

## Finger Trails Day 1

### Introduction

This activity encourages students to connect multiple representations of the numbers 1-5 as well as develop 'finger discrimination' so that students understand individual fingers really well. In the Atlantic article, *Why Kids Should Use Their Fingers in Math Class*, Jo Boaler and Lang Chen share the importance of using fingers for the brain's development of numbers.

### Agenda

Activity	Time	Description/Prompt	Materials
Mindset Message	10 min	Share the messages from the mindset video, <i>The Importance of Struggle</i> , <a href="https://youcubed.org/weeks/week-4-grade-K/">https://youcubed.org/weeks/week-4-grade-K/</a>	
Launch	10 min	Read the directions to the students and play once as a whole class.	<ul style="list-style-type: none"> <li>One six-sided die or online alternative</li> <li>Finger Trails Gameboard</li> <li>Magnets or whiteboard markers to use as/draw counters</li> </ul>
Play	20 min	<ul style="list-style-type: none"> <li>Have students use the Hand Outline handout to number their fingers.</li> <li>Have students find a partner in class.</li> <li>Pass out one Finger Trails board to each student and one six-sided die per pair of students.</li> <li>Have students play a few rounds of the game together.</li> </ul>	<ul style="list-style-type: none"> <li>Hand Outline Handouts</li> <li>Finger Trails Gameboard Handouts</li> <li>Six-sided dice</li> <li>Counters (or other markers)</li> </ul>
Discussion	10 min	Discuss the following questions as a whole class: <ul style="list-style-type: none"> <li>Which trail took the most turns to complete? Why?</li> <li>Which trail took the fewest turns to complete? Why?</li> </ul>	
Debrief Mindset Message	5 min	Ask students to reflect on the struggles they had while they explored the activity. Invite them to share the moments when they were challenged the most and what they learned from going through that challenge. Remind them of the idea that they are learning the most when they are struggling at the edge of their understanding.	

### Activity

Watch the mindset video before class. See if there are any clips from the video you want to share with your class. At the beginning of class share the mindset messages from the video with your students.

Introduce the activity by explaining the rules of the game (on the next page) to students and playing the game once as a whole class. For this you may want to project the game board on a whiteboard and use magnets as the counters or use whiteboard markers to draw and erase circles to represent the counters on each trail. You can use a regular die and read the result to the class after each roll, or, if you're projecting from a computer, you can Google "Roll a Die" and use Google's digital die. There are many other die rolling apps and websites you can use as well. However, we suggest a die that has dots rather than numbers on its faces, since one of the representations of number that we want students to familiarize themselves with are the traditional arrangements of dots that are used widely to represent those numbers. The representation of a dot pattern in an organized way is called cultural subitizing and is important for students to learn. An example of subitizing is when you know the "5" pattern you just know there are 5 dots and you do not need to count each dot individually.



Once students have experienced the game as a whole class they should pair up to play the game. In order to help students assign a number to each finger you may use the hand outline handout where they can color code and number the fingers they will use for each trail.



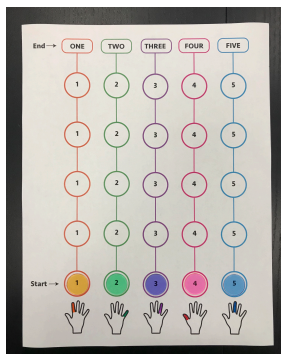
The students in each pair will take turns rolling their die and moving the counters on their own board. The first student to reach the end of the board with all their counters wins. Notice how students connect the representation of the number on the die to the symbolic representation of the number on the gameboard, and to the number of hops to move the counter forward.

It is useful for students to play the game a few times so they can start noticing patterns they can bring up in the discussion. Once they have played a few rounds you can bring students back to a full class discussion to talk about the following three questions: Which trail took the most turns to complete? Which trail took the fewest turns to complete? and Why? Encourage students to discuss other patterns they may have noticed. These questions will get at some basic notions of multiplication as well as distance, the absolute values of the numbers in play to be developed in later grades.

## Finger Trails Game Rules

### Game Rules:

1. Assign numbers 1-5 to the fingers on one of your hands in whatever order you want. Color in the finger you will use for each number underneath its corresponding trail.
2. Place counters (or some other form of marker) in the first circle of each trail to start the game.



3. Roll a die. If you get a number that is one through five, use your finger labeled with that number to slide the counter in the trail with that number, that number of spaces ahead. For example, if you roll 3, use your 3-finger to push the counter on the 3-trail 3 spaces ahead. The goal is to reach the end of each trail (the word for the number), even if you get a number greater than you need to get there.
4. If you roll a 6 or a number whose counter has reached the end of the board, re-roll.

### Optional Variations:

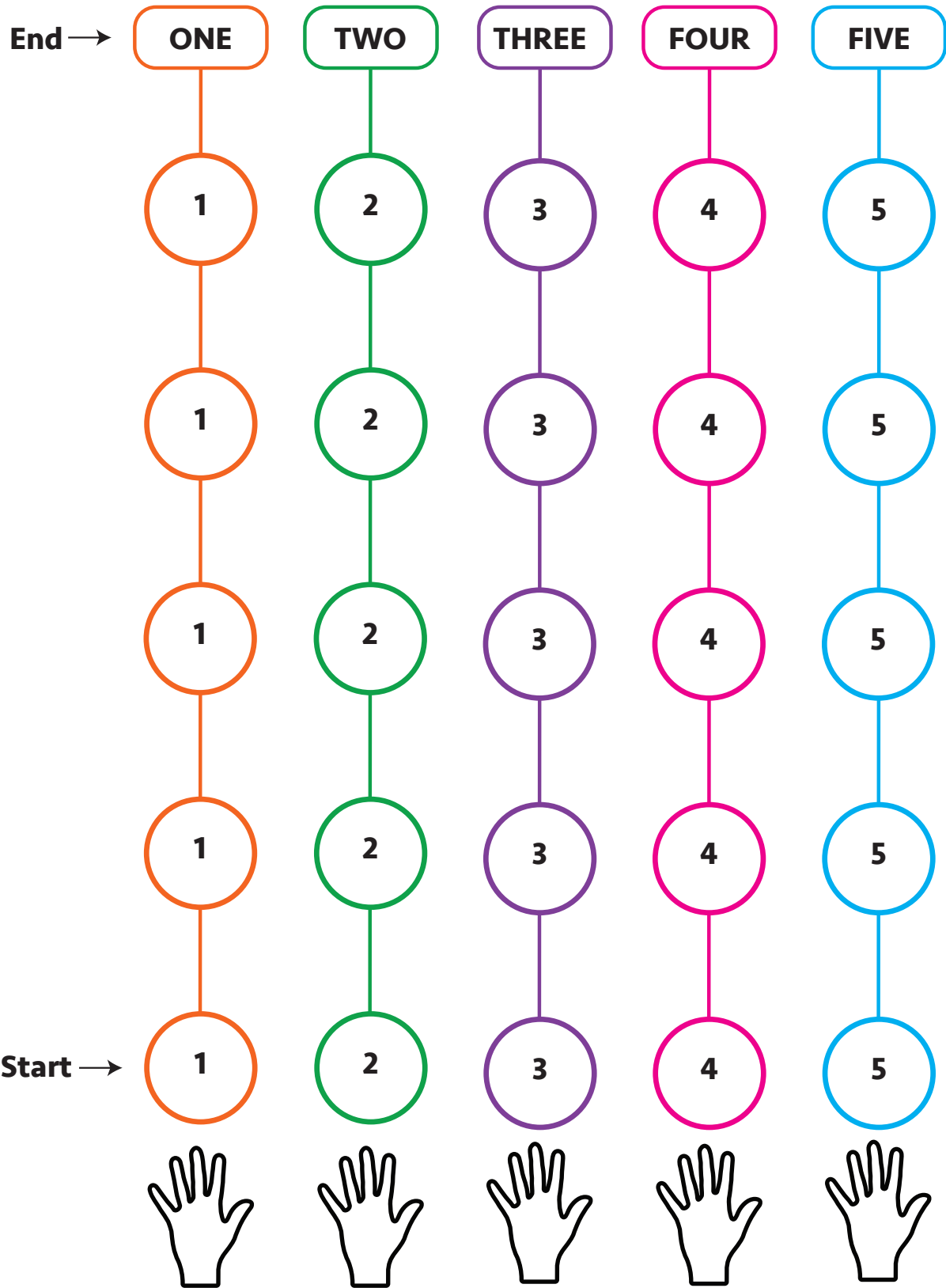
#### Lefty-Righty

- Give one student in the pair a right-handed board and the other one a left-handed board. Have them switch boards between games. This will help them with finger training in both hands rather than in just their dominant hand.

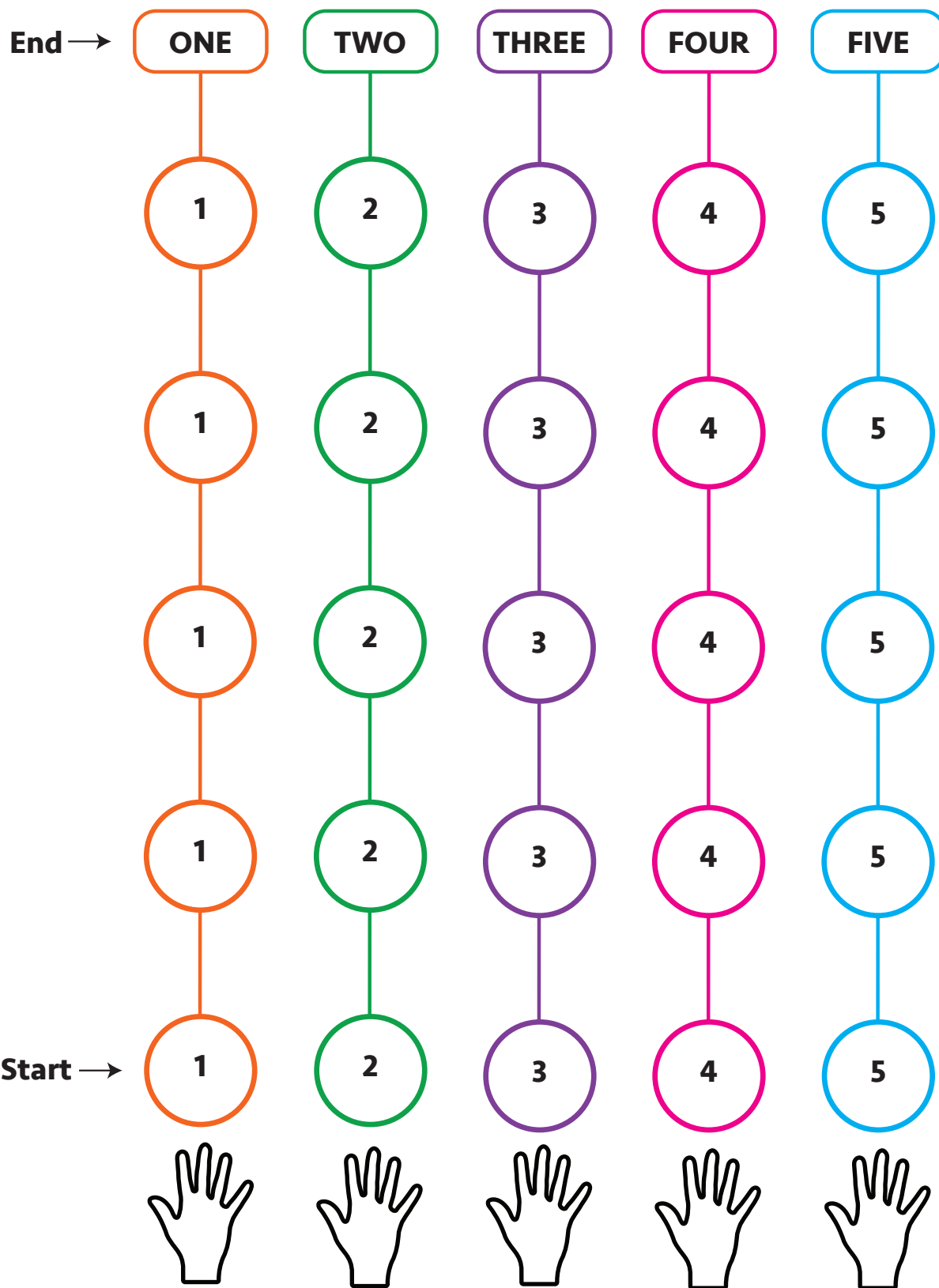
#### Backwards Six

- When you roll a 6, move each counter one step back.

# Finger Trails Gameboard



# Finger Trails Gameboard



Hand Outline  
Handout



Hand Outline  
Handout

