

The Day the Earth Caught Fire (dir. Val Guest, 1961)

Lesson by James Chester, Teach First

Sciences, Key Stage 3

Use a classic science fiction film to explore scientific ideas. Take up the role of a science journalist for the Daily Express while watching the film, with different assignments throughout.

This could be used as a single lesson where you can pick what activities to complete or include, or as a set of lessons spanning lots of different science skills/knowledge. It would work well for revision purposes, and each task can be made simpler/more complicated to suit the individual needs of each class.

Lesson Objective

- Explain how the phenomenon of sunspots occurs and what effects it may be having.
- Explore the pros and cons of nuclear power.
- Describe how mains water is collected and produced.
- Identify the effects of forest fires, pointed out how they allow carbon to be recycled.
- Compare data to determine whether ice flow rates are changing on Earth.
- Explain what is happening when a solar eclipse occurs.

You will need...

The Day the Earth Caught Fire DVD

Curriculum Links

Physics: Space physics:

- Our Sun as a star, other stars in our galaxy, other galaxies (science behind sunspots).
- The seasons and the Earth's tilt, day length at different times of year, in different hemispheres (What is a solar eclipse?).

Physics: Fuels and Energy Resources:

- Nuclear Power information and debate.

Chemistry: Earth and Atmosphere:

- The production of carbon dioxide by human activity and the impact on climate (looking at ice flow figures).
- The carbon cycle (integrated when looking at the importance of forest fires).

Activities

TRAILER: Setting the Scene

The beginning of the film shows the climate to be intensely hot. The screen is bleached red to signify this. After showing the film's introduction, ask students to describe individually, or in groups:

- How does the introduction make you feel?
- What has the filmmaker done to make you feel like this?

MAIN ATTRACTION: Real-time Tasks

This lesson works with the film in real time. As you are watching the film, pause it at the times given and the task will relate to the specific moment in the film. You can use as many or as few of these 'pause tasks' as you wish.

1. Pause the video at point (7:50 min). Set out the scenario so that the students are to act as Peter (the main character), and they have to complete the assignment to write a piece on sunspots and solar flares just as he does. This would work best in the form of a *Daily Express* newspaper column.

In order to research the facts the student can either use the Internet to find the information themselves or use worksheets/textbooks for the information:

Solar Flares

- Information about solar flares:
<http://solarscience.msfc.nasa.gov/flares.shtml> &
<http://hesperia.gsfc.nasa.gov/sftheory/flare.htm>
- Video of solar flares: <http://www.bbc.co.uk/news/science-environment-27806078>

Sunspots

- 'Is our sun falling silent?' by Rebecca Morelle, 18 Jan 2014.
<http://www.bbc.co.uk/news/science-environment-25743806>
- Wikipedia page on Sunspots: <http://en.wikipedia.org/wiki/Sunspot>

This should only be a short piece to keep pace high, roughly 500 words maximum.

2. Pause the video after (15:30 min). Here the students are asked to work out whether the differences in times at each pole mentioned in the film are, in fact, very close to each other when accounting for differing time zones. They can research the different time zones themselves:

- Time Zone Map: <http://www.worldtimezone.com/>
- Interactive Time Zone Website:
<http://www.timeanddate.com/time/map/>

3. (21:45 min onwards). This part of the film shows a clash between pro and anti nuclear power demonstrators. Students are divided in to half (either by whether they are pro or anti nuclear power themselves, or at the teacher's discretion) and then tasked with producing a compelling argument for their side of the debate. To research the topic students can use the Internet themselves or use information sheets:

- Nuclear Energy: Pros and Cons.
<http://www.triplepundit.com/2009/02/nuclear-energy-pros-and-cons/>
- Analysis: Is nuclear power the answer? By Alex Kirby, 17 Oct 2005. BBC article showing the debate.
<http://news.bbc.co.uk/1/hi/sci/tech/4216302.stm>.
- Geobytes GCSE blog, with information and useful links.
<http://geobytesgcse.blogspot.co.uk/2008/04/nuclear-debate.html>

After a set time to finish their pieces there is a teacher led debate with arguments for both sides written on the board by members of each pupil team. A winner is decided at the end and can be given a suitable prize!

4. Pause the film at point (23:50). Here there is a premature solar eclipse in the film. Pupils are tasked with explaining this phenomenon using information they find themselves. They must write a short newspaper column explaining how such an event occurs. It should be directed towards teaching a lay audience (use an example of a local newspaper to increase engagement) about eclipses and contain a diagram of the phenomenon. Higher ability students should explain how a lunar eclipse is different

- Solar Eclipse: What is a total solar eclipse and when is the next one?' by Joe Rao, 30 April 2014. <http://www.space.com/15584-solar->

[eclipses.html](#)

5. Pause the video at point (38:50). At this point in the film the journalists are asked to look in to past figures about the weather and compare them to their current readings. Pupils need to research and find real data on the ice flow rates and compare them with those mentioned in the film. They must present both sets of data and explain how they are different. This can be performed in groups or individually.

- Climate change indicators in the United States, Environmental Protection Agency, example of suitable data.
<http://www.epa.gov/climatechange/science/indicators/snow-ice/sea-ice.html>–

Ask at the end:

- Does the media use accurate scientific figures in films?
- How could this potentially be a problem?

Here you want to move the discussion towards how science is often misrepresented in the media, and how this could potentially damage society through propagation of false information.

6. Pause the video at point (1 h 05:00 min). With fires breaking out across London and across the world in the film, here the students will be tasked with researching forest fires, and seeing how they relate to the carbon cycle, and are often very important in keeping biodiversity high. The aim here is to produce a diagram of how this fits in to the carbon cycle.
 - Fire's carbon contribution, Sadie McMillan, 12 Nov 2007.
<http://www.geotimes.org/nov07/article.html?id=WebExtra111207.html>
 - The Carbon Cycle: a new look at the world's oldest fuel, Wood Heat Organisation. <http://www.woodheat.org/carbon-cycle.html>
 - The Fire Science Brief, http://www.firescience.gov/projects/briefs/03-1-1-06_FSBrief86.pdf–
 - How wildfires Work by Kevin Bonsor,
<http://science.howstuffworks.com/nature/natural-disasters/wildfire.htm>–
7. Pause the video at point (1h 07:26). Here in the film there is a water shortage due to the high temperatures and conditions. The students will

work in groups to produce leaflets that could be sent to the general population to explain why there is a hosepipe ban and why it is important to uphold this ban.

END CREDITS: Plenary

To conclude your lesson, you may want to carry out the final part of one or more of the tasks above. Alternatively, you could get your students to reflect on their findings and present their work. With the information they've gathered, what measures would they employ to cope with such a climate disaster?

Extras

Other Ideas

For an extra task the students can research how mains water is supplied and made clean. They can express this diagrammatically.

- Hose Pipe Bans and further links <http://www.water-guide.org.uk/hose-pipe-bans.html> .
- Is a hosepipe ban the most effective way to tackle a drought? By Leo Hickman, 13 Mar 2012. <http://www.theguardian.com/environment/blog/2012/mar/13/hosepipe-ban-water-drought-effective>
- How is the water I drink made safe? <http://water.usgs.gov/edu/qa-home-drinksafe.html>

Watch

Films also about apocalyptic visions of the future:

Day the World Ended (Roger Corman, 1955)

The Day After Tomorrow (Roland Emmerich, 2004)