

Homeschool Self-Guided Education Packet



TEACHER GUIDE

GRADES 2 – 3
STUDENT SHEETS INCLUDED





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.

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: KC Chiefs at Arrowhead, KC Royals at Kauffman
- **Find different modes of transport** - Answer: Trucks, cars, taxis, carriage
- **Find a water feature/fountain** - Answer: Fountain at Mill Creek Park
- **Find a sculpture** – Answer: World's Largest Shuttleclock
- **Find a fun attraction** – Answer: Starlight Theater, LEGOLAND/SEA LIFE
- **Find an iconic/famous/historical building** – Answer: Nelson Atkins Museum of Art, President Harry Truman's house, WW1 Museum Liberty Memorial

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.



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Missouri Learning Standards Alignment (Grades 2-3)

<u>Activity Component</u>	<u>What Students Do</u>	<u>MLS Standard(s) Alignment</u>	<u>Alignment Details</u>
Sort landmarks	Students categorize landmarks as Natural or Human-made and explain why each is important.	2-ESS2-2 (Earth's Systems / Structures)	Students demonstrate understanding of landforms and human constructions , distinguishing natural features (lakes, rivers) from human-built structures (buildings, fountains).
Select & draw landmarks	Students choose 5 landmarks for their "dream MINILAND" and sketch them.	2-ETS1-2 (Engineering Design – Develop a model)	Drawing landmarks is modeling a design solution , reflecting engineering/creative design practices.
Reflect on cultural/historical importance	Students explain how landmarks represent culture, history, or community needs .	3-ESS3-1 (Human Impacts / Human-Environment Interactions)	Students evaluate how human design and landmarks meet community needs and reflect cultural/historical context, mirroring MLS emphasis on human-environment interactions .
Decision-making / design	Selecting landmarks based on importance, fun, culture, or history.	3-ETS1-1 (Engineering Design – Define a simple design problem)	Students define design criteria for their dream MINILAND and make decisions considering constraints and purpose.



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

- ☐ A sports game
- ☐ A mode of transport
- ☐ A fountain
- ☐ A historical site
- ☐ A sculpture
- ☐ A fun attraction
- ☐ A famous/iconic building

For Extra Points: Name the famous place or landmark

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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	

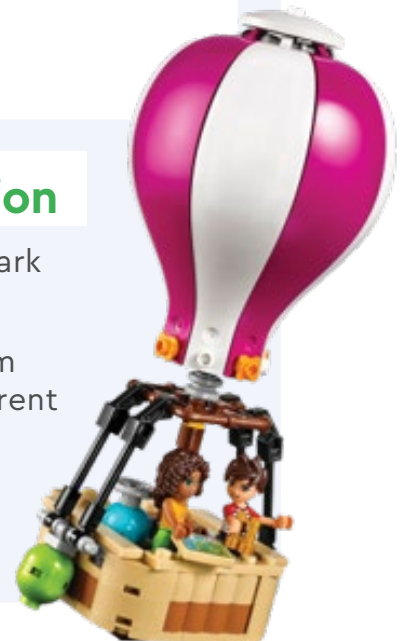
Design Your Own Dream MINILAND

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?



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!



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 student 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.
- Ride 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.

Aligned Learning Objectives

- **Data Collection & Organization** – Systematic recording of repeated observations and peer data.
- **Data Representation** – Grids, charts, and tables allow multiple forms of data visualization.
- **Analysis & Reasoning** – Students identify patterns, compare results, and make claims about fairness.
- **Collaboration & Observation** – Gathering data from peers encourages communication and comparison of results.

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Missouri Learning Standards Alignment (Grades 2-3)

<u>Activity Component</u>	<u>What Students Do</u>	<u>MLS Standard(s) Alignment</u>	<u>Alignment Details</u>
Ride multiple times to collect data	Students ride 4 times in different seats/rows, recording their scores each time.	Grade 2: DCI 2.MD – Collect, organize, and represent data using tally charts, tables, and graphs.	Students gather repeated measurements, practicing systematic data collection and observation.
Record others' scores	Students ask peers for scores and record them.	Grade 2: DCI 2.MD – Gather and organize categorical or discrete data from multiple sources.	Encourages collaborative data collection and recognition of multiple data points.
Represent data in multiple ways	Students represent scores in grids and explore alternative representations (charts, tables).	Grade 2: DCI 2.MD – Represent data using tally charts, pictographs, bar graphs, and tables; interpret data.	Students learn multiple methods to organize and visualize data, supporting MLS data literacy skills.
Analyze & reflect on fairness	Students reflect on whether the ride is fair (e.g., seat location affects scores).	Grade 3: DCI 3.MD – Solve problems involving data; make inferences and predictions based on patterns.	Students analyze patterns, make claims about fairness, and consider variables influencing outcomes.
Comparing repeated measures	Students compare scores across rides, seats, and rows.	Grade 3: DCI 3.MD – Recognize patterns, variability, and relationships in data.	Supports understanding of variability and the influence of different conditions on results.



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?)

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...

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.



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.

Aligned Learning Objectives

- **Engineering Design (ETS)** – Planning, testing, analyzing, and refining car designs based on evidence.
- **Physical Science (PS2 & PS1)** – Observing and measuring motion; understanding forces and material properties.
- **Data Analysis & Communication** – Comparing results, identifying patterns, and visually communicating solutions.
- **Critical Thinking** – Selecting top features based on evidence and refining designs for improved performance.

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Missouri Learning Standards Alignment (Grades 2-3)

<u>Activity Component</u>	<u>What Students Do</u>	<u>MLS Standard(s) Alignment</u>	<u>Alignment Details</u>
Investigate and test car designs	Students build cars and race them, collecting data on performance.	Grade 2: ETS.1 / 3: PS2.A – Plan and conduct investigations to test objects; understand forces affecting motion.	Students apply engineering design and physical science practices to test cars under controlled conditions.
Analyze and compare results	Students identify patterns in which design features make cars faster or slower.	Grade 2: ETS.2 / 3: PS2.B – Analyze performance data; identify trends or patterns.	Students examine results to determine which design features influence speed and motion.
Use evidence to explain effectiveness	Students determine the top 5 features for future car designs.	Grade 2: PS1.B / K-2 ETS1-3 / 3-5 ETS1-2 – Use evidence to compare objects and identify strengths/weaknesses; generate and compare solutions.	Students justify their selection of top features based on evidence and performance data.
Communicate solutions visually	Students draw a visual design of a car including the five most important features.	Grade 2: ETS.2 / 3: ETS.2 – Represent solutions through drawings, models, or diagrams.	Students create a visual model to communicate their design, aligning with MLS emphasis on communicating engineering solutions.
Observe motion and patterns	Students measure speed, distance, or motion of cars to predict performance.	Grade 3: PS2-1 / PS2-2 – Plan investigations to test effects of forces; observe motion to identify patterns for prediction.	Students gather motion data, recognize patterns, and make predictions, reinforcing understanding of forces and motion.

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?

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Big wheels | <input type="checkbox"/> Thin body |
| <input type="checkbox"/> Small wheels | <input type="checkbox"/> Dark colored bricks |
| <input type="checkbox"/> Long body | <input type="checkbox"/> Light colored bricks |
| <input type="checkbox"/> Short body | <input type="checkbox"/> Windshield |
| <input type="checkbox"/> Low body | <input type="checkbox"/> No windshield |
| <input type="checkbox"/> Tall body | <input type="checkbox"/> Heavy car |
| <input type="checkbox"/> Wide body | <input type="checkbox"/> 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. _____
2. _____
3. _____
4. _____
5. _____

Part 6 – Design Your Car

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

