Electric Vehicle Charging Infrastructure

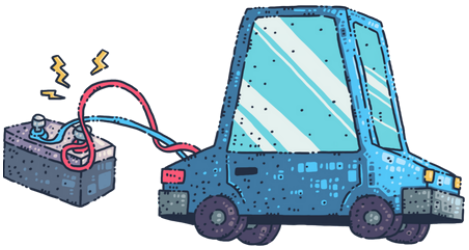
Designing Electric Vehicle Charging Stations

Keywords:

electric vehicles, charging stations, urban planning, sustainable transportation, infrastructure

Target group:

primary school pupils (ages 6-11)



Objectives:

This activity introduces pupils to the importance of electric vehicle (EV) charging stations in supporting sustainable transportation and reducing greenhouse gas emissions.
Through group collaboration and creative model-building, pupils will learn how EV infrastructure helps cities become cleaner and more accessible. They will consider key planning aspects such as location, accessibility, convenience, and community impact. By the end of the activity, pupils will understand how charging stations work, identify factors that influence their placement, and present a thoughtful design proposal for a charging network that supports people and the environment.

General Guideline on Time Allocation:

The duration needed to carry out this activity may vary depending on the specific group of children. Teachers are encouraged to adapt the implementation according to the needs, interests, and dynamics of the group.

In the preparatory phase, teachers may use a variety of activities to introduce and contextualize the chosen topic. These can include discussions, videos, drawings, storytelling, or even a field trip, depending on the age and background knowledge of the children.

The main construction phase, during which children plan and build their urban element using LEGO bricks, should typically not exceed 45 to 60 minutes. However, this phase often stimulates further curiosity and questions among the children, potentially leading to extended engagement or follow-up activities. For more detailed instructions and pedagogical support on how to implement activities of INNO–kids project, please download the Teacher's Methodological Guide.

Materials and Resources Needed:

- Maps of real or fictional urban areas (to help pupils visualise suitable locations for charging stations)
- Paper, coloured pencils, markers, glue, scissors
- LEGO sets or other construction materials
- Tablets or computers with access to educational apps or simple mapping tools (optional)
- Reference materials about EVs and sustainable urban transport (books, articles, infographics)

Note: Encourage pupils to use their imagination and repurpose available materials in creative and functional ways. If LEGO bricks are not available, pupils may draw, cut, and construct using paper and craft supplies.

Introduction:

Begin by asking pupils if they have seen or heard of electric vehicles (EVs). What makes them different from petrol or diesel cars? Explain that EVs produce fewer emissions and are better for the environment — but they need special places to recharge: charging stations. Use pictures or a short video to introduce real-world examples of charging stations and networks. Discuss why having enough well-placed charging points is important for encouraging people to choose electric vehicles. Then pose a challenge: “What would happen if there were not enough charging stations in your city?”

Procedure:

Preparation:

Introduce pupils to electric vehicles and how they help reduce air pollution and greenhouse gas emissions. Discuss the role of charging stations in supporting clean transportation and making cities more sustainable. Use maps or diagrams to show where charging stations are often placed — near homes, shopping centres, public transport stops, or car parks. Ask guiding questions such as: Where would be the best place to charge a car? What makes a station easy to use?

Construction:

Divide pupils into small groups and provide materials: maps or grid paper for planning, craft materials and LEGO pieces for building. Ask each group to:

- Choose a layout for their urban area (real or imagined)
- Identify the best locations for EV charging stations
- Consider accessibility for different users (families, people with disabilities, delivery drivers)
- Add green features like solar panels, green roofs, or small rest zones

Details:
As groups build and refine their models, support them in thinking through practical details: How many stations are needed for the area? What if several cars need to charge at once? How do people find and access the station? Reinforce that good infrastructure is both functional and people-friendly.

Stories:
Invite pupils to step into the shoes of different people who interact with their charging station network. Through role play or short written stories, they can act as an EV driver looking for a place to charge, a city planner presenting a new station to the public, or a local resident who is excited (or concerned) about changes in their neighbourhood. Encourage them to include realistic situations — like a driver after long journey needs a quick charge. Stories can include challenges (e.g. too many users, not enough access) and how their design solves them.

Presentation:
Invite each group to present their EV charging station model. Pupils should explain how they chose locations for the charging stations, what sustainable features they included, and how their network helps both people and the environment. Encourage them to use maps, models, or digital tools to support their explanation. After each presentation, open the floor for questions, comments, or suggestions from classmates.

Tips:

- Encourage pupils to think both practically and creatively — remind them that charging stations are not just about technology, but about people and the environment too. Use real-life examples of EV infrastructure to inspire ideas and deepen understanding.
- Ask open-ended questions to guide critical thinking: “How can you make your station more inviting?”
- Keep the energy positive and celebrate diverse approaches, whether simple or ambitious.

Additional Considerations:

Differentiation:

Provide additional support or simplified instructions for pupils who may require extra assistance. For advanced pupils, offer extension tasks such as researching further sustainable practices or designing more complex models.

Assessment:

Assess pupils based on their participation and engagement during discussions and hands-on activities. Evaluate the creativity, effort, collaboration, depth of understanding demonstrated in their models, critical thinking, ability to provide constructive feedback and presentation skills.

Extension Activities:

- Plan a visit to a local EV charging station or invite a guest speaker working in urban development or sustainable transport.
- Launch a class project to design a realistic proposal for placing a small charging station at or near the school.
- Pupils can create awareness posters or infographics encouraging electric vehicle use and responsible energy consumption.

Curriculum Connections:

This activity integrates:
Science *(charging stations, sustainable transportation)*
Social Studies *(urban planning, community mobility and health)*
Art *(design, creativity, construction)*
Language *(oral communication, storytelling, and listening skills)*
Technology *(usage of digital tools and educational apps)*

SDG Connections:

- **SDG 9:** Industry, Innovation and Infrastructure – Pupils design infrastructure to support sustainable technology.
- **SDG 11:** Sustainable Cities and Communities – The activity encourages urban planning that benefits both people and the planet.
- **SDG 13:** Climate Action – Pupils learn how shifting to electric vehicles helps reduce emissions and fight climate change.

Co-funded by the European Union

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