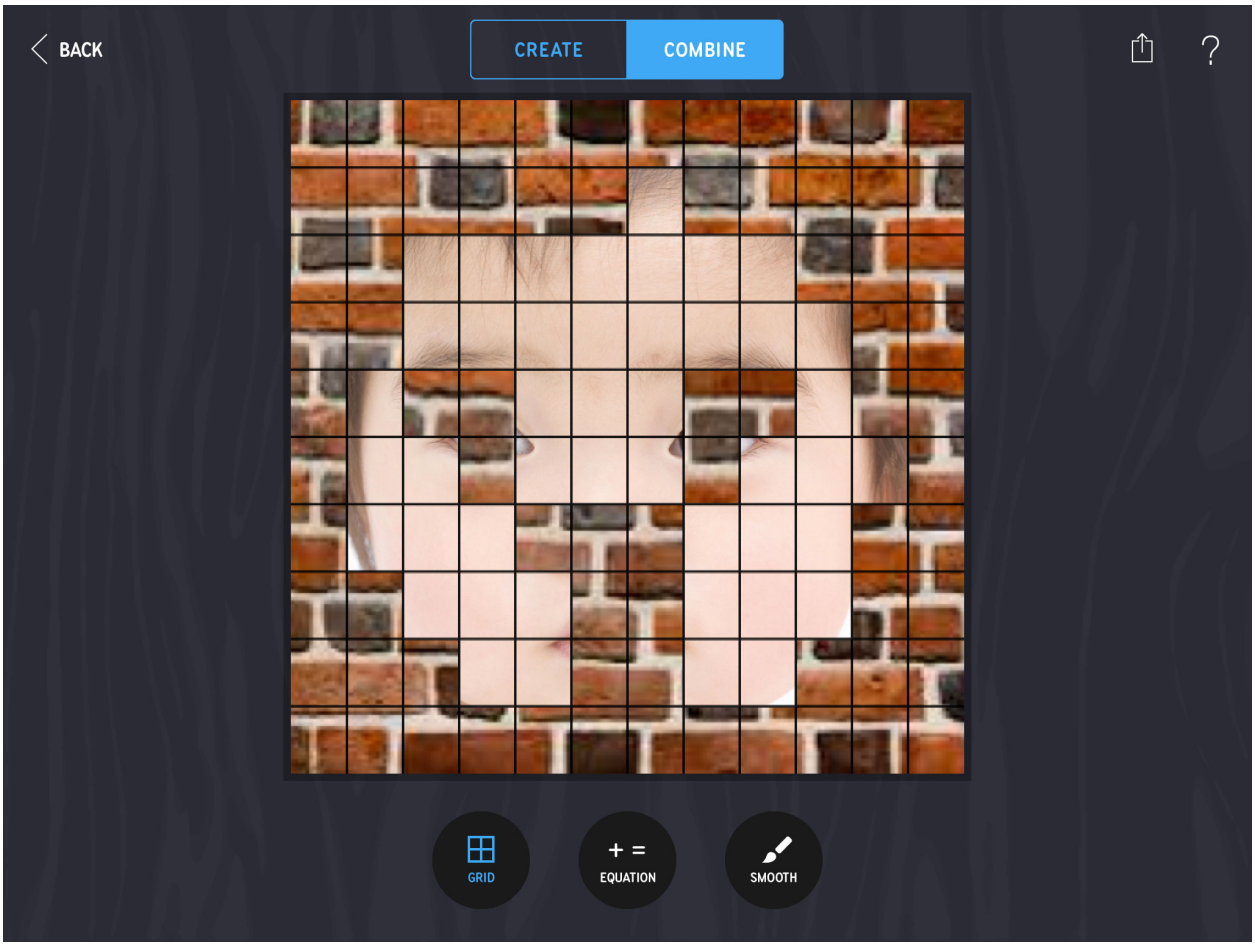
Fraction Mash Activity 3: Hidden Face Challenge

Comparing Fractional Quantities and Equivalent Fractions

Overview

Students create a mashup, hiding parts of their friend's face within another image, and pose the question: What is the greatest fraction of a person's face that can be revealed before figuring out who it is? What is the smallest fraction that can remain hidden so it is still recognizable? In comparing different mashups, students explore which fractional quantities are larger, smaller or equivalent.



Big Idea

How much of your face can be hidden in such a way that you are still recognizable to your peers? How much can be revealed without someone figuring out and that it's you? In this activity, the question of "how much" is answered in terms of fractional quantities of the whole picture. Students will use different grids to partition their pictures and select which parts of their faces to reveal. In sharing and comparing their final mashups, students will figure out what fractional parts of the faces are represented in their mashups and which fractional quantities are larger, smaller, or equivalent. For example, if one student used 4/16 of their face in their picture and another

student used 1/4 of their face in their picture, who wins the challenge? Both since both are equivalent—1/4 of the whole.

NOTE: The concept of the "whole" is important to consider with Fraction Mash. For the purposes of this app, the "whole" is the picture itself – the image that fits within a frame. The parts of one picture combine with parts of another picture to make one whole picture: the mashup.

Learning Objectives

Students will use denominators, numerators, and various grid options to solve problems built around real world images.

From this activity, students will be able to:

- Increase or decrease denominators to affect the number of parts in the whole.
- Compare fractions – greater, less than, equal to.
- Use grid overlays to partition the whole into fractional parts of different types.

Vocabulary

- Fraction
- Equivalent Fractions
- Denominator
- Numerator
- Grid
- Whole

Grades

Elementary School, 3–5

Standards Addressed

Grade Level: 3, 4

Common Core Standards-Math
CCSS.MATH.CONTENT.3.NF.A.2.A
CCSS.MATH.CONTENT.3.NF.A.3.A
CCSS.MATH.CONTENT.3.NF.A.3.B
CCSS.MATH.CONTENT.3.NF.A.3.D
CCSS.MATH.CONTENT.4.NF.B.3.B

Mathematical Practices
MP1
MP2
MP4

Classroom Strategies

Single-device implementation
Create a set of mashups before class in which you hide faces of either popular (to your students) celebrities or students in the class in objects as shown in the example. Using an interactive white board or projector, talk through the fraction of the entire image that is "face parts" in comparison to the rest of the image. Discuss features of images, in terms of fractions, that allow faces to be successfully hidden. Then work as a class to create some new Hidden Face mashups.

Multiple-device implementation
This activity works well with students working in pairs. Have students take turns being the models and the photographer. This can lead to interesting investigations of fractions that have to do with the differing combinations for mashups.

Tips and Tricks: To facilitate a fair challenge, have students send their mashups to you anonymously so the class is unaware who is in the photo mashups. Also encourage students to use object photos or people that blend best with their friend so they are unrecognizable. If you feel some students will be more recognizable than others regardless of fractional parts selected, you can offer students four preselected photographs that everyone has to mashup for the challenge.

App Features You Will Use

In **Create Mode**, you will use:	

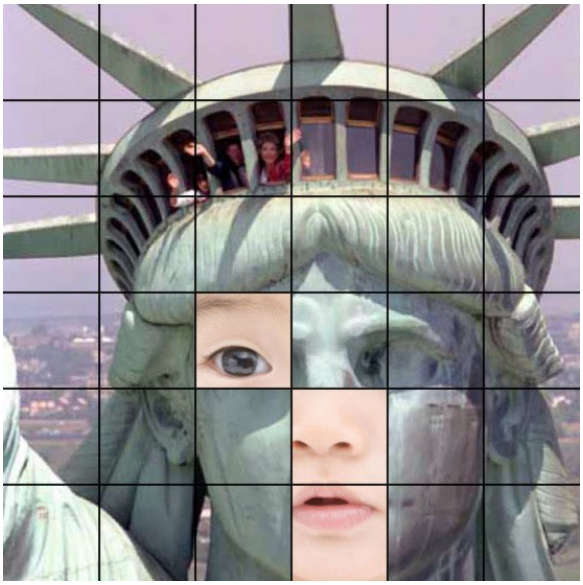
	Swipe right to increase or left to decrease the numerators and denominators. This controls how many parts are in your mashup and how big they are.
	Import or take a new picture.
	(Visible when you choose to take a new photo) Turn the grid on/off.
	(Visible when you choose to take a new photo.) View a semi-transparent overlay of the other picture.
	Change grid options to slice the picture the way you want. Custom allows you to choose how many parts as the number of rows times the number of columns.
In **Combine Mode**, you can use:	
	View the equation that expresses the sum of the mashup
	Turn on/off an effect that blends images.

Expected Activity Time

Hidden Face Challenge (20 minutes)

Materials and Prep

- ☐ *Hidden Face Challenge* Student Sheets
- ☐ iPad with Fraction Mash app
- ☐ Wifi access for sharing mashups



Activity Prompt

Intro: Do you ever see faces hidden in objects? In this activity, you will hide your face in an object in two ways: 1) trying to show as much of your face as possible yet still be hidden, and, 2) show as little of your face as possible yet your classmates can still tell it's you in the picture.

Hidden Face Challenge: Create two images, one in which you are trying to show as much of your face without being recognizable to the class, and another where you are trying to show as little of your face as possible while still being recognizable.

What To Do

Hidden Face Challenge (20 minutes):
Have students open the app, and select "Make A Mashup."

To start, students need to choose two pictures to mash, one of an object and one of themselves.

- Students can import from the camera roll or take new pictures.
- Suggest that students turn on the Overlay feature while taking a new photo to help them line up their shot.
- To adjust individual photos in the frames, students can use two fingers to zoom or rotate.

Encourage students to think about where they want to place the face on/in the object and:

- Decide whether they are trying to show as much of their face but still be hidden or as little of their face but still be recognizable.
- Experiment with choosing parts and selecting Combine to check to see how the mashups look.
- As they work, have students save their mashups.
- Once saved, anonymously post their images to the online project space or send them to you (the teacher) so you can share them with the class. Have students rate which ones show the greatest fractional parts of the whole to least for each challenge. Pick winners.

Discussion

Prompt students to share the mashups they made and what they had to do to achieve the effects they wanted. Ask students:

- Which mashups have the fewest fractional parts of the whole? The most?
- What grids seem most effective in revealing or hiding someone?
- How do the pictures with unlike denominators compare?
- As you created your mashups, did you notice any parts of your face that was highly important to achieving the effect?

Examples of language and discourse to listen for as students engage with Fraction Mash:

- "The larger denominator gives me more pieces, but they're smaller."
- "The face sections are about the same as the object sections, yet the face still seems hidden because …"
- "1/2 is a larger piece than 1/9 so …"
- Statements about comparative fractional quantities and ways in which increasing or decreasing denominators helped to achieve the result they were after.

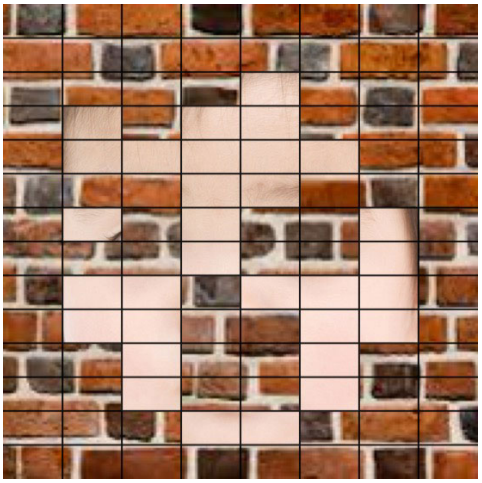
Extensions and Inquiring Further

Examine what fraction of the whole image their different facial parts are. The faces can be resized by zooming. How does this affect the fractions of each part (eyes, nose, etc.)? Is the eye 1/8 of the face? 1/10? Etc.

Name: _____ Date: _____

Fraction Mash Activity 3: Hidden Face Challenge

Combine a picture of your face with another object in two ways: 1) show as much of your face as possible but remain unrecognizable to your classmates, and 2) show as little of your face as possible while allowing everyone to still know that it's you.



To Do:

1. Decide which challenge you would like to do.
2. Take two new pictures, or use pictures from your camera roll. Resize the pictures by pinching to line up features like eyes and mouths.
3. Think about where you want to place your face on/in the object.
4. Experiment with choosing parts and selecting **Combine** to see how your mashups look.
5. When you get the mashup you want, save it to your camera roll and share with your teacher.

Name: _____ Date: _____

Fraction Mash Activity 3: Hidden Face Challenge Reflection Questions

1. As you created mashups and changed the denominators and numerators, what did you notice? Which worked best. Why?

2. Were you able to have more than half the mashup consist of “face parts” without your peers recognizing you If so, how were you able to do this?

3. Find classmates who created mashups with fractions that were similar to yours. Describe the similarities and differences in the outcomes and include the fractions used in your description. How were your mashups similar? How were they different?