Homeschool Self-Guided Education Packet

TEACHER GUIDE

GRADES 4 - 5

STUDENT SHEETS INCLUDED

LEGO DISCOVERY CENTER

VISIT GUIDE: GRADE 4-5

Welcome to LEGO® Discovery Center

LEGO® Discovery Center
connects learning and fun together like LEGO® bricks!

Our self-guided homeschool visits allow students to **explore, discover**, **and create** in an engaging environment filled with hands-on activities. The guide is designed to add fun, focused, and interactive learning during your visit.

This guide includes **curriculum-based challenges and activities** covering Mathematics, English, History, and Science for 3 attractions! Including:

MINI WORLD
Marvel at LEGO® landmarks while telling your own story.

LEGO® Imagination Express
Think like a scientist on a data investigation!

LEGO® Racers Build & Test
Design and test your way to the finish line!

The attractions can be visited in any order.

TEACHER GUIDE: GRADES 4-5

LEGO® MINI WORLD

Explore and play in an updated fantastical world of awesome LEGO builds! Made with over 1.5 million LEGO bricks, planes fly over the tallest towers, day turns to night and some local landmarks creep into the skyline too. Can you recognize them?

NGSS-Aligned Learning Objectives

- **Develop and Use Models (3-5-ETS1-2):** Students design LEGO models that represent real-world landmarks and personal experiences, showing how models can explain and communicate ideas.
- **Define and Solve Problems (3-5-ETS1-1, 3-5-ETS1-2, 4-ETS1-1):** Students analyze how city landmarks meet community needs and brainstorm improvements, practicing problem-solving and design thinking.
- **Communicate Information & Construct Explanations (Science & Engineering Practices):** Students storyboard, write, and share reflections about their models to explain how their design represents experiences and community functions.
- **Connect Science to Society & Environment (5-ESS3-1):** Students explore how communities use science, engineering, and infrastructure to support people and protect resources.

Challenge

Use MINI WORLD as inspiration to build and retell a story about an experience you've had in your own city using LEGO Bricks as you tool. **Setting the Scene:** As you explore MINILAND, ask your student some of the following questions:

- What buildings do you see in MINI WORLD?
- How many places have you visited?
- What did you do there?
- Who were you with?
- Did you enjoy it?
- Do you have any stories to share?

Post Challenge

Building the Story: Students are asked to write down observations, collect data, and identify connections to community. Afterwards they are tasked to solve a design challenge and sketch it. Then students are tasked with retelling a personal story, sequencing events and drawing them. Before lastly, writing a paragraph communicating ideas, iterations and evaluation about an experience they had in their own city.

Student Name: _____

MINI WORLD: My Favorite Memory

Part 1 – Observations

As you explore MINI WORLD, record your observations below.

Landmark/Building	What is it used for?	Have you visited a place like this in your city? (Yes/No)	Notes

Reflection Question: Which building is your favorite and why?

_____

_____

Student Name: _____

MINI WORLD: My Favorite Memory

Part 2 – Design Challenge

Every building or landmark solves a problem. Pick one and think about how you might improve it.

Landmark	**Problem it Solves:** (e.g., crossing river, government building)	1 Idea to Improve It
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Sketch of My Idea

Bonus Question: How would you change or help the community or environment?

_____

_____

Student Name: _____

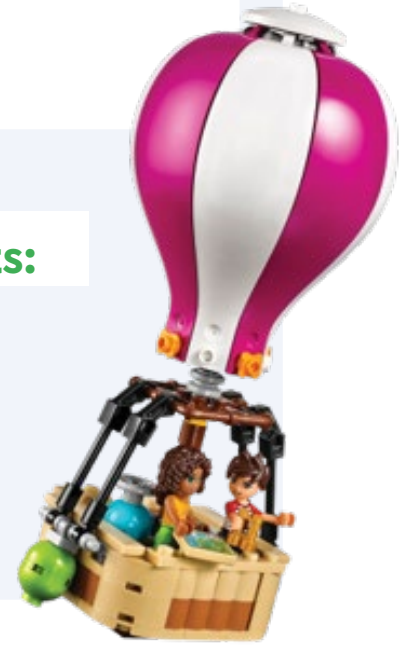
MINI WORLD: My Favorite Memory

Part 3 – My City Storyboard

Think of a story about an experience you've had in your own city. Use the boxes to sketch and label each part. (Beginning, Middle, Middle, Ending) Then head over to any build zone and recreate your scene using LEGO® bricks.

Writing Prompts:

- Who was there?
- What happened?
- Why was it special?



Student Name: _____

MINI WORLD: My Favorite Memory

Part 4 – Reflection & Sharing

Write about your LEGO® model and your experience.

Questions to Address: What did you build? What details did you include and why? How does your LEGO model connect to your city? If you rebuilt it, what would you do differently? Share your model with someone and write one nice thing they noticed about your work.

TEACHER GUIDE: GRADES 4-5

Imagination Express

Step aboard the Imagination Express and travel through a giant LEGO® world! Collect points along the way with your magic wand but watch out for moles and space pirates!

NGSS-Aligned Learning Objectives

- Collect and analyze numerical data to identify trends and outliers.
- Design and conduct a controlled investigation to test the effects of changing variables (like seat position).
- Represent data using appropriate visualizations (grids, graphs, tables).
- Evaluate whether a test or experience is fair based on collected data and reasoned argument.

NGSS Standards Addressed

Science & Engineering Practices: Data collection, interpretation, fairness, and argument from evidence. **3-5-ETS1-3:** Fair test & investigation design. **5-ESS1-2:** Data representation and pattern identification.

Challenge

Students are instructed via voiceovers to use your magic wand to hit targets and collect points – this is done by pointing and shooting. A score appears on a screen in front of each students which tallies their success. To gather the appropriate amount of data, enjoy the ride up to 4 times! Adults are encouraged to ride also; this way students have more data to utilize.

Ride 1: Choose any seat and sit on the right side.
Ride 2: Choose the same seat but sit on the left side.
Ride 3: Choose a seat in a different row, sit on the right side.
Rode 4: Choose the same row but sit on the left side.

- At the conclusion of each ride, students must remember their score.
- Students can also ask other riders what their scores were.
- After exiting the ride each time, students must write down their score and those of others.

Post Challenge

Students are encouraged to think about the different ways they can represent this data and are to explore how the same data can be represented in different ways. They are challenged to represent the data in a grid form. They can also reflect on whether Imagination Express was fair.

Student Name: _____

Data Investigation: Is the Game/Ride Fair?

Part 1 – Planning Our Investigation

Our Question: Is the game/ride fair for all players, no matter where they sit or how many times they play?

Prediction (Hypothesis):

_____

_____

Variables:

- What we will change (Independent Variable):

_____

- What we will measure (Dependent Variable):

_____

- What we will keep the same (Controlled Variable):

_____

Part 2 – Collecting Our Data

Player Name	Seat/Row	Try #	Score	Notes (anything unusual?)

Student Name: _____

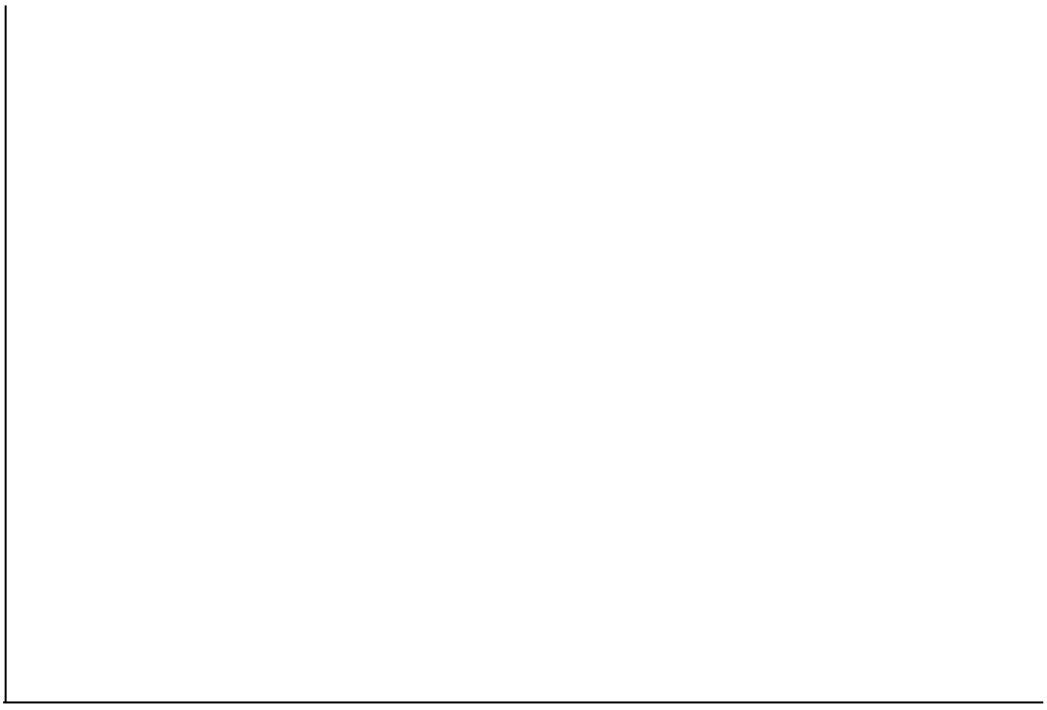
Data Investigation: Is the Game/Ride Fair?

Part 3 – Analyzing the Data

Step1- Organize your data: Make a graph (bar, line, or dot plot) to show scores for different seats/rows. Color code if you want to show first rides vs repeat rides.

Step 2- Look for patterns:

- Do some seats have higher scores?
- Do scores improve with more tries?
- Any unusual results (outliers)?



Student Name: _____

Data Investigation: Is the Game/Ride Fair?

Part 4 – Drawing Conclusions

1. Was the game/ride fair? Why or why not?

_____

_____

2. What could make it more fair?

_____

_____

3. If you did the investigation again, what would you change?

_____

_____

Part 5 – Reflection & NGSS Connections

- Analyzing Data: How did our graph help us see patterns?
- Planning Investigations: How did we keep the test fair?
- Arguing from Evidence: What evidence supports your conclusion?

Final Statement: I think the game/ride IS or IS NOT fair because…

_____

_____

TEACHER GUIDE: GRADES 4-5

LEGO® Build & Test

In the Build and Test area, students will find brick pits featuring car pieces including wheels, body pieces, and axels. They can then use two different ramps to test the durability and speed of their cars.

NGSS-Aligned Learning Objectives

- **Science & Engineering Practices (SEPs):** Students will communicate solutions through data collection, interpretation, fairness, and argument from evidence.
- **Forces & Materials (4-PS3-1, 5-PS1-3):** Students focus on what influences design performance and outcomes. Use evidence to explain the relationship between the speed of an object and its energy. Make observations and measurements to identify materials based on their properties.
- **Engineering & Design Cycle (3-5-ETS1-1, 3-5ETS1-2):** Students will critique needs or opportunities for designing and test materials, tools, and techniques for solutions. Define a design problem with criteria and constraints.
- **Fair Testing Practices (3-5-ETS1-3):** Students evaluate whether a test or experience is fair based on collected data and reasoned argument. Plan and carry out fair tests in which variables are controlled.

Challenge

Students must build cars and race them against other students' builds. Students need to observe which cars win the race and critically consider what design features are more prominent in the winning cars. They are then asked to tick which features listed on their worksheet help the cars go faster.

Post Challenge

Students are challenged to review the data from build and test and determine the design features needed for a fast car. They are asked to list the top 5 features. They are then tasked with creating a visual design of the car featuring the five most important design elements.

STUDENT WORKSHEET

LEGO® Build & Test

Student Name: _____

Car Building & Racing Investigation

You will build and race cars to find out which design features make a car go faster. After each race, record your results and look for patterns. Use your data to design a new car with the best features!

Part 1 – Challenge

Build LEGO® cars and then race them on the ramp. Try and make sure everyone is building different types of cars so you can test which cars are the fastest. Take note of the fastest times: **READY, SET GO!**

Times

1. _____ 3. _____

2. _____ 4. _____

Part 2 – Race Results

Record results below. Tick the features each car had and write the race outcome.

Car #	Wheels (Big/Small)	Weight (Light/Heavy)	Body (Wide/Narrow)	Other Features	Race Result (Win/Lose)
Car 1					
Car 2					
Car 3					
Car 4					

Car Building & Racing Investigation

Part 3 – Evaluation

Tick which design features make a car go faster.

- ☐ Big wheels
- ☐ Small wheels
- ☐ Long body
- ☐ Short body
- ☐ Low body
- ☐ Tall body
- ☐ Wide body
- ☐ Thin body
- ☐ Dark colored bricks
- ☐ Light colored bricks
- ☐ Windshield
- ☐ No windshield
- ☐ Heavy car
- ☐ Light car

Review the data from your test and write down the top 5 things needed for a fast car.

1. _____
2. _____
3. _____
4. _____
5. _____

Car Building & Racing Investigation

Part 6 – Design Your Car

Draw and label your car design below, showing the 5 features you chose.