

Ingrow Education Centre



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Science

Science is based around experiential learning, rational explanation, observation and investigation. Our science workshops aim to build upon these principles, whilst linking specific science areas of study in a context based setting.

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Outline:

Get involved with the force of friction and how it affects moving objects. Explore what forces interact and how different surface materials and lubricants affect the amount of friction that is generated. This experiment aims to consolidate understanding of what friction is and how it is created, with specific application to the movement of trains. It helps inspire critical thinking skills through considering what variables increase or decrease this everyday force.

Learning Outcomes:

- Compare how things move on different surfaces
- Notice that some forces need contact between two objects
- Recognise that some mechanisms such as leavers allow a smaller force to have a greater effect
- Identify the effects of friction that act between moving surfaces
- Asking relevant questions and using scientific reasoning to answer them
- Setting up simple practical enquires, comparative and fair tests
- Making systematic and careful observations and where appropriate taking accurate measurements using standard units and using a range of equipment

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Outline:

Pupils will be challenged to explain why changes of state are needed to move a steam train. Investigate which fuel gives the most energy when it is burned. This activity aims to reinforce understanding of states of matter and how temperature dictates a chemical's state. It encourages pupils to think about and consider the importance of variables in an investigation and how it is necessary to control these when carrying out a fair test.

Learning Outcomes:

- Observe that some materials change state when they are heated or cooled
- Understand the temperature at which water changes state
- Asking relevant questions and using scientific reasoning to answer them
- Setting up simple practical enquires, comparative and fair tests
- Making systematic and careful observations and where appropriate taking accurate measurements using standard units and using a range of equipment

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Outline:

Test your knowledge and understanding of how air resistance affects moving objects and how the design of trains affect the level of air resistance. Design your own train in groups and observe how its shape affects the wind tunnel test. In addition, pupils will experience first-hand how shape affects air resistance. This

workshop aims to enhance understanding of air resistance, the forces involved and how different properties affect it.

Learning Outcomes:

- Explain the unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Identify the effects of air resistance that act between moving surfaces
- Pupils work scientifically by exploring moving objects and incorporating knowledge to design and make trains to test how the shape effects the air resistance
- Asking relevant questions and using scientific reasoning to answer them
- Setting up simple practical enquires, comparative and fair tests
- Making systematic and careful observations and where appropriate taking accurate measurements using standard units and using a range of equipment

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**Outline:**

Take part in activities exploring the properties of sound. Develop and reinforce knowledge and understanding of sound; how volume, direction, movement and the material or medium it travels through affect the properties we perceive. The workshop aims to demonstrate how a range of conditions can alter how we hear sound and the scientific explanations involved.

**Learning Outcomes:**

- Identify how sounds are made, associating some of them with something vibrating
- Recognise that vibrations from sounds travel through a medium to the ear
- Find patterns between the pitch of a sound and the features of the object that produced it
- Find patterns between the volume of a sound and the strength of the vibration that produced it
- Recognise that sounds get fainter as the distance from the sound source increases
- Asking relevant questions and using scientific reasoning to answer them
- Setting up simple practical enquires, comparative and fair tests
- Making systematic and careful observations and where appropriate taking accurate measurements using standard units and using a range of equipment

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Outline:

Learn about and explore the life of a tree, using your observation skills to find the different types of inhabitants who live on, under and around the tree, and then record your findings. You will also learn about how these creatures co-exist and are part of a life cycle.

Learning Outcomes:

- Identification and classification
- Identify and describe the basic structure of a tree
- Observe changes across the four seasons
- Identify that most living things live in habitats to which they are suited and how they are dependant on each other
- Name a variety of animals in their habitats
- Recognise that living things can be grouped in a variety of ways