



# Illusions: Things aren't always as they seem...

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**Introduction:** Perceptions control how we experience our world; they are the tools which we use to interact and gain an understanding of the environment around us. Illusions are distortions of our perceptions. People often think that illusions are simply tricks that provide entertainment. However, the delusions they can create come in many forms, often obstructing our brain's ability to determine what is real from what is imagined. During this unit of work, students will use a variety of interdisciplinary learning lessons to understand different types of illusions and how they influence their daily lives.

## Lesson 1: Consumer Illusions

This lesson will introduce different types of illusions, ending with consumer illusions.

In groups, students will be given 2-3 articles on one of the following research topics:

- Cadbury's chocolate linked to deforestation in Brazil.
- Scottish salmon farming.
- Sustainable fashion.
- The horse meat scandal.

Students will extract key information from the articles to make a poster on their topic. This will allow for cooperative learning across the classroom. To conclude, Fairtrade and its implications will be introduced.

## Lesson 4: Illusions online

During this lesson, students will question if online illusions are easy to identify.

In pairs, students will be use computers to research and discuss one of the following:

- Catfishing
- Photoshop
- Fake news

A worksheet will be provided for students to reorganise and extract information they find to promote literacy across the curriculum.

Groups will then feedback the information they found to the class.

Finally tips for how to be safe online and use the internet safely will be discussed.

## Lesson 2: It's a kind of magic

As most students will relate illusions to magic tricks, the aim of this lesson is to show the chemistry behind two illusions. The lesson will start with a WOW demonstration of the 'Red cloth magic trick'<sup>1</sup>. Students will discuss the redox chemical reactions behind this demonstration.

Next, in pairs students will use the microscale reaction 'Rainbow Fizz'<sup>2</sup> act out a magic trick to their partners. This will be followed by a discussion on the neutralisation reaction taking place.



Figure 1 Example of Rainbow fizz taken from Dr Allan.<sup>3</sup>

## Lesson 5: Refraction

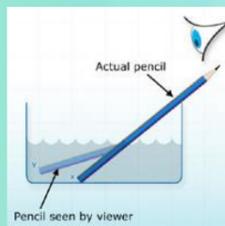


Figure 3 Bending pencil taken from Preproom.<sup>5</sup>

This lesson aims to show students the uses of refraction, the bending of light. To start, a demonstration of the 'Bending Pencil'<sup>5</sup> optical illusion caused by refraction will stimulate discussion.

Next, in an inquiry-based practical students will plan and run an experiment to see how different lens' cause light to bend. Using the results, the class will decide which lens is better for individuals who are short sighted.

Following this, examples of how glasses have developed over time and the advances in technology will be highlighted.

## Lesson 3: Camouflage

This outdoor learning lesson will allow students to walk around the school grounds to see if they can find examples of camouflage, taking photos on their phones to upload to a class padlet.



Figure 2 Green fly camouflaged, taken from Pixabay.<sup>4</sup>

Students will then debate if plants can be camouflaged in order to adapt to their environment. The limitations which chlorophyll has on plants ability to camouflage will be discussed, along with real examples of plants which are camouflaged.

## Lesson 6: Forecast Illusions

In the final lesson, a starter of 'Who wants to be a STEM millionaire?' will summarise the topics covered so far.

Next forecast illusions and false prophets will be introduced. This will be followed by discussing the Nobel Prize for Physics in 2021 which was based on climate modelling.

Students will use a simple computer model to predict temperature increase by 2021 using data from 1900-2000. This will be compared to the real temperature.

To conclude, there will be a class discussion on actions we can take to reduce climate change.

## Learning Outcomes:

HWB: 3-34a, 3-39a, 4-37a.

LIT: 3-02a, 304a 3-06a, 3-09a, 3-10a, 3-15a.

NUM: 3-01a, 3-07a, 3-08a, 3-20a.

SCN: 3-01a, 3-11a, 3-15b, 3-18a, 4-10a, 4-20a.

SOC: 3-08a, 3-17b, 3-20a.

TCH: 3-02a, 3-03a, 3-05a, 3-13b.

## Aims and Wider Implications

The aim of this unit is to engage students in interdisciplinary learning to enhancing their conceptual understanding of several topics. By engaging with consumer and climate issues this meets the CfE's desire to have sustainability implemented across the curriculum. This unit has wider implications for students across Scotland, using a variety of pedagogies to encourage students to critically think about the validity of information presented to them and the impact it can have on our society.

## References:

1 Dynamic science, <http://www.dynamicscience.com.au/tester/solutions1/chemistry/chemicaldemos/bluebattery.html>, (accessed October 2021).

2 Royal society of chemistry, <https://edu.rsc.org/exhibition-chemistry/rainbow-fizz/2000057.article>, (accessed October 2021).

3 Twitter <https://twitter.com/drallan12/status/1177600333872271360?s=12>, (accessed October 2021).

4 Pixabay, <https://pixabay.com/photos/grasshopper-katydid-camouflage-422075/>, (accessed October 2021).

5 Preproom, <https://www.preproom.org/practicals/pr.aspx?prID=1045> (accessed October 2021).