



Parsnip Pancakes

Revised By Mikaela Taylor, FoodCorps

Theme: Science, Cooking, Math

Grade Level: 4th - 5th

Subject Area: Science, Math, ELA

Summary: Students learn about solids, liquids, and gases using the ingredients of parsnip pancakes and learn about the metric system, conversions and math through measurements of ingredients in this recipe. Students can also have an opportunity to use their five senses, learn about the parsnip, and write about their observations of the cooking process. Then, they make and eat some pancakes!

Standards:

Fifth Grade Grade

ELA

- CCSS.ELA-LITERACY.W.5.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Common Core Math

- CCSS.MATH.CONTENT.5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

NGSS

- 5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
- 5-PS1-3. Make observations and measurements to identify materials based on their properties.

Preparation: Collect and organize ingredients for baking the recipe, print worksheets off, grate parsnips.

Teaching Time: 1 hour

Cooking Time: 40 min

Materials:

- For exploration of flour:
 - Flour
 - Water
 - Magnifying glass (one for each group)
 - 2 ounce sample cups (two for each group)
 - Spoons (one for each group)
- Parsnip Pancakes:

- Hot plate and frying pan OR portable electric griddle
- Spatula
- Mixing bowls
- Measuring cups
- Liquid measuring cup
- Grater
- Mixing spoon
- Oven mitt
- Cutting mats
- Napkins or plates
- Ingredients:
 - 1 cup whole wheat pastry flour (or ½ cup whole wheat and ½ cup pastry flour)
 - 1 teaspoon baking powder
 - ½ teaspoon baking soda
 - ½ teaspoon salt
 - ¾ teaspoon ground cinnamon
 - ¼ teaspoon ground nutmeg
 - ¼ teaspoon ground ginger
 - 1 egg
 - 2 tablespoons packed Muscovado sugar or brown sugar
 - 1 cup buttermilk
 - 1 teaspoon vanilla extract
 - 2 cups finely grated parsnips
 - Butter or oil for frying the pancakes

Lesson Procedure:

1. Have all students wash hands and clean desk spaces
2. Discuss the similarities and differences between solids, liquids and gases.
3. Begin mixing the ingredients for parsnip pancakes, having students come up to read the recipe and help measure the ingredients. While each ingredient is added, students follow along on their worksheet and determine if it is a solid, liquid or gas.
4. Discuss the differences between physical and chemical changes, and have students determine which change the cooking of the pancakes is considered. Make note of the combination of an acid (buttermilk) and base (baking soda) to create the chemical reaction.
5. Begin cooking the parsnip pancakes -- while these are cooking, have students conduct the flour experiment.
 - a. Give each group a magnifying glass, 2 2-ounce cups (one with flour and one with water).
 - b. Have students walk through the “Is flour a solid or a liquid” worksheet
6. Discuss results as a class and try the pancakes!

Wrap up:

Flour acts like a fluid in some ways because it seems to sometimes take the shape of its container, such as how it fits easily into a flour bag. But if you take a magnifying glass and look at the flour or another powder up close, you can see that it is made of small, solid building blocks. Another way to test this is if you pour water onto a flat surface like a desk, it will try to take the shape of the desk (flat) by spreading out and creating a puddle. If you pour flour onto a (dry) desk though, it forms a small mound, not taking the shape of the desk like a true liquid would do.

Extended:

While the pancakes are cooking, discuss metric conversions and the use of the metric system as a standard of measurement. Review the base units used when discussing mass (grams), volume (liters), and

length (meters). Have students come up with a creative acronym to remember the main metric pre-fixes: kilo, hecta, deca, base, deci, centi, milli. As an example: Kittens Hate Dogs Because Dogs Can't Bark. These acronyms are much easier to remember if they are personal and funny to the student.

Once they have an acronym, write the letters out on the board as follows:

K H D B D C M

Make note that each letter is separated by a power of 10. When moving from one unit to another follow the simple rules:

- However many places you move, that's how many places your decimal will move
- Whatever direction you move, that is the direction your decimal will move

Example: millimeters to meters → move decimal three places to the left.

Do a conversion example with students, then have them complete the metric conversions for the recipes on their own.

NAME _____

DATE _____

Parsnip Pancakes: Solid, Liquid or Gas?

1. Draw a line to match the state of matter with the correct description:

- | | |
|--------|---|
| Solid | is invisible |
| Liquid | becomes the shape of the container it is in |
| Gas | does not change shape easily |

2. Is flour a solid or a liquid?

- a. Try filling up a clear container with flour. Does flour become the shape of the container it is in?

- b. Use a spoonful of flour to try to make a pile of flour on your table. Does the flour hold its shape or does it become flat like the table?

- c. Compare flour to a liquid like water. Use a spoonful of water to try to make a pile of water on your table. Does the water hold its shape or does it become flat like the table?

- d. When you look closely at flour, what do you see?

- e. Is flour a solid or a liquid? Why?

3. For each item listed below, circle if it is a solid, liquid or gas:

Water	Solid	Liquid	Gas
Parsnips	Solid	Liquid	Gas
Flour	Solid	Liquid	Gas
Buttermilk	Solid	Liquid	Gas
Egg (before it is cooked)	Solid	Liquid	Gas
Egg (after it is cooked)	Solid	Liquid	Gas
Baking powder	Solid	Liquid	Gas
Baking soda	Solid	Liquid	Gas
Vanilla extract	Solid	Liquid	Gas
Sugar	Solid	Liquid	Gas
Butter (in the refrigerator)	Solid	Liquid	Gas
Butter (heated to 95°F)	Solid	Liquid	Gas
Salt	Solid	Liquid	Gas
Cinnamon	Solid	Liquid	Gas
Parsnip Pancakes	Solid	Liquid	Gas
Carbon Dioxide	Solid	Liquid	Gas

3. Metric Conversions

a. What base metric unit of measurement is used when discussing mass?

b. What base metric unit of measurement is used when discussing volume?

c. If the recipe called for 50 g of flour to make parsnip pancakes, how many mg of flour would you need?

d. If the recipe called for 100 mL of buttermilk, how many liters of buttermilk would you need?

e. If the recipe called for 0.20 kg of sugar, how many grams of sugar would you need?
