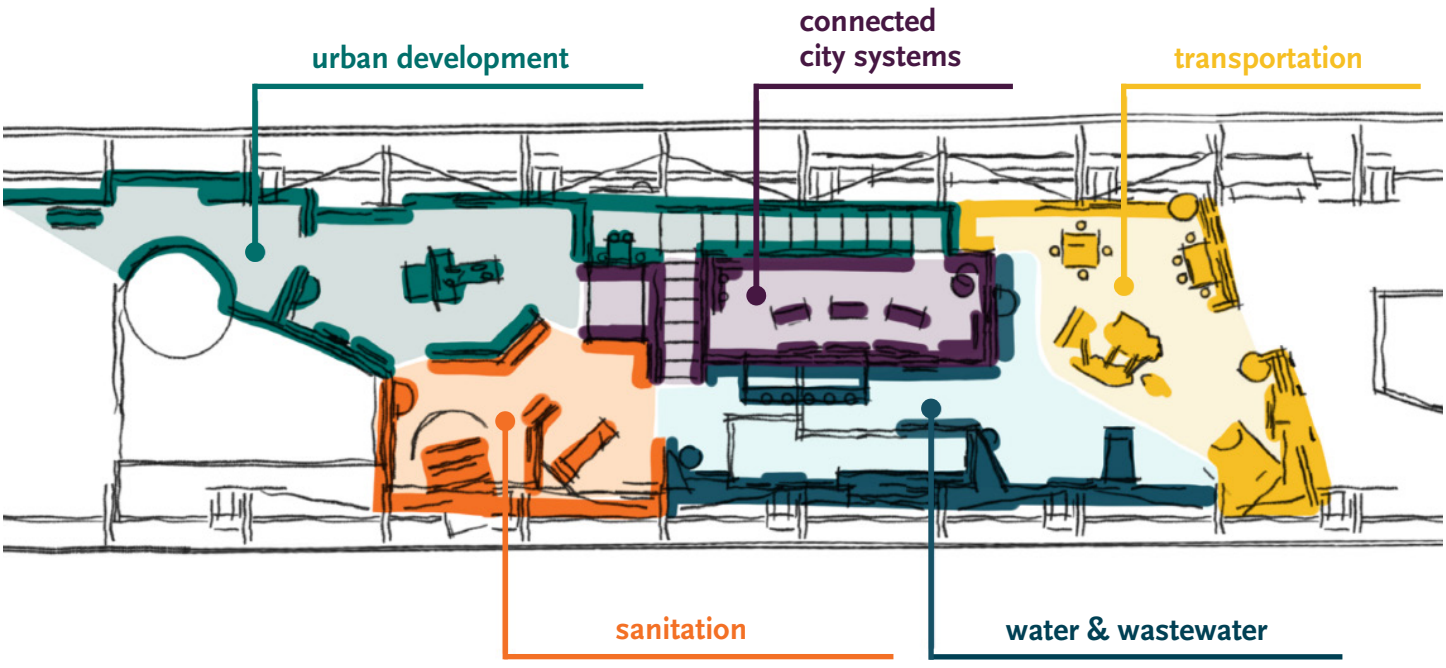
Educator Guide: CityWorks Worksheet
Grade 6 – 8

Welcome to the CityWorks exhibition at the New York Hall of Science!

CityWorks is an immersive exhibit that invites students to explore four major infrastructure systems that keep New York City running. Through hands-on activities, interactive displays, and real-world examples, students learn how each system functions, how they connect to one another, and how they affect daily life in the city. The four main sections include:

- **Transportation:** Explore how engineering, management, and design shape the way subways, buses, sidewalks, and roads work.
- **Water & Wastewater:** Discover how clean water reaches our homes and where it goes after we use it, including filtration, treatment, and sewer systems.
- **Sanitation:** Learn about NYC's waste system, from collection to recycling, and explore the many tools, vehicles, and workers involved in managing our city's trash.
- **Urban Development:** Explore how New York City's buildings and neighborhoods are designed and built. Learn about the materials, engineering, and construction processes that create the city.
- **Connected City Systems:** Explore how natural and human-made systems work together and against each other in a city.



CityWorks Exhibit Worksheet for Grade 6–8

For school groups interested in a more structured experience, NYSCI has developed grade appropriate exhibit worksheets that guide students through *CityWorks*.

Using This Worksheet Provides

- **Focused Exploration**
  Each section focuses on one key exhibit in each of the major city infrastructure systems: Transportation, Water & Wastewater, Sanitation, and Urban Development. It offers students prompts and activities to deepen their understanding of that system.
- **Independent Discovery**
  The worksheet invites students to explore the exhibition from beginning to end. While it offers a suggested pathway, teachers can also encourage students to visit other exhibits in *CityWorks* as they work through the activities or after completing the worksheet.
- **Student Reflection**
  The worksheet contains reflection questions at the end that invite students to connect what they observe in *CityWorks* to their own thoughts or questions about their own communities and the systems that shape their daily lives.

TIPS FOR USE

Pre-visit

Review key vocabulary terms found throughout the exhibit before your visit:

- **Wastewater** — water that has been used in homes, schools, or businesses and goes down sinks, toilets, and drains.
- **Infrastructure** — the basic physical structures and systems a city needs to function, like roads, bridges, pipes, and buildings.
- **System** — a set of connected parts that work together to carry out a task or process (for example, pipes and pumps moving water).
- **Sanitation** — keeping environments clean and healthy through services like trash collection and wastewater treatment.
- **Materials Recovery Facility (MRF)** — a recycling plant that receives, sorts, and processes mixed recyclable materials into separate streams (paper, plastics, glass, metals) so they can be sold and reused to make new products.

Print and prepare copies of the worksheet. Since worksheets contain color-coded exhibit sections as visual references, it is best to print worksheets in color if possible.

Collect and bring clipboards and pencils to ease writing on the worksheets while in the exhibit.

During visit

- Encourage students to use the worksheet to navigate their experience exploring the exhibit and explain how to use the map on their worksheet to find each of the four exhibits highlighted in the worksheet.
- Support students' interaction with exhibits by structuring exhibit exploration time to include time for students to explore exhibits of their choice.

Post-visit

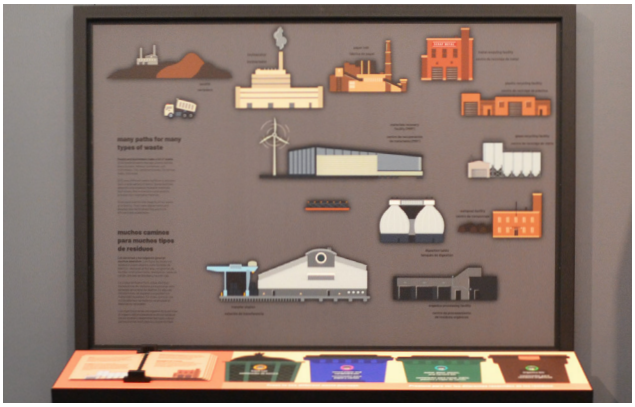
- Use student responses on the worksheet as a springboard for further discussion or projects about how cities work and how students can help improve them.

We hope *CityWorks* inspires your students to imagine, design, and problem-solve as future city planners and engineers, ready to make their communities better places to live.

Curriculum Connections

The following table outlines how *CityWorks* exhibits align with the New York State Science Learning Standards (NYSSLS), Science and Engineering Practices, Disciplinary Core Ideas, Crosscutting Concepts, and corresponding Amplify curriculum units.

CityWorks Exhibit	Mass Transit Design	Aqueduct Model	Wastestream Journey Map	Flood Maps
NYSSLS Standards (Performance Expectations)	MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution.	MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.	MS-ESS3-3: Apply scientific principles to design a method f or monitoring and minimizing human impact on the environment.	MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
Science & Engineering Practices	Constructing explanations and designing solutions	Developing and using models	Analyzing and interpreting data	Developing and using models; Analyzing and interpreting data
Disciplinary Core Ideas	ETS1.A: Defining and Delimiting Engineering Problems	ESS3.A: Natural Resources	ESS3.C: Human Impacts on Earth Systems	ESS2.C: The Roles of Water in Earth's Surface Processes
Crosscutting Concepts	Systems and system models	Energy and matter	Systems and system models	Stability and Change
Amplify Unit Connections	Thermal Energy (6–8)	Earth, Moon, and Sun (6–8)	The Earth's Changing Climate (6–8)	Climate Change, Earth Science (6–8)



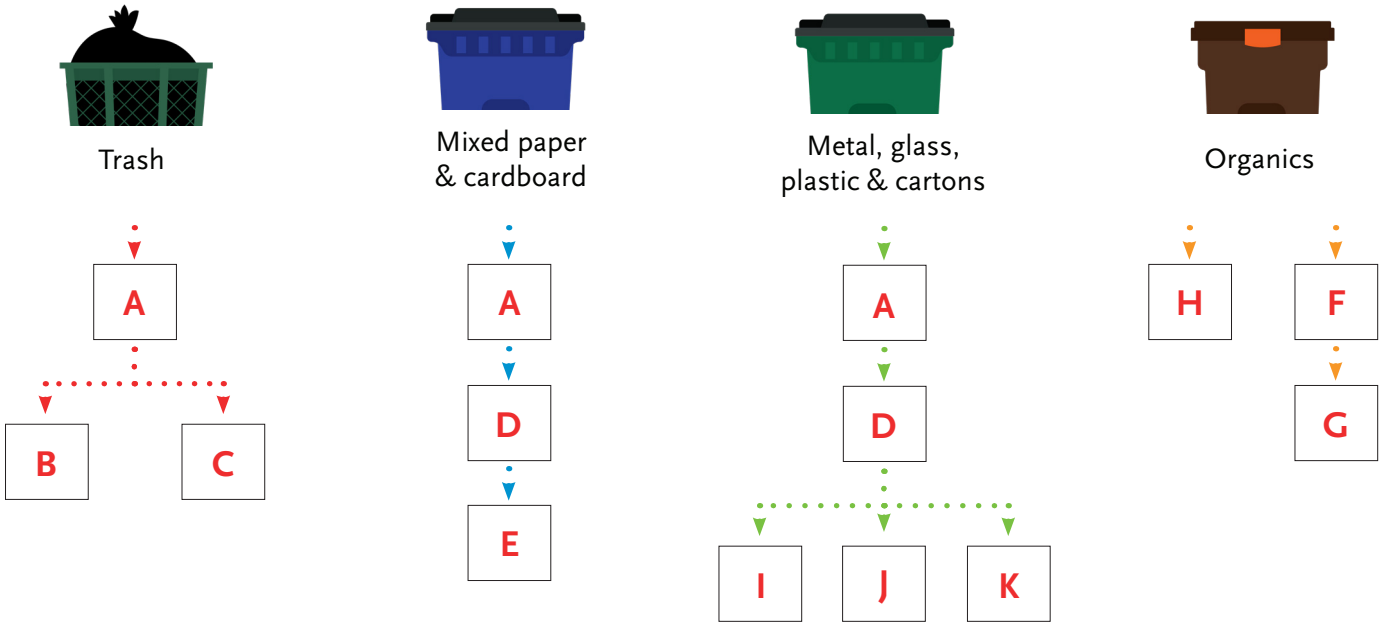
Sanitation

Visit Wastestream Journey Map in the Sanitation area. Watch how trash, organics, and recyclables travel through NYC's waste system.

Look closely at the map. Notice how waste items move a long different paths to reach landfills, incinerators, organics processing, composting, transfer stations, and recycling centers/Material Recovery Facilities (MRFs).

Where does the waste go?

Fill in each waste journey pathway blank with the letter that matches the correct facility from the list below.



A. Transfer Station
B. Landfill
C. Incinerator
D. Materials Recovery Facility
E. Paper Mill
F. Organics Processing
G. Digestion Tanks
H. Compost Facility
I. Glass Recycling Facility
J. Plastic Recycling Facility
K. Metal Recycling Facility