



# Chocolate Mug Cake

**Kid Description:** Grab a grown-up to make a chocolate mug cake in less than five minutes. You'll only need a few ingredients and a microwave — no oven needed! Just don't feed this to Ruff (or any dog... chocolate could make dogs sick).

This recipe makes one serving. If you want more servings, make sure to gather more mugs. You'll need to help kids measure ingredients and operate the microwave.



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## Time:

20 minutes total (but only 3 minutes for baking!)

## Explore:

kitchen chemistry, inquiry process (predict, document, test, reflect)

## Materials:

- ☐ Microwave
- ☐ Recipe printout
- ☐ Kitchen measuring tools
- ☐ Microwave-safe mug
- ☐ 4 tbsp flour
- ☐ 4 tbsp sugar
- ☐ 4 tbsp cocoa
- ☐ 1 egg
- ☐ 3 tbsp milk
- ☐ 3 tbsp vegetable oil
- ☐ ½ tsp vanilla
- ☐ 1 tbsp chocolate chips

## Predict

★ Brainstorm and predict how to make a cake.

- **Ask:** What ingredients do you think you need for a cake? Why?
- **Ask:** What do you need to do to the ingredients? Why?
- **Ask:** How long does a cake usually take to bake in an oven?

★ Explain what you're going to make, and how you'll make it.

- **Explain:** We're going to make a chocolate cake today, but we'll use a microwave instead of an oven. It takes a lot less time to cook things in a microwave than in an oven.

★ Introduce the ingredients you'll use. Have kids sort them into two piles: liquid ingredients and dry ingredients.

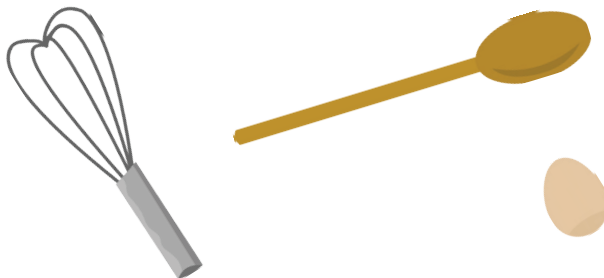
- **Ask:** Which ingredients are dry and which are wet, or liquid?



- **Ask:** What do you think each ingredient does to the cake?
- **Ask:** What do you predict would happen if you forgot an ingredient or put in too much of one ingredient? (Hint: Use sugar as an example)



- ★ On the printout, write down kids' predictions of when the cake will start to rise in the microwave.
  - **Ask:** What happens to a cake when it is baking? (some answers: gets hotter, you can smell it, it rises)
  - **Explain:** Some ingredients help the cake rise when it's baking. We're going to bake the cake for three minutes in the microwave.
  - **Ask:** Based on our investigating the ingredients, and any baking you've done before, when do you predict the cake will start to rise, or get bigger? I'll document your prediction by writing it on the printout.



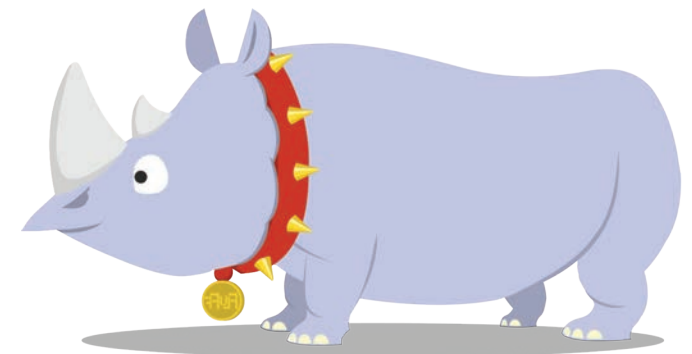
## Bake

- ★ Make sure kids wash their hands!
- ★ Have kids follow along with the recipe on their printout. If there are multiple kids, help them take turns measuring each ingredient.
  - **Explain:** This is the recipe. A recipe tells us all of the ingredients we need and the instructions to make something. Follow along and check off each ingredient as we add it to the mug to make sure we don't miss anything!
- ★ When all ingredients are mixed into the mug, just before putting the mug in the microwave:
  - **Ask:** Let's investigate the mix! Can you see each of the ingredients now?
  - **Ask:** What happened to the ingredients?
  - **Ask:** What does the cake look like now? What do you think it will look like when it comes out of the microwave?
- ★ Optional: Take a photo of your mug cake before and after you put it in the microwave to compare!



## The Recipe

- Mix all the dry ingredients into a mug.
- In a separate bowl, crack the egg and then beat it.
- Add the egg to the dry ingredients in the mug.
- Add the liquid ingredients to the mug. Mix all ingredients in the mug. Make sure there are no lumps!
- Add the chocolate chips and stir.
- Put the mug in the microwave on high for 3 minutes.



## Investigate

- ★ Have kids observe the mug cake as it cooks in the microwave.
  - **Ask:** What's happening to the ingredients?
  - **Ask:** What does it smell like?
  - **Ask:** What do you think it will taste like?
- ★ Watch the timer on the microwave when the cake starts to rise. Write down the time on the kid's recipe printout.
  - **Ask:** How much time did it take for the cake to rise?
  - **Ask:** Was your prediction about the cake's rising time right?



## Test

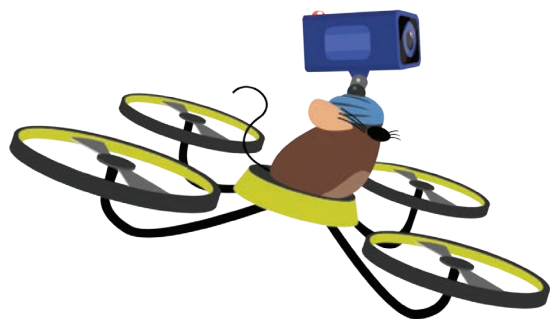
- ★ Leave the mug in the microwave for two minutes to let it cool. An adult should take out the mug from the microwave since the mug might still be hot.
- ★ On the printout, have kids draw what their finished mug cake looks like.
- ★ Before eating:
  - **Ask:** Can you see each of the ingredients now?
  - **Ask:** What happened to the ingredients?
  - **Ask:** How does the cake look different?
- ★ Time to eat!
  - **Ask:** What does the cake taste like?
  - **Ask:** Which ingredients can you taste?

## Reflect

- **Ask:** What made the ingredients change into a cake?
- **Ask:** What would happen if we baked the cake for less time? More time?
- **Ask:** What do you think the cake would look or taste like if we took out an ingredient?

## Extension

Try making the recipe again but remove one of the ingredients. Have kids predict and observe what happens to the cake without that ingredient. How long does it take to rise? Does it taste different?



## Next:

Now try making **the rainbow popsicle** recipe to see what happens when you freeze ingredients!

# Recipe

## Chocolate Mug Cake



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### Predict It

Predict how long it will take for the cake to start rising. Then, observe what happens and write down how long it took for the cake to start rising.

### Prediction

\_\_\_\_\_ minutes and \_\_\_\_\_ seconds

### Result

\_\_\_\_\_ minutes and \_\_\_\_\_ seconds

### Make It

#### Ingredients

4 tablespoons of flour  
4 tablespoons of sugar  
4 tablespoons of cocoa  
1 egg  
3 tablespoons of milk  
3 tablespoons of vegetable oil  
½ teaspoon of vanilla  
1 tablespoon of chocolate chips



#### Recipe

1. Mix all the dry ingredients into a mug.
2. In a separate bowl, crack the egg and then beat it.
3. Add the egg to the dry ingredients in the mug.
4. Add the liquid ingredients to the mug. Mix all ingredients in the mug. Make sure there are no lumps!
5. Add the chocolate chips and stir.
6. Put the mug in the microwave on high for 3 minutes.

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### Draw It



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