

Making More Doughnuts



Unit 4
Creative Solutions



Lesson Plan

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Smithsonian

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Answer Key: Making More Doughnuts

page 10—More Doughnuts, Please!

Students should draw a baker who has made doughnuts in the top box and a machine making doughnuts in the bottom box.

page 11—My Favorite Doughnut!

Students should draw and write about their favorite kinds of doughnuts.

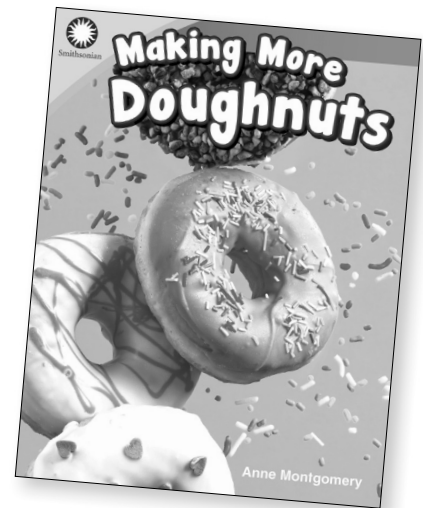
page 17—Making More Doughnuts Quiz

1. B
2. C
3. Doughnuts are sold at stores and/or doughnut shops.

Making More Doughnuts

Materials

- ▶ *Making More Doughnuts* books
- ▶ copies of student activity sheets (pages 9–19)
- ▶ sticky notes
- ▶ **STEAM Challenge materials include but are not limited to the following:**
 - ✓ clay
 - ✓ cookie cutters
 - ✓ molding dough
 - ✓ plastic knives
 - ✓ plastic table cloth or waxed paper
 - ✓ rolling pins



Learning Objective

- ▶ **Reading:** With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.
- ▶ **Writing:** Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book.
- ▶ **Speaking and Listening:** Participate in collaborative conversations with diverse partners about grade appropriate topics and texts with peers and adults in small and larger groups.
- ▶ **Engineering:** Define an engineering problem, design and evaluate solutions, and optimize a design based on test results.

Phenomena

How people make things can change over time.

Lesson Timeline

| Day 1 | Day 2 | Day 3 | Day 4 | Days 5–10 |
|--|--|-------|--|--|
| Introductory and Before Reading Activities (page 4) | During Reading Activities (page 5) | | After Reading Activities (page 5) | STEAM Challenge and Assessments (pages 6–8) |
| Define the STEAM Challenge and make connections between ideas. | Research doughnuts, make connections between ideas, and brainstorm design solutions. | | Write about favorite doughnuts. | Design, build, test, improve, reflect on, and share doughnuts. Complete the assessments. |

Making More Doughnuts (cont.)

STEAM Vocabulary

bakers
love

machines
stores

Introductory Activity

Define the Problem

1. Distribute sticky notes to students, and have them color quick pictures of their favorite kinds of doughnuts. Ask students to share their pictures and tell the class the flavors of the doughnuts. Have them put their sticky notes on the board or chart paper. Tell students that they will be reading a book about making delicious doughnuts.
2. Distribute the *Making More Doughnuts* books to students. Reveal the STEAM Challenge by reading aloud to students pages 18–19 of the book.
 - ▶ Display the Interactiv-eBook for a more digitally enhanced introduction to the challenge.
3. Distribute *Make a Plan* (page 9) to students. Read the STEAM Challenge summary aloud to students. Have each student complete the summary by tracing the words.

Note: You may wish to distribute all student activity sheets as one packet. They will be used throughout the STEAM Challenge.

Before Reading

1. Write the vocabulary words on the board, and define each word.
2. Write the following related words on the board: *cook, delicious, create, sell, make, and like*. Ask students which words relate to each vocabulary word. Accept any groupings as long as students can provide logical explanations.
3. Introduce some of the sight words used throughout the book: *we, for, it, they, then, and more*. Write the words on the board. Have students “air write” the words by holding their index fingers out in front of their bodies and pretending to write the words in the air as they spell them out loud.
4. Explain to students that ideas in a text usually connect to each other. Good readers try to figure out what the connection is to better understand what the book is about. Tell students they will practice making these connections as they read *Making More Doughnuts*.

Making More Doughnuts (cont.)

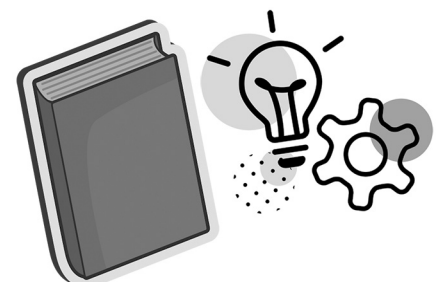
During Reading

Research and Brainstorm

1. Tell students that as they read, they will see an author making connections from one page to the next. Good readers follow the connections to understand the text. Have students look for how the pages connect as they read the book.
2. Distribute the *Making More Doughnuts* books to students. Have students preview the book by looking at the images on each page.
 - Read the book aloud as students follow along. Then, reread the text, encouraging students to read as much text as they can.
 - Display the Interactiv-eBook for a more digitally enhanced reading experience. You may wish to have students annotate the PDFs as you read.
 - Play the audio recording as students follow along to serve as a model of fluent reading in small groups or at a listening station. The recording will help **English language learners** practice fluency and aid in comprehension.
3. Discuss the title of the book with students. Ask them why they think the author chose the title *Making More Doughnuts* rather than *Making Doughnuts*.
 - Compare the photographs on page 5 and page 7 to the photograph on page 9. Draw connections between each photo and the increased number of doughnuts.
4. Distribute *More Doughnuts, Please!* (page 10) to students. Have them draw pictures showing what happened when there was a need for more doughnuts. Discuss students' pictures.
5. Lead students with guiding thoughts and questions as they discuss the STEAM Challenge: *What is the usual shape of doughnuts? What other shapes have you seen?* Then, have students independently record ideas on their *Make a Plan* activity sheets.

After Reading

1. Write the vocabulary words on the board, and review their meanings with the class. Distribute drawing paper to students. Assign one word to each student or to a group of students. Have students draw simple symbols or images to represent the words. Have students share their images with the class.
2. Review the board or chart where students put the sticky notes of their favorite doughnuts. Explain to students that there is not a right or wrong answer to a question such as *What is your favorite _____?* Each person has personal thoughts and preferences that are called *opinions*.
 - Distinguish opinions from other types of writing by naming some other topics such as *Facts About Pandas* or *What I Did at School Today*. Identify some other opinion topics to provide additional context to the concept of opinion: favorite movie, the best pet, or favorite food.
3. Distribute *My Favorite Doughnut!* (page 11) to students. Have each student draw and color their favorite doughnut at the top of the page and write about their favorite doughnut at the bottom of the page. Provide sentence frames to support students as needed: *My favorite doughnut is _____. I like _____.*



Making More Doughnuts (cont.)

Prep

- Prepare all materials for the STEAM Challenge.
- You may choose to invite volunteers to help monitor and facilitate group work if you are doing the STEAM Challenge with multiple groups at once.
- Review all designs prior to building.

STEAM Challenge

Design and Build

1. Discuss the following questions to guide student thinking with the STEAM Challenge:
 - *How are doughnuts usually eaten?* Refer students to the photograph on page 17, and draw on personal experience to help students understand that doughnuts are usually eaten with hands and not utensils.
 - *How do you think eating doughnuts with your hands affects the size and shape of doughnuts?* Refer to the photograph on page 17, and explain that the girl is able to hold the doughnut easily because it is not too big or too small. Ask students to think about how this will affect their designs.
2. Distribute previously completed activity sheets. Review the STEAM Challenge on pages 18–19 together. List materials on the board, and encourage students to preview the materials they have to work with.
 - Discuss with students any rules for working with the clay or molding dough in the classroom. Remind students that they will be making a model of food and the materials for the challenge cannot be eaten.
3. Ask students to independently sketch and label their designs on their *Make a Plan* activity sheets.
4. Organize students into teams of two or more. Distribute one copy of *Team Plans* (page 12) to each team. Ask teams to have members share their plans. Then, have each team choose, sketch, and label a team plan.
 - **Challenge** students by adding goals (e.g., the doughnuts must be made with a limited amount of clay, or the doughnut can only be held with one hand).
5. Explain to students that when they build their models, they must follow their design plans. Reassure them they will have an opportunity to change and improve their design plans after they present them. Review classroom expectations for working with materials. Then, give teams time to gather materials and create doughnuts.
 - Digitally record students' processes to share at a later date with students and parents.
6. Distribute *Think about It* (page 13) to students. Explain that reflection is an important part of the engineering design process. Read aloud numbers 1 and 2 on the activity sheet, and have students mark their responses. Ask volunteers to share.

Making More Doughnuts (cont.)

Prep

- ▶ Prepare all materials for the STEAM Challenge.
- ▶ Review all designs before teams begin improvements.

STEAM Challenge

Test and Improve

1. Discuss the following questions to guide student thinking with the STEAM Challenge:
 - ▶ *What do you think is the best shape for a doughnut? Why?* Encourage students to share any opinion that is backed by reasoning. Allow other students to question and challenge proposed design shapes by asking questions.
 - ▶ *How are doughnuts packaged? How does this affect their design?* Have students talk about their prior experience with doughnuts. Most doughnuts are carried in a box. They typically are not stacked on top of each other but are laid side by side. Discuss how doughnuts of different shapes would influence how the doughnuts are transported.
2. Gather teams for testing. Explain that teams will offer feedback after the test. Use *Friendly Feedback* (page 14) to review best practices for giving feedback.
3. Distribute *Making More Doughnuts Test Results* (page 15) to students, and ask them to record results for each team.
4. Allow each team time to show their doughnut and share a little about why they chose the design they did. Display the doughnuts for all to see. To enhance the experience, display the doughnuts in a doughnut box from a doughnut store.
5. Provide time for teams to brainstorm ways to improve their designs based on test results and feedback. Refer students back to their *Team Plans* activity sheets. Ask them to sketch their improved design plans and explain any changes.
 - ▶ **Challenge** successful teams with additional goals for the second design (e.g., the doughnuts must be made with a limited amount of clay, or the doughnut can only be held with one hand).
6. Have teams gather materials to improve their designs. Then, have them make their improvements and retest their doughnuts. (**Note:** If students will be observing, recording, and offering feedback for the retest, provide extra *Making More Doughnuts Test Results* sheets to students.)
7. Have students complete numbers 3 and 4 on their *Think about It* activity sheets.

Making More Doughnuts (cont.)

STEAM Challenge

Reflect and Share

1. Encourage students to share their experiences about the STEAM Challenge and working with a team. Guide a discussion by asking students to share their responses to numbers 1–4 on their *Think about It* activity sheets.
2. Prompt students to think about how seeing other teams' designs encouraged them to change their own designs. *What does this tell you about learning from other designs? What did you learn about improving designs?*
3. Have students complete numbers 5 and 6 on their *Think about It* activity sheets.
4. Distribute *Engineering Design Process* (page 16) to students, and review how they used each step to complete the challenge. Use the statements on *Engineering Design Process Reflection* (page 19) to help students think about the steps.
 - ▶ Have students annotate the infographic with words or pictures specific to this challenge.
 - ▶ Encourage students to identify the steps in the process that were the easiest by circling them. Have students identify the steps that were the most challenging by coloring them with crayons.
5. Review the photographs on pages 11 and 13. Tell students that when making items in large amounts, such as doughnuts, a machine is often used. Explain that someone has to design how the machine will look and work. That person is often called an *engineer*.
 - ▶ Brainstorm other machines that are used to make items in large quantities. Discuss engineering as a career option.

Assessment Activities

1. Have students complete a short posttest, *Making More Doughnuts Quiz* (page 17), to assess this lesson's reading objective. Read the questions on the posttest aloud for students.
 - ▶ Students may use the Interactiv-eBook activities in the Digital Resources for assessment purposes (optional).
2. Guide students to complete *Teamwork Rubric* (page 18) to reflect on and evaluate their work and collaboration skills.
3. Have students verbally answer the Think and Do questions from the book.

Do you want to make baked goods?

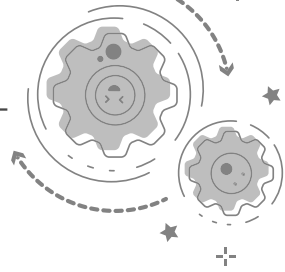
"My job is to study the history of food. I learned about a cake called the Smith Island cake. It has ten layers of yellow cake with chocolate icing. This cake is the official dessert of Maryland."

— *Paula J. Johnson, National Museum of American History*

Read this career advice aloud to students. Read the author's name and job title. Discuss the advice, and encourage students to think about what they could do at school and at home to prepare for this type of career.

Name: _____

Date: _____



Make a Plan

Directions: Write the challenge. Brainstorm ideas.
Sketch a plan.

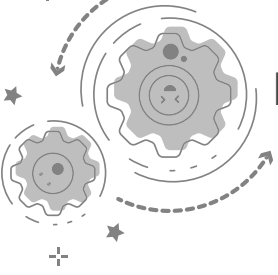
Challenge: Design and make

doughnuts

that are easy to hold.

My Thoughts

My Plan



Name: _____

Date: _____

More Doughnuts, Please!

Directions: People wanted more doughnuts. Draw what happened.

more doughnuts

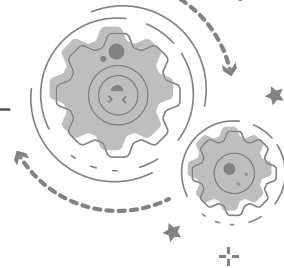


more doughnuts



Name: _____

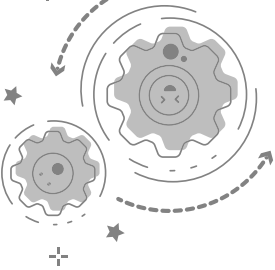
Date: _____



My Favorite Doughnut!

Directions: Draw and write about your favorite kind of doughnut.

SAMPLE



Team Members: _____

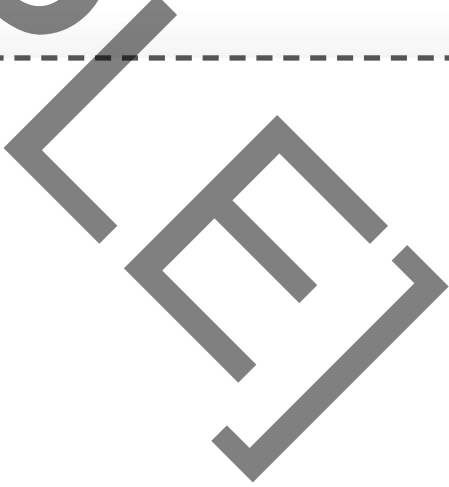
Team Plans

Directions: Sketch **Plan 1**. Sketch **Plan 2**.

Plan 1

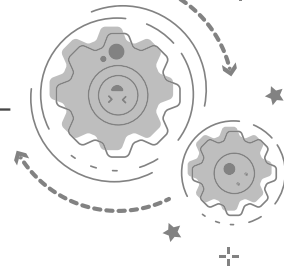
SAMPLE

Plan 2



Name: _____

Date: _____



Think about It

Directions: Check *yes* or *no*. Circle the words. Fill in the blanks.

1. My team listened to each other. ☐ yes ☐ no

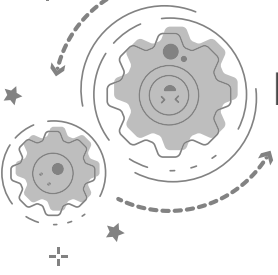
2. I added my ideas to the design. ☐ yes ☐ no

3. Our first plan (worked/did not work) because

4. Our second plan was (better/worse).

5. I learned

6. It was hard when



Name: _____

Date: _____

Friendly Feedback

Directions: Ask questions. Give ideas. Use these sentences to get started.

Clarify

How did you _____
_____?

Warm Feedback

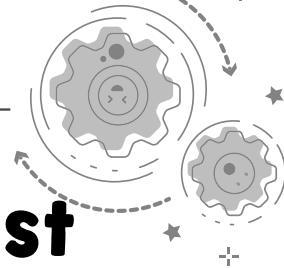
I like _____ because _____.

Cool Feedback

You might want to try _____
_____.

Name: _____

Date: _____



Making More Doughnuts Test Results

Directions: Mark the chart for the doughnut test. Circle *yes* or *no*.

| Team | Can you hold the doughnut in one hand? | Will the doughnut be easy to eat? |
|------|--|-----------------------------------|
| 1 | yes no | yes no |
| 2 | yes no | yes no |
| 3 | yes no | yes no |
| 4 | yes no | yes no |

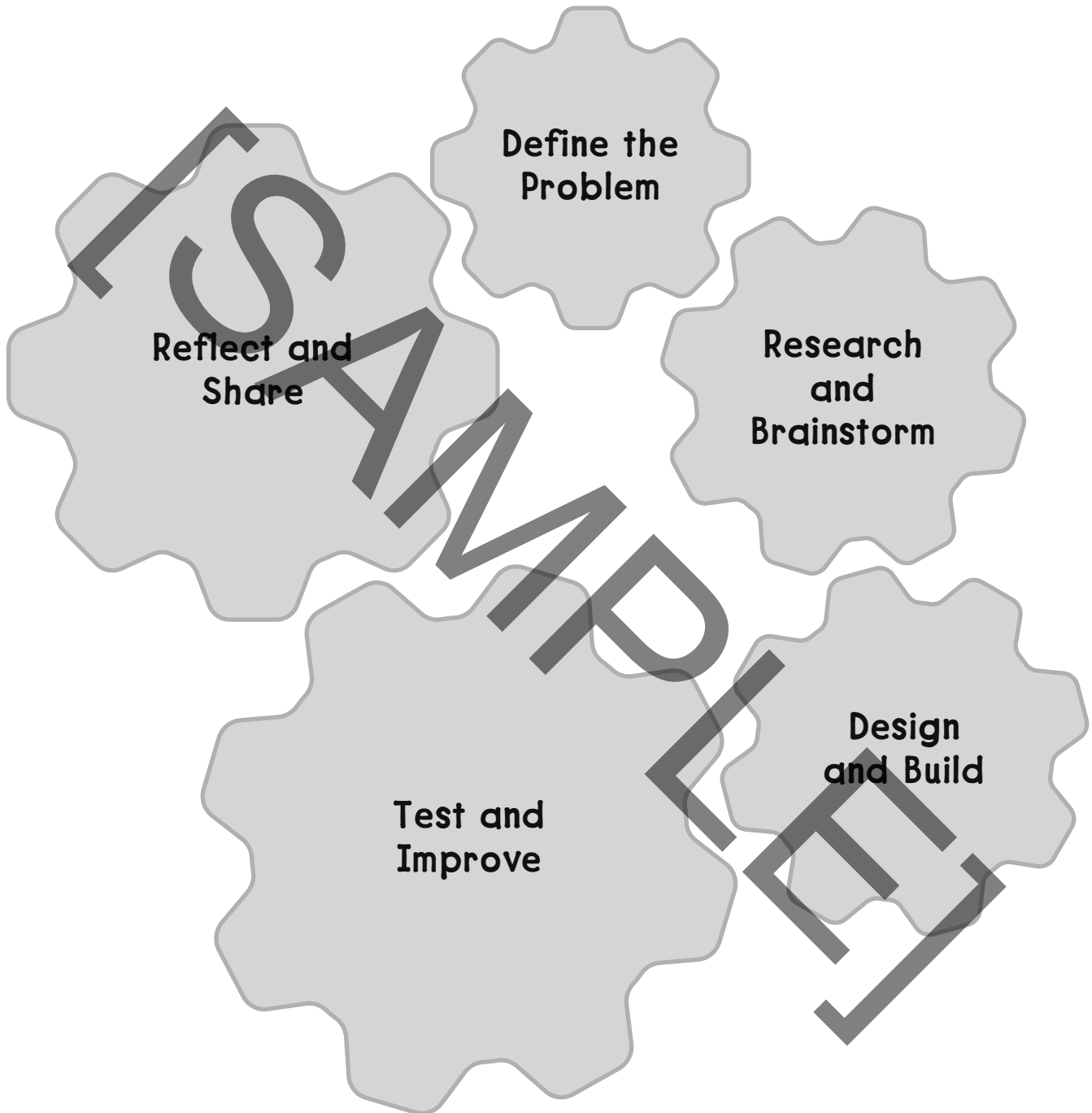
Draw the doughnut that was the best.



Name: _____

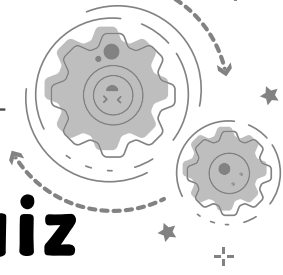
Date: _____

Engineering Design Process



Name: _____

Date: _____



Making More Doughnuts Quiz

Directions: Listen to your teacher. Answer the questions. Show what you know.

1. Whose job is it to make doughnuts?

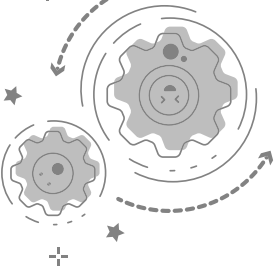
- ☐ (A) teachers
- ☐ (B) bakers
- ☐ (C) doctors

2. Why were doughnut machines made?



- ☐ (A) Doughnuts were made at home.
- ☐ (B) Bakers made doughnuts.
- ☐ (C) People wanted more doughnuts.

3. Where are doughnuts mainly sold?





Name: _____

Date: _____

Teamwork Rubric

Directions: Think about your team. Circle the faces to show what you did. Write about how you helped.

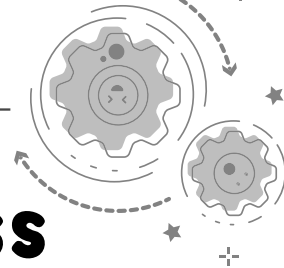
 = Always  = Often  = Sometimes

| | | | |
|---|--|---|---|
|  I listened to people on my team. |  |  |  |
|  I helped people on my team. |  |  |  |
|  I shared ideas with people on my team. |  |  |  |
|  We made choices as a team. |  |  |  |

I helped my team when I _____

Name: _____

Date: _____



Engineering Design Process Reflection

Directions: Read the list. Check the boxes to show what you did.

Define the Problem

- ☐ I understood the problem or task.

Research and Brainstorm

- ☐ I researched and brainstormed ideas.

Design and Build

- ☐ I designed and built models.

Test and Improve

- ☐ I tested and improved models.

Reflect and Share

- ☐ I reflected on and shared my work.



STEAM CHALLENGE



1 Research and Brainstorm

Learn about doughnuts.



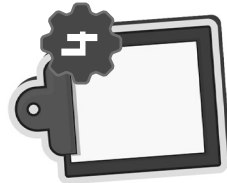
2 Design and Build

Draw your plan. Make your doughnut!



3 Test and Improve

Hold your doughnut in your hands. Then, try to make it better.



4 Reflect and Share

What did you learn?

The Problem

Your town bakers need a new shape for their doughnuts. They want your help.

The Goals

- Your doughnut should be a good shape and size to hold and eat.
- It should be made from play clay.
- Your doughnut should be held easily.

