

### MYTH

Mobile phone radiation can pop popcorn



### OBJECTIVES

Investigate the change in current produced by mobile phone radiation

### BACKGROUND INFORMATION

In June 2008 a series of videos became available online that depicted mobile phones popping popcorn kernels. It was later revealed by Cardo Systems Inc. that the videos were a hoax and were developed as part of a viral marketing campaign. (The popped popcorn was dropped onto the table and the unpopped kernels were digitally edited out.) However, the myth that mobile phones can pop popcorn has continued to circulate.

(The website for this video is: <http://www.youtube.com/watch?v=TOLNiBVyGyA>)

In this experiment the effect of the combined current output from four mobile phones is measured in a salt water solution. Using the resistance of the salt water solution, the power generated by the phone transmissions can be determined using the formula  $P = I^2R$  where P is power, I is current and R is resistance.

### PRECAUTIONS

#### WHAT YOU NEED

- 8 mobile phones
- Popcorn kernels
- Shallow dish
- Low stand or second shallow dish
- Salt
- Water
- Multi meter

#### WHAT TO DO

##### Part I

1. Set up four mobile phones on a table or flat bench so that the receivers/transmitters are all pointing towards a central point.
2. Place 3-4 popcorn kernels at the central point.
3. Use the remaining four mobile phones to ring the mobile phones that are set up on the bench until they transfer to message bank or ring out. Record your observations. This can be tested with more mobile phones or by ringing the stationary phones more than once.

##### Part II

4. Fill the shallow dish with salt water.
5. Place the dish on a stand or on another inverted shallow dish. Place four of the mobile phones underneath.

6. Measure the resistance and current (multimeter will need to be set to micro Amps,  $\mu\text{A}$ , scale) in the salt water using the multimeter. Leave the probes set up in the salt water.
7. Use the remaining four mobile phones to ring the mobile phones that are set up under the salt water and record any changes in current.

### QUESTIONS

1. Calculate the amount of power transferred to the salt water from the mobile phone radiation. Use  $P = I^2 R$  where  $P$  is power,  $I$  is current and  $R$  is resistance.
2. In what parts of the method are errors likely to occur? Discuss how these might affect your results. *If the probes of the multimeter are not kept exactly the same distance apart in the dish, the current result will be affected. Also, in trying to pop the popcorn, all the mobile phones point towards the kernel but when the salt water is tested it is above the mobile phones and has a much larger surface area so the salt water may actually be exposed to more radiation than the popcorn kernel.*
3. What other variables might you test to further investigate this myth? *How many times the phones ring, the brand of mobile phone, the number of corn kernels, the effect of air temperature ...*

### RESOURCES USED TO DEVELOP THIS ACTIVITY

1. *Crazy Popcorn - mobile phone and corn [streaming video recording].* (2008). Retrieved on 20 November, 2009 from <http://www.youtube.com/watch?v=TOLNiBVyGyA>
2. Carroll, J. (2008). *Phone popcorn secrets revealed [streaming video recording].* Retrieved on 20 November, 2009 from <http://www.cnn.com/video/#/video/tech/2008/07/09/carroll.cellphone.popcorn.cnn>

