

# Probability

## Activity 3 - Tossing Shells

People often flip a coin when they want to make a quick decision about something. For example, if you don't know what to eat for supper you can say: "We'll have pizza if we get heads, and we'll have Stir Fry if we get tails." Flipping a coin is not always the best way to make decisions; nevertheless, it is frequently used. Some societies use shells instead of coins. Shells are also used for fortune telling and games of chance. For this activity you may use pasta shells or buttons instead of real shells.

### Activity Experiment:

- Toss a shell 10 times.
- Record the number of times it lands with the opening up or down.
- Repeat for 10 more tosses.
- Continue tossing and recording until you have tossed the shell for 50 times. Make all your records of results in sets of 10 tosses.
- In this experiment a successful outcome occurs when the shell lands with the opening up.
- Write down the success fraction for each set of 10 tosses, using the formula:

$$\begin{aligned} \text{Success Fraction (SF)} &= \text{Total number up} / \text{Total number of tosses} \\ \text{(SF)} &= \text{Total number up} / 10 \end{aligned}$$

Use the following table to record all your results:

	Tosses in sets of 10				
	10	20	30	40	50
Number of times opening up					
Number of times opening down					
Success Fraction					
SF in decimal form					

---



---

Can you believe THIS is math?

# Probability

## Activity 3 - Tossing Shells - *continued*

### Activity Questions:

- Did the results of your experiment turn out the way you expected? Why? Why not?
- Which set of 10 tosses was the most successful in your experiment? How did you determine this?
- How were the results the same or different in each of the 10 sets of tosses?
- According to your experimental results, what is the probability of the shell landing with the opening up?

### Further Ideas:

Pitch and Toss or Igba-ita is a popular game in Nigeria which used to be played with shells. Now it is played with coins. You can try it with your friends and family. Here's how to play:

- Each player has a heap of shells (coins).
- One player is the challenger.
- The challenger picks up four shells (coins), while others each drop one or two in a pile in the centre.
- The challenger tosses his or her four shells (coins) and notes how they land. If the openings are all up, all down or two up and two down, he or she wins all the shells in the centre. In the case of coins, if the coins all land with heads up, tails up or two heads and two tails up, he or she wins all the coins in the centre.
- Otherwise, the challenger adds the four shells (coins) to the centre pile and takes his/her turn.
- The player who wins all of the shells (coins) wins the game.

---

---

# Can you believe THIS is math?