



STEC@UKZN

"Lock Down"

## DEAR FAMILIES

Welcome to the tenth issue of the STEC@UKZN "Lock Down". Missed the first issues? Find them at [http://www.stec.ukzn.ac.za/lockdown\\_activities.aspx](http://www.stec.ukzn.ac.za/lockdown_activities.aspx)

*Join us this Thursday for our "live" workshop on "Bubblemania Science". For more information or to register contact us via email on: [stec@ukzn.ac.za](mailto:stec@ukzn.ac.za)*



## WHAT ANIMAL AM I?

I have 6 legs.  
There are almost 20 000 species of my kind worldwide.  
I can see ultraviolet but not red.  
Not all of us sting.  
I feed on nectar and pollen.  
You know me to be black and yellow. But I can have a variety of colors, which include white, red, orange, green, blue and even purple!  
I am very important for pollinating plants.  
I appear in rock paintings which have been dated to 15 000 BC.



## WHAT FRUIT OR VEGGIE AM I?

I am classified as a berry but I am commonly used as a vegetable ingredient or side dish.  
I am usually red, but I can also be green, white, black, purple, pink and yellow.  
I am one of the best plant-based sources of umami flavour.  
My plants are vines, typically growing 180 cm or more above the ground if supported.  
Aztecs were one of the first to have domesticated the fruit and used in their cooking.  
I feature in some films and my name stands for the most trusted measurement of quality for movies.



### What you need.

- Paper and pen/pencils for each player

### How to Play:

- Create a grid of squares at least 6×6. The larger the grid, the longer the game.
- The players take turns in writing their symbol in an empty cell. Placing a symbol blocks all of the neighbouring cells.
- The first player who can't move loses.

### Example:

The shaded areas are blocked. The first player 'X' wins because 'O' has no more moves available.

	X				

	X				
			O		

			X		
			X	O	

	X				
X	O				

	X				
X	O	X			

					O
X	O	X			

					O
	X				
X	O	X			

					O
O	X				
X	O	X			

					O
O	X				
X	O	X			

Adapted from: <http://www.papg.com/show?2XMX>



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## MATHEMATICS CHALLENGE



😊	♥	♥	☁	21
☁	😊	😊	😊	25
♥	😊	☁	♥	21
☁	☁	☁	☁	16
20	23	20	20	

The sum of each row and column is given! Can you figure out and calculate the value of each shape?

Source: <https://www.mathinenglish.com/PagePL1P26to30.php>

## "ESSENTIAL GOODS" EXPERIMENT



### Glow Stick Science

What do fireflies, jellyfish and glow sticks have in common? One flies, one lives deep in the ocean and one provides entertainment in night clubs. So what is the link? All of them use some intriguing chemical reactions to produce light.

#### You will need:

- 1 glow stick
- A cup of ice cold water
- A cup of hot water (not boiling)

#### What to Do:

1. You need a dark room. To get your glow stick glowing, carefully bend your glow stick in multiple places. You should hear it cracking. Shake the glow stick a bit.
2. Place one end of your glow stick in the ice cold water for about 20 seconds. *What do you notice?*
3. Now put one end of your glow stick into the hot water for about 20 seconds. *What do you see now?*

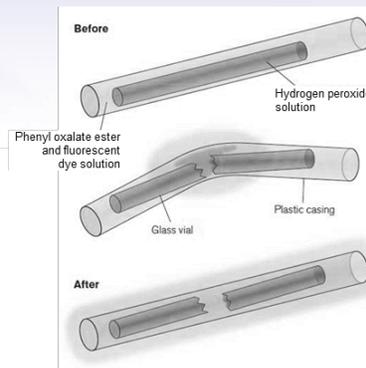
#### Safety note:

The chemicals in your glow stick are corrosive and can irritate the skin. So if your glow stick leaks, take care not to get the liquid on your hands; if you do, wash them with soapy water straight away.



### What's Happening?

Your glow stick consists of various parts: a glass vial filled with Hydrogen peroxide which is inside a plastic casing filled with an ester and a fluorescent dye solution. When



the glass capsule inside your glow stick breaks, it releases the Hydrogen peroxide. By shaking your glow stick you are mixing the chemicals and start a chemical reaction.

This chemical reaction excites the electrons in the dye and they rise to a

higher energy level. This is an intermediate state and eventually the electrons return to their normal level. When they return to their normal level, they release energy in the form of light. This process is called **chemiluminescence**, or in the case of the firefly and the jelly fish, **bioluminescence**. Bioluminescence is a subset of chemiluminescence, where the light-producing chemical reaction occurs inside an organism.

When you put the glow stick into the ice water it affects the rate of the reaction. A cold temperature slows the reaction down and your glow stick will last longer. But it will cause less light to be released, so it will not be as bright as at room temperature. When you put your glow stick in hot water the rate of your reaction will increase and during that time it will glow much more brightly. But it will reduce the amount of time your glow stick lasts.

Source:

[https://en.wikipedia.org/wiki/Glow\\_stick](https://en.wikipedia.org/wiki/Glow_stick)

<http://www.stevespanglerscience.com/lab/experiments/light-sticks-the-science-of-liquid-light>

Solution:

What animal am I: Bee

What fruit or veggie am I: Tomato

Mathematics Challenge:

😊 = 7

♥ = 5

☁ = 4