Science 11+ Lesson ID: C107 Population Pressure

Facilitation Notes

Population Pressure

Students will construct

Engage © 5 min.

education

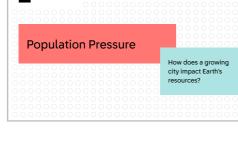
Introduce the context of a busy city and the many resources required to make it function.



You can introduce the students to the objective and

0 | Goals and Objectives

learning targets of this lesson.



Depending on your local context, you can reference a

1 Introduction

nearby town or city and discuss how it has grown in recent years. If more suitable, ask students about a major city in your region or name a well-known city such as New York, Miami or New Orleans. These cities have small areas of land, but have grown in population rapidly. Students can consider why cities grow and the possible impacts of such growth. 2 | Context Ask students to brainstorm activities that could be

Ask students what they know about the growth of cities.

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?

What activities are

happening in a city at any

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?

green and yellow LEGO® minifigures to assign student roles and help each student 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

happening in a city at any given moment. Emphasise that

Explore () 15 min.

3 | Groups and Roles Divide the students into groups of 4. Use the blue, red,

instructions.

In groups of 4, students will build a city that represents different ways resources



Factory Shop

Three houses

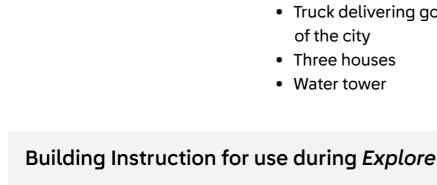
4 | Build and Explore

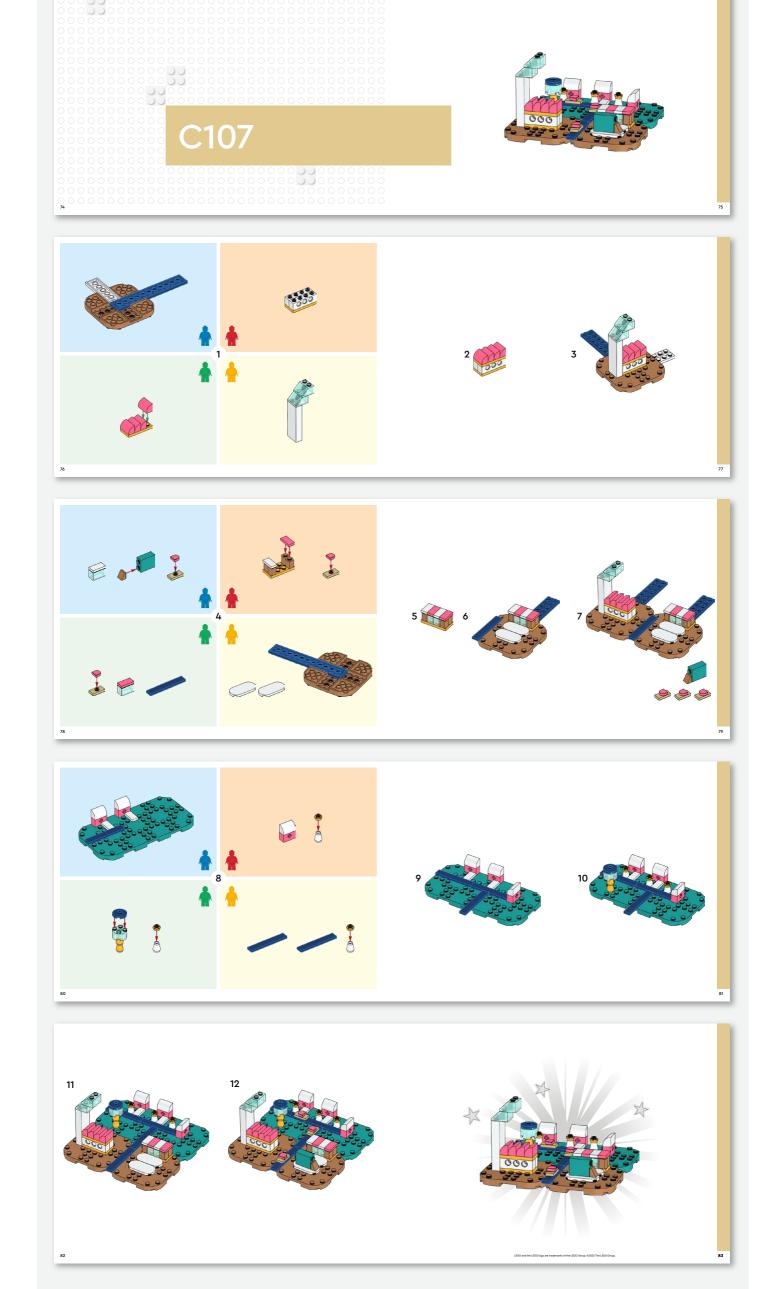
Cars Truck delivering goods from the factory to other parts of the city

This is a miniature scale model of a city. If students need

support, you can help them identify these elements:

- Water tower





Elaborate (15 min.

Explain © 5 min.

for each activity.

What are all the different activities

the busy city? How does this impact

the environment?

happening in this city?

What resources are needed to keep these activities working for

trucks and cars are both using fuel.) Encourage students to identify patterns in resources.

Students will consider how population growth will impact resource use in

Students will discuss what is happening in the city and the resources required

5 | Share

brainstorming:

and water.)

You can prompt students' thinking with questions and

cooling their home and using electricity.)

• What are all the components included in the model?

List or display some ideas. What resources are being

What are some that might be unseen? (For example,

people living in the houses are using water, heating and

used for these activities? (For example, fuel, electricity

How can we group resource use together? (For example,

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.

Solar cells or panels on the factory and homes

To check student understanding, you can look for the

• Students can connect an increase in population to an

• Students can describe how an increase in population

impacts use of Earth's resources and the environment. • Students can model solutions to minimise resource use

Wind turbines to create sustainable energy

You can also suggest some solution ideas:

increase in resources consumed.

• A public transportation system

• Urban or rooftop gardens

6 Build 10:00 Guide students in connecting an increase in population to an increase in resources consumed and therefore to impacts on the greater environment. If students need

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

Rainwater collection systems 7 | Share Your Build

following:

as a population increases. Students 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

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

enables people to avoid or minimise using cars and fueldependent vehicles to get around. The parking garage

conservation in city settings. The electric bike rental system

air and supports biodiversity in the area.

the city and then build solutions that conserve those resources. Afterwards, students will share their solutions and relate this experience to real-life examples of cities with Earth-friendly features. The population® of this city What will this do to the city's use of resources? Redesign the city so that it conserves Earth's resource and continues to function for the growing number of

Evaluate © 5 min.

use of resources as populations increase.

9 Show What You Know You can ask students to write answers in their notebooks or use other methods established in your classroom.



Explain what

happens to resource use

as populations increase. What impact can this have on Earth's

10 | Clean Up

An optional evaluative prompt asks students to explain what happens to the

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