

# PROBABILITY EXPLORATIONS STARRING THE TI-73

## FLIPPING A SINGLE COIN

Each student must have a coin that clearly distinguishes HEADS from TAILS.

Have the student flip the coin 50 times and tally the results in a table like the one below:

# of HEADS	# of TAILS

Discuss how often heads “should have” come up and have each student compare that with what actually happened. Discuss any irregularities.

Now let’s do this activity electronically by using the random number generator residing in the TI-73.

NOTE: It is a good practice to “seed” the calculator’s random number generator before using the probability menu. Each student should use a different seed value. So have each student pick any 7 digit number (and use a different one each time) at random and store it into the variable rand as shown below:

To see what menu we will use:  
<MATH> <PRB>

Now let’s go back to the home screen, type in the 7-digit number and store it into rand.

You can actually use any size number for the seed.

```
MATH NUM LOG
1:rand
2:randInt(
3:nPr
4:nCr
5:!
6:coin(
7:dice(
```

```
3141592→rand
3141592
```

Now we are ready to “flip a coin electronically.” Clear the home screen.

<MATH> <PRB> 6

Home screen:

Type this, <ENTER>

```
MATH NUM LOG
1:rand
2:randInt(
3:nPr
4:nCr
5:!
6:coin(
7:dice(
```

```
coin(
```

```
coin(1) (1)
```

Here is where you must decide whether the number one represents Heads or Tails. For our discussion, One represents a Heads, while a Zero represents a Tails.

To “reflip” the coin, just press the <ENTER> key.

Run this “experiment” electronically for 50 trials and record the results as you did before:

# of HEADS	# of TAILS

Again discuss how often heads “should have” come up and have each student compare that with what actually happened. Discuss any irregularities. Compare this simulated electronic data with the actual experimental data and the mathematical probabilities.

Since the discussion should lead to using many more trials, combine each person’s data.

### Class Data Using a Coin

# of Heads	# of Tails	Total # of Trials	% Heads	% Tails

### Class Data Using the Calculator to Simulate the Coin Flip

# of Heads	# of Tails	Total # of Trials	% Heads	% Tails

Discuss how these two sets of data compares with the expected (mathematical) probabilities.

## FLIPPING TWO COINS

For this activity we are going to simulate flipping two coins at a time and tallying the number of times we get zero heads, one heads, or two heads. Each student will perform 50 trials (although the number of trials is optional). After the individual data is collected we will combine each student’s data into one set of class data. We will use this to compare with the expected probabilities.

### Individual Data: Flipping Two Coins

0 Heads	1 Head	2 Heads

### Class Data: Flipping Two Coins

0 Heads	1 Heads	2 Heads	Total Trials	% 0 Heads	% 1 Heads	% 2 Heads

Now let us investigate the expected probabilities. Have the students discuss and list all the possible arrangements of how many heads and tails there are when flipping two coins at a time.

Now compute what percentage of the time you would mathematically expect there to be:

0 Heads

1 Heads

2 Heads

Compare these with the experimental percentages on the previous page. Discuss what you observe.

### **FLIPPING THREE COINS**

Using the previous 2 examples, design a similar activity but for flipping 3 coins at the same time. Write out the directions and solution below.