
SSE School Workshops

2021

Key information

Resource type	School Workshop
Duration	1hr 40/45 minutes To be delivered as a whole session or as 2 separate sessions If delivering in two sessions, start session 2 at slide 9
Location	Classroom/Hall
Max number of students	
Age group	Pre options (years 7-9 in UK, primary 7, S1 & S2 in Scotland))
Target number of volunteers	Minimum of 1
Facilitator	SSE volunteer or teacher
Room set up	Desks and chairs arranged facing a screen with session presentation and connection to sound. The students will be working in teams of 4, therefore it will be helpful if they're already placed and arranged in these groups.
Required materials	<p>Mini whiteboards (if school utilises), if not, A4 paper</p> <p>Storm simulation handout</p> <p>Background to Winchester handout (1 per group)</p> <p>Role simulation cards (4 copies per group)</p> <p>Paper and pens (1 set per team of 4)</p>

Session Aims and Objectives

In this session, the students will gain an understanding of the impact a storm has on the infrastructure of a town. Students will need to use their evaluation skills to determine what is the most appropriate response to support the vital infrastructure of Winchester! Students will learn about what steps SSE carry out to protect and maintain vital energy supplies. Putting this knowledge in place, groups will determine how best to respond to an incoming storm.

Learning Outcomes

1. To develop an understanding of how the weather can affect the energy network.
2. To evaluate the most important steps needed to create a resilient energy network.
3. To work together to formulate a plan to safeguard a town against significant storm damage.

Curriculum Links

KS3: Geography Curriculum - understand, through the use of detailed place-based exemplars at a variety of scales, the key processes in: physical geography relating to: geological timescales and plate tectonics; rocks, weathering and soils; **weather and climate**.

KS3: Science Curriculum: interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions, fuels and **energy** resources.

Workshop timings

Activity	Time Allocation Guide
Starter Activity	5 mins
Scenarios of a storm (individual work)	15 mins
Introduction to storm (individual and partner work)	15 mins
Protecting against Storm Damage 1	15 mins
Group Simulation	25 mins
Group presentations	15 mins
Individual Reflection	7 mins
Plenary	5 mins

Time allocation	Activity	Description/instruction	Teacher/facilitator to check learning by	Resources
Starter- 5 mins	Impact of an extreme storm	<p>If SSE volunteers delivering the session- Introduce yourself by explaining what you do at SSE. To act as an icebreaker, put three facts about yourself on the board, 2 are true, 1 is a lie - students need to try and work out which one is a lie.</p> <p>https://www.youtube.com/watch?v=S8jl1wSEbV0</p> <p>Play this video to students as the lesson starts. Ask students to watch the</p>	Ask students to share their thoughts. Explain that all will be revealed shortly!	YouTube video

		<p>video carefully and write down what impact the storm has on a town/city. List all the effects it may have e.g. electricity lines falling down, train tracks destroyed.</p> <p>Extension question - get students to think about who might be most vulnerable in a storm? What can be done to help these people?</p>		
15 minutes	Scenarios of a storm	<p>Display 7 scenarios relating to a storm. Get students to use mini whiteboards to note down what they would do in that specific situation. Teacher to then ask students to explain their choice. If mini whiteboards aren't available, get students to complete the task in their notebooks.</p> <p>A storm forecasted to have 80MPH-100MPH winds is due to hit your local town in two days' time. Extreme rainfall is also forecast, which could cause extensive flooding and damage to the local area. You need to prioritise protecting the following elements of the town but have a limited budget and time. How would you prioritise protecting them?</p> <p>Extension: Why did you put them in the order you selected?</p> <ul style="list-style-type: none"> -Local Nursery - room for 50 young children and 15 staff. -Train tracks and station - key route for people accessing the town. -Local electricity sub-station - infrastructure to transfer electricity to the town's 50,000 residents. -Hospital - regional hospital including a large A&E dept. - Retirement home - building with 60 elderly people. - Secondary School - Main secondary school in the city with 2,200 students. - Cathedral - Main tourist attraction in the town. Generates £40 million to the local economy. 	<p>Checking learning by using mini-white boards to assess understanding. Teacher to ask students to justify why they selected the answer.</p>	<p>Mini whiteboards if possible.</p>

15 minutes	Intro to Storm	<p>This section will introduce students to the effects a storm can have on the energy network and the steps taken by companies like SSE to safeguard the risk to its users.</p> <p>(1) Explain to students that energy companies are trying to prevent the following when a storm hits: (show images for each one).</p> <ul style="list-style-type: none"> - Trees/foilage falling on electricity lines. - Flooding - flood electricity substations and foundations possibly washed away. - Damaged infrastructure including power lines and sub-stations. <p>Explain how SSE safeguard against these risks.</p> <p>(2) Ask students what the impact of the following can be on a local town if the above happens?</p> <p>Energy companies are committed to ensure that users continue to have energy despite the risk of storm damage. Power cuts can have challenging consequences for local communities.</p> <p>(3) Split students into pairs. Get students in pairs to think about the</p>	<p>Cold calling students after section (2).</p> <p>Circulate around room to hear pairs discuss ideas in section (3).</p>	

		<p>impact of a power-cut. What would be impacted if a power cut lasted for 2+ hours. Encourage students to think beyond their homes and extend their thinking to the wider town/city (e.g. traffic lights, oxygen supplies at hospitals).</p>		
15 minutes	Protecting against storm damage	<p>Introduce students to the steps taken by SSE to protect communities against the risk of storm damage to the power network:</p> <ul style="list-style-type: none"> (1) Delivering food, torches and vital supplies to vulnerable members of the community (e.g. elderly). (2) Provide power packs so people can charge mobile phones. (3) Repair crews on call to fix damaged lines and energy infrastructure. (4) Pro-active protection by ensuring sub-stations are built to protect against the risks of storm damage. (5) Customer service support. <p>Introduce the economic impact of a power cut to the energy company! For every minute a household is off grid, company receives a £20 penalty.</p> <p>Individual scenario work: This activity will simulate the pressure energy companies are under to fix the impact of a storm. Students will have 5 minutes to decide what the key actions will be. For every 1 minute it takes, 2000 homes in the small town off grid, the company are penalised £40,000.</p> <p>Present on board the scenario - students need to decide upon 5 things they would do to help protect the energy network/community. A town of 2000 homes (8000 people) has just been hit by a</p>	<p>Circulate around the room to hear student thinking. Opportunity to hear from students at end of activity.</p>	<p>Handout to help students with this activity.</p>

		<p>storm. Power is down. What would your priority steps be to fix the network and minimise risks to population?</p> <p>Use handout - Get students to work as quickly as they can to try and take as many steps as possible to help re-connect as many people as possible back onto the grid. Once finished, students put hands up to notify teacher they are done. Exercise finishes at 5 minutes! This exercise tests their ability to work under pressure and take into consideration the economic impact of power-cuts to SSE.</p>		
25 minutes	Group activity-protecting a town	<p>Teacher to split students into groups of four. The scenario is based upon an incoming storm about to hit the town of Winchester (an SSE supplier location). Forecast of 60MPH winds with possible heavy rain. Unlikely to shut down the city but important to take steps to legislate against risk. Each member of the group is given a specific area of responsibility to protect against the impact of the storm.</p> <p>The aim of the exercise is for students to firstly, determine what they would do to protect their specific area of focus and secondly, as a group, determine what are the key priorities.</p> <p>Each group receives the following:</p> <p>(1) Information about Winchester (population, economy, size, power network, transport etc).</p> <p>(2) Information cards for each of the 4 key areas to protect.</p> <p>Student 1: In charge of protecting vulnerable people. Student given a map plotting the key places in the city with hospitals, hospices, nurseries etc.</p>		<p>Information pack for each student depending on their role.</p> <p>Background to Winchester handout.</p> <p>A3 paper for mind-mapping.</p>

		<p>Student needs to prioritise three of these places and choose course of action for these locations.</p> <p>Student 2: Transport - Student given timetables for Winchester train station, key road map. Student to decide what to do with trains, roads before the storm hits. Explain the importance of the train station on the town and number of people returning to the town use the train.</p> <p>Student 3: Energy infrastructure - provide a map with the towns sub stations as well as solar/wind farms in the area that power Winchester. Student to decide which ones to protect/switch off.</p> <p>Student 4: Local economy. Present student with a factbook outlining the key ways Winchester earns an income (including Tourism stats). Student to decide which areas to prioritise. Important that they simply cannot shut down the entire city!</p> <p>Give students 10 minutes individually to work through their scenarios. Groups will then have 15 minutes to present their plans of action and decide the key 10 things they would do to protect Winchester against the risks of storm damage.</p>		
10-15 minutes	Group presentations	Give each group 2-3 minutes to present their storm preparation plan and highlight the 10 things they would do to protect the city of Winchester.		
7 minutes	Individual reflection	Give students the chance to reflect on the activity and the role they played within the group. Fill in individual reflection worksheet with the following questions:	Individual reflection to encourage students to think about group work and the key	

		<p>(1) What did you enjoy about working within a group?</p> <p>(2) What would you improve the next time you work in a group?</p> <p>(3) What was the hardest thing about preparing the city for the impact of a storm?</p> <p>(4) What have you learnt about the impact a storm can have on a local community?</p>	themes explored within the lesson.	
5 minutes	Plenary	Refer to the video at the beginning of the lesson (in starter). Pose question to students now and select students to answer. 'From what we have explored today, what impact does a storm have on a town/city?'		

Key words:

- Storm
- Infrastructure
- Prioritisation
- Energy Network
- Safety

Feedback links

Please ensure your host supports us with feedback on the session:

[Host feedback link](#)

Please also provide us with your feedback on the session:

[Volunteer feedback link](#)

Further Information

For more information about STEM careers, in particular Engineering careers, please visit the Institution of Engineering & Technology's education website at <https://education.theiet.org>. You will also find a large range of our STEM education resources and activities available free of charge, along with competitions and funding opportunities to support your STEM education engagement.