Sourdough Lesson Plan

HIGH SCHOOL

LEARN. BAKE. SHARE

Introduction

There are as many tips and "how-tos" for sourdough as there are bakers. It may seem complicated initially, but once you understand the basics, you and your students will be baking crusty, naturallyleavened bread in no time.

The Sourdough Lesson is a three-week student-driven lesson plan. Our simplified timeline will give students an active and healthy sourdough starter within two weeks, feeding only once a day and working within the parameters of a school schedule. Working in teams of two or three, students will start and grow their own starters and bake one Rustic Sourdough Bread recipe. This recipe makes two large loaves of bread, one to enjoy in class and one to be donated or shared as an act of kindness.

Because the starter requires daily attention from each team, this lesson is designed for classes that meet daily. During the first two weeks, students cultivate, build, and maintain their starters, requiring only about 15 to 20 minutes per class period. Week 3, baking the bread, will take 2 to 3 full class periods in a row.

Teachers (or student helpers) will have a few tasks to complete before, during, and after school. In this schedule, we need to balance the time the starter spends in a warm room, growing and developing, with time in the refrigerator, which will slow the starter so it will not develop too fast. On the days the starters remain in the fridge overnight, teachers will take them out of the fridge first thing in the morning and then put them back in at the end of the day. Teachers should check each starter for mold at least once daily and ensure students follow the feeding schedule.

Though baking requires precision, a sourdough starter is more forgiving. Just remember, if the pioneers' starters could survive the Oregon Trail, your starters can survive teenagers in a classroom.

This Lesson Packet is divided into sections so you can easily find and print any section you need.

SECTION 1: Goals and Objectives

SECTION 2: Equipment, Ingredients, and Resources

SECTION 3: Guide to Sourdough Starter Schedule

SECTION 4: FAQ, Discussion questions, and Vocabulary

SECTION 1

GOALS AND OBJECTIVES

Goals

Students will learn the science behind cultivating and maintaining the balance of wild yeast and lactic acid bacteria that comprise a sourdough starter.

Students will bake the Rustic Sourdough Bread recipe.

Students will share their bread with someone as an act of kindness and service to connect with their community.

Objectives

I can perform daily tasks and keep a daily schedule to develop and maintain a sourdough starter and observe the changes from the wild yeast. (DOK 1; Bloom's Understanding)

I can compile data around our starter, find evidence that it is successful, and infer it is ready to bake with. (DOK 3; Blooms Analyze)

I can synthesize my knowledge of sourdough starter, yeast, baking math and science to make the Rustic Sourdough Bread recipe. (DOK 4; Blooms Synthesize)

SECTION 2

EQUIPMENT, INGREDIENTS, AND RESOURCES

Required Equipment and Ingredients for each team growing 1 sourdough starter and baking 1 Rustic Bread Recipe (which yields 2 loaves)

We provide the following supplies based on the number of students and the number of teams baking:

Golden Wheat Whole Wheat Flour

All-Purpose Flour

Instant yeast*

Bowl scrapers

Bread bags for sharing

**This recipe calls for a little instant yeast, which will guarantee a strong rise.*

Sourdough Starter

EQUIPMENT

1 clear 1-quart capacity container (clear is best) with a lid

Bowl for feeding

Kitchen scale(s) (preferred)

1 spatula/spoon (plastic or silicone works best)

INGREDIENTS

Golden Wheat Whole Wheat Flour

All-Purpose Flour

Water

Rustic Sourdough Bread

EQUIPMENT

1 mixing bowl

1 spatula or mixing spoon

kitchen scale (preferred) or liquid and dry measuring cups

measuring spoons

dough scraper

baking sheet

knife for scoring

INGREDIENTS

Ripe starter

Water

Instant yeast

Salt

All Purpose Flour

ADDITIONAL RESOURCES

Do you want to learn about about sourdough, explore discard recipes, and more?
Go to www.kingarthurbaking.com

SECTION 3

GUIDE TO SOURDOUGH STARTER SCHEDULE

Over the next two weeks, your students will come in once a day to mix, discard, and feed their starters. See instructions for Stir Only days and Discard and Feed days in the Student Packet.

A sourdough feeding station (pictured above) helps keep things focused and organized. Identify a place in the class where they will find their starter containers (labeled and on a cookie sheet for easy in and out of the fridge), flour, water, scales, and the mixing tools they'll need daily.

Make sure you have the refrigerator space for all the starter containers. Consider how many containers can fit in the fridge simultaneously if you are doing multiple classes.

Weight wins! The starter can be challenging to measure by volume, so weighing is best (we recommend grams). Demonstrate how to use a scale and how the tare function works.

With this schedule, the most significant risk to the starters is mold. When testing this lesson, we found that when students used a second bowl to measure and feed their starter and carefully put the starter back into the cleaned storage container, there were fewer mold issues.

As the weeks progress, you can use your demo starter or student discard to make an extra starter in case mold grows.

Students love to name their starters! Share cool names with us at bakeforgood@kingarthurbaking.

IMPORTANT

Starting and growing the sourdough starter requires daily attention. While the starter requires only 15 to 20 minutes of attention each day, missing a day can ruin the starter by allowing mold to grow.

Weekly Schedule

This week, we will begin by feeding the starters whole grain flour. Whole grain flour naturally has more wild yeast than all-purpose flour, giving the starters a better chance at success.

Students are instructed to stir their starter vigorously for 30 seconds. This must be done daily, especially during the first week. This agitation will help keep mold at bay long enough for the yeast and lactic acid bacteria to grow and develop.

Check starters for mold each day.

Week 1 Day

1: Monday

Starter: N/A **Flour:** 57g Whole grain flour **Water:** 75 g

Demonstrate how to use a scale to weigh the container and ingredients. Explain why mixing every day is important to deter mold. Starters should stay on the counter in the classroom overnight.

Some people like to have their class take their starter "on a walk" around the outside of their building to collect more wild yeast, but this is not required.

Day 2: Tuesday

Starter: 0 **Flour:** 0g **Water:** 0g

Make sure your students have thoroughly stirred their starter and they didn't get any on the sides of the container. At this point, the starter should look like wet concrete. You might see some slightly dark discoloration or strong, unpleasant smells. These are common during the first week but will improve as the starters develop.

Today is a **stir only** day.

Starters stay out in the classroom overnight.

If you are in a warm or humid environment, have students come in a second time each day this week to stir, or you give each starter a good stir the day before you leave.

Day 3: Wednesday

Starter: 0 **Flour:** 0g **Water:** 0g

Students may see some bubbles now, but this is just the bacteria, not yeast activity. Make sure all starters are thoroughly mixed and the lids are on.

Today is a **stir only** day.

Starters stay out in the classroom overnight.

Day 4: Thursday

Starter: 114g **Flour:** 57g Whole grain flour **Water:** 57g

Students may notice a sour smell, odors, or even some activity. Make sure you are thoroughly checking for mold growth.

Today is **discard and feed** day.

Starters stay out in the classroom overnight.

We recommend that students weigh out each ingredient separately (starting with the water) in a different container to mix. This will allow the first container to be cleaned with warm water (no soap) daily.

Day 5: Friday

Starter: 114g **Flour:** 57g Whole grain flour **Water:** 57g

Before class, make sure to check all starters for mold. By this point, most (if not all) starters should be alive and bubbling. Don't worry if some starters are less active than others. They will all catch up.

Today is a **discard and feed** day for your students.

Leave the starters out at room temperature until the end of the school day, then place them in the refrigerator over the weekend.

Week 2

This week is for developing cultures. Notice the schedule this week calls for all-purpose flour. On Day 6 (Monday), students use half whole grain and half all-purpose flour. Using some whole grain on the first day gives the starters a little more pep after being in the fridge during the weekend. From Day 7 on, feed with all-purpose flour.

Starters will now be kept in the refrigerator overnight. We are balancing time at room temperature, where the yeast can be active, eat, and grow, with time in the refrigerator, where yeast will slow down in the cold. Take the starters out of the refrigerator as soon as you get to your classroom in the morning, and do not put them back into the refrigerator until you are about to leave for the day.

Students should see activity in the form of bubbling and the starter doubling in size between feedings. Continue to check for mold each day.

Discard

You can begin to collect and use your discard as soon as you get a consistent overnight rise and fall from your starters (this should be towards the middle of week 2).

You can use your discard on the same day you collect it! After you feed your starter, pour the discard into another container to measure out and use what you need.

You can combine your entire class's discard in the same jar in the fridge (a Cambro container works great for this!)

Day 6: Monday

Starter: 57g **Flour:** 29g Whole Grain Flour, 28g All-Purpose Flour **Water:** 57g

Starters may be “sluggish” or slow to bubble and become active after being in the cold for the week-end. Don’t forget to check for mold before class.

Today is **discard and feed** day.

Starters go in the refrigerator overnight.

Day 7: Tuesday

Starter: 57g **Flour:** 57g All-Purpose Flour **Water:** 57g

The starter colonies should be established this week, but checking for mold is still important. If a group still hasn’t seen any activity, it’s time to discard that starter and replace it with an extra starter you made.

Today is **discard and feed** day.

Starters go in the refrigerator overnight.

Day 8: Wednesday S**tarter:** 57g F**lour:** 57g All-Purpose Flour W**ater:**

Before class, make sure to check all starters for mold. By this point, most (if not all) starters should be alive and bubbling. Don’t worry if some starters are less active than others, as long as there is some activity they will catch up. If you have a starter that still has no activity, that team may have to take from the discard of another active starter to use as their own.

Today is a **discard and feed day** for your students.

Starters go in the refrigerator overnight.

Day 9: Thursday

Starter: 57g **Flour:** 57g All-Purpose Flour **Water:** 57g

At this point, starters should rise and fall within 12 hours, so keeping it out overnight is not ideal and may produce hooch. (The liquid that collects on the top of your starter when it hasn't been fed in a while.)

Today is a **discard and feed** day.

Starters go in the refrigerator overnight.

Day 10: Friday

Starter: 57g **Flour:** 57g All-Purpose Flour **Water:** 57g

By Day 10, you should have all healthy starters. A healthy starter will be bubbly, with a bright, fruity aroma. If your starters are not ready, keep up the feeding routine for a few

Today is a **discard and feed** day for your students

Starters go in the fridge over the weekend.

If you are baking next week, proceed to Day 11. If you are NOT baking, you can now store starters in the refrigerator, discarding and feeding once a week.

Week 3

This week is for bulking and baking. On Monday, your students will feed and discard as before (because of the time starters spent in the fridge over the weekend). On Tuesday, students will bulk or grow the size of their starters so they have enough to begin making the recipe on Wednesday.

This recipe will need 2 to 3 class periods, with an overnight rest in the refrigerator in between (it helps make it sour, too!). Make sure you choose the timeline that best fits your classroom.

After Week 2, we encourage you to stay on track and bake the following week. If that is not possible, your starters can remain in the refrigerator, feeding once a week.

Day 11: Monday

Starter: 57g **Flour:** 57g All-Purpose Flour **Water:** 57g

Starters may be sluggish after spending time in the refrigerator, so today is a **discard and feed** day to let the starter wake up and become active again. Students might find a layer of hooch on top of their starters.

Starters go in the fridge overnight.

Day 12: Tuesday

Starter: 114g **Flour:** 114g All-Purpose Flour **Water:** 114g

Bulking is building up enough starter for your recipe. On this day, students will stir to deflate and discard all but 114g of starter and add 114g each of flour and water.

Starter goes in the fridge overnight.

You should have about 57g of unused starter that you can continue to maintain for future baking!

Day 13: Wednesday

Students will stir and deflate their starter. Then, they will remove what they need for the Rustic Sourdough Bread recipe.

We encourage your students (or even colleagues) to take it home and keep it going so they can bake it at home. See instructions in the FAQ for maintaining it over long periods of time.

Once established, your starter can stay in the fridge for up to a week between feedings. Any time you bake, reuse the week 3 timeline for feeding, bulking, and baking.

Day 14: Thursday

Rustic Sourdough Bread

Day 15: Friday

Rustic Sourdough Bread

SECTION 4

FAQ, DISCUSSION QUESTIONS, AND VOCABULARY

Sourdough FAQ

WHAT IS SOURDOUGH?

Sourdough refers both to bread and to the starter used to make it. Starter begins with a combination of flour and liquid and can range from a stiff starter made entirely with rye flour and water to a liquid batter of milk and cornmeal — with plenty of options in between.

When flour is mixed with liquid, the friendly bacteria (lactobacilli) and wild yeast in both the flour and your surrounding environment start working together. Within this flour-and-water slurry (now called starter), these tiny living creatures generate byproducts that cause bread to rise and give it a complex, rich flavor.

DOES A RIPE SOURDOUGH STARTER LOOK LIKE?

feedings you do, the more active your starter will be and the better your results. See to the left of a hungry (neglected) starter, a starter right after feeding, and a ripe The time it takes for your starter to become ripe may vary.

I WANT TO KEEP MY STARTER ALIVE, HOW DO I MAINTAIN IT?

Once your starter is up and going, you'll need to store it and maintain it by storing starters in the refrigerator and feeding them weekly. Stick to a consistent feeding schedule, keeping a 1:1:1 ratio as used previously. When you are ready to bake, start with Day 11, a divide and feed day, to give starters a chance to perk up. Then, continue to Day 12 to bulk up your starter and make your dough on Day 13.

Room-temperature storage: Feed every 12 hours (twice a day). Discard all but 57g of starter and feed with 57g of water and 57g of flour. Stir and cover.

WHY DISCARD SO MUCH STARTER?

It may seem wasteful, but unless you discard starter at some point, you'll quickly end up with a lot of starter. Also, keeping the volume down offers the yeast more food to eat each time you feed it; it's not fighting with so many other little yeast cells to get enough to eat. You don't have to throw out the discard starter if you don't want to; you can give it to a friend or use it to bake. Many recipes on our site use "discard" starter, including pizza crust, pretzels, waffles, and even chocolate cake. Ensure you wait until you see a daily rise and fall of your starters (which will likely begin in week 2) before using it in discard recipes! See our Sourdough Discard Recipe Collection for some of our favorites.

WHAT IF I DON'T HAVE ENOUGH STARTER FOR THE RECIPE?

To build a larger quantity of starter, simply increase the amount of flour and water you add at each feeding, being sure to keep the amount of flour and water the same by weight. This should allow you to make enough for a large recipe with some left over to keep and maintain. For example, the last feeding before you bake, rather than saving 57g of starter, save 113g (1/2 cup) sourdough starter, and feed it 113g (1/2 cup) of water and 113g (1 scant cup) of flour.

SHOULD I THROW IT OUT AND START OVER?

sourdough starter begins to mold, or the odor is not the usual clean, sour aroma (an smell is OK), or if it develops a pink or orange color, throw it out. But if a dark liquid of the starter, don't worry — that's the hooch, and it's fine. It just means that your hungry and needs to be fed.

Discussion Questions

1. What effect does temperature have on your sourdough starter? What about time?
2. Why do you think we started with Whole grain flour and then switched to All Purpose flour?
3. Where did you see the most significant change in activity for your starter? Where did you see the smallest or least amount of change in activity? What do you think caused these changes?
4. Once your starter is mature, does age or environment has a bigger effect on your starter?