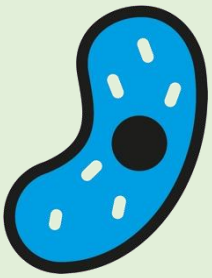
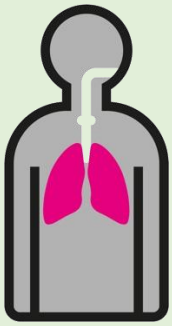
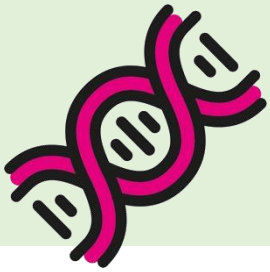
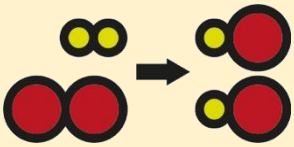
The Big Ideas of Science at the Skegness Academy

Cells are alive		Cells are alive; all living things are composed of cells, both singly and in multicellular organisms, working together as tissues, organs and organ systems. The exchange of substances between cells and their environment allows the life processes to occur, fueled by the organelles within performing their function. Differentiated cells allow living things to thrive in a huge variety of habitats.
Bodies are systems		Cells work together as tissues. Tissues work together as organs. Many organs work together as organ systems. Multicellular organisms (such as humans, animals and plants) are able to survive because many organ systems work simultaneously to carry out the 7 life processes. When one part of the system doesn't work, this can have a negative impact on the health of the organism.
Organisms are independent		Living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many ways. Living organisms are interdependent and rely on other organisms in their community to survive and reproduce.
Ecosystems recycle resources		All of the resources required for life, and produced by living things, are recycled in nature. The chemicals in ecosystems such as water, minerals and carbon are continually cycling through the natural world. Animals are ultimately dependent on green plants (or other producers) as their source of energy.
Characteristics are Inherited		Genetic information in a cell is held in the chemical DNA. All living things have DNA, which is passed from parent to offspring during reproduction. A section of DNA which is responsible for a particular protein (or part of the body) is called a gene. Genes determine the development and structure of organisms.

Species show variation		All life today is directly descended from a universal common ancestor that was a simple one-celled organism. Over countless generations changes resulting from natural variation within a species lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment become extinct.
Structures determines properties		Matter is composed of atoms; atoms can link together and arrange in a variety of ways leading to the formation of different structures. This behavior and arrangement of atoms explain the properties of different materials.
Reactions rearrange matter		In chemical reactions, atoms are rearranged to form new substances. All chemical reactions involve the rearrangement of atoms. The numbers and types of atoms are the same before and after a chemical reaction. We can represent these reactions using equations.
Earth systems interact		The composition of the Earth and its atmosphere and the processes occurring within them shape the Earth's surface and its climate. Chemicals in the earth have industrial uses and human industry produces chemicals which can affect the earth.
Forces predict motion		The ways in which objects move depends on the forces acting on them. If the forces acting on an object are unbalanced, the object will change its speed, direction or shape. The behavior of objects in motion follow mathematical laws that can be used to make predictions about speed, distance travelled, the time taken and acceleration.
Fields produce forces		Objects can have an effect on other objects without touching them. In some cases, the effect travels out from the source to the receiver in the form of radiation. In other cases, action at a distance is explained in terms of the existence of a field of influence between objects such as a magnetic, electrical or gravitational field.

Energy is conserved		Energy cannot be created or destroyed, although it can be transferred from one store to another. Different events can be explained in terms of the energy transfers involved. Energy can be transferred in useful ways for example for transportation, heating and to generate electricity. In these processes, some energy becomes less easy to use.
Electricity transfers energy		An electrical current is the flow of charge and is a way of transferring energy. The electricity that we rely on for everyday use is generated in power stations and transferred to homes and businesses using the National Grid. Electrical devices use circuits with various components to transfer energy in useful ways.
Radiation transfers energy		Waves carry energy from one place to another and can also carry information. Electromagnetic waves have various uses, particularly in communications and medicine. Ionising radiation is released from changes to the nuclei of atoms.