

Name: _____

Date: _____

Confusing Senses



Hearing

We have 5 senses



Touch



Smell



Taste



Sight

We use these senses to discover information about the world around us. They work together inside our brain to help us learn what the things we see, touch, hear, smell and taste are.

For example, if you have an ice cream, you can touch it, taste it, smell it and look at it, and each one will help you figure out what it is.

But, what about when we can't use all of our senses? Are we still as good at knowing what things are?



The Mystery Box

Here are our mystery boxes! Inside each box is a different object, which you need to touch (using the holes on the sides) and smell (using the holes on the top) to know what it is.

No peeking!

This experiment will help us find out whether our smell and touch can work together to figure out what a mystery object is, even without the use of our other senses.

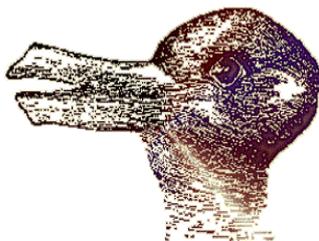
You should first touch the object, then smell the object. Write down what it feels like and what it smells like, then what you think it is. At the end, we'll open the boxes to see what is really inside!

Box Colour	It feels like...	It smells like...	I think it is...	It actually is...
Red				
Orange				
Yellow				
Green				
Blue				
Purple				
Pink				
Black				
Gold				
Silver				

How did you do? Compare your answers with your neighbour, and see if you had the same or different thoughts.

Sometimes, what one of our senses learns does not agree with our other senses, and our brain must decide which it thinks is right, or if combining the information makes sense. This is how our senses can confuse us, and why we're not always right!

We depend a lot on our sense of sight, so needing to only use our other senses is difficult. But even sight can get confused sometimes too!

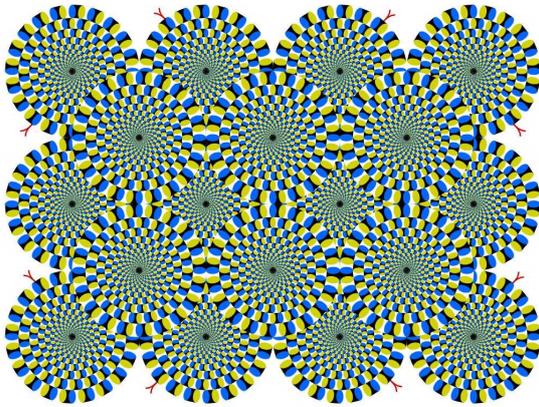


← What animal do you see here?

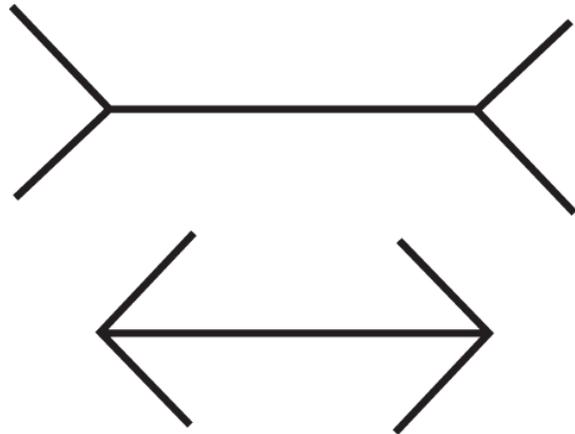
This picture can be confusing because our eyes can see it as two different things! This is called a visual illusion.

Here are some more optical illusions! Discuss in pairs how these illusions are confusing!

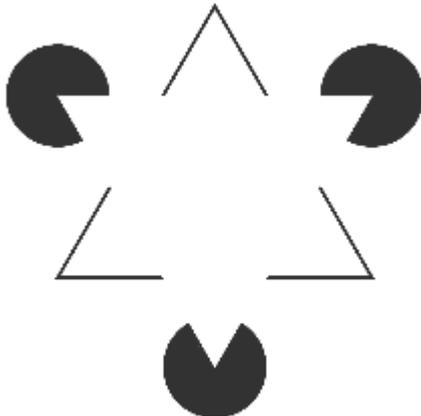
1.



2.



3.



4.



If you've ever had a cold, you might know that when your nose becomes blocked, everything tastes different. This is because of how our senses of smell and taste are connected. While we have taste buds on our tongue which help us taste, a lot of what we 'taste' is actually a combination of what our nose is smelling, and what our tongue is feeling, as well as what we can actually taste with our taste buds!

Some people have senses that are even more confusing than others! There is a condition called **synaesthesia**, which causes a crossover between senses. When people with synaesthesia sense something with one sense, it automatically triggers a sensation in another sense. For example, some people see all **numbers** as having colours, and others can even taste shapes!



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Teacher Information Sheet

Class Information:

This science class would work well with a group of up to 30 children aged 5-8. but with 30 students and a limited time frame it may work better to have children in groups of 2 or 3.

Finally, remember to check allergy records, and remember to have children wash their hands. Students each need a worksheet and pen/pencil.

Warm-Ups and Cool-downs:

A good pairs activity here would be for children to describe an item by how it smells, tastes, feels, sounds and looks without using the name of the item to their partner, so that the partner can guess what the item is. This could be re-used as a cooldown using a whole class game.

The Mystery Boxes:

Use around 10 mystery boxes, in order to have a good variety of stimuli, and to use each box only for one pair of items, else the smells in the boxes will begin to mix.

The boxes work well when they are between shoebox and paper box size. Create several small holes on the top, and two holes on opposite ends of the box to put your hands through. After cutting the holes for the hands, line them either with Sellotape, some other softening material to avoid papercuts.

Decorate the boxes to make them distinct and more appealing!

The Stimuli:

Some of your touch-stimuli will match with the scents in the boxes, some will contradict the scents. Particularly when using objects with not so strong smells, I would recommend blu-tacking a sheet of tissue to the inside of the top of the box, and to have a small sample of the smelling-object between the tissue and the smelling holes. An example of 10 stimuli pairings could include:

- Orange & peel
- Toothpaste tube & mint
- Marbles & chocolate
- Sponge & fresh bread
- Coffee beans & grounds
- Flower & petals
- Cotton wool & sweet smelling soap
- Powder paints & washing powder
- Sticks & pencil shavings
- Play-doh

The Hidden Science:

Our senses are constantly interacting. This article on how we perceive food offers a great, simple explanation for how our senses interact. https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.leatherheadfood.com/files/2016/08/White-Paper-How-Our-Senses-Inter-act.pdf&ved=2ahUKEwiRoIP3w6foAhUKQRUIHYwEARwQFjABegQIDBAG&usg=AOvVaw032T6gGcg_qF4QtLYzVycS

Particularly important to this experiment is the phenomenon of cross-modality. Stimulations from all of our sensory organs are collated as nervous impulses in the brain, each sense in its own receptor area. Cross-modality describes how our senses interact in the brain, both in terms of one sense interacting with one other sense, or as all senses working together. By changing the stimulation to one sense, we can alter how an object is perceived by another. For example, a rougher object will be perceived as more sour than a smooth object. Therefore, by having stimuli that do not agree with one another, it is possible to alter the perception of another sense.

Synaesthesia is a condition where the sensory pathways in the brain are connected more so than in the average brain, so that a sensation of one sensory modality causes the perception of a sensation in another modality. Here is an interesting article on the topic: <https://amp.theguardian.com/science/2010/nov/19/>

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