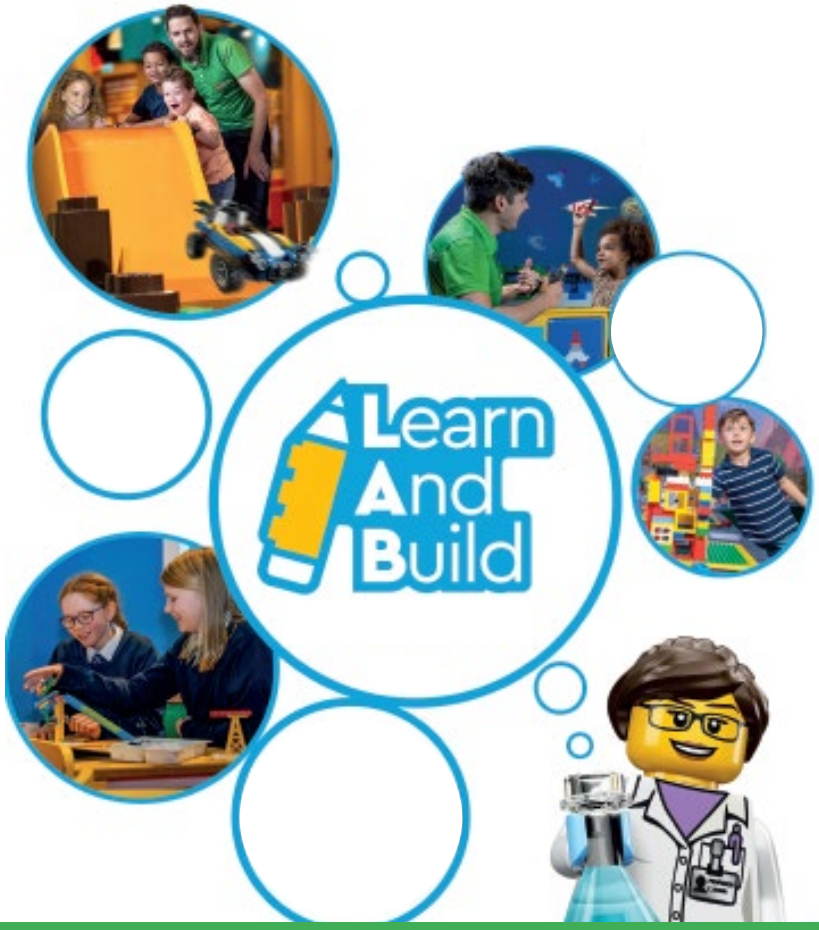
Homeschool Self-Guided Education Packet



TEACHER GUIDE

GRADES 2 – 3

STUDENT SHEETS INCLUDED

LEGOLAND® DISCOVERY CENTER

LEGOLAND DISCOVERY CENTER

VISIT GUIDE: GRADE 2-3

Welcome to LEGOLAND® Discovery Center

LEGOLAND® 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:

MINILAND
Marvel at LEGO landmarks while learning about geography.

LEGO® Kingdom Quest
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 2-3

LEGO® MINILAND

MINILAND is a miniature replica featuring the city's most loved buildings and landmarks. Fun Facts: All of the MINILAND models took a total of 5000 hours to design and build. MINILAND is made up of over 1.5 Million LEGO® Bricks. There are over 500 Minifigures!

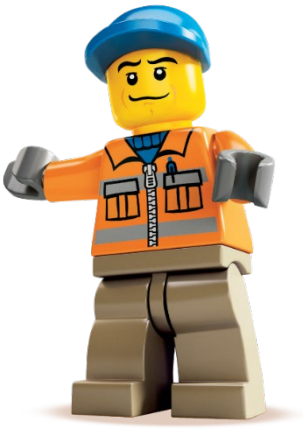
Challenge

Students are challenged to explore MINILAND and identify historic or notable city landmarks, and look for activities located in specific locations, such as sports and transportation. They are asked to find these key items and locations:

- **Find a sports game** – Answer: Detroit Lions football game at Ford Field
- **Find an airport** - Answer: Detroit Metropolitan Wayne Country Airport (Detroit Metro Airport)
- **Find a famous boat** - Answer: Detroit Princess
- **Find a body of water** – Answer: Detroit River
- **Find a sculpture** – Answer: Spirit of Detroit
- **Find a fun attraction with a ride** – Answer: LEGOLAND Discovery Center
- **Find an iconic building** – Answer: GMRENCEN

Post Challenge

Students are asked to put each landmark in the correct group (i.e. Natural or Human-made) and tell you why it's important. Then they are tasked to select 5 landmarks to include in their dream version of MINILAND and draw them, before finally thinking and reflecting on how landmarks represent culture, history or community needs.



TEACHER GUIDE: GRADES 2-3

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NGSS-Aligned Learning Objectives

- **Observation & Identification:** Identify and describe natural and human-made landmarks.
- **Classification & Sorting:** Classify landmarks by type and function.
- **Design & Modeling:** Use drawings/models to design a new version of MINILAND.
- **Cultural & Community Awareness:** Explain how landmarks represent culture, history, or community needs.
- **Reflection & Communication:** Communicate ideas and reflect on design decisions.

NGSS Standards Addressed

- **2-ESS2-2** – Develop a model to represent shapes/kinds of land and water in an area.
    - → Students identify landmarks, lakes, and fountains, then create a model in their "dream MINILAND."

- **2-ETS1-1** – Ask questions and gather information to define a problem.
    - → Choosing which landmarks to include and thinking about their importance is a design decision.

- **2-ETS1-2** – Develop a simple sketch, drawing, or model to show how an object solves a problem.
    - → Drawing their chosen landmarks is directly aligned here.

- **3-ETS1-1** – Define a simple design problem with criteria and constraints.
    - → Students "design" their dream version of MINILAND with criteria (fun, history, culture).

- **3-ESS3-1** – Make a claim about the merit of a design solution related to human needs and the environment.
    - → Students can reflect on how landmarks (lake, buildings, fountains) are designed to adapt to their environment.

STUDENT WORKSHEET

LEGO® MINILAND

Student Name: _____

Designing MINILAND: Natural vs. Human-Made Landmarks

Part 1 – Landmark Scavenger Hunt

What can you see in MINILAND? (Check the boxes)

Famous Place or Landmark	For Extra Points: Name the famous place or landmark
☐ A sports game	
☐ An airport	
☐ A famous boat	
☐ A body of water	
☐ A sculpture	
☐ A fun attraction or ride	
☐ A famous building	

Part 2 – Landmark Sorting

Landmark	What Type? (Circle One)	Why Is It Important?
	Natural Human-made	
	Natural Human-made	
	Natural Human-made	
	Natural Human-made	
	Natural Human-made	
	Natural Human-made	
	Natural Human-made	

Student Name: _____

Design Your Own Dream MINILAND

Part 3 – Design & Modeling

If you had to build a MINILAND of your own out of LEGO® bricks, what are the top 5 landmarks you would include?

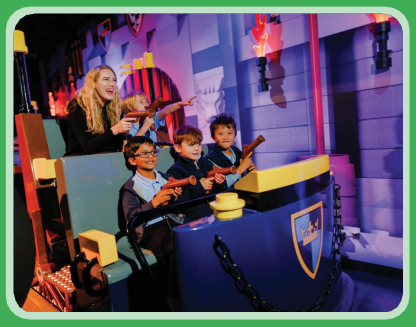
Part 4 – Reflection

- What makes a landmark special to people?
- How does your dream MINILAND show different people and cultures?
- Why do cities build landmarks?

TEACHER GUIDE: GRADES 2-3

LEGO® Kingdom Quest

Kingdom Quest is a ride in which riders board carriages and are transported through a series of interactive screens. Each person in the carriage is provided with a "blunderbuss" and compete to save the princess and get the highest score!



NGSS-Aligned Learning Objectives

- **Plan and Test Variables:** Change one factor at a time (seat, side, row) to investigate results.
- **Collect and Represent Data:** Record scores and show results using charts, graphs, tables, or grids.
- **Analyze and Compare:** Use math (tallies, averages, comparisons) to find patterns in the data.
- **Explain and Argue with Evidence:** Decide if the game was fair and support your answer with data.

NGSS Standards Addressed

2-PS1-1: Plan and conduct an investigation to describe and classify materials by their observable properties. **2-PS1-2:** Analyze data from tests of objects to determine which materials are best suited for an intended purpose. **2-PS1-4:** Construct an argument with evidence that some changes caused to materials can be reversible. **3-PS2-2:** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion. **3-5-ETS1-3:** Plan and carry out fair tests in which variables are controlled.

Challenge

Students are instructed via voiceovers to zap the bad guys with the blunderbuss – this is done by pointing and shooting. A score appears on a screen in front of each students which tallies their success in zapping the bad guys. 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 Kingdom Quest 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:

I think the _____ (seat/side/row) will get the highest score

because _____

Plan Your Test:

- What will you change? (seat, side, row):

_____

- What will you keep the same?:

_____

- What will you measure?:

_____

Part 2 – Collecting Our Data

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

Student Name: _____

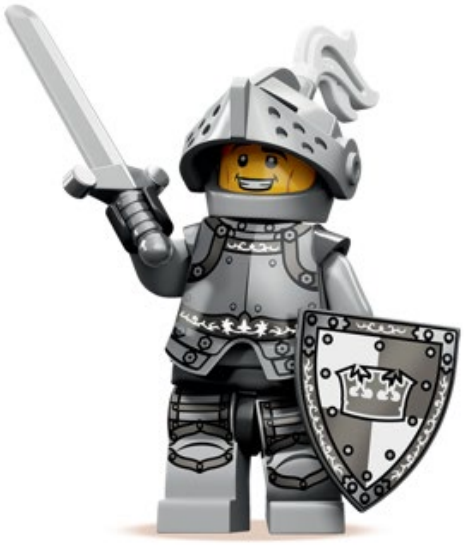
Data Investigation: Is the Game/Ride Fair?

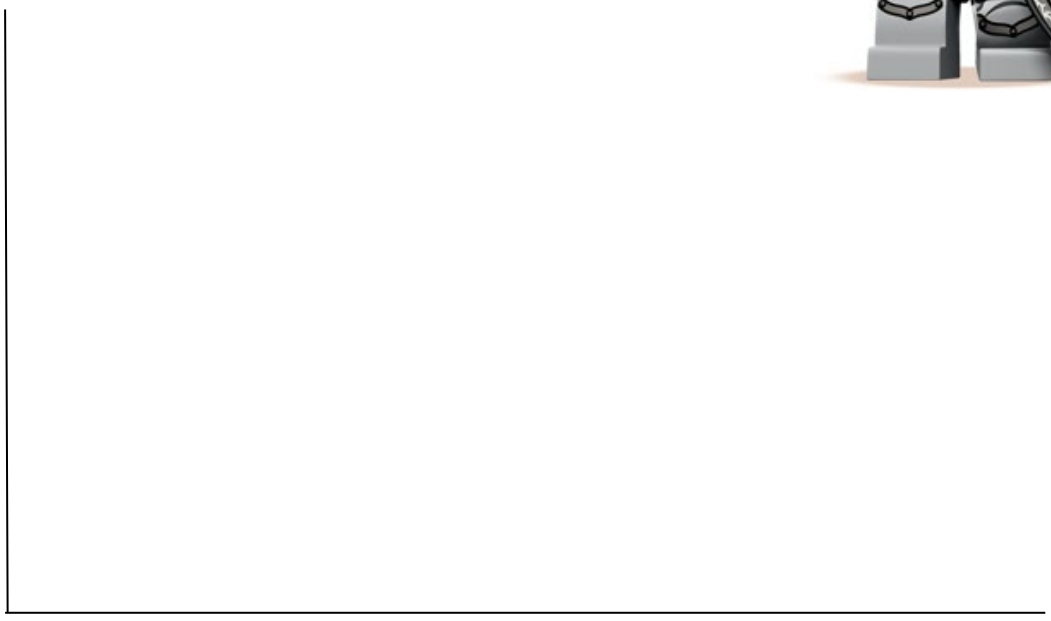
Part 3 – Data Representation & Analysis

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. Label your axes **"Ride #"** and **"Scores."**

Step 2 - Math Challenge:

- Which ride had the highest average?
- Which seat/side/row gave the lowest score?
- Did changing sides or rows make a difference?





Data Investigation: Is the Game/Ride Fair?

Part 4 – Evidence & Explanation

1. Was the game/ride fair? Why or why not? Use your data to explain your answer

_____

_____

2. If you could redesign the game to make it fairer, what would you change?

_____

_____

3. How would you test your idea?

_____

_____

Part 5 – Reflection & NGSS Connections

- Analyzing Data: What patterns did you notice in your data?
- Did your prediction match your results? Why or why not?
- What did you learn about how changing variables (seat, side, row) can affect outcomes?

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

_____

_____

TEACHER GUIDE: GRADES 2-3

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

- **Investigate and test** car designs by racing them and collecting data on performance.
- **Analyze and compare results** to identify patterns in which design features make cars faster or slower.
- **Use evidence to explain** which features are most effective and select the top 5 to improve future designs.
- **Communicate solutions visually** by creating a car design that includes the most important features.

NGSS Standards Addressed

2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties best suited for an intended purpose. **K-2-ETS1-3:** Analyze data from tests of two objects to compare the strengths/weaknesses of how each performs. **3-PS2-1:** Plan and conduct an investigation to provide evidence of the effects of balanced or unbalanced forces on the motion of an object. **3-PS2-2:** Make observations and measurements of motion to identify patterns to predict future motion. **3-5-ETS1-2:** Generate and compare multiple solutions to a problem based on criteria/constraints.

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 Name: _____

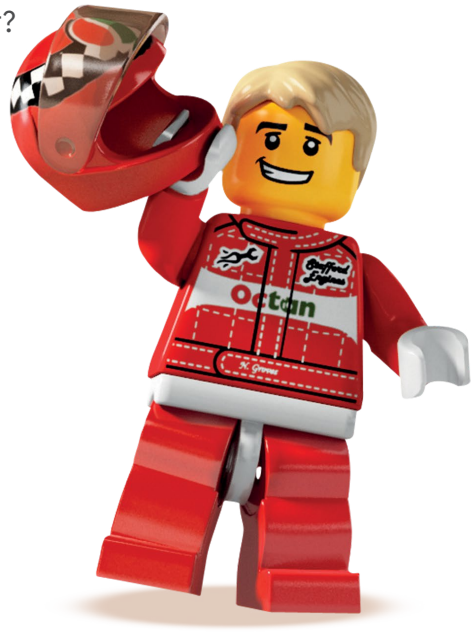
Car Building & Racing Investigation

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 – Prediction

Question: Which features do you think will make the fastest car?

- ☐ 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



Part 2 – 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.

READY, SET GO!

Part 3 – 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 4 – Finding Patterns

Question: Which patterns do you see? Which features helped cars go faster?

Part 5 – Top 5 Features

List the 5 most important features for making a fast car.

1. _____ 3. _____

2. _____ 4. _____

5. _____

Part 6 – Design Your Car

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