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Teaching science with cartoons from the Zagreb School of Animation

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Cartoons are fun to watch but can also help inspire students and enhance their understanding of science. Here's how to do that with some classics of European animation.

Cartoons and comics are a popular visual aid in teaching, and their potential in science education is well documented.[1] They can be an informal and fun way to approach curriculum topics, and the use of images, humour, and narrative stories makes them relatable and helps capture students' attention. Some studies have found that cartoons and comics can lead to a better understanding of scientific concepts and enhance learning outcomes.[1,2]

Apart from instructional cartoons made specifically for teaching, animated fiction films can be used to kick-start discussions about important curriculum topics in a fun and unconventional way.

For example, Professor Balthazar, a whimsical Croatian cartoon about a famous inventor who uses the power of science and technology to solve his world's problems, is fun to watch and can be used to illustrate the scientific method. Balthazar goes from encountering a problem, to thinking and researching it, and then to developing a solution. To achieve this, he often uses books, mathematics, scientific equipment and expeditions.[3]

His colourful 'miraculous machine' – a tool of creativity leading to people's happiness – also raises interesting questions about the use of scientific instrumentation and the role of engineering and technology in making scientific discoveries. For example, why does science need big machines, and how do they work? Do societal problems always require a technological solution?

The Zagreb School of Animation and its cartoons

This cartoon was originally produced in the 1960s by the renowned Zagreb School of Animation. According to the non-governmental organisation Association Professor Balthazar, which is using the character in educational initiatives while also producing new episodes, the cartoon was especially popular in former Yugoslavia, Scandinavia, Germany, France, and Portugal.

The Zagreb School of Animation came to fame due to their innovations in animation techniques and their focus on humanistic topics that examine an ordinary person's struggles in an urbanised and polluted world in a humorous way.[4]

Their cartoons, which are freely available on the Zagreb Film's YouTube channel, deal with timeless topics such as the importance of friendship and altruism or persevering through challenges and failures. Many episodes tackle environmental pollution, war and the challenges of capitalism and technological change. These are all topics relevant to education and society today. Some of their films deal with scientific topics, providing an entry point to discuss issues such as astrobiology, artificial intelligence and climate change.

Examples of cartoons and science topics

Here is a selection of cartoons that are freely accessible, categorised by the relevant topics they address, and complemented by suggestions for discussion starters arising from those.

Space science

A Visit From Space and Cow On The Moon feature space travel, moon landings, astronautics and girls in science. They also tackle the importance of helping newcomers, as well as the possibility of life beyond Earth – an active research area for astrobiologists.

A female scientist working on her space rocket designs in Cow On The Moon

Image courtesy of Zagreb Film/Association Professor Balthazar

The topics astronomy, exoplanet discovery and space travel are also featured in several others episodes of Professor Balthazar, including in Victor's Egg-o-mat, Starlight Serenades and Bald Is Beautiful.

Discussion starters

- Do you think there is life on other planets, and why is that?
- What could alien lifeforms look like? What can the principles of newtonian physics and darwinian evolution tell us about that?
- How could we communicate with alien species? If they sent signals, would we be able to detect and understand them?
- Could alien species pose a threat? Should we even be trying to find and contact them?
- How can you tell that the Moon landings were real? What are your thoughts on plans to send people back to the Moon?
- What are reasons for future Moon expeditions? Would you like to work on those missions as a scientist or an astronaut, and why?

Professor Balthazar using a telescope

Image courtesy of Zagreb Film/Association Professor Balthazar

Robotics, automation and Artificial Intelligence (AI)

Playful Robot, Inspektor Maska: Citizen IM-5 and An All-round Help, tackle robotics and the quest for automation, which are relevant to today's discussions about AI and its impact on society and the economy. They deal with the inventors' motivations, the programming of robots and unintended consequences, such as what happens when AI starts to make its own decisions.

The importance of automation on people's lives, and the citizens' oversight of its deployment, also feature in Professor Balthazar's episode Steeples Are Funny.

Meanwhile, Abrakadabra contrasts old ways of thinking and acting, rooted in tradition, beliefs and magic, with new ap-

proaches grounded in modernity, evidence and technology. It addresses the relationship between scientific and non-scientific worldviews in a fun way, and it offers starting points for discussing the benefits of technological progress.

A scientist character in Playful Robot

Image courtesy of Zagreb Film/Association Professor Balthazar

Discussion starters:

- What is the motivation behind robotisation?
- If robots are supposed to take over (parts of) our work, what will we do with the extra free time we gain?
- Automation has already relieved us of many tasks in humans' recent history and increased our productivity significantly. Did we gain more free time through these developments and if not, why?
- Can robots have a consciousness?
- Can AI be creative? How do we define creativity?

The Devil's Work is about a young office worker who uses chemistry to make a potion to make himself more confident and popular. It features citizen science and raises questions about lab safety and scientific methodology, as well as how science differs from magic in its methods and outcomes.

Environment, pollution and climate change

A Windy Story and Snowtime For Comedy deal with environmental disasters and suggest sustainable, natural ways of adapting to the changing climate by recycling renewable resources. They can inspire discussions about the importance of climate mitigation, adaptation, as well as geoengineering – controversial large-scale manipulations of the Earth's climate to counteract the effects of global warming.

Two Bees Or Not Two Bees and The Endless Deviltry are focused on human-made pollution and present ideas of recycling a bad by-product of industry into something useful through upcycling and the circular economy.

Man The Polluter is a series of short animations, compiled into a single 50-minute programme, co-produced with the National Film Board of Canada. The films talk about pollution, the balance between economic and ecological needs and the democratic control of new technology. It does so in an unusual way, for example, by examining an imagined new way of dealing with rubbish: removing it with time machines and what consequences that might have. It raises a range of questions about climate change, pollution, recycling and the striking reality that some environmental issues have been known for decades but yet remain an unsolved problem to this day. Can we inspire the future generations to finally find sustainable solutions?

Professor Balthazar in Snowtime For Comedy

Image courtesy of Zagreb Film/Association Professor Balthazar

Discussion starters:

- What large-scale solutions could combat climate change if adapted globally?
- Which examples of the circular economy, in which industrial by-products are used as resources, can you think of?
- Can you think of any examples where transforming to a circular system could be achieved and beneficial? Which factors do we need to consider when thinking about these processes?
- How can we contribute personally to waste reduction? Which items that you use daily could be upcycled once they have served their original purpose?

Of course, all of the animations can be viewed and interpreted differently, which is another strength in that it can help to teach critical viewing skills, allow for a diversity of opinion and encourage a healthy debate about important curriculum topics.

All in all, this intriguing, award-winning collection of animated films, made by one of the most celebrated groups in animation history, offers many opportunities to engage with scientific and societal topics while exploring one of the most impressive bodies of work in European art history. ‹‹

References

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[2] Putri SA et al. (2024) Effectiveness of Using Animation Videos in Science Learning in Elementary Schools: A Systematic Literature Reviews. *Indonesian Journal Of Educational Research and Review* **7**: 667–678. doi: 10.23887/ijerr.v7i3.82242

[3] Tatalović M (2025) The educational value of representations of science and innovation in the animated TV series Professor Balthazar. *Cultures of Science* **8**: 241-248. doi: 10.1177/20966083251356764

[4] Tatalović M (2025) Representations of science and innovation in Professor Balthazar and related films of the Zagreb school of animation. *Pulse: the Journal of Science and Culture* **12**. doi: 10.5281/zenodo.20042547

Resources

- Have a look at the Professor Balthazar films on the official YouTube channel.
- Check out other films of Zagreb Film.
- Watch the Man The Polluter film.
- Catch and keep your student's attention by encouraging them to create science videos: McHugh M, McCauley V (2017) Hooked on Science. *Science in School* **39**: 55–59.
- A motion picture is worth a thousand words: Godinho T (2021) Screen time: fantastic film clips from the EIROs. *Science in School* **51**.
- Try a project that blends chemistry, art, and peer learning: Egan P (2025) Adventures in cyanoprinting: where art and chemistry meet *Science in School* **73**.
- Explore the form and function of proteins with an engaging art competition from EMBL: Hall S (2024) Unfold Your World: using art to explore the story of life. *Science in School* **67**.
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