



# Face-Off

## The Big Idea:

Draw or print out faces, then cut them into squares and rectangles. Roll the dice to switch pieces with your partner, then do the math to find out just how mixed-up your face really is!

## You Will Need:

- ★ Clean sheets of paper
- ★ Ruler and pencil, or else a printer
- ★ Markers
- ★ Scissors
- ★ A die, or hands that can do rock-paper-scissors (see below)

## The Math Behind the Scenes:

Younger kids can count and add the pieces as more of them trade places. Mid-elementary kids can identify coordinates, counting the rows and columns for a given puzzle piece – this lays great groundwork for graphing in the future. Big kids can figure out what fraction, percentage and decimal of pieces switched, and move fluently between them – in a country where many adults are nervous about calculating the tip. Here's your kids' chance to get a leg up!

## Make a Face

You can make fun faces in two ways. One is to draw them yourselves:

1. If you have a printer, choose a grid from below, and print one per player. Or, draw your own matching grid with a pencil and ruler.
  - ★ Use a 10-piece grid to practice the simplest math – each piece is 10%.
  - ★ The next level up is the 20-piece grid – each piece is 5%.
  - ★ Advanced learners can tackle the 25-piece grid – each piece is 4%.
  - ★ And the top level uses 16 pieces – each piece is 6.25%.
2. Write each square's number in its bottom right corner lightly with a pencil (as shown below). That will help you track pieces later as you assemble.
3. Kids can now use markers to draw a face, using the dotted guidelines. You want all faces to be laid out the same way so you can switch similar pieces.
4. Then cut each picture along the dotted lines to make squares/rectangles.

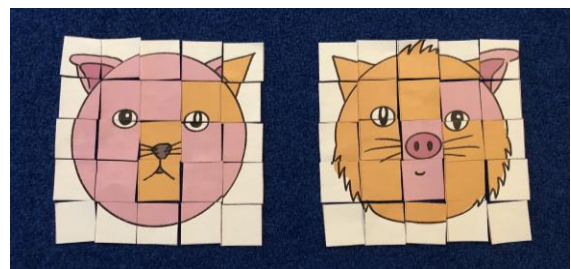
OR, you can print photos of yourselves and/or famous people. As long as the heads are about the same size, and you cut the same squares, they will work.

A minimum of 2 players is required to play the game, but you can play with 3. Once players have made faces, you're ready to face-off!

## Face-Off!

Here's how to play:

1. Set a target number of pieces to switch, e.g. 16 pieces out of 25.
2. The 1<sup>st</sup> player rolls the die. Or, if your dice are lost in the couch, try this: In rock-paper-scissors style, both of you stick out 0, 1, 2 or 3 fingers. Add them to get a number from 1 to 6.
3. The player chooses that number of pieces from his/her face and swaps them with the matching pieces in the other face. Whoa, so messed up!
4. Then the player does a math challenge from below. Try as many as you can!
5. The 2<sup>nd</sup> player rolls the die (or the players use fingers), and switches pieces.
6. If you have 3 players, the 3<sup>rd</sup> player rolls the die (or the players use fingers) and switches pieces.
7. The first player to reach the target number (e.g. 16) is the winner!



## Riddles and Questions

PreK to K:

- ★ How many pieces are in the top row? Count from left to right.
- ★ Now count another row from right to left.
- ★ Now try counting down from that number!

1<sup>st</sup>- and 2<sup>nd</sup>-graders:

- ★ How many pieces switched on the last turn, and then on this turn? What does that add up to?
- ★ By subtracting, can you figure out how many pieces are still in their starting faces?

3<sup>rd</sup>-graders:

- ★ What fraction of the picture does each piece represent?
- ★ Out of the total pieces, what fraction have switched so far?
- ★ Can you reduce that fraction?

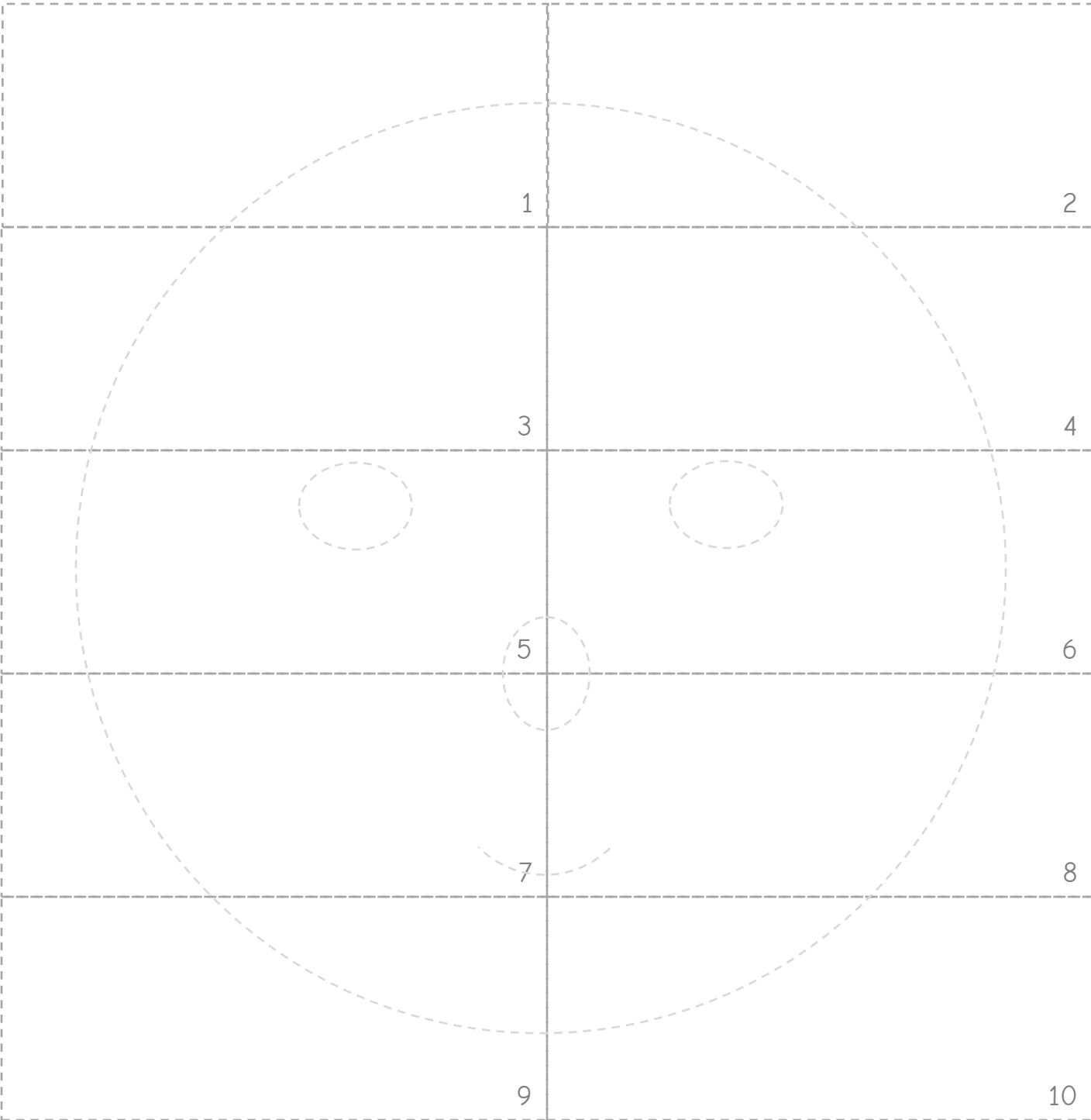
4<sup>th</sup>- and 5<sup>th</sup>-graders:

- ★ What percent of the picture does each piece represent?
- ★ Out of the total pieces, what percentage of them have switched so far?
- ★ What decimal number does each piece of the picture represent?
- ★ Of the pieces that have switched so far, how would you express that as a decimal?

Grids can be found starting on the next page!

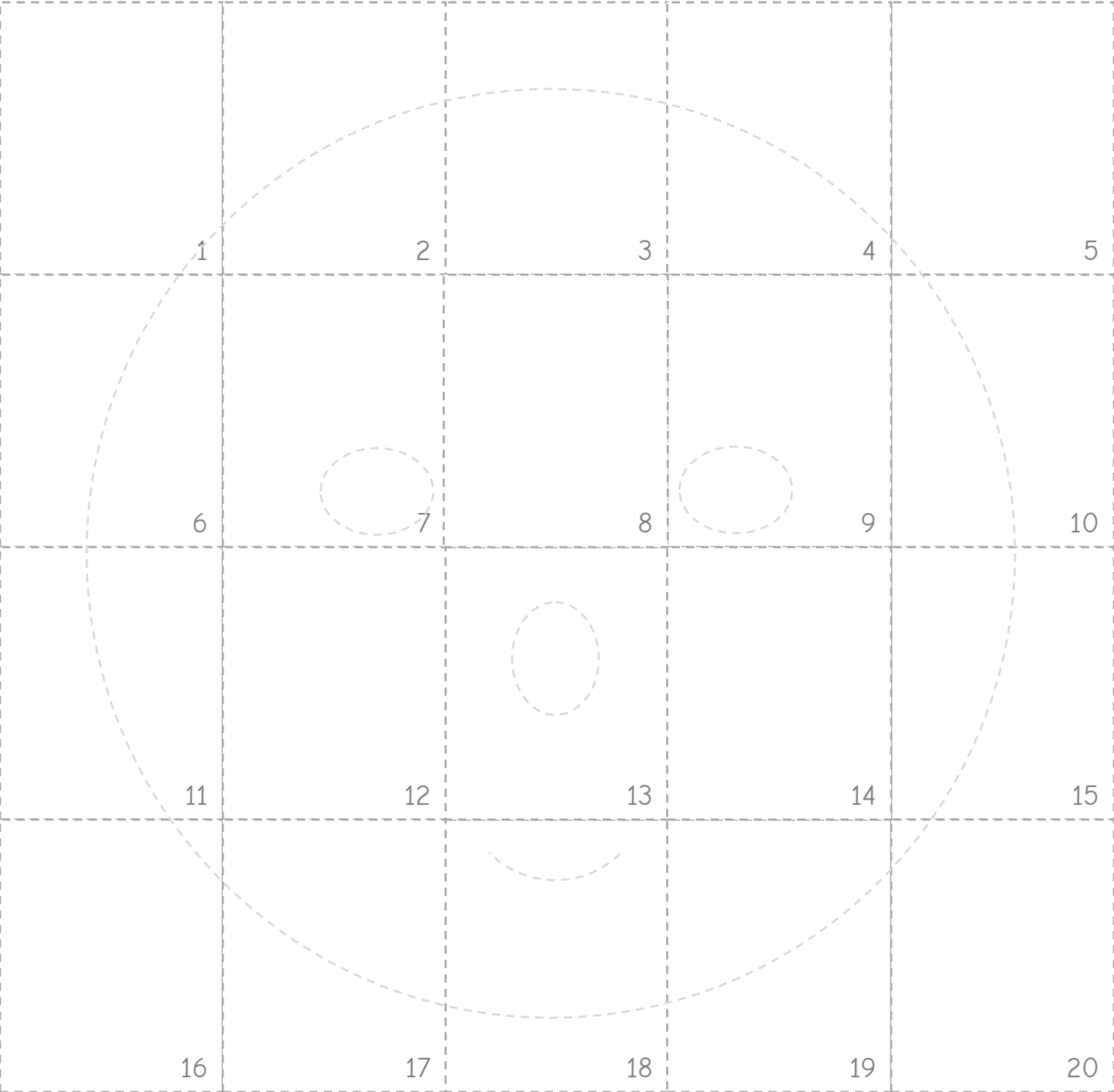
# Level 1: 10 Sections

To draw: 4 inches wide, 1 ½ inches tall



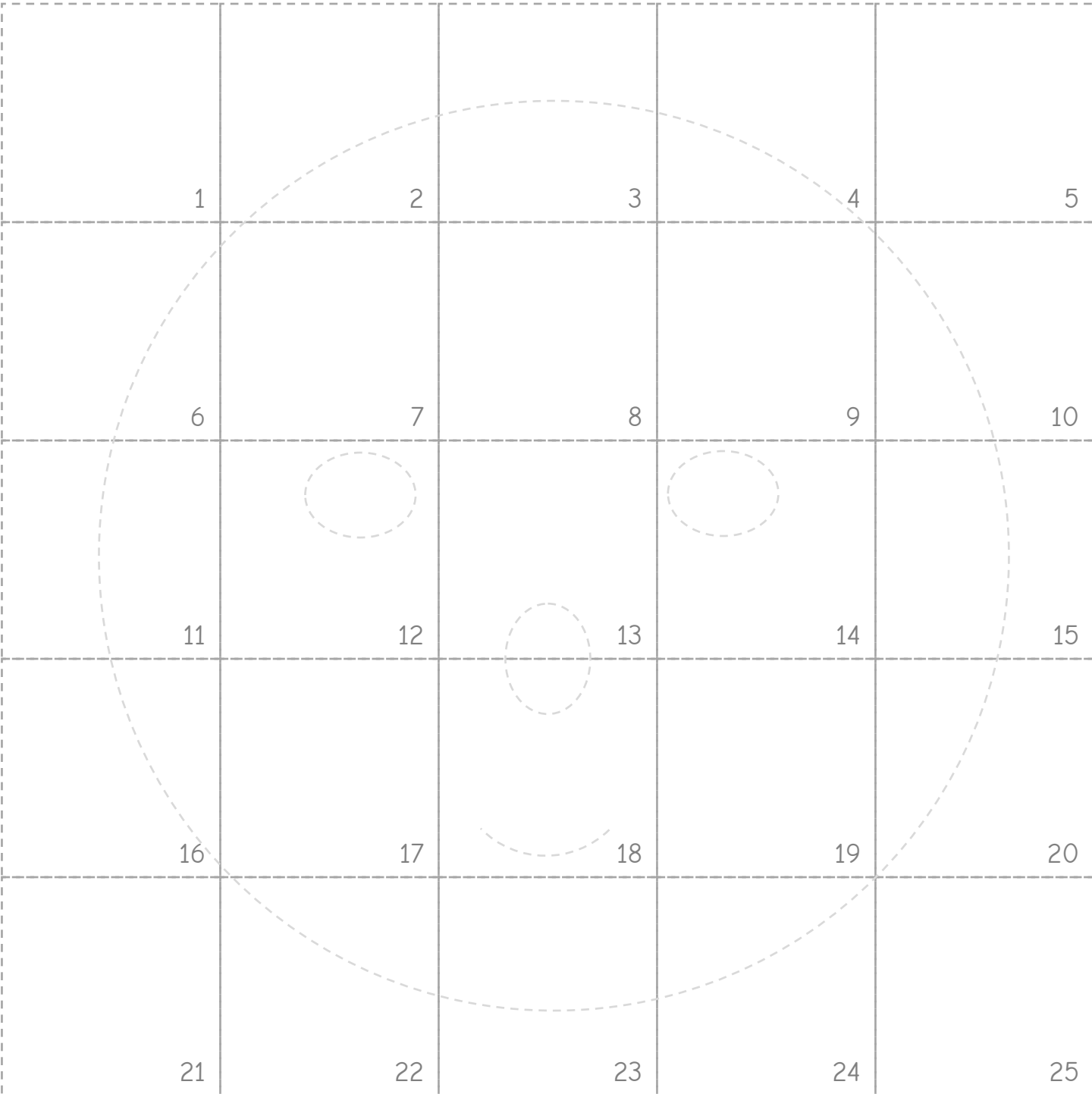
# Level 2: 20 Sections

To draw: 1 1/2 inches wide, and 1 3/4 inches tall



# Level 3: 25 Sections

To draw: 1 ½ inches wide, and 1 ½ inches tall



# Level 4: 16 Sections

To draw:  $1\frac{3}{4}$  inches wide, and  $1\frac{3}{4}$  inches tall

