Materials You'll Need:

- 2 slices of bread (slightly stale works well!)
- 1 large egg
- 1/4 cup milk (any kind)
- 1/2 teaspoon vanilla extract (optional)
- Pinch of salt
- Butter or cooking oil for the pan
- Maple syrup and other toppings (optional)
- Mixing bowl
- Whisk or fork
- Measuring cups and spoons
- Frying pan or griddle
- Spatula
- Plate
- Stove or hot plate (Adult supervision recommended!)
- Notebook and pen/pencil

Introduction: Bonjour, Chemistry!

You love French toast, right? It's sweet, custardy, and delicious! But did you know that making French toast is actually a fun chemistry experiment? Today, we're going to become food scientists and explore the amazing chemical reactions that turn simple ingredients into a breakfast masterpiece.

Activity 1: The Emulsion Tango

First, let's make our batter. Crack the egg into the mixing bowl. Add the milk, vanilla (if using), and a pinch of salt. Now, whisk everything together vigorously!

Observation Time: What do you see happening? The egg yolk contains fats and proteins, while the milk is mostly water. Normally, oil (fat) and water don't mix well. But watch as you whisk! The egg yolk acts as an **emulsifier**. Special molecules in the yolk help the fat and water mix together, creating a smooth, creamy liquid called an **emulsion**. Think of mayonnaise or salad dressing â€“ they're emulsions too! Write down your observations about how the mixture changes as you whisk.

Activity 2: The Maillard Reaction Magic & Heat Transfer

Now for the cooking! Ask an adult for help with the stove or hot plate. Heat your pan over medium heat and add a little butter or oil.

Dip each slice of bread into the egg mixture, letting it soak for about 10-15 seconds on each side. Don't let it get too soggy!

Carefully place the soaked bread onto the hot pan. Listen to that sizzle! That's the sound of **heat transfer**. Heat energy is moving from the hot pan to the cooler bread, causing the ingredients to cook.

Cook for about 2-4 minutes per side, until golden brown. Watch closely! See that beautiful browning? That's not burning (hopefully!); it's a chemical reaction called the **Maillard reaction**. This complex reaction happens between amino acids (from the egg and milk proteins) and reducing sugars (from the

milk and bread) when heated. It creates hundreds of new flavor and aroma compounds, plus the lovely brown color. It's the same reaction that makes toast toasty, seared steak savory, and roasted coffee aromatic!

Observation Time: Note the changes in color, texture, and smell as the French toast cooks. How does the heat seem to affect the bread and the egg mixture? Describe the Maillard reaction in your own words.

Activity 3: Taste the Science!

Use the spatula to transfer your French toast to a plate. Let it cool slightly. Now for the best part â€“ tasting!

Analysis: Describe the taste and texture. Is it different from plain bread? How did the egg mixture change the bread? How did cooking change the texture and flavor? Can you taste the results of the Maillard reaction?

Conclusion: Chemistry on Your Plate

Congratulations, Food Scientist! You successfully used chemistry to make delicious French toast. You created an **emulsion** with eggs and milk, observed **heat transfer** during cooking, and witnessed the flavorful magic of the **Maillard reaction**. Chemistry isn't just in labs; it's happening in your kitchen every day! Think about other foods you cook â€“ can you spot other examples of emulsions or the Maillard reaction?