

Facilitation Notes

Engage ⌚ 5 min.

Introduce the context of a busy city and the many resources required to make it function.

LEGO education

Population Pressure

I can explain how resource use affects the environment.
I can describe how an increase in population impacts a city's resources.
I can model solutions that minimise use of Earth's resources.

Population Pressure

Pupils will construct an argument that explains how increases in human population impact Earth's resources.

0 | Objectives

You can introduce the pupils to the objective and learning outcomes of this lesson.

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Population Pressure

How does a growing city impact Earth's resources?

1 | Introduction

Ask pupils what they know about the growth of cities. Depending on your local context, you can reference a nearby town or city and discuss how it has grown in recent years. If more suitable, ask pupils about a major city in your region or name a well-known city such as London, New York or Tokyo. These cities have small areas of land, but have grown in population rapidly. Pupils can consider why cities grow and the possible impacts of such growth.

2 | Context

Ask pupils to brainstorm activities that could be happening in a city at any given moment. Emphasise that these could be personal activities such as taking a shower or eating, as well as larger systems of activities such as transportation lines running and factories, businesses and offices working. Introduce the key vocabulary *resources* and ask: *What resources do you use each day to live, work and play?*

What activities are happening in a city at any given moment? People, businesses and factories are all making life work in a busy system. Their activities all require **resources**. Do they have enough for everyone?

Explore ⌚ 15 min.

In groups of 4, pupils will build a city that represents different ways resources can be used.

3 | Groups and Roles

Divide the pupils into groups of 4. Use the blue, red, green and yellow LEGO® minifigures to assign pupil roles and help each pupil find which part of the collaborative model they will build. They can find the corresponding blue, red, green and yellow LEGO minifigure icons in the building instructions.

Build:

- City

Name all the activities happening in the city. What resources are being used?

4 | Build and Explore

This is a miniature scale model of a city. If pupils need support, you can help them identify these elements:

- Factory
- Shop
- Cars
- Truck delivering goods from the factory to other parts of the city
- Three houses
- Water tower

Building Instruction for use during Explore

C107

Explain ⌚ 5 min.

Pupils will discuss what is happening in the city and the resources required for each activity.

What are all the different activities happening in this city? What resources are needed to keep these activities working for the busy city? How does this impact the environment?

5 | Share

You can prompt pupils' thinking with questions and brainstorming:

- *What are all the components included in the model? What are some that might be unseen?* (For example, people living in the houses are using water, heating and cooling their home and using electricity.)
- List or display some ideas. *What resources are being used for these activities?* (For example, fuel, electricity and water.)
- *How can we group resource use together?* (For example, trucks and cars are both using fuel.) Encourage pupils to identify patterns in resources.

Elaborate ⌚ 15 min.

Pupils will consider how population growth will impact resource use in the city and then build solutions that conserve those resources. Afterwards, pupils will share their solutions and relate this experience to real-life examples of cities with Earth-friendly features.

The population¹¹ of this city is booming! What will this do to the city's use of resources? Redesign the city so that it conserves Earth's resources and continues to function for the growing number of people.

6 | Build

Guide pupils in connecting an increase in population to an increase in resources consumed and therefore to impacts on the greater environment. If pupils need support, you can lead brainstorming before groups start to build. For example, groups can try to solve specific resource problems, such as needing more fuel for trucks and cars. You can also suggest some solution ideas:

- A public transportation system
- Solar cells or panels on the factory and homes
- Wind turbines to create sustainable energy
- Urban or rooftop gardens
- Rainwater collection systems

Present your new city. How do your changes impact the resources used by the larger population?

7 | Share Your Build

To check pupil understanding, you can look for the following:

- Pupils can connect an increase in population to an increase in resources consumed.
- Pupils can describe how an increase in population impacts use of Earth's resources and the environment.
- Pupils can model solutions to minimise resource use as a population increases.
- Pupils can explain how their solutions conserve Earth's resources, even as the population increases.

8 | In Real Life

Discuss how the two photographs show resource conservation in city settings. The electric bike rental system enables people to avoid or minimise using cars and fuel-dependent vehicles to get around. The multi-storey carpark shows how space can be used efficiently for businesses as well as the parking needs of a growing population. The outside of the building supports plant life, which cleans the air and supports biodiversity in the area.

Evaluate ⌚ 5 min.

An optional evaluative prompt asks pupils to explain what happens to the use of resources as populations increase.

Explain what happens to resource use as populations increase. What impact can this have on Earth's resources?

9 | Show What You Know

You can ask pupils to write answers in their exercise books or use other methods established in your classroom.

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Clean Up

10 | Clean Up