

Lesson Plan

NEUROHEADWAY

Neuroscience Into Education

Introduction

We are daily exposed to different experiences in our life. In order to survive as living beings, we must interact with our environment. We develop different patterns of interaction and these patterns are primarily based upon our bodily capacities (senses, brain), our reality and our language.

Aims

This module aims to evaluate the relationship of language, thought and reality. The following issues will be discussed:

- How do we acquire knowledge about our environment?
- Is language part of our genetic structure, or do we learn it through our sensory experiences?
- How is language related to thought? Does language affect our view of reality?

Before answering these questions we have to define basic terms relevant for this topic:

What is reality?

Our world consists of objects, events and actions independent of human understanding and beliefs. On a daily basis we receive a flow of information from our five senses about our external reality, and yet we can process a small portion of this flow. The language encodes only one part of our environment.

On the other side is virtual reality. It is an artificial environment which is decoded through sensory experiences provided by a computer and media.

Your senses and your brain

a) Senses

The **five senses** are the five main tools that humans use to categorize the world. Through our five senses we receive information from the world. We see with our eyes, we smell with our noses, we listen with our ears, we taste with our tongue, and we touch with our skin. Most of the time the senses and brain work together to tell us what is going on around us.

b) What is so special about the brain?

How do we acquire knowledge about our environment?

The brain is one of the most important organs of the human body. It can perform more actions than the most powerful computer. The brain receives a flood of information about the colourful and complex world around us. Our sensory experience is transformed into electrical signals called nerve impulses that are transmitted to the brain. If you touch a hot spot, the neurons send a message from your skin to your brain. Nerves respond quickly in order to keep you out of danger. After integrating all information, the brain creates images, knowledge/understanding of the world. In the same time the brain stores data in memory.

The brain is divided into left and right hemispheres.

- The left side of the brain is connected to logic, language, mathematics, etc.
- The right side of the brain is connected to imagination, creativity and the arts.
- The right hemisphere controls the left side of the body, the left hemisphere controls the right side.
- The main language centres are Broca's area and Vernicke's area.
- The two halves are designed to work together.

The following terms are relevant for understanding the brain:

1. **Sensation** is passively receiving information through sensory inputs.
2. **Perception** is interpreting this information.
3. **Cognition** describes the act of acquiring knowledge through perception, imagination, remembering, and selective attention.

Power point Example

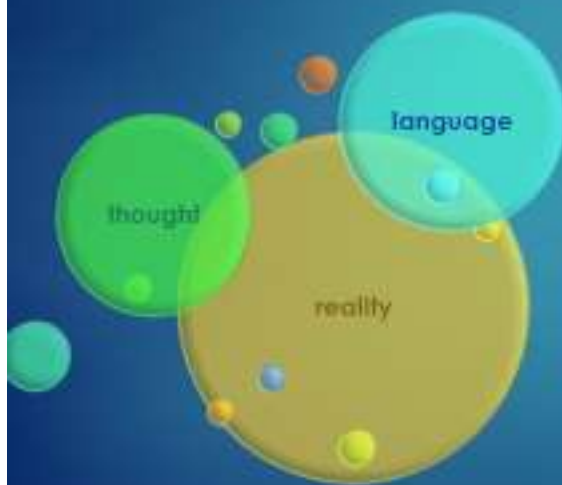
NEUROHEADWAY

Neuroscience Into Education

INTRODUCTION

AIMS

This lesson aims to evaluate the relationship between **language**, **thought** and **reality**.



The following issues will be discussed:



How do we acquire knowledge about the external world/reality?



Is language part of our genetic structure, or do we learn it through our experiences?



Does language affect our view of reality?

WHAT IS REALITY?

- ▶ objects, qualities, external events and actions
- ▶ all of your experiences that determine how things appear to you
- ▶ independent of our understanding, independent of our beliefs



Virtual reality?

- ▶ an artificial environment



OUR SENSES

- ▶ The **five senses** are the five, main tools that humans use to categorize the world. Through our 5 senses we receive information from the world, decode and memorize it.
- ▶ We see with our eyes, we smell with our noses, we listen with our ears, we taste with our tongue, and we touch with our skin.



WHAT IS SO SPECIAL ABOUT THE BRAIN?

The brain can perform more actions than the most powerful computer. It receives a flood of information about the world around us. If you touch a hot spot, the neurons send a message from your skin to your brain in order to keep you out of danger.

- ▶ The human brain is divided into two parts: the left hemisphere controls language, comprehension, math, and vision. The right hemisphere controls senses, imagination, artistic skills, etc.
- ▶ Each hemisphere controls the opposite side of the body.
- ▶ The left part of the brain is important for language and is called the 'dominant' hemisphere.
- ▶ These two halves are designed to cooperate.

How do you work?



BRAIN ACTIVITIES: HOW DO WE ACQUIRE KNOWLEDGE ABOUT OUR ENVIRONMENT?

The human brain is the main control center, receiving, processing and sending information to other parts of the body.



1. Sense experience is converted into electrical signals. Our brain cell (neurons) communicate with one another.



2. Sensory integration in the brain -making sense of our experiences achieved by the senses



3. Images/concepts, thoughts, memory, knowledge

