

**The Superhero
Science Show**

**Information for teachers
and group leaders**

What will the show involve?

We all love superheroes and often wish we had a super power but is it really possible to be super human? In this exciting 45 minute show we'll take a look at some of the most popular super powers our favourite comic book heroes have and delve a little deeper to see how we can use science to recreate some of these superhero qualities. We'll also be taking a look at how nature is going one step further and actually achieving what we mere mortals are unable to do.

The show is presented by two of our Enablers and will provide opportunities for children to get involved with the show whether it be as volunteers for a particular demonstration or as whole audience participation.

Please note that although the show is not directly linked to the primary science curriculum in terms of topics covered, our aim with this show is to present scientific concepts in a fun and interesting way so that we might spark the children's interest in science and inspire them to study science further as they get older.

Evaluation

Eureka! constantly aims to improve its programmes for school groups and feedback from adults and children is an essential part of this. We try and capture as much feedback as possible from teachers and children to guide our future programmes.

Teachers will be given a questionnaire at the end of the workshop and we'd appreciate it if you could fill this in on the day and hand to a member of staff, or alternatively return to Jenny Goodall c/o Eureka!, Discovery Road, Halifax, HX1 2NE

Additional resources & information

Please find the following documents in this pack:

- **Teacher's assessment chart** - *this outlines the aims and objectives of the show, including the key activities which children will be taking part in and their learning outcomes.*
- **Evaluation forms** – *from for the lead teacher to complete.*

Risk assessment

- Please visit our website <https://www.eureka.org.uk/education/resources/> to download both the general museum risk assessment and the one for The Superhero Science Show.
- We advise you to make a preview visit to carry out your own risk assessment for the overall visit.

The Superhero Science Show

Teacher assessment chart

Aims and objectives – by the end of this workshop children should have learned:

- That science, technology and engineering can be used to re-create some of the super powers of their favourite superheroes.
- That many creatures in the natural world have amazing super powers of their own.
- The three things needed for the fire triangle – fuel, oxygen & a source of heat.
- That light travels through different substances at different speeds.

Overview: Through a series of interactive science demonstrations, powerpoint presentation and discussion, this show will look at the science behind superhero powers and make links with nature where appropriate.

Activities	Learning Outcomes
Super strength – a demonstration to show a drinks can being crushed using air pressure	<i>That steam which is a gas, takes up more room than water which is a liquid.</i> <i>That when steam in a can is plunged into cold water it cools down and changes from a gas to a liquid.</i> <i>That if the air pressure inside the can is much lower than the air pressure on the outside, the unbalanced pressures will crush the can.</i> <i>That insects such as the leaf-cutter ant, rhinoceros beetle and dung beetle can carry things which weigh much more than their own body weight.</i>
Climbing walls – a fun demonstration to show how Hollywood makes it look like Spiderman can scale a skyscraper followed by a discussion about how scientists are using the gecko as inspiration to do this for real.	<i>That the gecko can cling to and climb walls because of electrostatic forces between thousands of tiny hairs on its feet and the surface.</i>
Super vision – using a thermal imaging camera to identify very hot and very cold objects	<i>That infrared is a type of light energy which shows whether something is hot or cold.</i> <i>That the more infrared energy something gives out, the hotter it is.</i> <i>That humans can't detect infrared energy but some animals like the pit viper can.</i>
Generating lightning – using a Van de Graaff generator to show how lightning is created	<i>That lots of things have positive and negative charges and if you separate them they will be attracted towards each other.</i> <i>That lightning is created by the negative charges in storm clouds being attracted towards the positive charges in the ground.</i> <i>That electric eels can generate electricity to stun their prey or warn off predators.</i>
Creating a fire tornado	<i>That a tornado is created because of different temperatures in the air clashing and creating a swirling motion that is pulled towards the ground.</i> <i>That we can artificially create a fire tornado by swirling the air using a 'tornado tube'.</i>
Fireball in hand	<i>That we need three things to produce fire; fuel, oxygen and a source of heat (the fire triangle).</i>

	<i>That water is a good absorber of heat.</i>
Controlling fire - Ruben's tube	<i>That we can control the intensity of a fire by controlling the amount of fuel.</i> <i>That flames will change direction due to air movement.</i>
Invisibility - Glassware glycerol	<i>That light travels through different substances at different speeds. (They have different refractive indexes).</i> <i>That our eyes may not be able to distinguish between two substances with the same refractive index.</i>
Examples from nature – octopus & tardigrade	<i>That cephalopods have an amazing ability to camouflage themselves so they appear invisible.</i> <i>That the tardigrade has adapted to survive in such extreme environments that it is close to being indestructible.</i>

The Superhero Science Show Teacher Evaluation

1. Was this your first school visit to Eureka!? (please circle)

Yes No

2. Was the science show the main reason you decided to make a school booking?

Yes No

3. How did you find out about the Science Show? (please tick)

☐ Eureka! Email
 ☐ Eureka! Website
 ☐ Social Media
 ☐ Word of Mouth
 ☐ Other

Other, please state _____

4. Measuring impact - Please read the following statements and tick the option which most applies to you.

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Impact on my class					
I feel this visit inspired my class					
My class learnt something new about Science					
I feel my class will be more interested in Science than before they came					
Eureka! is a good place to learn about science in a different way to school					
About Me					
I discovered something new during my visit					
The visit made me feel more confident about supporting my class in learning about Science					
The visit made me feel more confident about science					
I would recommend a visit to other teachers					

5. What do you feel were the highlights of the workshop?

6. Is there anything we could have done to improve the workshop?

7. Would you consider attending another Science Show at Eureka!? (please circle)

Yes No

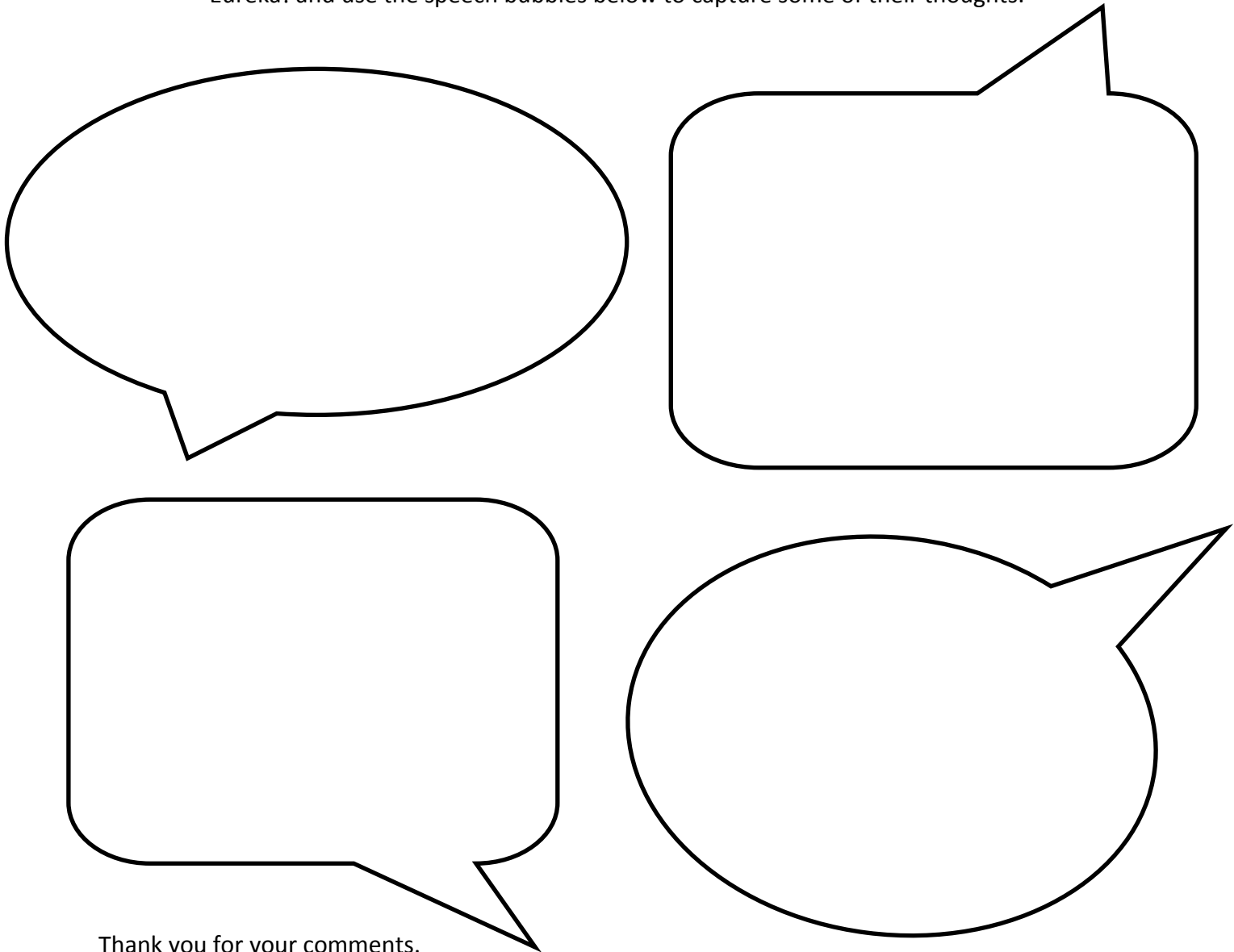
If NO would you like to tell us why not?

P.T.O



7. Is there anything else you would like to tell us either about the science show or any other aspects of your visit?

We'd love to hear what the children thought about the session too. As a follow-up activity the day after why not ask the children what they can remember about the science show and their visit to Eureka! and use the speech bubbles below to capture some of their thoughts.

Four speech bubble templates are provided for children to write their thoughts. The top-left bubble is a classic oval shape with a small tail pointing down and to the left. The top-right bubble is a rounded rectangle with a small tail pointing up and to the right. The bottom-left bubble is a rounded rectangle with a small tail pointing down and to the right. The bottom-right bubble is a large, irregular oval shape with a small tail pointing up and to the right.

Thank you for your comments.

Please return to: **Jenny Goodall, Play & Learning Officer**, Eureka! The National Children's Museum, Discovery Road, Halifax, West Yorkshire, HX1 2NE