

MANAGING OUR NEED FOR SPEED (LEVEL 1)

Description	Learners will explore the theme of transportation with vehicles in the sea, land and air. Learners will explore how vehicles move and related regulations, before making their own dream vehicle
Leading Question	Can you make your vehicle?
Total Time Required	~5 hours over 5 days
Supplies Required	Tub, Water, Paper, Tube and other scrap material
Learning Outcomes	<ol style="list-style-type: none"> 1. Grasping the initial ideas of the physics concepts of gravity, force, motion, sinking-floating, wind 2. Making hypothesis and testing these through experiments 3. Understand the importance of transportation safety rules and regulations and related professions
Previous Learning	Beginners understanding of science experiments and hypothesis.

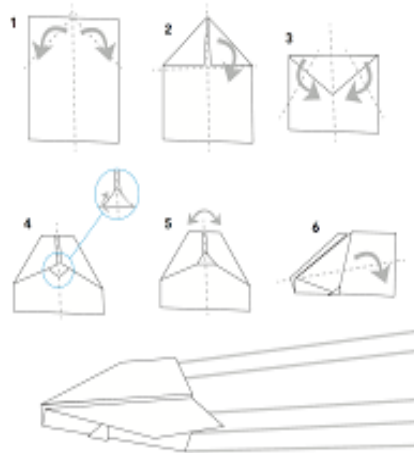
DAY 1

Today you will explore different vehicles and transportation regulations.

Suggested Duration	Activity and Description
10 minutes	<ul style="list-style-type: none"> • Learners will explore how we go from one place to another. • Draw and label the different ways to get to places <ul style="list-style-type: none"> - Example: Bikes, rickshaw, car, boats.
15 minutes	<ul style="list-style-type: none"> • Learners will start by making a list with all the air vehicles they know. • Learners will draw and write all the reasons people would use air vehicles <ul style="list-style-type: none"> - Example: To travel to another country, to go to space, to deliver emergency post.
10 minutes	<ul style="list-style-type: none"> • Learners will make their own paper planes by following the steps:

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15 minutes

- Learners will explore how different things fly.
- Learners will fly their plane. They will try different ways to throw the plane and see if it flies higher or further.
- Learners will think about why some planes are going higher or further than others.
- Learners will add wind with a fan or by blowing air to see if the plane flies further.

DAY 2

Today you will explore water vehicles and what causes them to float.

Suggested Duration	Activity and Description
5 minutes	<ul style="list-style-type: none"> • Learners will make a list with water vehicles that they know. • They will think about the different types of water bodies like lakes, rivers and seas. • They will also think about the reason people would go on water vehicles.
15 minutes	<ul style="list-style-type: none"> • Learners will write or draw the different reasons why people would use water vehicles. <ul style="list-style-type: none"> - Example: fishing, transportation, pearl diving.
20 minutes	<ul style="list-style-type: none"> • Learners will explore what sinking and floating is. • Fill a tub with water and collect a few “waterproof” objects that do not have batteries.

- Make a list of these objects and try to guess whether the objects will sink or float in the water. Then place the objects in the tub and write what happens.

Object	Guess / Hypothesis	Result / Experiment Evidence
1.Spoon	Sink	Float
2.Bowl	Sink	Sink
3.Block	Float	Sink
4.Pen Cover	Sink	Float

10 minutes

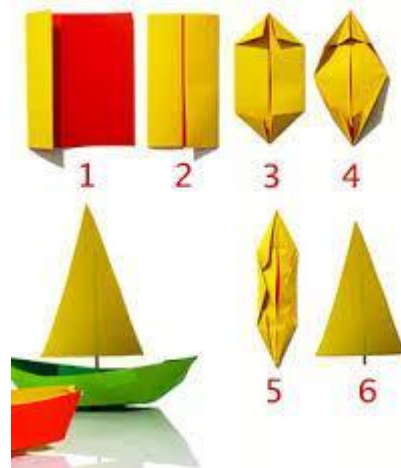
- Learners will think about the reasons that some objects sink or float
- Example:
 - Objects that are heavy sink
 - Objects that are big sink.

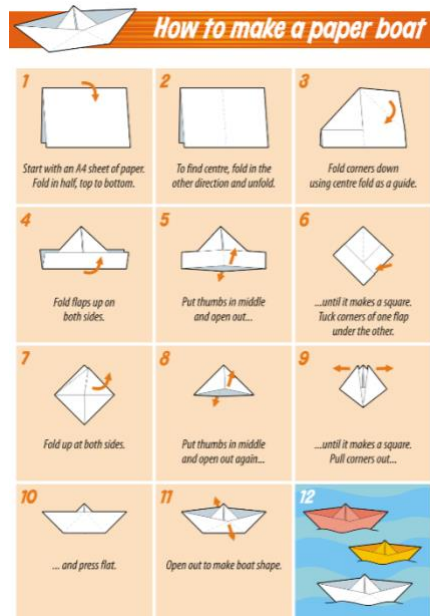
5 minutes

- Learners will do the experiment again to test their reasons and make a guess on how boats float.

20 minutes

- Learners will make paper boats that float on the water.





- Learners will make multiple boats and check if it sinks or floats.
- Learners will try to move their boat.
 - Learners can blow on the boats to see how it pushes forward. This is how it sails with the wind.
 - Learners will create their own rowing oars to explore how engine propellers help push the water and move forward.

10 minutes

- Learners will make their own oars with popsicle sticks or straws. Make sure the bottom of the oar has a broad and flat surface.





DAY 3

Today you will explore land vehicles and what causes them to slow down.

Suggested Duration	Activity and Description
15 minutes	<ul style="list-style-type: none"> ● Learners will make a list and draw a list of land vehicles that they know. Try to organize these in terms of speed from fastest to slowest ● For example: <ul style="list-style-type: none"> - Train - Motorbike - Car - Bus - Bicycle
5 minutes	<ul style="list-style-type: none"> ● Learners will explore how vehicles move to go faster or slower on different surfaces. They will also explore the importance of round wheels to help land motion. ● Extension activity: learners can explore the concept of friction. Friction is the resistance of motion when one object rubs against another. Anytime two objects rub against each other, they cause friction. Friction works against the motion and acts in the opposite direction – it is what causes objects to slow down unless pushed. Any object that rubs against another object causes friction, for example even if you rub your hands together that causes friction.
15 minutes	<ul style="list-style-type: none"> ● Learners will design roads to reduce resistance or friction. ● Is it easier for the vehicle to move faster when the ground is bumpy or uneven?

- Learners will guess and test whether they think a tube or toy car can move faster on different surfaces and roads.

Surface	Guess / Hypothesis	Result / Experiment Evidence
Smooth wooden or tile floor	Fast – Low Resistance (Friction)	Fast – Low Resistance (Friction)
Sweater on a surface (bumpy or uneven surface)	Medium – Med Resistance (Friction)	Slow – High Resistance (Friction)
Cement floor	Fast – Low Resistance (Friction)	Medium – Resistance (Friction)
Carpet		
Grass		

- Learners will explore why they think some surfaces increase or decrease resistance and share answer with parents.

DAY 4

Today you will learn about the rules and regulations for transportation.

Suggested Duration	Activity and Description
20 minutes	<ul style="list-style-type: none"> • Land vehicles: Learners will explore all traffic rules. • As traffic police, they will make 5 relevant signs that help slow down land transportation to prevent accidents. • For example <ul style="list-style-type: none"> - Red, yellow and green light, stop sign, school zone sign, zebra crossing, speed limit sign.
20 minutes	<ul style="list-style-type: none"> • Learners will think about traffic in the water and people that will help in managing this. • Learners can make their own lighthouse to help boats navigate in the darkness

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- Lighthouse is a tall structure that can help boats find their way in the darkness with a light at the top.



- Learners can make this with empty toilet paper rolls, tubes and paper.

20 minutes

- Learners will pretend to be the air-traffic controller and help planes with when to take-off, land or where to fly to make sure that planes do not crash into each other.
- They will think of the shortest message they can send to pilots to make sure there are no issues.
- Literacy extension: Learners can write, or role play the key messages for any one or three of the scenarios below. Learners will need to think about the key messages to share and a clear and short way to communicate it. Options:
 - Someone booking a railway ticket on the phone (Key points: i) Origin and Destination - From where to where are they travelling; ii) Date and timing; iii) Name of the train; iv) Class of travel; v) Number of passengers)
 - A captain on a ship letting the ship crew know about a storm (Key points: i) Details on the storm – intensity of the storm; ii) What should the crew be doing; iii) What safety precautions can we take etc.)
 - An announcement from the pilot in the plane (Key points: i) Destination – where are they travelling; ii) Travel – how long is the flight and what will the weather be; iii) Safety procedures - seatbelt, walking in the plane etc.)

DAY 5

Today you will imagine and create their own vehicle that combines all the science principles that they have learnt.

Suggested Duration

Activity and Description

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20 minutes	<ul style="list-style-type: none"> ● Learners will imagine and create their own vehicle that combines all the science principles they have learnt until now: <ul style="list-style-type: none"> - Anti-gravity - Floating - Low resistance ● Learners will describe the features of this vehicle through drawings or writing. <ul style="list-style-type: none"> - How can we make sure that the vehicles stay in the air and not fall with gravity? - What will make the vehicle stay afloat in the water? - How can the vehicle face the least friction to move forward with the most speed and the least amount of effort?
10 minutes	<ul style="list-style-type: none"> ● Learners will think of the purpose of the vehicle ● For example: <ul style="list-style-type: none"> - To pick up sick people to go to the hospital - Pick up children to go to school
20 minutes	<ul style="list-style-type: none"> ● Learners will draw their vehicle and label it and show it their family. ● They will explain the relevant features to make it work best on land, water and air.

ASSESSMENT CRITERIA

- Creativity in the final vehicle designed, including the purpose
- Demonstration of understanding of core physics concepts
- Ability to design a plane that flies, the fastest land transportation and a boat that floats
- Clarity of road signs, lighthouse and ATC
- Learners hypothesis and guesses with reasons explaining the project phenomena

ADDITIONAL ENRICHMENT ACTIVITIES

- Create a journal of daily practices to be shared with friends.
- Lead daily workout sessions for the family
- Write down a suggested meal schedule for a week following the Healthy Plate model rations.

MODIFICATIONS TO SIMPLIFY

Learners can test the concepts of friction and sinking and floating by designing their own boat and testing the cars and then design their own vehicle.

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