

Get Ratty

The World Around Us

ICLs: Wonderful World | World in Motion
Year 6/7



Cross Curricular Skills developed/displayed in this assessment activity

Communication	- Talking and Listening
Thinking Skills and Personal Capabilities displayed/developed in this assessment task:	Managing Information Thinking Problem Solving - Being Creative Working with others Self Management

What It's About

Rentokil has developed traps that send you an email when they make a catch. It takes pressure measurements to distinguish between vermin and family pets, and it kills quickly and humanely by releasing carbon dioxide gas. This activity challenges the children to design electrical circuits that would alert the user in different ways when an object or animal is sensed.

Where It Fits

Movement

- The causes and effects of energy

Key Questions

- How do things work?

Suggested Learning Intentions

- To express opinions and give reasons based on what has been read.
- To experiment with objects and ideas in a playful way.
- To experiment with different ideas, actions and outcomes.
- To understand how learning in science relates to news in the world around us.

Discussion Starters

When the children are thinking about the task

- Is it right to kill animals in this way?
- Could there be a way to get rid of the rats without killing them?
- Why are rats thought to be pests?

When the children are considering the position of the switch in the circuit:

- What do you think electricity is like?
- How does a switch work?

When the children are designing circuits for their invention:

- What sort of things can be made to work by using an electric circuit?

Running the Task

1. Use page 1 as a stimulus to discuss the idea of the rat trap that lets you know when a rat has been caught. Challenge the children to make a circuit to show how the trap might work. Note: you will need to use a bulb for the gas releaser and a buzzer for the email sender (in this way the bulb will light and the buzzer will sound when the switch is closed. The switch would close when the rat enters the trap.)
2. Using the concept cartoon on page 2 as a stimulus ask the children to discussion pairs or small teams which of the rats they agree with. Ask the children to investigate the situation practically by moving the position of the switch in the circuit they made for the task on page 1.
3. Use the text on the left hand side of page 3 to challenge the children to further modify their circuit so that the bulb and buzzer are brighter and louder or dimmer and quieter. Share and discuss various solutions to this task.
4. Using the text on the right hand side of page 3 as a stimulus discuss with the children the various things that can be made to work by using electricity, e.g. bulbs, buzzers, motors etc.

Challenge them to list ideas for electrical circuits to “protect a pet” and then model one or two of their ideas by making a circuit and describing how it works.

Web links

<http://www.bbc.co.uk/schools/revisewise/science/physical>

A look at a range of science topics exploring the different facts children would like to know about physical processes. There are activities, fact sheets and quizzes on electricity for children.

<http://www.warrinerprimaries.com/Topic/circuits.htm>

A link to many more websites for children about electricity.

<http://www.teachers.tv>

A teacher support site about electricity and circuits, includes video clips, resources and support materials.

Assessment for Learning Smart Grid*

Use the Smart Grid to help the class review their learning. For additional information about how to use a Smart Grid view the 'How to use' guide.

Thumbs Up	We were great at the task because...		
Thumbs Sideways	We were good at the task because...		
Thumbs Down	We were OK at the task because...		
		we could draw the circuit diagram including...	
		we worked out how to change the circuit so that a buzzer and bulb were included.	
		we made the bulb brighter and the buzzer louder by...	
		we could explain how a switch works in a circuit.	
		we had an idea for a pet invention and were able to work out the electrical circuit for it. Our idea was...	
		Next time we will...	

* Smart Grids are part of the Smart Science series developed by the Centre for Science Education, Sheffield Hallam University

Science at your Fingertips

What is needed for an electric circuit to work?

A circuit must be 'complete' for it to work. This means that there must be no breaks in the circuit, so that the electricity can flow around the circuit.

A circuit also needs the number and type of batteries to be 'matched' to the components such as bulbs and buzzers if the circuit is going to work correctly. If extra batteries are added a bulb will shine more brightly or a buzzer will be louder. However, too many batteries could cause a bulb to 'blow'! Too few batteries would mean a dimmer bulb and a quieter buzzer.

How does a switch work?

A switch makes a break in the circuit so that electricity cannot flow across the gap. The switch can be opened or closed to turn components on or off... just like a light switch. In the case of the pressure switch in the Rat trap the weight of the rat would push two metal contacts in the switch together, and in doing so closing the gap in the circuit.

Does it matter where the switch is in a simple circuit?

No. For the electricity to flow, a complete circuit is needed. A break anywhere in the circuit will switch off the flow.

Connecting the Learning

Chinese Zodiac Stories

The Chinese Zodiac is made up of 12 animals and the rat is the top one. There are various stories about why the rat is in the Zodiac. Here is just one of them.

A long time ago, in China, the cat and the rat were best friends. One day the Cat found out that the Emperor was holding a special party so that he could elect twelve animals to represent each year in the Chinese calendar. On the day of the party the cat said to the rat, "I am going to take a nap, will you wake me when it is time to go?" The rat thought, "I am the smallest of the animals and if the cat goes

to the party I have got no chance of being elected” so when the time came he left on his own without waking the cat and was elected as one of the twelve Zodiac animals.

When the cat woke up and found out what the rat had done he was furious and even to this day cats and rats are the worst of enemies.

Can you make up your own story about why the rat became one of the Zodiac signs?

Rats as pets

Although they can cause problems in the wild, some people really like looking after rats. What characteristics do you think would make rats suitable for keeping as pets? Check out your ideas by doing some research.