Give Probability

What are the chances that you will find an eraser that is hiding under one of two cups? Because there is only one eraser and two cups, your chance is 1 out of 2. You could write that chance as $\frac{1}{2}$. The number for your chance is $\frac{1}{2}$ because the eraser is under 1 out of a total of 2 cups. If there were 1 eraser and 10 cups, your chance of finding it would be 1 out of 10 or $\frac{1}{10}$. (That's a much smaller chance!) Using math to figure out the chance that something will happen is called **probability**. Let's try it!

Fractions, like $\frac{1}{2}$ or $\frac{1}{10}$, are a great way to write down probability because they can give a lot of information in a small space.

1 Draw a chart like the one shown, or use the chart from the Student Activity Sheet. Working with a partner, decide who will hide the eraser and who will try to find it.

2 **Hider's Job:** Turn both cups upside down on your desk. Place the eraser under one cup. Your partner is not allowed to look while you mix up the cups. Let your partner know when it is time to choose a cup.

3 **Finder's Job:** Don't peek when your partner is mixing up the cups. When it is time to choose a cup, lift the cup that you think might have the eraser under it. Then put a mark in the chart to show whether you did or did not find the eraser.

YOU WILL NEED:

2 opaque cups
1 small eraser
1 chart per person
pen or pencil

Trial	Found Eraser!	No Eraser
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
Total =		

a Chance

4 Repeat steps 2 and 3 for a total of 10 trials. Count the number of times you found the eraser and write it in your chart.

5 Trade jobs with your partner, and do 10 more trials.

6 Remember when we said your chance of finding the eraser was $\frac{1}{2}$. This means that you could expect to find the eraser about half the time. Out of 10 trials did you find the eraser about 5 times? Compare your results with your partner's.

You may not have found the eraser exactly 5 times. It does not mean that you made a mistake. It does not mean that the math is wrong either. When you average together the results of many people though, the average is likely to be very close to 5.

TEACHER:
To get a larger sample of results, record the number of times that each student found the eraser and have the students find the average. Are your class's results very close to 5?

Why are your chances of finding the eraser the same as your chances of not finding the eraser?