Heads Up

Preparation:

Start with a stack of about 9 to 15 coins. It is easier if the coins are all the same size but that is not required. Nickels work well. Be sure they are clean and easy to read heads and tails. It works well with playing cards using fronts and backs. If you have plastic counters in your classroom with 2 colored sides they work great. My wife has red - yellow counters form her math material she uses. I use round circles that are white on one side and black on the other but that requires some work to make them and cut them out. They are the easiest to see for students at a desk. I provide a set of circles like this on the last two pages. If you want to us them print the page of back circles on white paper and cut out the circles.

Note: If you use the cut out circles be sure the paper disks are not stuck together . when you lay them out on the desk be sure to separate them so they are not stuck together or overlapping.

Presentation:

1. Start with a stack of about 9 to 15 coins. Take any number of the coins and lay them out on the desk. Ask a student to turn over as many or as few coins as they like. They can also shuffle the coins in any way they like until they are satisfied that they have controlled the arraignment of the coins facing up.

Additional Touch: If you want you can lay out about 6 to 9 coins and then have the student add as many coins as they like. This way the student really has a free choice as to the number of coins on the desk and the arraignment of the coins facing up.

2. With your eyes shut or your back turned to the desk pick up chips from the desk and put them in a stack in your hand. **Pick up the number of chips that is equal to the NUMBER OF HEARDS UP COINS ON THE DESK.** You will have a stack of chips in your hand and there will be a number of chops left on the desk.

3. Take the stack in your hand, and **TURN the stack over in one smooth motion so they do not notice the move. Turn around or open your eyes and place the stack on the desk** Announce that you are positive that there are an equal number of coins in your stack that are heads up as the number of heads up coins on the desk. To prove this have the student count the number of coins that are heads up on the desk. Now have them do the same with your stack. Both stacks will have the same number of heads.

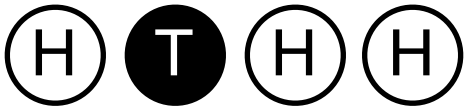
Note: This trick can be done over and over. The number of coins used may differ, the number of coins in either stack may differ, and the number of heads in the stack may differ , but the stacks will always contain the same number of heads.

Example 1

5 heads face up

Your stack: Pick any 5 coins

leaving 3 heads



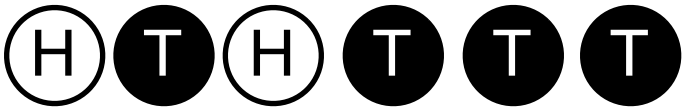
Turn your stack over and you have 3 heads

the remaining coins have 3 heads

Example 2

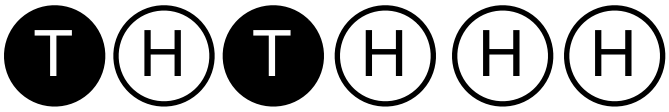
6 heads face up

Your stack: Pick any 6coins



leaving 4 heads

Turn your stack over and you have 4 heads

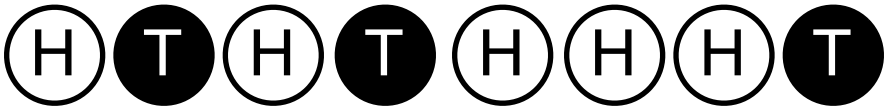


the remaining coins have 4 heads

Example 3

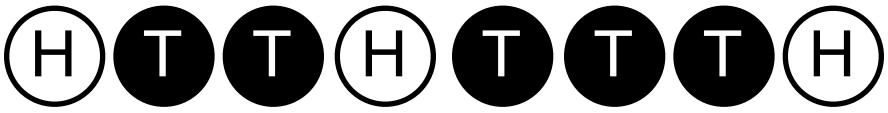
8 heads face up

Your stack: Pick any 8 coins



leaving 3 heads

Turn your stack over and you have 3 heads



the remaining coins have 3 heads

Example 4

all 5 heads face up (rare case)

Your stack: Pick all 5 coins

leaving 0 heads

Turn your stack over and you have 0 heads

the remaining coins have 0 heads

How the trick works

The number of coins and the number of tails does not matter. The only number that matters is the number of heads up coins.

There are H heads up coins on the desk.

You pick H coins from the desk for your stack.
If your stack has X heads then your stack has **H – X Tails.**

There were H heads up coins on the desk.
You have X of them in your stack so there are **H – X heads up coins on the desk.**

When you turn over the **H – X Tails in your stack**
there are now F – X heads up coins in your stack.

The exact number of face up coins on the desk.

Example

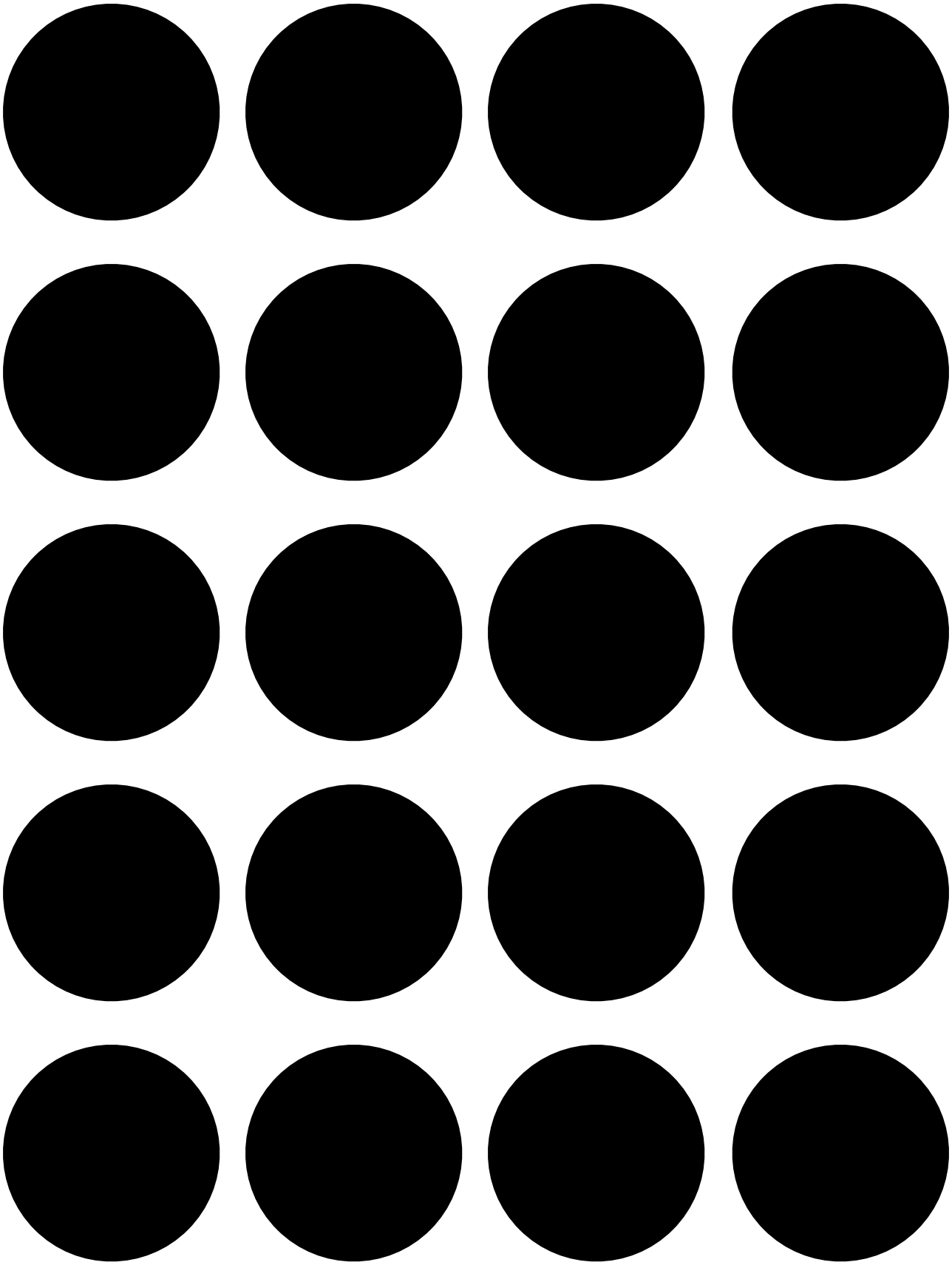
There are 9 heads up coins on the desk.

You pick 9 coins from the desk for your stack.
If your stack has 3 heads then your stack has **6 Tails.**

There were 9 heads up coins on the desk.
You have 3 of them in your stack so there are **6 heads up coins on the desk.**

When you turn over the **6 Tails in your stack**
there are now 6 heads up coins in your stack.

The exact number of face up coins on the desk.



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