



## Digital Design for English Language Learners: Crazy Animal Hybrids

*In this activity, students combine animals to make new, crazy hybrid creatures and explore the fractional parts, redefining of a whole, and equivalent fractions.*

### Learning Goals

1. Students will create visual models of fractions, then recreate the models using different grids and denominators
2. Students will redefine a whole by looking at their creature with a different denominator.
3. Students will explore the inverse relationship that larger denominators yield more parts that are smaller in size.
4. Students will use mathematical language to describe the part to the whole relationship in their hybrid creature.

### Prep

The instructor should have foundational knowledge of [Fraction Mash app](#).

This activity was adapted from [Paraffe](#), [Pandaphant](#), [Pengorse](#) and may be referenced for more information.

### Materials

- iPads with [Fraction Mash app](#) installed.
- Internet access (optional)
- Printed images of different animals (optional)
- [Spanish English Picture Dictionary](#).
- Design notebooks (optional).

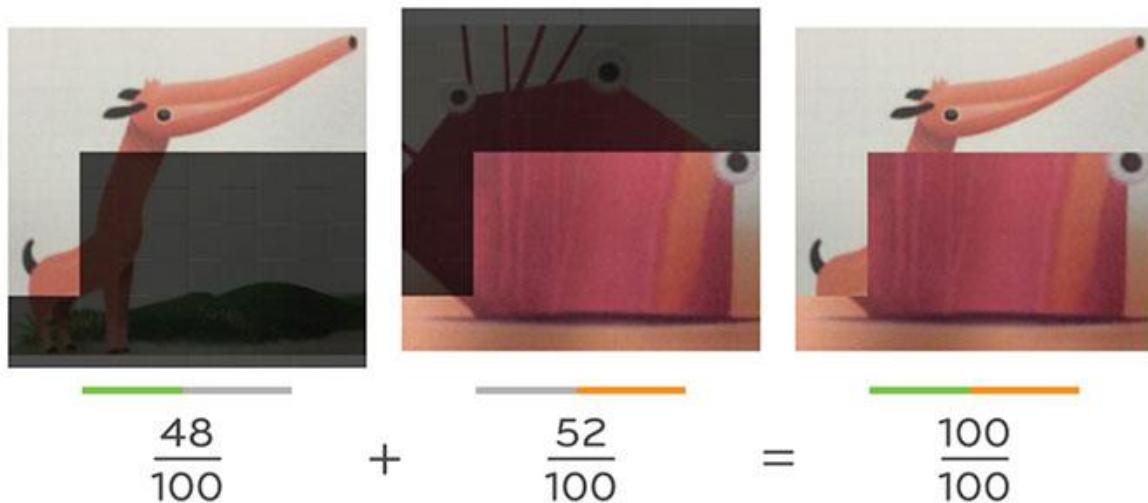
### Key Vocabulary

- hybrid
- fraction
- whole
- part
- denominator

- numerator
- equivalent
- greater than
- less than
- one half (1/2)

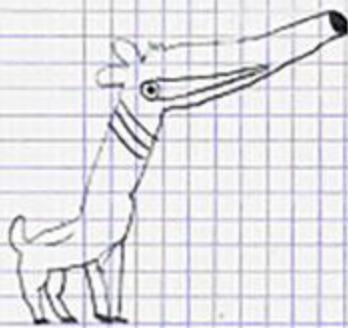
## Getting Started

### Crazy Animal Hybrids

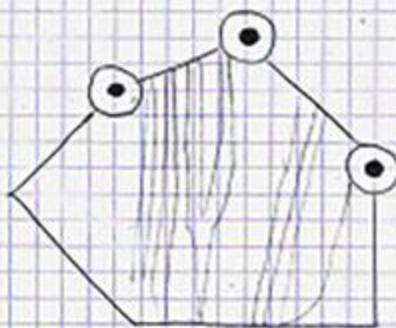


- Show students pictures or videos of hybrid creatures. Images of mythological creatures such as the pegasus and centaur are excellent for demonstrating hybrid creatures. [See examples.](#)
- Encourage students to dream up hybrid animals based on their favorite real animals, perhaps based on unique characteristics or adaptations of animals, or even fictional characters that they love. If students have access to other unique characters (as seen in the example taken from NYSCI's Connected Worlds exhibition), encourage them to take photos and mashup in this activity.
- Students will draw hybrid creatures in their design notebook or on graph paper, possibly using printed images as references.
- Students will bring images (digital, printed, or drawn) into the Fraction Mash app to create a hybrid mashup creature.

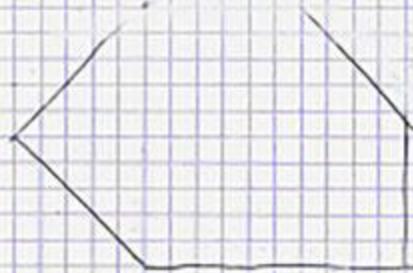
Ante Pony



Rock Roller



Antroller



There are 100 squares in the whole grid.  
My first animal, the Ante Pony, is on 18 squares.  
This fraction is  $\frac{18}{100}$  or  $\frac{9}{50}$ . My second animal,  
the Rock Roller, is on 7 squares. The fraction is  
 $\frac{7}{100}$  or  $\frac{7}{50}$ .

1<sup>st</sup> Point (-1,-5)

2<sup>nd</sup> Point (18,-5)

3<sup>rd</sup> Point (10,-5)

4<sup>th</sup> Point (-29,-5)

5<sup>th</sup> Point (-5,-5)

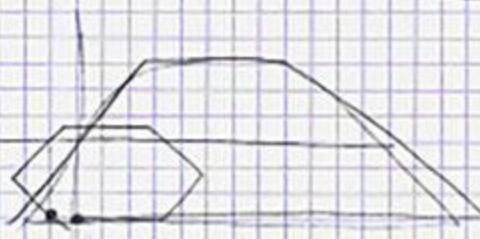
6<sup>th</sup> Point (-1,-5)

7<sup>th</sup> Point (-27,-5)

8<sup>th</sup> Point (-33,-5)

9<sup>th</sup> Point (-25,-5)

10<sup>th</sup> Point (-7,-5)



**Tip:** Ensure that students really understand this concept by showing or modeling a sample of a hybrid creature, and then have them draw it.

### **Guiding Questions:**

- If you take away all the background grid pieces (those that do not include the new hybrid animal), how many grid pieces are left? That is your new whole (new denominator).
- Using your new whole, what is the new portion (numerator) dedicated to each part of the hybrid animal?
- If you compare fractional parts of the hybrid to that of the original creatures, are they similar? Different? For instance, in an original picture, the head of a horse might be  $\frac{4}{16}$  of the animal. Once the new hybrid animal is created with the head of a horse and body of a human, the head might now be  $\frac{8}{32}$ . What can you discover by comparing these two fractions?

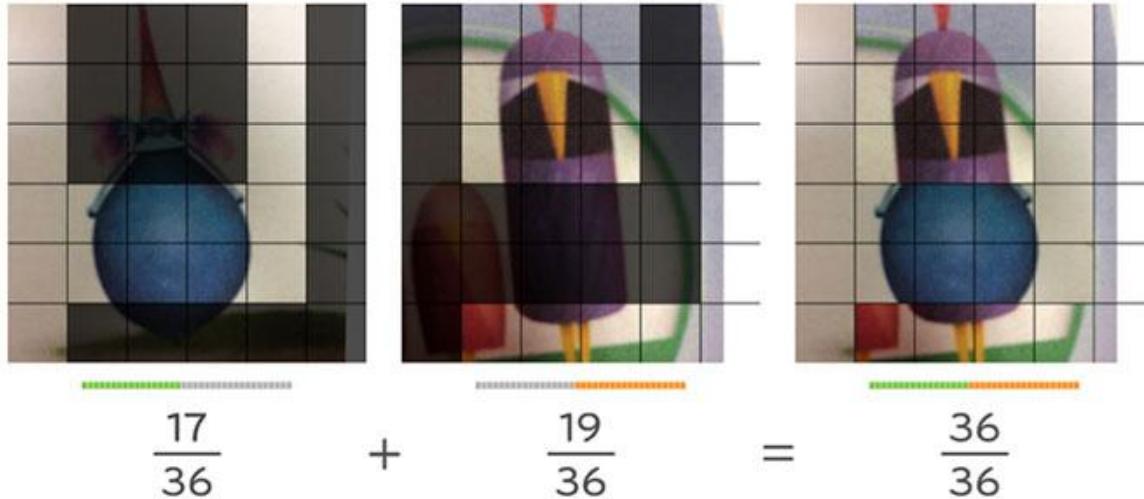
### **Share and Present**

Students will share their hybrid creature drawings with a small group or with the class. They can explain why they chose the two animals that make up their new hybrid and what its new name is. Students should begin using mathematical language to describe the number of parts/pieces that make up their hybrid.

### **Sentence Frames for Using Math Language**

1. I used \_\_\_\_\_ (shape) grid.
2. There are \_\_\_\_\_ pieces (e.g. squares) in the whole grid. My first animal, the \_\_\_\_\_, is on \_\_\_\_\_ pieces (e.g. squares). This fraction is \_\_\_\_\_. My second animal, the \_\_\_\_\_, is on \_\_\_\_\_ pieces (e.g. squares). This fraction is \_\_\_\_\_.  
\_\_\_\_\_.
3. When I count the number of pieces (e.g. squares) with ONLY the animal in them, the new whole number is \_\_\_\_\_. (Do not count the background, pieces that do not include animal). The new fraction of one animal is \_\_\_\_\_. This is \_\_\_\_\_ (greater than or less than)  $\frac{1}{2}$ . The new fraction of the other animal is \_\_\_\_\_. This is (greater than/less than)  $\frac{1}{2}$ . (If students have used a grid to determine the fractional parts of the original animals with that of the new hybrid, you may be able to have them compare the fractional parts of original animals vs. new hybrid.)
4. The original animal's \_\_\_\_\_ (body part) was this fraction \_\_\_\_\_. The \_\_\_\_\_ (body part) in the new hybrid is this fraction of the new whole \_\_\_\_\_.

## Digital Design in Fraction Mash



### Redefine the whole

As students are creating their hybrid creatures, they are learning how to *redefine the whole*. **Tip:** Explain redefining the whole, as this is a difficult concept to comprehend for second language learners but this app is a great way to introduce them to it and allows them time/the ability to demonstrate what they do and do not understand.

Ensure that the grid option is on. Count the number of squares the entire hybrid animal takes up. DO NOT count the background. If the animal is just barely in a square part, do not count it. The total parts will be the redefined “whole,” or the new denominator.

Then count the number of parts that make up each animal. The total of each animal part will make up the new numerators. Students should write these new fractions in their design notebooks.

- Students will then change to a custom grid, increase the denominator, and count how many parts/pieces (e.g. squares) comprise the whole hybrid animal and how many squares comprise each animal in the mashup.
- Have students explore what happens with at least three different grids (increasing or decreasing the denominator each time).
- Students will compare the fractions across the different grids and denominators. What do they notice? Are the fractions equivalent? Do they take up the same space

## **Guiding Questions**

- Are the fractional makeups of each grid examination more or less equivalent?
- Are there any new fractions that are NOT the same? Why do you think this happened?

The visual examples of their newly created animals are students' anchors for understanding. Stop to check for understanding as they experiment with different grids. Have students describe what they notice, what makes up the whole, and how they would express the parts of the whole.

## **Share and Present**

Students will share their hybrid creatures with the class. When it is helpful to an individual learner, the Sentence Frames for Using Math Language can be available for them to talk about the math involved in the creation of their creatures.

**Tip:** Allow for students to be able to communicate in the way they are the most comfortable – this may include a translator, using gestures and key words to explain parts of their hybrid animals, or “code switching” (alternating between two or more languages). Allowing for multiple modes of expression, you are more likely to see what they understand.

## **Questions for Understanding**

- What is the redefined (new) whole? (The new whole eliminates the background pieces that don't include any animal parts.)
- What are the redefined (new) numerators (parts of each animal)?
- How could you create a new creature that is  $\frac{1}{2}$  of each creature?

## **Extend Your Learning**

- Write or tell a story or myth to explain how your hybrid creature came to be.
- Print out the hybrid creatures along with their stories and create a group gallery!

**Tip:** The purpose of the “extending your learning” piece is to challenge ELLs at any level from beginners to commanding to be empowered to extend their thinking the best way possible.