Electricity: Sparking Our Imaginations Through Dance

Handout Notes

What is it?

Electricity: *Sparking our Imaginations through Dance* is a short participatory video about the tiny charges that make up the material world and which are the source of electricity. There is discussion, experimentation, and discovery through creative dance activities, with options for working individually, in pairs or in a group.

Who is this video for?

The video is aimed at KS2 teachers to offer ideas for teaching your class about *electricity* in fun, creative and embodied ways. You could use this video to help prepare a lesson or just play it live in the classroom and get the children to follow the activities *(start the video at 01:49).*

You could also enjoy this video at home with your family or in any other setting — it's for anyone who likes to dance and enjoys learning about nature!

Who made it?

The project was written and directed by Katie Lusby from The Place's Creative Learning Team and award winning artist and physicist Geraldine Cox who devised the scientific content. The video is delivered by dance artist Corinne Meredith and musician Michael Sebastian, was filmed by Alice Underwood and edited by Jim Beck and Kamau Kelly. The project is funded by Artsmark and produced by A New Direction. Special thanks to Professor Mike Tarbutt at Imperial College London and teacher Paul Tyler for reviewing the project outline.

Why did you make it?

The video was made as part of an Artsmark CPD series with the aim of helping teachers and schools meet the necessary criteria for their Artsmark journey. This video focuses on *Curriculum Design*, which explores how a broad arts and cultural curriculum is embedded throughout the school and how this can increase children and young people's knowledge, skills and understanding of the arts. The video is an example of how dance could be used within the science curriculum, but the techniques you learn here could then be applied to other topics and subjects throughout your school.

We also made the video for a wider audience and aimed to:

- Provide a resource for families and schools wanting to teach children about electricity
- Introduce important science ideas using movement, allowing children to learn in a physical way
- Encourage creativity and imagination by highlighting the cross-curricular links between art and science
- Encourage curiosity in the world around us, unveiling the beauty and wonder in scientific ideas
- Have fun!

How is the video structured?

00:00-01:10	**The Place** – who we are and what we do
01:01-01:48	**Curriculum Design** – how this video can help your school's Artsmark journey
01:49-04:07	***What is the world made of?*** – science explanation and experiment
04:08-06:33	**Creative Activity (1)** – dance exploration of opposite charges attracting
06:34-07:44	**Creative Activity (1)** – suggestions for variations
07:45-08:44	***How does lightning occur?*** – science explanation
08:45-11:23	**Creative Activity (2)** – dance exploration of a thunderstorm
11:24-11:54	**Creative Activity (2)** – suggestions for variations
11:55-12:19	**Key Learning Points** – press pause and recap what we've learnt
12:20-13:14	**Thank you and goodbye!**

How should I use the film?

Clear a space for everyone to move safely and press <*Play*>. You can pause the video at any point to discuss ideas or investigate dance tasks further, or to do the experiment with the balloon. When the recap slide is reached, you can pause the video and take a moment to discuss what you have learnt.

You can also create your own lesson plan. It might slot into your existing science curriculum, or you can use it as additional content. It may also inspire ideas about how you can incorporate dance and art into other curriculum areas. You can find additional music to accompany the activities in the Spotify playlist detailed at the end of this handout, or choose your own tunes!

You may also enjoy exploring these links:

1. A short video about an electrostatic ballet toy built by artist Naum Gabo for his five-year-old daughter, displayed by Tate Gallery.
2. Watch lightning strikes around the earth in real time.

What is the science story?

The world is made of tiny + and – charges. Have you ever felt a small electric shock when you take off a polyester top? Or touched something (e.g. a shopping trolley, or car door) and felt a flash of energy? If the answer is "yes" then you have felt charges! When charges flow like this we call them electricity.

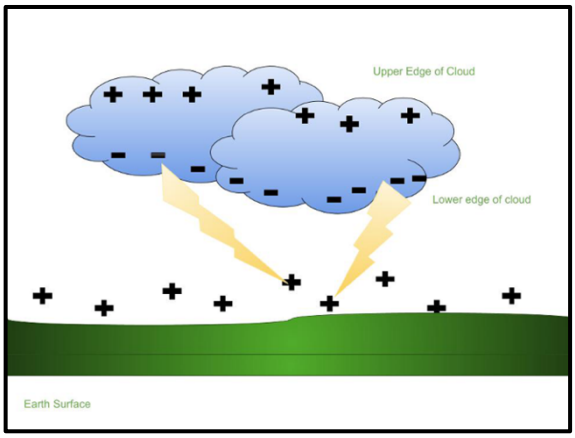
Charges are very tiny. In the tip of your finger are many more charges than there are stars in the entire visible Universe. But mostly we don't think about these charges. Our fingers don't emit electricity in day-to-day life. This is because charges snap together with their opposites to make

neutral combinations. + and – charges love to be together. So, we live mostly in a neutral world. Luckily, we can easily experiment with charges, just by brushing them off certain materials.

Take a balloon and rub it for 30 seconds on your jumper (wool works best!). Now you have transferred some negative charges from your jumper to the balloon. Your balloon is now charged. Hold it over some little pieces of paper and watch the paper dance!

The negative charges on the balloon are attracting the positive charges in the paper.

Think, about the immense power of these tiny charges for a moment. The little piece of paper is being pulled downwards by the gravity of the entire earth, and a few infinitesimally tiny charges are lifting the paper up. They are very strong indeed.



The most spectacular example of charges flowing to make electricity is lightening. As the clouds grow and the ice crystals in them dance and jostle, negative charges are knocked off the crystals and gather at the bottom of the cloud. The top of the cloud becomes more positive. The electricity flows when there is so many negative charges at the bottom of the cloud that they flow through the air towards earth to reach the positive charges. Sometimes they flow upwards towards the positive charges in the cloud. Lightning is just like the spark we first discussed from your clothes or something in the house, but on a much bigger scale.

Key learning points:

- The material world we see around us is made of + **and - charges**. Opposite charges love to pair up.
- Sometimes we feel the spark of electric charges flowing and we call this flow **electricity**. Lightning is the same effect, but on a much bigger scale.
- **Charges are tiny.** There are many more charges in your fingertip than stars in the entire visible Universe.
- **Charges are very strong.** A few tiny charges can compete with the gravitational force of the Earth.

What are the creative dance activities?

The creative activities use movement and dance to help students understand the science in a different way – through their bodies! It doesn't matter what it looks like; just enjoy the physical sensations as you experience them. You can adapt and develop the activities however you like. If you feel inspired, think about how you could do something similar for a different topic!

Activity 1: Opposite charges attract (*go to 04:08 in the video*)
The first part of the activity serves as warm-up, by stretching-out and mobilising our joints.

Step 1
Imagine that you're a piece of paper. Start to fold and unfold your pieces of paper. Can you use your elbows and knees to fold and unfold your limbs? Can you fold your whole body in half, maybe forwards or maybe sideways? Keep folding and unfolding your body in any way you like, finding as many different ways to fold and unfold as you can. See if you can take yourself closer to the floor, and then see what kind of folding and unfolding your piece of paper can do at a lower level.

Step 2
Imagine that there's a huge negatively charged balloon above you. The charge is so strong that it attracts the positive charges in your piece of paper and pulls you away from the floor. Use your folding and unfolding movements to get drawn up towards your balloon. When you can't go up any further, relax back down! Repeat a few times: how many different ways you can you fold and unfold your piece of paper? What happens if you imagine that you are lots of little pieces of paper dancing up towards the balloon?

Ideas for variations

- **GROUP**. *Imagine that you are a giant charged balloon and each child is a piece of paper*. Have the children spread out in the room, then place yourself at one end of the room. Your negative charges attract the positive charges in the "paper children" and draw them all the way across the room. Have fun with changing your position in the room and having the children finding different ways to travel towards you.

- **PAIRS**. *Imagine that Partner "A" is negatively charged, and Partner "B" is positively charged*. Have "A" hold out their hand or other body part and "B" mirror them. "A" is going to move that body part in the space around them (up, down, different directions) and "B" is going to mirror and follow the movements, like opposite charges attracting. Encourage "A" to make their movements simple and clear so that they're easy to follow. Remain on the spot to begin with, exploring the range of movements, then try having "A" travel in the space, attracting "B" with them wherever they go!

- **SOLO**. *Imagine that one part of your body is negatively charged, and another part is positively charged*. Explore how these two body parts/opposite charges are attracted to one another. Try as many different combinations as you can think of!

Activity 2: The thunderstorm (*go to 08:45 in the video*)

Step 1
Imagine that your whole body is a cloud. How can you make yourself soft, light and floaty, as if you were full of air? Enjoy moving in this quality for a while. Make your shapes really round and curved.

Step 2
Imagine that some ice crystals start forming inside your cloud. How does this make you move now? Can you find some sharper, isolated movements to represent this? The ice crystals start to collide and bump into each other. Really let them dance and jostle inside you! They start to collide more frequently as the storm begins to brew...can you create this chaos inside your body?

Step 3
Imagine that the more negatively charged ice crystals are sinking to the bottom of your cloud, and the positive ice crystals are gathering at the top of your cloud. The positive charges and the negative charges want to be together and the force between them becomes so strong that the lighting charges through the air – What does a charge of lightning feel like in your body? Strong and powerful? How would you describe the shape? Sharp and zigzagged? Try another charge of lightning and hold your shape. And another!

Ideas for variations

- **GROUP**. Arrange your class into two groups – positively and negatively charged ice crystals – but have them spread out and all mixed up to begin. As everyone does their colliding ice crystal dance, the positively charged group can travel through the space and gather on one side, while the negatively charged group travel through the space and find each other on the other side. See how you can find a way to show the lightning strike as a charge of electricity flowing between the two groups.

Where can I view the film?
Here

Where can I find the playlist?
Here. The playlist generally increases in speed/energy/intensity, finishing with some dramatic options for the thunderstorm dance! Have a listen and see which ones you like best/find most useful for your explorations of the ideas.

Who can I contact with questions and suggestions?
We are keen to hear your thoughts and learn about how you have used this film. Please fill out this short survey or email any questions, feedback or photos to learning@theplace.org.uk.