separate at all?
3. Do you think it will take longer or shorter for the other types of milk? List the 4 types of milk in order of longest shaking time to shortest. Explain why you ordered them this way.

Let's Make Butter!

- Measure the milk and pour it into the jar, screw on the lid, start the timer and begin shaking the jar vigorously.
- Take turns shaking and time tracking. Eventually the milk will become thicker (looking like whipped cream), but keep shaking.
- If you get tired and need a break, make sure to stop the timer so that you have an accurate shake time. Restart the timer when you begin shaking again. After the milk

thickens into a cream, it will then start to separate into solid butterfat and liquid whey. Keep shaking.

- When you have a lump of yellow butter and some liquid buttermilk, stop shaking and record your time.
 - Pour the liquid out into one of your small bowls. Continue shaking the solid butter in the jar until no more buttermilk is forming (remember to include this in your shake time. Pour the additional liquid (buttermilk) into your small bowl.
 - Dump the lump of butter into the large bowl. Pour cold water over the butter and squeeze the butter against the side of the bowl with the spatula to press out any extra buttermilk. Pour off the liquid and repeat until all the buttermilk has been squeezed out and the water no longer turns cloudy.
4. Measure the volume of your finished butter and record in the table. Each group will share their answers with the class.
 5. As a class calculate the ratio of liquid to solid (milk to butter) ratio for each type. How was the actual outcome different from your prediction? Why do you think that was?
 6. Using your calculated liquid to solid ratio, how much milk would you need to make 1 cup of butter?
 7. Did it take longer or shorter than you thought to shake the milk into butter?
 8. How did the type of milk used effect the shake time?
 9. What were the factors or variables that may have influenced your outcome?
 10. How might this experiment be improved?